



AeroAudio

WWW.AEROAUDIO.EU

FM TRANSMITTER

50 - 300 - 500 - 1000 - 1500 WATT



MANUAL



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1.1 GENERAL DESCRIPTION

The FM Radio Transmitter is a reference point for the global market of FM Transmitters.

The display board on the front panel can indicate and change frequency, forward and reflected power, amplifier temperature, modulation level, alarms level, emphasis, remote enable.

The rear panel contains XLR balanced inputs with input level controls, BNC for MPX output from internal stereo coder (*if option is present*), BNC for MPX input, 2xBNC for SCA operation. There are also two DB9 ports: one for wired external control and one for remote control (RS485).

As far as audio performances are concerned, only one word is needed: "transparent".

With a signal-to-noise ratio of 80dB, the whole dynamic of the modern digital audio sources are reproduced with high fidelity.

With a crosstalk of 60dB (with stereo option) there is no chance to "misunderstand" the source of the signals.

The RF output is via an N Female or 7/16" type connector.

The power amplifier is based by LDMOS devices. A fresh air tunnel through the transmitter keeps cool air running right through the heatsink. The amplifier is protected from damage by temperature control systems and antenna fault (SWR) monitoring. There is an added control on reflected power and heatsink temperature, that is foldback thresholds that permits to stay on air at a reduced output power even if conditions are not optimal.

The switching-type power supply automatically adapts itself to any input voltage from 90 to 260V.

1.2 MAIN FEATURES

- Availability of 50 to 1500W. Ethernet / Stereo / Ethernet + Stereo
- 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.
- RS485 connection for remote control.
- Automatic output power level control.
- Control of all the functions via 2Rx16C display.
- All the final stages with LDMOS technology.



1.3 TECHNICAL CHARACTERISTICS

RF SECTION	
Frequency Range	87.5 - 108MHz
Reference Stability	±2.5ppm (0° - 50°C)
Output Power	50W, 300W, 500W, 1000W
Power Level	0 – 100% (from front panel)
RF Output Connector / Impedance	N (AEROTX50) 7/16" (AEROTX300, AEROTX500, AEROTX1000)
RF Output Impedance	50Ω
RF Monitor Connector / Level	BNC (*) / -48dBc ±1dB
Off lock Attenuation	> 60dB
Asynchronous AM S/N Ratio	> 65dB
Synchronous AM S/N Ratio	> 60dB
Spurious and Harmonics Suppression	Meets or exceeds all FCC and ETSI requirements
Modulation Capability	Meets or exceeds all FCC and ETSI requirements
MPX OPERATION SECTION	
Audio Input Connector / Impedance	BNC 10kΩ unbalanced
Audio Input Level	2.2Vpp nominal / -6dB/+12dB adjustable from rear panel
Frequency Amplitude Response	±0.2dB 30Hz - 100kHz
THD (Total Harmonic Distortion)	< 0.1% 30-100kHz (< 0.05% 30-53kHz)
S/N Ratio with CCIR unweighted	Better than 73dB
S/N Ratio with CCIR weighted	Better than 73dB
MONO OPERATION SECTION	
Audio Input Connector / Impedance	XLR / Balanced 600Ω / 10kΩ (jumper)
Audio Input Level	2.2Vpp nominal / -6dB/+12dB adjustable from rear panel
Frequency Amplitude Response	±0.5dB 30Hz - 15kHz
T.H.D. (Total Harmonic Distortion)	< 0.05% 30Hz - 15kHz
Pre-emphasis	Flat, 50μs, 75μs (ON / OFF from display, 50 / 75 from jumper)
S/N Ratio with CCIR unweighted filter	Better than 73dB
S/N Ratio with CCIR weighted filter	Better than 73dB
INTERNAL CODER OPERATION (Option)	
Audio Input Connector / Impedance	XLR / Balanced 600Ω / 10kΩ (jumper)
Audio Input Level	2.2Vpp nominal / -6dB / +12dB adjustable from rear panel
MPX Output Connector / Impedance	BNC / 50Ω
MPX Output Level	5.6Vpp
Frequency Amplitude Response	±0.5dB 30Hz - 15kHz
THD (Total 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 unweighted filter	Better than 70dB



AEROTX FM TRANSMITTERS

S/N Ratio with CCIR weighted filter	Better than 70dB
SCA OPERATION (2 Inputs)	
SCA Input Connector / Impedance	BNC / 10kΩ unbalanced
Audio Input Level	2Vpp nominal for ±7.5kHz deviation
Frequency Amplitude Response	±0.2dB 50k - 100kHz
OUTPUT SIGNAL	
RF Monitor Level / Connector	-60dBc / BNC 50Ω
MPX Analogue Output / Connector	0dBu from internal stereo coder / BNC 50Ω
Pilot Carrier Output	1Vpp digitally synthesized
PROTECTION THRESHOLDS (AEROTX50)	
Forward Power	55W (AEROTX50) 330W (AEROTX300) 550W (AEROTX500) 1100W (AEROTX1000)
Reflected Power	55W (AEROTX50) 30W, 25W with foldback (AEROTX300) 50W, 40W with foldback (AEROTX500) 100W (AEROTX1000)
I _{DC}	0.0A – 15.0A max (AEROTX50) 0.0A – 14.0A max (AEROTX300) 0.0A – 15.5A max (AEROTX500) 0.0A – 16.5A max
V _{DC}	12.0V – 54.0V max (AEROTX300) 25.0V – 55.0V max (AEROTX500) 25.0V – 54.0V max (AEROTX1000)
Temperature	75°C with reset at 70°C (AEROTX50) 75°C with reset at 70°C (65°C with foldback)
GENERAL	
Power Supply Socket	90 – 260VAC* ±15%, 50/60Hz ±4%
Power Consumption	130VA (AEROTX50) 450VA (AEROTX300) 700VA (AEROTX500) 1.45kVA (AEROTX1000)
Front Panel User Interface	LCD Display + Keyboard
Remote Control	SNMP / Web Server (<i>option</i>)
Telemeasures	RS485 / DB9 Connector
USB Port	USB-B Connector
Cabinet	Rack 19"-1U (AEROTX50) Rack 19"-2U
Weight	4kg (AEROTX50) 10kg (AEROTX300, AEROTX500) 12kg (AEROTX1000)
Ambient Temperature	-5° to +50°C
Relative Humidity	95% non-condensing
Altitude	2000m
Screw, nuts and mechanical parts standard	Metric



Note:

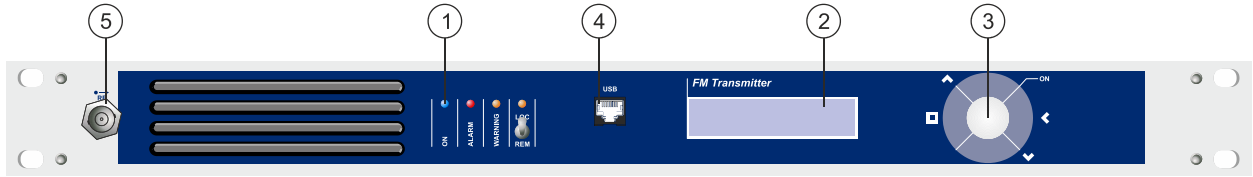
Specifications and characteristics are subject to change without notice

Warning! The RF Monitor connector (if present) must only be used for quality measures, it must not be used for verification of amplitude and presence of spurious

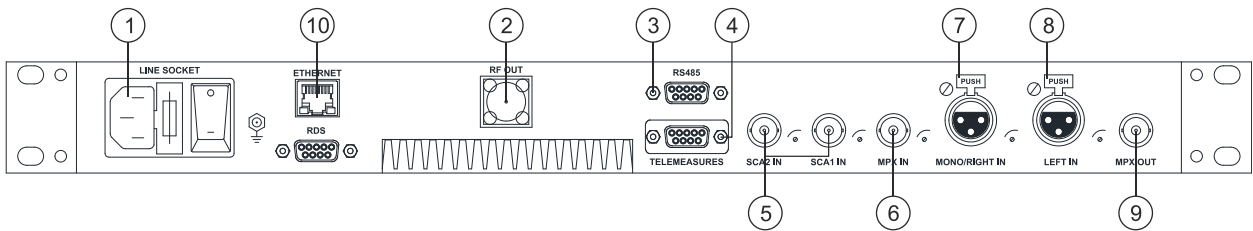
****The supply voltage (110 - 220VAC) can be selected using a screwdriver on the switch located on the right-hand side of the apparatus when viewed frontally***



1.4 AEROTX50 FRONT AND REAR PANEL



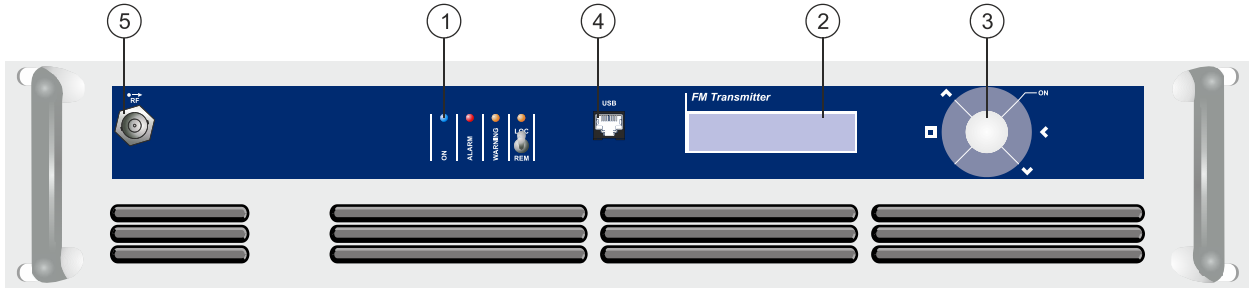
1	Status LEDs
2	Graphic LCD Display
3	Keys
4	USB Port
5	RF Monitor



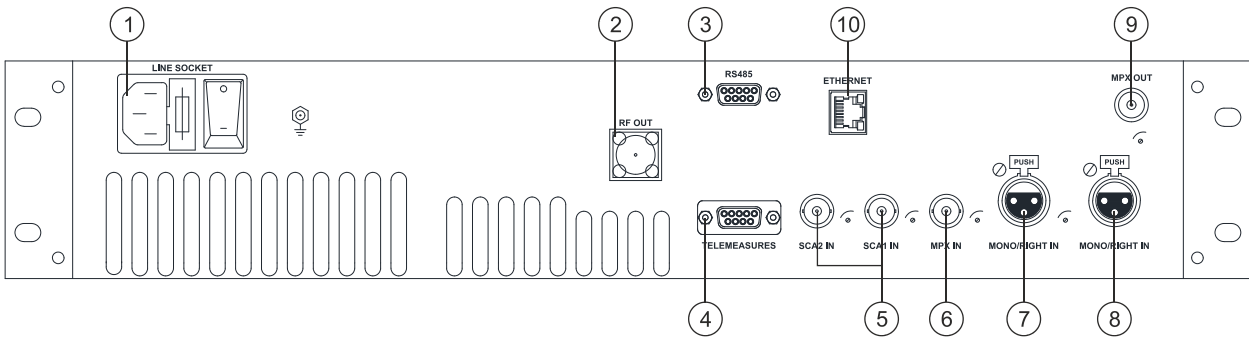
1	Line Socket with Main Switch
2	RF OUT
3	RS485 Port
4	TELEMESURES Port
5	SCA IN 1 / SCA IN 2 Connectors
6	MPX IN Connector
7	MONO/RIGHT IN Connector
8	LEFT IN Connector
9	MPX OUT Connector
10	ETHERNET Port (<i>Optional</i>)



1.5 AEROTX300 / AEROTX500 FRONT AND REAR PANEL



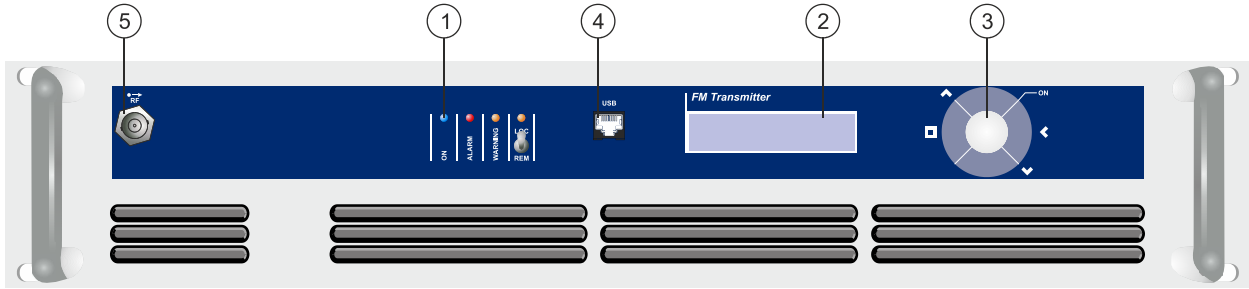
1	Status LEDs
2	Graphic LCD Display
3	Keys
4	USB Port
5	RF Monitor



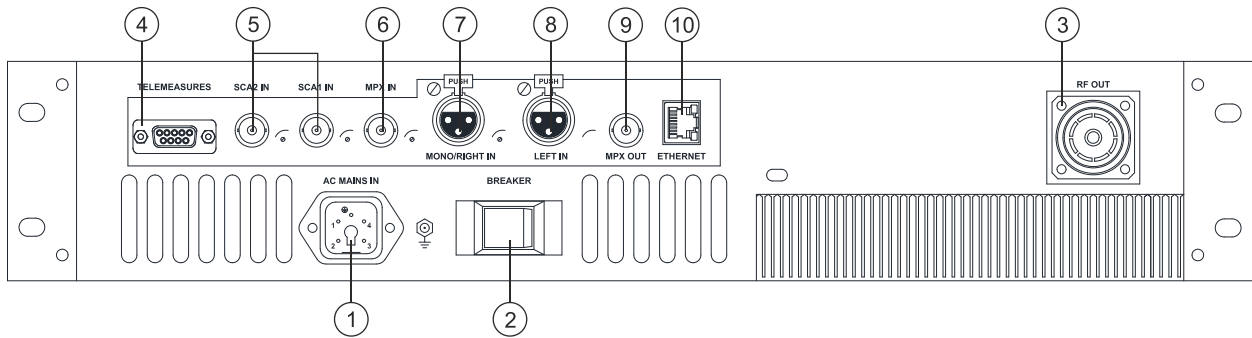
1	Line Socket with Main Switch
2	RF OUT
3	RS485 Port
4	TELEMEASURES Port
5	SCA IN 1 / SCA IN 2 Connectors
6	MPX IN Connector
7	MONO/RIGHT IN Connector
8	LEFT IN Connector
9	MPX OUT Connector
10	ETHERNET Port (<i>Optional</i>)



1.6 AEROTX1000 FRONT AND REAR PANEL



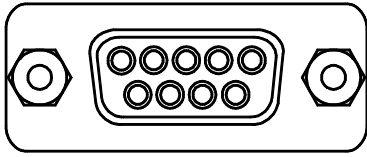
1	Status LEDs
2	Graphic LCD Display
3	Keys
4	USB Port
5	RF Monitor



1	Line Socket with Main Switch
2	Circuit Breaker
3	RF OUT
4	TELEMEASURES Port
5	SCA IN 1 / SCA IN 2 Connectors
6	MPX IN Connector
7	MONO/RIGHT IN Connector
8	LEFT IN Connector
9	MPX OUT Connector
10	ETHERNET Port (<i>Optional</i>)

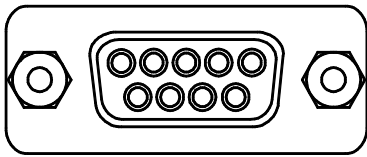


- Connectors description



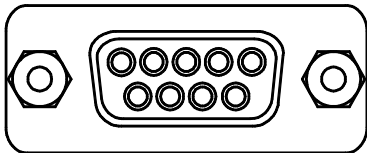
RS485

- Pin1: Not Used
- Pin 2: RX-
- Pin 3: RX+
- Pin 4: +5Vdc
- Pin 5: GND
- Pin 6: Not Used
- Pin 7: TX-
- Pin 8: TX+
- Pin 9: Not Used



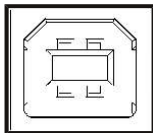
TELEMEASURES

- Pin 1: Temp
- Pin 2: REF Power
- Pin 3: FWD Power
- Pin 4: Alarm
- Pin 5: ON/OFF
- Pin 6: GND
- Pin 7: GND
- Pin 8: GND
- Pin 9: GND



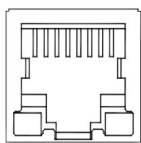
RDS

- Pin 1: Not Used
- Pin 2: RX-
- Pin 3: RX+
- Pin 4: +5Vdc
- Pin 5: GND
- Pin 6: Not Used
- Pin 7: TX-
- Pin 8: TX+
- Pin 9: Not Used



USB-B

- Pin 1: +5Vdc
- Pin 2: DATA-
- Pin 3: DATA+
- Pin 4: GND



ETHERNET

- Pin 1: +5Vdc
- Pin 2: DATA-
- Pin 3: DATA+
- Pin 4: GND



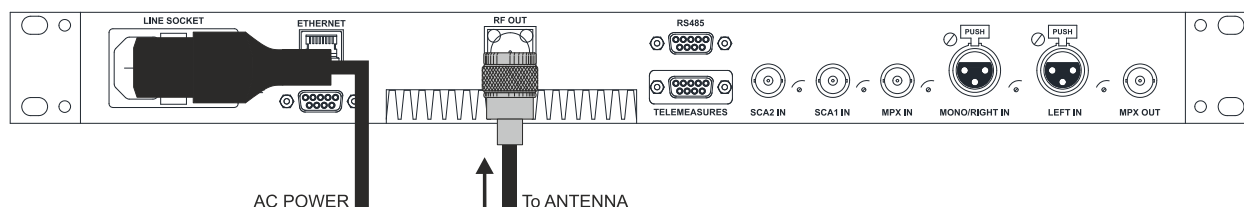
2 – INSTALLATION

2.1 OPERATING ENVIRONMENT

You can install the equipment 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.

2.2 FIRST INSTALLATION

Correct installation of the equipment is important for maximum performance and reliability. Antenna and earth connections must be installed with the greatest care. The equipment adjustment isn't required, because the unit is completely adjusted by our technical staff.



1. Connect power supply cables of the Amplifier and the Exciter to the electric network.
2. Connect the Antenna cable to RF OUT connector of the Amplifier.

Note: the draw is only indicative

2.3 FIRST START-UP

After double checking the connections (carefully read the previous paragraph), you are ready to switch on the amplifier arming the breaker on the rear panel. In order to safely put the overall transmitter (amplifier and exciter) in a normal working mode, follow the steps described below.

1. Switch on the Transmitter from the Mains Switch on the back, leaving it in stand-by mode (the LED ON on front panel button has to be switched off).
2. Set the working frequency on the Transmitter in MODULATION section of the Menu.
3. Set in POWER CONTROL section the operation mode: AUTOMATIC.
4. Verify that the output power set is 0W.
5. Switch-on the Exciter pressing for 3 seconds the front panel blue button (the blue LED ON has to switch on).
6. Set the output power at 10% of the nominal one (for example 5W if is a 50W Exciter) with the AUTO LEVEL command.
7. Verify the absence of reflected power (it would mean that the RF output cable, the antenna and/or the combiner is not well made).
8. Set the nominal power and confirm (when output power is increasing the blue LED ON has to blink).

In MANUAL mode the indication near the MANUAL LEVEL is not expressed in watts, but it is expressed in "points" from 0 to 255.



3 – OPERATION

3.1 LOCAL CONTROL

A large number of options of the transmitter can be easily and intuitively controlled through the human machine interface on the front panel. This is composed by a graphic display, five buttons and four LEDs.

3.1.1 LEDs

At the left side of the display, four status LEDs allow to gather informations concerning the general status of the system without having to look at the display. Also the ON push-button on the right-hand side can be illuminated. Their meaning is explained in the table below.

LED	COLOUR	DESCRIPTION
ON	Blue	The button is illuminated when the RF amplifier stage and the high power supplies are enabled. It blinks during initialization if the amplifier is going to enable the RF power
ALARM	Red	This LED lits when an alarm condition is actually present
WARNING	Yellow	This LED lits when an warning condition is actually present
LOCAL	Yellow	The LED lits when the local control is enabled

3.2 INITIALIZATION

Just after giving power, a screen showing the type and version of the transmitter appears on the display. During this period, the controller checks the good communication among internal parts of the equipment, keeping the RF amplifier stage and the high power supplies off.

If the electricity had been cut while the transmitter was on (for example, caused by a black-out), the same state is restored at the next powering on. During the initialization period, if the transmitter is going to switch on the high power supplies and RF amplifier stage, the ON illuminated push-button on the right and the message "Powering up" on the display blink. The operator can stop the powering up pressing the ON button, putting the transmitter in standby.

3.3 POWERING ON AND OFF

The transmitter stores all the settings and status in a non-volatile memory and restores them after main power is applied. In this way, the transmitter automatically enable or keep the high power supplies and the RF amplifier stage disabled as in the last time the main power was cut.

If the transmitter is in standby and you want to power it on, press the ON button for at least 5 seconds. The button will lit to show that the RF amplifier stage is enabled. After some seconds, the Exciter power socket on the back panel is powered. While the transmitter is on, press the ON button to switch off the high power supplies and RF amplifier stage, putting the transmitter in stand-by mode. The light of the ON button is switched-off.



3.4 MENU MANAGEMENT

After the initialization, the main screen appears on the display.

It is composed by two parts. On the left, the forward and reflected power measures. On the right the audio meter bars. The user can read or modify locally the configuration parameters using the five buttons on the front panel. All the parameters are organized in a hierarchical menu and the user may move between them in a simple and intuitive way. To enter the main menu, press the RET button.

3.5 COMPOSITION OF MENU

Each menu is composed by a single item. By pressing UP/DOWN buttons, the menu is scrolled up/down and the selected item is changed.

There are 3 types of items in a menu, characterized by a different suffix appended to the item name:

- submenus, with leading dots (...);
- read/write parameters, with a modify symbol (←) appended;
- read-only parameters, without any suffix.

In case of failure, the value of the failed parameter (read/write or read-only) blinks to show the malfunction, until the alarm condition disappears.

Submenu

A submenu item is indicated only by the name of the submenu and the leading dots. Press the RET button on a submenu to show the child menu, browsing the tree-like menu from the top to the bottom. As before, this new (sub)menu is composed by a single items that can be other submenu or parameter. To go back to the previous (parent) menu, press the ESC button. If the menu showed is the main menu, press the ESC button to go back to the main screen.

Read/write parameters

The row of a read/write parameter is composed by two lines: the top line contains the name of the parameter (with suffix ←), the bottom line contains its value or an "action symbol".

By pressing RET on a read/write parameter, the associated value starts blinking, meaning that it is possible to change it by pressing buttons. Some parameters can be changed continuously in a range (e. g., the power level); press the UP (DOWN) button to increase (decrease) the value. For other parameters, the value can be chosen from a short list (e. g., the emphasis); press the UP (DOWN) button to scroll up (down) the list. For some other complex parameters, like the frequency or the date, the user can change a token at a time (a digit of the frequency, a field of the date) by pressing UP/DOWN buttons, moving to the next token by pressing RET.

Usually, until now, no real change of the parameter took place (there are some exceptions, well described later). It is necessary to accept the new value by pressing the RET button again. At any time, it is possible to press the ESC button to cancel the changes. There are some "special" read/write parameters that represent only an action to make (e. g., Clear Log). Their value is shown with the symbol >|. By pressing the RET button, a confirmation question appears with NO answer as proposal. Change to YES and press RET in order to perform the associated action (e. g., clearing the log content). It should be noticed that, if the remote control is enabled, a read/write parameter could become a read-only parameter until the remote control is disabled.



Read-only parameters

The row of a read-only parameter is composed by two lines: the top line contains the name of the parameter the bottom line contains its value. The user can read this value, but not modify it. No action is associated to RET and ESC buttons when a read-only parameter is selected.

3.6 PARAMETERS AND MENUS DESCRIPTION

This paragraph contains a detailed description of all the menus and parameters. Please be sure to read this section very carefully before changing any setting of the amplifier. Check the menu map for a general overview of the parameters.

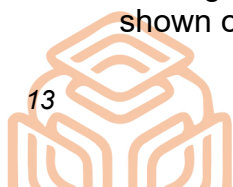
The menus and parameters arrangement is subject to change, mostly with the firmware version. Your arrangement could be slightly different than the one described in this manual. For any questions, contact the Customer Service.

3.7 MAIN MENU

Inputs...

Press RET to enter the menu related to input signals (audio and reference).

- **Emphasis (ON, OFF)**
The transmitter supports emphasis: choose OFF for no emphasis, ON for emphasis enabling.
- **Coder (ON, OFF)**
In case of coder present choose ON for stereo coder transmission, OFF for Mono transmission.
- **SquelchTime (0s – 240s)**
Clicking on the keyboard, after selecting this voice, goes into the menu that allows to choose the squelch time. This is the time of wait without input signal after, which the AEROTX mute the power amplifier. This time can be chosen a steps of 5 seconds and can also be disabled, in this case the AEROTX never mutes the power amplifier with or without the input signal. Push the buttons up and down to select the desired value and click for confirm.
- **Squelch (ON, OFF)**
This option enables or disables the Squelch's command on the AEROTX.
- **L.....||| / R.....||| (only stereo model)**
Left and Right bars appears only with stereo transmission (stereo coder present and ON) as indication of actual input levels of Left and Right Signals.
- **Left Measure**
The left signal is measured and converted to Vpp (peak-to-peak). This value is shown on this parameter and used to draw the left meters.
- **Right Measure**
The right signal is measured and converted to Vpp (peak-to-peak). This value is shown on this parameter and used to draw the right meters.



Reference...

Press RET to enter the menu with parameters related to reference.

- **PLL (Locked, Unlocked)**

This is the status of an internal PLL. It should be always Locked, otherwise an alarm will be raised and the RF output will be muted.

Modulation...

Press RET to enter the menu related to the FM modulation.

- **Mute Status (Mute, No Mute)**

This option shows the work's status of the AEROTX transmitter.

- **FREQUENCY (88.00-108.00MHz)**

This is the output signal frequency. With this parameter, the frequency can be set by 10kHz steps.

- **DEVIATION**

This is the current deviation in kHz and its meter bar.

Ambient Temp

This is the ambient temperature measured in the display board.

PwrAmplifiers...

Press RET to enter the menu related to the power amplifier.

- **PA1 V/I**

For each power amplifier (pallet), the supply voltage and current drawn is shown. The number of items in this menu depends on the type of amplifier.

- **Amplifier Temp**

This is the heat sink temperature of the power amplifier.

PowerControl...

Press RET to enter the menu related to the power control.

- **PwrControl Mode (Automatic, Manual)**

This parameter sets the power control mode: Automatic or Manual. When the mode is changed, the relevant level is automatically zeroed.

- **Auto Level**

This is the desired output power level. In automatic power control mode, the ALC will take care to maintain this level stable over time, even with temperature fluctuations or devices aging.

- **Manual Level**

This parameter changes the output power in manual power control mode. Its value is a number in the range 0-1023. Increasing this value will increase the output power.

The relation between this number and the power is not mathematically known and is generally non-linear. Moreover, the output power isn't maintained stable



(the ALC is disabled), so it'll change with temperature fluctuations and devices aging.

- **ALC Status**

In automatic power control mode, this shows the status of ALC. It is Locked when the desired power is currently reached. Other values are:

- Disabled: in manual power control mode
- Ramp up: just after the switching on of the amplifier
- Stopped: when the amplifier is OFF or the RF input is absent
- Unlocked: when the desired power couldn't be reached
- Pull up: when the ALC is increasing the power level
- Pull down: when the ALC is decreasing the power level
- Max limit: when the ALC reached the maximum correction
- Muted: when the desired power set is 0W

PwrProgramm...

Press RET to enter Power Programming menu.

- **PwrProgramming (Enabled, Disabled)**

The Power Programming feature can be globally enabled and disabled through this parameter.

- **Event (1...15)**

This is the first event of the Power Programming configuration. The first field (Mon) is the day of the week, the second (06:00) is the time and the third (-3.0dB) is the output power level associated to the event (MUTE to mute the amplifier).

Press RET button to edit the event, field by field. After changing, the list of events will be automatically sorted, so the event just modified could move to another position.

Use the last parameter in this menu (Clear Event) to delete a single or all the events.

If the Event is not programmed the <EMPTY> label will be shown.

- **Clear Event**

This parameter is used to delete one or all events in the list. Press RET to choose the event number or "All" for the entire list.

Temp Foldback Thres.

This parameter sets the temperature foldback thresholds.

RFL Foldback Thres.

This parameter sets the reflected foldback thresholds.

LockOut Counter

This counter counts a prefixed number of alarm's events; when it reach the number of alarms equal to the value setted, the transmitter goes in lock status.

Log...

Press RET to enter the menu with parameters related to the Log.



View Log...

Press RET button to read the full Log with alarm and events.

View AlmHist...

Press RET button to read the Log of Alarms only.

- **Clear Log**

This parameter let you erase the entire content of Log and Alarms history.

Working Timer...

Press RET to enter the menu with parameters related to the working timer.

- **Working Timer**

This read-only parameter shows the working timer. This timer increments each second while the RF amplifier stage is enabled (at least one high power supply is on).

- **Reset Timer**

This parameter let you reset the working timer.

AlmThresholds...

Press RET to enter the menu with parameters related to the alarms threshold.

- **Fwd Max Alarm**

This parameter shows the maximum output power alarm threshold.

- **Fwd Min Alarm**

This parameter shows the minimum output power alarm threshold.

- **Rfl Max Alarm**

This parameter shows the maximum reflected power alarm threshold.

- **I Max Alarm**

This parameter shows the maximum current sinked by a single pallet alarm threshold.

- **I Min Alarm**

This parameter shows the minimum current sinked by a single pallet alarm threshold.

- **I Unb. Alarm**

This parameter shows the unbalance alarm threshold.

- **Temp. Alarm**

This parameter shows the maximum heat sink temperature alarm threshold.

- **V Max Alarm**

This parameter shows the maximum voltage alarm threshold.

- **V Min Alarm**

This parameter shows the minimum voltage alarm threshold.



WrnThresholds

Press RET to enter the menu with parameters related to the warnings.

- **Warnings (Enabled, Disabled)**
Differently than alarms, all the warnings can be disabled at the same time, changing this parameter to Disabled.
- **Fwd Max Warning**
This parameter shows the maximum forward power warning threshold.
- **Fwd Min Warning**
This parameter shows the minimum forward power warning threshold.
- **Rfl Max Warning**
This parameter shows the maximum reflected power warning threshold.
- **I Max Warning**
This parameter shows the maximum current sinked by a single pallet warning threshold.
- **I Min Warning**
This parameter shows the minimum current sinked by a single pallet warning threshold.
- **Temp Max Warning**
This parameter shows the maximum temperature warning threshold.
- **V Max Warning**
This parameter shows the maximum voltage warning threshold.
- **V Min Warning**
This parameter shows the minimum voltage warning threshold.

Settings...

Press RET to enter general settings menu.

- **Password (Disabled, *.*.*.*)**
A password can be enabled to prevent unauthorized people changing transmitter settings through local control (menus on the display). The password is disabled by default.
Press RET to enter a new password. It is composed by 5 numerical digits (0-9). If the local control is password locked, the sequence *.*.*.* appears on this menu. All the parameters in the menus are read-only, except this one that can be used to unlock the password. Even the ON/OFF button on the front panel is disabled. To unlock the menus, press RET and re-enter the same password.
WARNING: be careful to enable a new password, because the transmitter isn't usable if the password is forgotten.
- **Address (1-8)**
In a dual-drive, 1+1 or N+1 system, a unique address is assigned to each driver and/or amplifier.



This parameter shows and set this address. In a single-driver single-transmitter, choose the address 1.

- **Remote switch (Enabled, Disabled)**

With this menu you have the possibility to enable / disable the 'Remote' lever switch on the front panel.

Remote (Enabled, Disabled)

Local / remote control mode (this option is visible if the 'Remote' lever switch is disabled).

- **Interlock (Enabled, Disabled)**

This voice can be enabled or disabled, and allows the switch-on of the transmitter by an external command.

- **TLC (Stationary, Impulsive)**

This voice shows the TLC's type mode: impulsive or stationary.

- **Date**

This parameter is the actual date, used for time stamping events in the log and alarms history.

- **Time**

This parameter is the actual time, used for time stamping events in the log and alarms history.

Display...

Press RET to enter the Display submenu.

- **Backlight**

The display backlight intensity can be read and changed with this parameter.

- **Contrast**

The display contrast level can be read and changed with this parameter.

- **Screensaver**

This parameter sets the inactivity period (in seconds) after that the display backlight is decreased to a minimum level in order to extend display lifetime. Set the screensaver to 0s to disable this feature.

- **IP Config...**

With this parameter it is possible to configure the IP address:

- IP Address
- IP Netmask
- IP Gateway
- Primary DNS
- Secondary DNS
- Web Port
- IP Mode (Manual / Automatic)



- DNS Mode
- Save Net conf. (to confirm the parameters, the configured IP configuration must be saved)

Language (English, Italian)

This parameter set the language used on the display interface.

Reset IP Config.

Activate this menu item to reset the IP configuration to default values. Refer to the Ethernet Guide paragraph for additional details.

Info...

Press RET to enter info menu.

- **Model**
This read-only parameter shows the model version.
- **Control Release**
This is the firmware release of the control system. Please, report this and all the other release numbers to the technical support, if needed.
- **Hw Release**
This is the hardware release of the transmitter. Please, report this and all the other release numbers to the technical support, if needed.
- **Serial Number**
This read-only parameter shows the serial number of the amplifier as written on the label on the back panel.

Inst. Option...

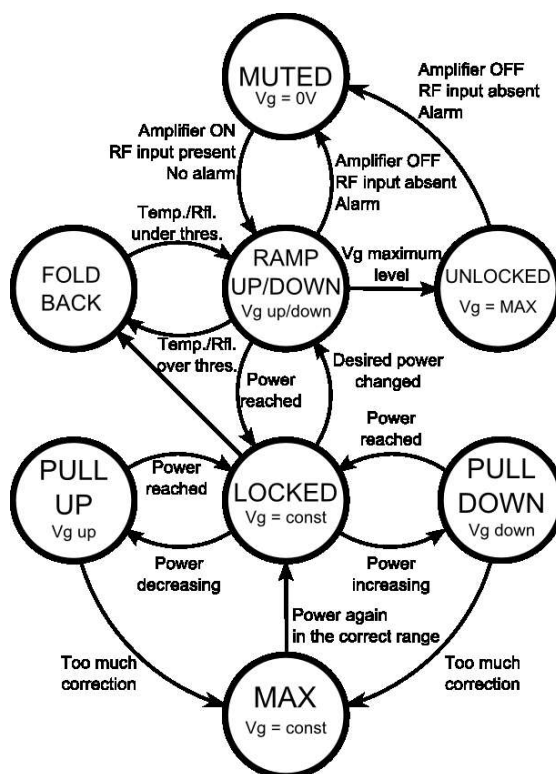
- **Coder (Present, Absent)**
If a valid stereo coder board is detected, it appears as Present on this parameter. Otherwise Absent is shown.
- **Web Installed (Present, Absent)**
The voice 'Present' is shown when in equipment is mounted the web server control board. If not mounted the voice is 'Absent'.

3.8 ALC: AUTOMATIC LEVEL CONTROL

There are two power control mode available: manual and automatic. In manual mode, it is possible to change the output power indirectly through the output voltage V_g from power supply units that is maintained fixed over time. This is a typical open-loop control system where the output power usually changes with temperature fluctuations and devices aging. The user changes the voltage level V_g from power supply units through a number value in the range 0..255 steps (see the Power Control menu).

In automatic mode, the control logic implements a closed-loop ALC algorithm. The user set a desired output power and the ALC maintains it stable, changing automatically the output voltage from power supply units.





The actual output power level is monitored and compared with the desired power set through local or remote control. If it is higher or lower than the desired power, the output voltage from power supply units is automatically decreased or increased. ALC algorithm is a complex piece of software (as usual with closed-loop control), because it should avoid instability (output power oscillations), over-driving the power amplifier and fast response when the desired power is changed. The user should have a general understanding of the ALC principles in order to face all the conditions that may happen. The ALC can be described in a simple way, considering it a finite-state machine and looking at its graph.

The start state is named MUTED where the voltage V_g (output voltage from PSUs) is zeroed. The algorithm is in this state in three cases:

1. the amplifier is OFF
2. the RF input signal is absent or has a too low level
3. there is one or more protective alarms

From MUTED state the algorithm goes in RAMP UP/DOWN state when the above conditions are all false. In this state, the voltage V_g is fastly increased to reach the desired value. If the V_g is increased up to its upper limit but the desired output power has not been reached, the algorithm goes and remains in UNLOCKED state, that is a serious malfunction of the amplifier. In normal conditions, the desired output power is reached during RAMP UP/DOWN state and the algorithm goes in LOCKED state, where it indefinitely remains if the output power remains stable. If the output power decreases or increases (for any reasons such as the temperature fluctuations or devices aging), the algorithm goes in PULL UP or PULL DOWN state, where the voltage V_g is increased or decreased until the output power is restored to the desired value. If the increase or decrease of voltage V_g is too high, the algorithm safely goes in MAX state and stop increasing or decreasing the voltage. Also this condition manifests a malfunction in the amplifier. The user could set two foldback thresholds in the Power Control menu, one for temperature and one for reflected power (when they are zero, the associated foldback functionality is disabled). If the temperature exceeds the foldback threshold T_{fbh} ,



the ALC algorithm decreases immediately the output power and goes in T FOLDBACK state. Every 5 minutes, the temperature is compared with T_{fbh} : if it is always greater, the output power is decreased again. If it is lower than the second threshold $T_{fbl} = T_{fbh} - 5^{\circ}\text{C}$, ALC algorithm exits T FOLDBACK and goes back to RAMP UP state, reaching again the desired output power level. If it is in the hysteresis range $T_{fbl} \dots T_{fbh}$, the output power stays at the decreased level reached. In this way, the amplifier can stay on-air at a reduced output power level, if the ambient temperature is too high to emit the full power in antenna. A similar behaviour is associated to reflected foldback. The only difference with temperature foldback is that the compare between the reflected power and the thresholds is performed continuously (and not every 5 minutes). If a low matching antenna system is connected, the amplifier can stay on air at a low power. Keep in mind that it is always possible to go back in MUTED state from whatever state, when the amplifier is switched off (through local or remote control), the RF input signal is absent or any protective alarm appears. For a better readability, the graph above doesn't show these state transitions.

3.9 POWER PROGRAMMING

Normally the amplifier is configured in automatic power control mode, so the output power level is set by the user (usually at the nominal level) and kept stable during time by the internal logic system.

Power Programming gives the user the possibility to program up to 15 events in a week. For each event an output power level is associated. When the Power Programming is enabled, the internal logic system automatically change the output power level associated to the current time.

Through the menus or the remote control, the Power Programming table can be modified, adding, editing or deleting single event. For each event the user specify the day of the week (Mon-Sun), the time (hours and minutes) and the power reduction. Even MUTE can be set as the output power in order to completely mute the amplifier in a certain time interval.

For example, with the following Power Programming configuration, the amplifier will emit the nominal power during the entire week, but in the night (00:00 - 07:00) will emit -6dB (Nominal Power/4).

EVENT N.	DAY	TIME	POWER
1	Mon	00:00	-6dB
2	Mon	07:00	0dB
3	Tue	00:00	-6dB
4	Tue	07:00	0dB
5	Wed	00:00	-6dB
6	Wed	07:00	0dB
7	Thu	00:00	-6dB
8	Thu	07:00	0dB
9	Fri	00:00	-6dB
10	Fri	07:00	0dB
11	Sat	00:00	-6dB
12	Sat	07:00	0dB
13	Sun	00:00	-6dB
14	Sun	07:00	0dB



3.10 ALARMS

The amplifier is a complex piece of equipment composed by several valuable parts. In order to protect them and for security reasons during critical conditions, or just to inform the user about a fault, all the important parameters are continuously acquired by the control system. Depending on their values, some actions can be automatically taken by the controller system.

The user should carefully understand these behaviours to promptly face these conditions and reduce the off-time period. Some seconds after powering up (pressing the ON button), the control system checks that all the parameters are lower than a maximum alarm threshold.

If one or more of them are higher, a protection action takes place, depending on the parameter that caused the alarm. If one RF powers (output, input and reflected) or temperature is over the thresholds, the RF amplifier stage is immediately disabled (pulling down the gates of the pallets) and the high power supplies are immediately switched-off. Also the EXCITER power socket on the back panel is disabled.

If a parameter related to a pallet (voltage or current) is higher than the threshold, only the high power supplies that feed the fault pallet are switched-off. In this way, the amplifier continues working even at a lower output power level. After some seconds the alarm occurs, the protection action is reversed, so the high power supplies switched-off are switched-on again.

After 5 times an alarm occurs, the protection action is not reversed and the high power supplies switched-off remain off. To unlock this condition, you need to switch-off the amplifier pressing the ON button.

Supply voltages are also monitored for a minimum value. If the supply voltage of a pallet is lower than minimum threshold, an alarm is triggered, but no action takes place. In this way, a broken fuse can be immediately noticed.

All the alarm thresholds are carefully set during manufacturing and testing phases, so the user doesn't need to modify them.

3.11 WARNINGS

Together with alarms, the control system checks also for warnings. Beyond alarm, there are warning thresholds that are usually lower than alarm thresholds. Warnings are usually used for receiving alert information (for example, by remote control), before the amplifier is partially or totally switched-off. If a warning condition occurs, no action is automatically taken by the control system, apart from switching on the WARNING LED.

Differently from alarms thresholds, warnings thresholds can be customized. Also, the user has the possibility to globally disable the warnings check.

3.12 LOG AND ALARMS HISTORY

The log is a detailed list of events (for example, switching on and off), alarms and warnings stored in a non-volatile memory that can be read by the user on the display or by remote control. Each event has a timestamp and a short description about it. After a fault condition, the user can read the log to acquire information about the sequence of events, alarms and warnings conditions to better understand what happened. The alarms history is a shrunk version of the log filled only with alarms conditions.

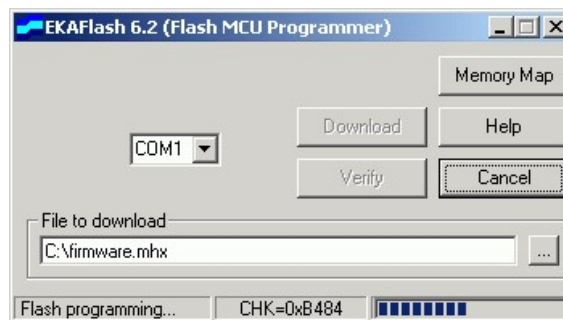


3.13 FIRMWARE UPGRADE

The control system firmware of the device can be upgraded to later versions without removing the equipment from the rack or replacing any chip. You only need a Windows PC with a USB port and a USB cable.

Carefully follow the steps below to upgrade to a new firmware.

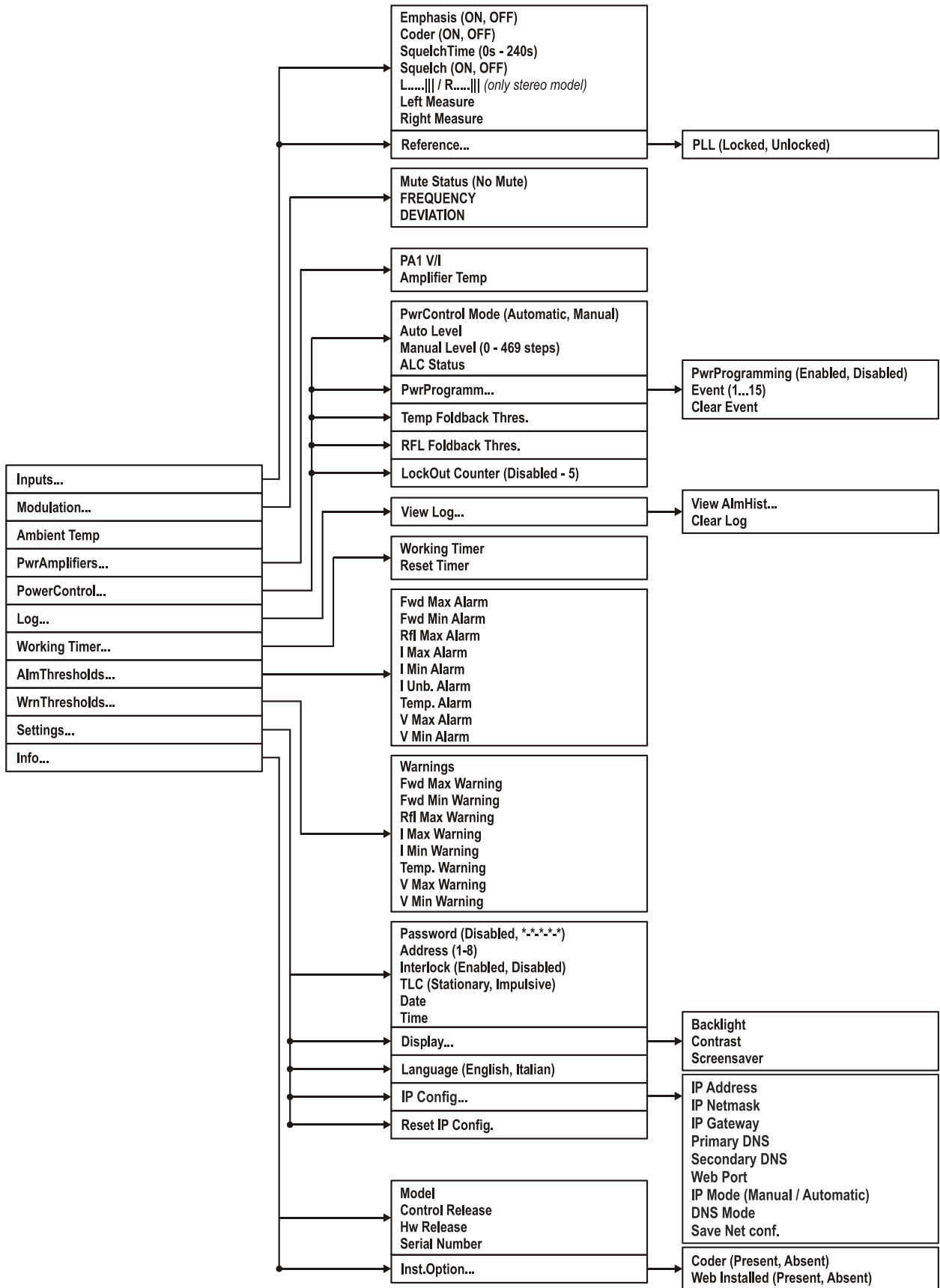
- Obtain EKAFlash software that must be installed on the PC. You can download EKAFlash from the web site. Install EKAFlash on the PC you want to use during the upgrade.
- Connect a USB cable between the computer and the USB port on the back panel of the device. Just after the connection, Windows should automatically detect the device and ask for the driver to install, if it is the first time. You can find the correct driver on the CD supplied with the equipment or on web site. The driver creates a virtual serial COM port, assigning it a number. Check the Device Manager window to know the COM number.
- Run EKAFlash, select the USB virtual serial port, choose the firmware file (usually with .mhx extension) by pressing the "..." button and click on the Download button
- Switch off the device and switch it on again. The upgrade of the firmware begins on the EKAFlash window. The figure below shows the firmware upgrade process
- After upgrading, the equipment will automatically start with the new firmware.



Warning! Keep in mind that the firmware upgrade is a critical task. You could have a non-working machine if the upgrading process doesn't end with success or if you download a wrong firmware.



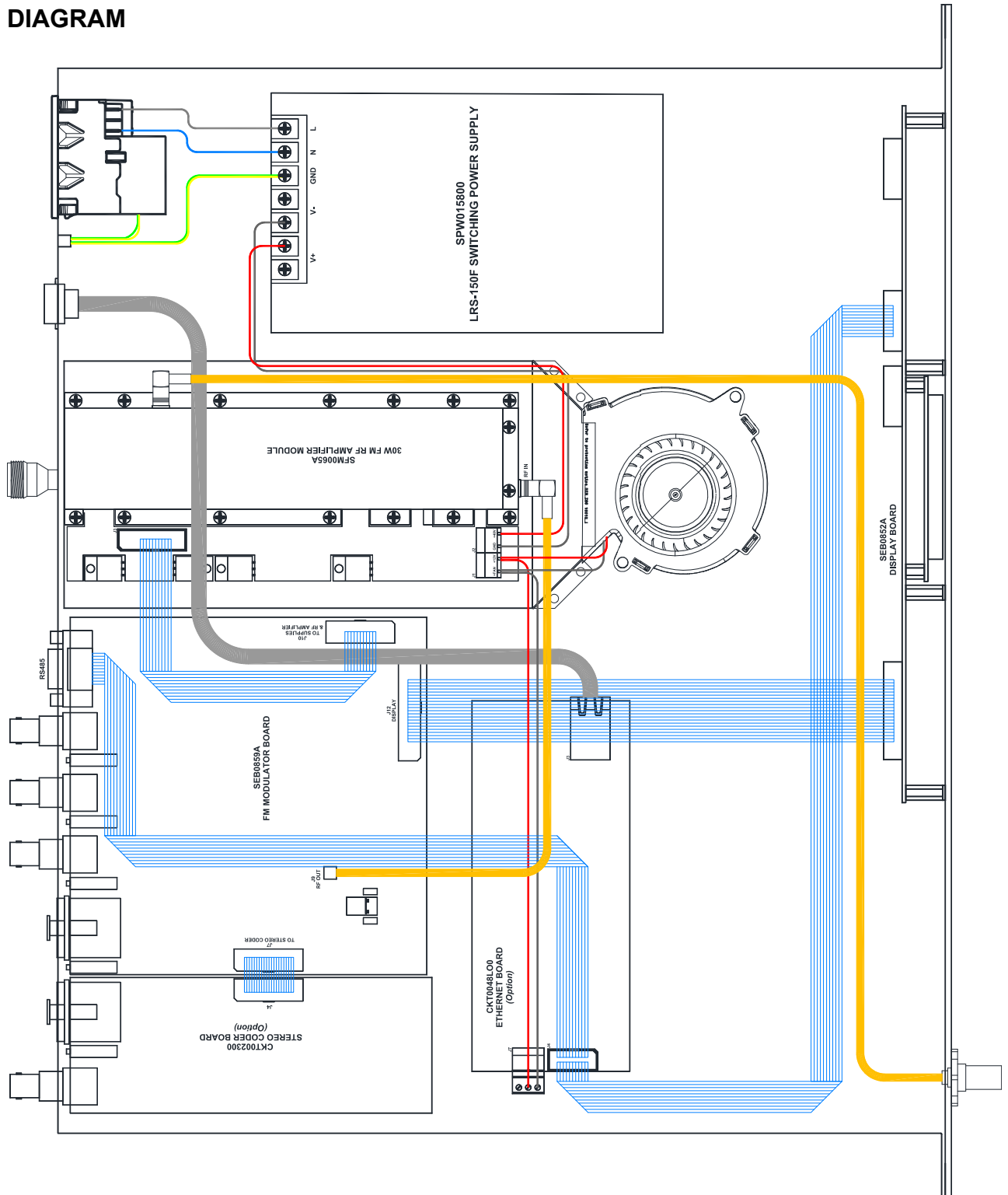
• Menu map



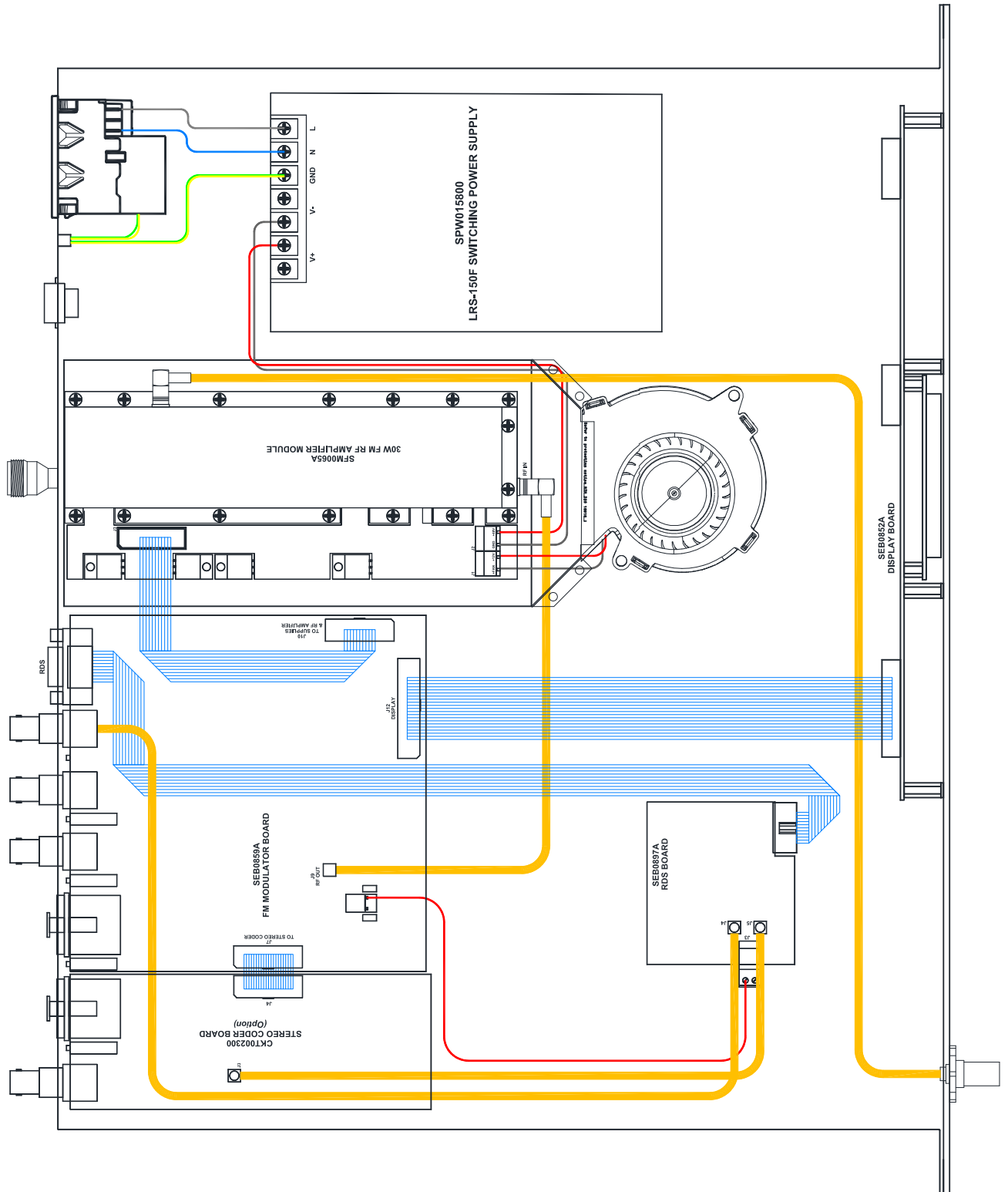
4 – DIAGRAMS

4.1 AEROTX50 WIRING

DIAGRAM



4.1.1 RDS OPTION WIRING DIAGRAM



4.1.2 AES/EBU IN OPTION WIRING DIAGRAM

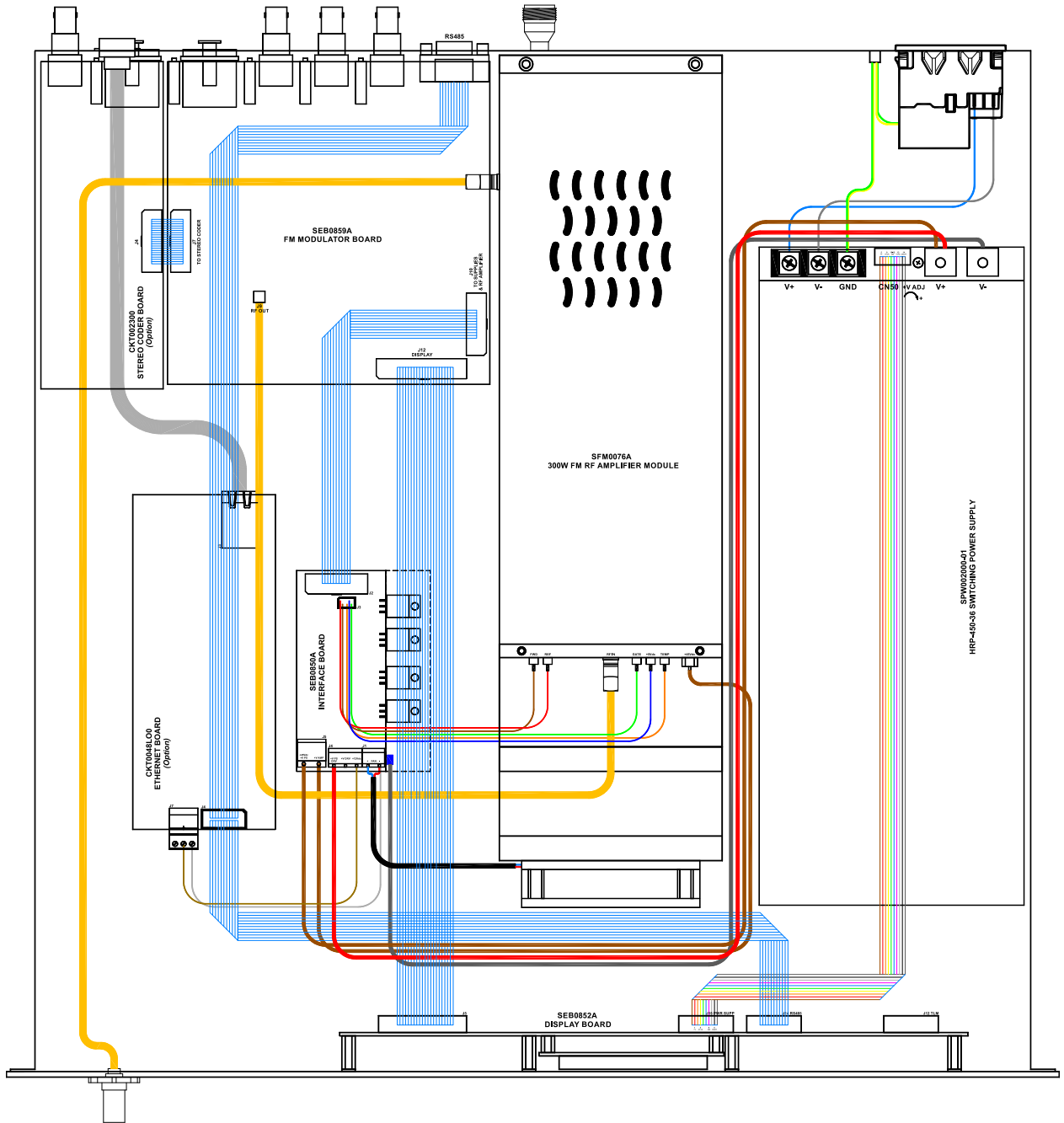


Component list

CODE	DESCRIPTION	QTY
CCB850200	RG316 50Ω CABLE	1
CCN077100	3x5mm MALE-FEMALE TURRET	8
CCN251300	90° SMB CONNECTOR	2
CCN251800	SMB CONNECTOR FOR RG174 CABLE	1
CCN269500	DB9 FEMALE CONNECTOR FOR IU008059 CABLE	1
CCN269900	10 WAY FEMALE CONNECTOR	2
CCN270000	16 WAY FEMALE CONNECTOR	2
CCN284100	3 POLES CANON CONNECTOR	1
CCN285500	26 WAY FEMALE CONNECTOR	2
CFN003800	RL48-19-14 PAPST BLOWER	1
CKT011000	RDS OPTION	1
CKT002300	STEREO CODER BOARD OPTION	1
CKT00480L0	ETHERNET BOARD OPTION	1
MFP0346R1V	1U FRONT PANEL	1
MFS0003A0	3A FUSE	2
MFU000200-01	FUSE-HOLDER FOR 4A FUSE	1
MMA1778R0P	PLEXIGLASS DISPLAY PROTECTION	1
MMA2555R0P	ETHERNET OPTION TAP	2
MMA2556R1P	AIR CONVEYOR MECHANICAL DETAIL	1
MPF000300	10A NETWORK AC FILTER WITH FUSE-HOLDER	1
MSK203500	BNC FEMALE CONNECTOR FOR RG316 CABLE	1
PCB7990A0	10 POLES FLAT CABLE	0.6
RCA0618R3S	1U BOX	1
RCA0619R1P	1U BOX COVER	1
RCB025600	16 WAY AWG 28 FLAT CABLE	0.2
RCB025700	26 WAY AWG 28 FLAT CABLE	0.3
RCB100100-02	2mt H05 CABLE	1
RMS075800	4.8 TYCO FASTON	3
RMS076100	12.7Ø BLACK PLASTIC TAP	1
RMS076800	22.2Ø BLACK PLASTIC TAP	1
SEB0007BR0	VCO BOARD WITH INTEGRATED PLL	1
SEB0852AR1	DISPLAY BOARD	1
SEB0859AR0	FM MODULATOR BOARD	1
SFM0065AR1	30/100W FM RF AMPLIFIER MODULE	1
SPW015800	LRS-150F-36 SWITCHING POWER SUPPLY	1



4.2 AEROTX300 WIRING DIAGRAM

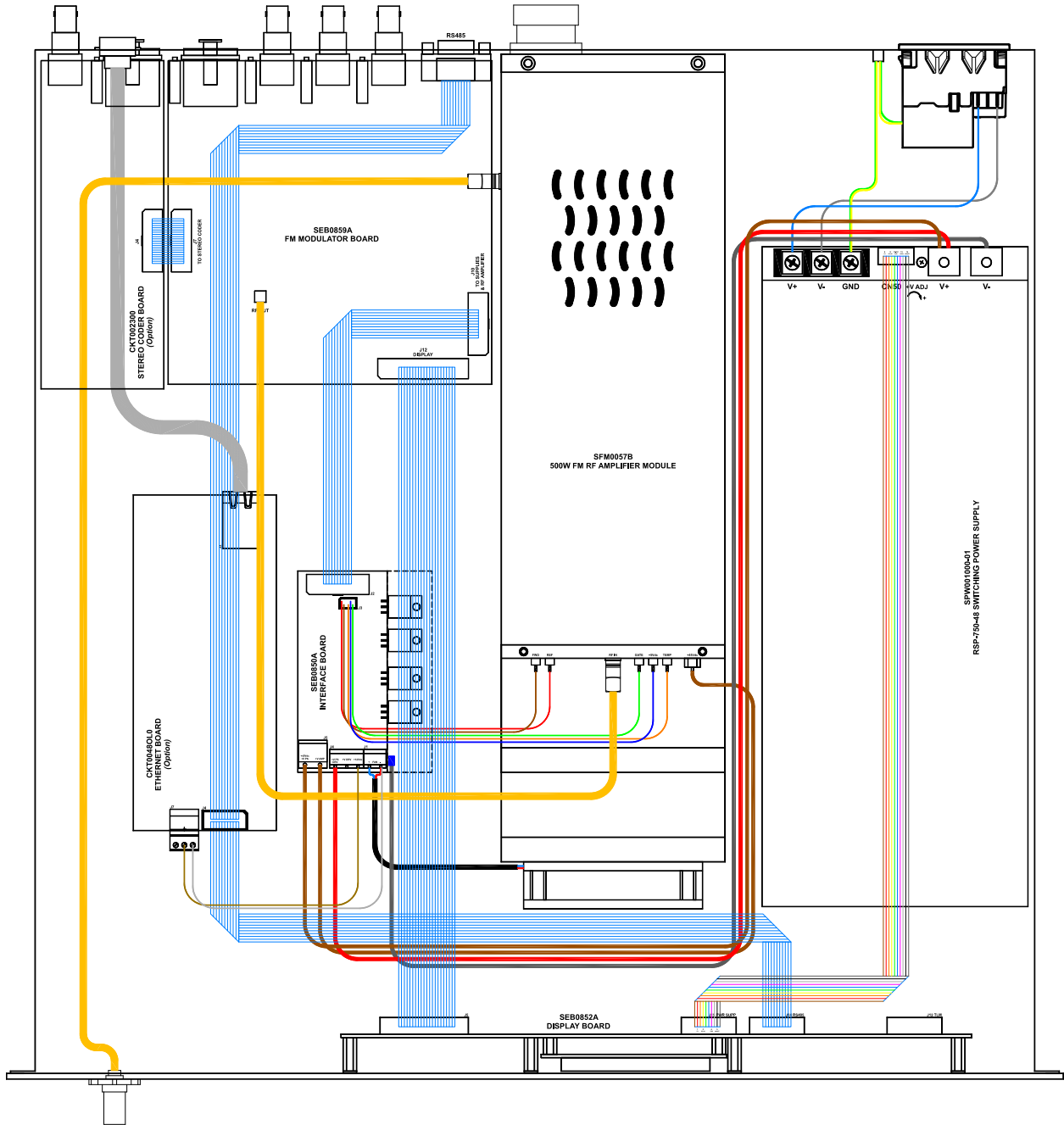


Component list

CODE	DESCRIPTION	QTY
CCB850200	RG316 50Ω CABLE	1
CCN251300	90° SMB CONNECTOR	2
CCN251800	SMB CONNECTOR FOR RG174 CABLE	1
CCN269500	DB9 FEMALE CONNECTOR FOR IU008059 CABLE	1
CCN269900	10 WAY FEMALE CONNECTOR	1
CCN270000	16 WAY FEMALE CONNECTOR	2
CCN284100	3 POLES CANON CONNECTOR	1
CCN285500	26 WAY FEMALE CONNECTOR	2
CFN001700	8214JN PAPST BLOWER	1
CFN760200	G80-18 BLOWER GRID	1
CSB015500	5x10mm GALVANIZED SCREW FOR BLOWER	4
MFP0347R0V	2U FRONT PANEL	1
MFS0005A0	5A FUSE	2
MFS001300	15A 32V FUSE	1
MFU000200-01	FUSE-HOLDER FOR 4A FUSE	1
MMA031500	2U HANDLE KIT	2
MMA122000	BLOWER SUPPORT MECHANICAL DETAIL	1
MMA1778R0P	PLEXIGLASS DISPLAY PROTECTION	1
MMA2555R0P	ETHERNET OPTION TAP	2
MMA2598R1P	POWER SUPPLY SHIELD	1
MPF000300	10A NETWORK AC FILTER WITH FUSE-HOLDER	1
MSK203500	BNC FEMALE CONNECTOR FOR RG 316 CABLE	1
PCB7990A0	10 POLES GREY FLAT CABLE	0.5
RCA0614R2S	1U BOX	1
RCA0636R0I	1U BOX COVER	1
RCB025600	16 WAY AWG 28 FLAT CABLE	0.2
RCB025700	26 WAY AWG 28 FLAT CABLE	0.35
RCB100100-02	2mt H05 CABLE	1
RMS075800	4.8 TYCO FASTON	3
RMS076100	DP-500 Ø12.7mm BLACK PLASTIC CAP	1
RMS076800	DP-875 Ø22.2mm BLACK PLASTIC CAP	1
SEB0007BR0	VCO BOARD WITH INTEGRATED PLL	1
SEB0852AR1	DISPLAY BOARD	1
SEB0859AR0	FM MODULATOR BOARD	1
SFM0076AR0	500W FM RF AMPLIFIER MODULE	1
SPW002000-01	HRP-450-36 SWITCHING POWER SUPPLY	1



4.3 AEROTX500 WIRING DIAGRAM

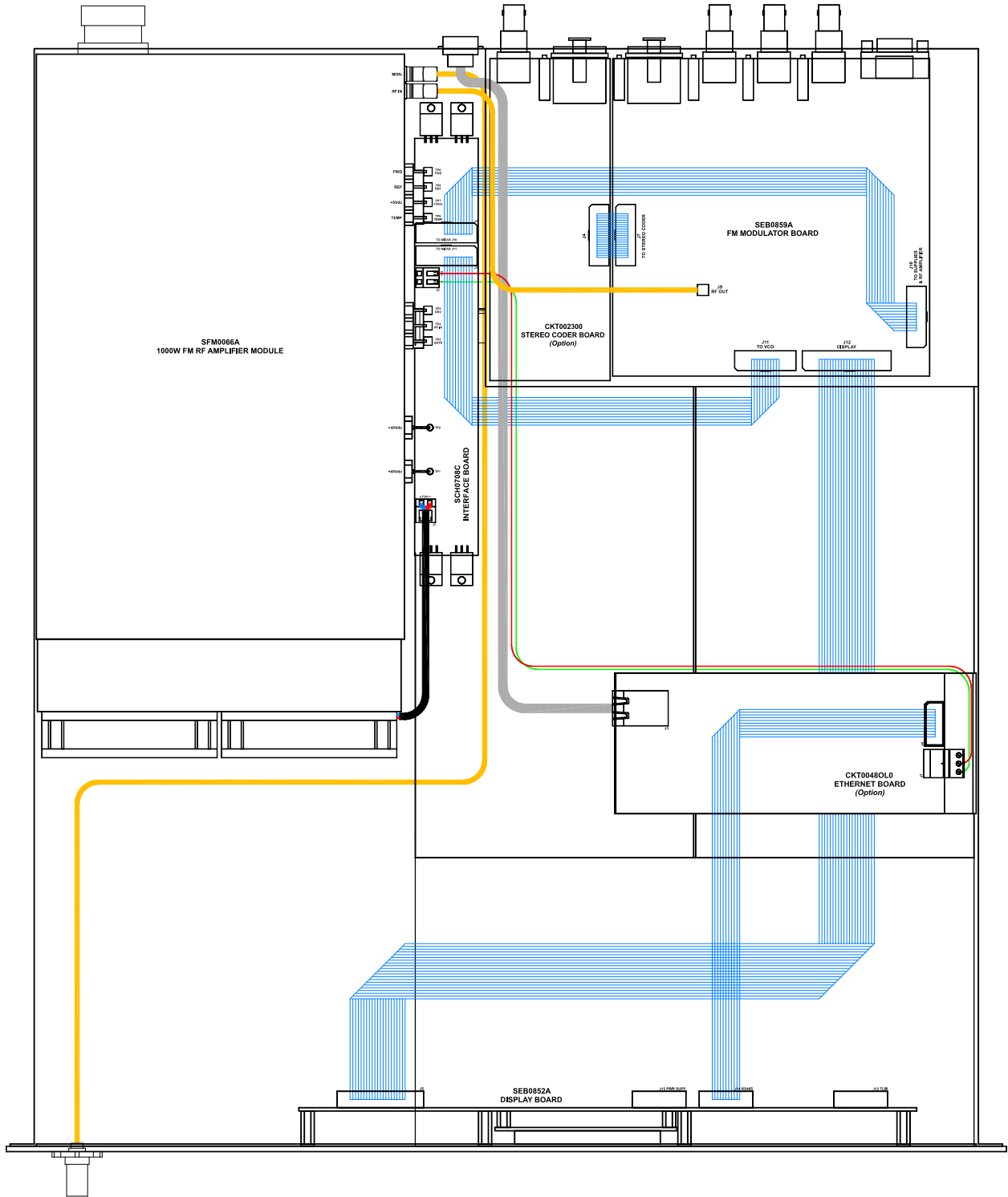


Component list

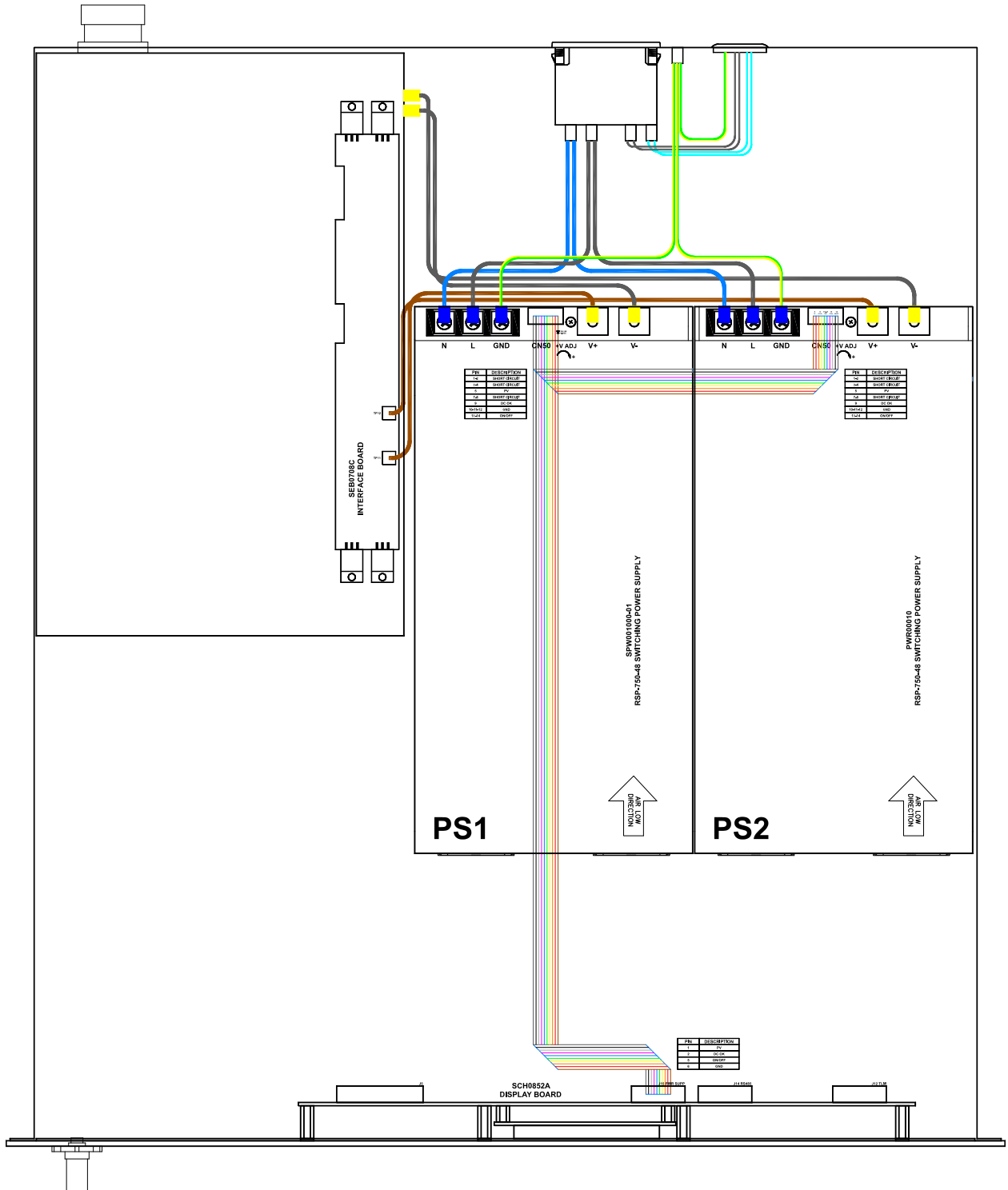
CODE	DESCRIPTION	QTY
CCN077100	3x5mm MALE-FEMALE TURRET	8
CCN251800	SMB CONNECTOR FOR RG174 CABLE	1
CCN284100	3 POLES CANON CONNECTOR	1
CFN001700	8214JN PAPST BLOWER	1
CKT002300	STEREO CODER BOARD OPTION	1
CKT0048OL0	ETHERNET BOARD OPTION	1
MFP0347R0V	2U FRONT PANEL	1
MFS001400	25A 32V FUSE	1
MFU000200-01	FUSE-HOLDER FOR 4A FUSE	1
MMA031500	2U HANDLE KIT	2
MMA122000	BLOWER SUPPORT MECHANICAL DETAIL	1
MMA1778R0P	PLEXIGLASS DISPLAY PROTECTION	1
MMA2555R0P	ETHERNET OPTION TAP	2
MMA2598R1P	POWER SUPPLY SHIELD	1
MPF000300	10A NETWORK AC FILTER WITH FUSE-HOLDER	1
MSK203500	BNC FEMALE CONNECTOR FOR RG316 CABLE	1
PCB799000	10 POLES FLAT CABLE	0.5
RCA0614R2S	1U BOX	1
RCA0636R0I	1U BOX COVER	1
RCB023100-02	JUMPER FOR RS-750 SWITCHING POWER SUPPLY	1
RCB100100-02	2mt H05 CABLE	1
SEB0007BR0	VCO BOARD WITH INTEGRATED PLL	1
SEB0852AR1	DISPLAY BOARD	1
SEB0859AR0	FM MODULATOR BOARD	1
SFM0057BR1	500W FM RF AMPLIFIER MODULE	1
SPW001000-01	RSP-750-48SWITCHING POWER SUPPLY	1



4.4 AEROTX1000 WIRING DIAGRAM



4.4.1 AEROTX1000 ELECTRIC NETWORK WIRING DIAGRAM

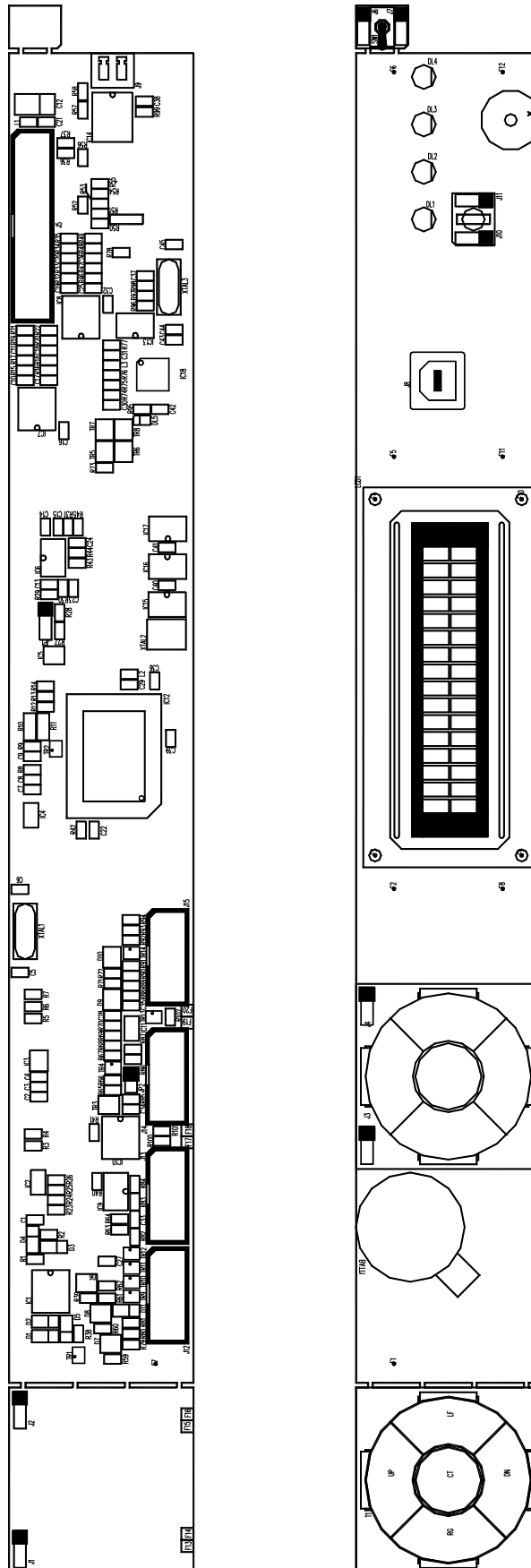


Component list

CODE	DESCRIPTION	QTY
CCB850200	RG316 50Ω CABLE	0.9
CCB896000	15cm SMB-BNC FEMALE CONNECTOR FOR RG316 CABLE	1
CCN251300	90° SMB CONNECTOR	3
CCN251800	SMB CONNECTOR FOR RG174 CABLE	1
CCN269500	DB9 FEMALE CONNECTOR FOR IU008059 CABLE	1
CCN269900	10 WAY FEMALE CONNECTOR	2
CCN270000	16 WAY FEMALE CONNECTOR	2
CCN284100	3 POLES CANON CONNECTOR	1
CCN285500	26 WAY FEMALE CONNECTOR	2
CCN296100	PENTHAPOLAR AC SOCKET	1
CFN001700	8214NJ PAPST BLOWER	2
CFN760200	G80-18 GRID BLOWER	2
CKT002300	STEREO CODER OPTION	1
CKT0048OL0	ETHERNET BOARD OPTION	1
MFP0347R0V	2U FRONT PANEL	1
MFS0010B0	10A FUSE	1
MFS001100	32V 30A FUSE	2
MMA2023R1P	SUPPORT BOARDS MECHANICAL DETAIL	1
MMA2050R0P	MECHANICAL DETAIL	1
MMA2298R2P	AIR CONVEYOR SUPPORT	1
PCB7990A0	10 POLES FLAT CABLE	0.8
RCA0518R2S	1U BOX	1
RCA0520R0P	1U BOX COVER	1
RCB023300-02	2 x DISPLAY-SWITCHING POWER SUPPLY CABLES	1
RCB025600	16 WAY AWG 28 FLAT CABLE	1
RCB025700	26 WAY AWG 28 FLAT CABLE	0.4
RMS076100	12.7Ø BLACK PLASTIC TAP	1
RMS076800	22.2Ø BLACK PLASTIC TAP	1
RMS097800	CKA03 I SHIELD	1
RMS0999A0	CKM04 ILME AC SOCKET	1
SEB0007BR0	VCO BOARD WITH INTEGRATED PLL	1
SEB0852AR1	DISPLAY BOARD	1
SEB0859AR0	FM MODULATOR BOARD	1
SFM0066AR1	1000W FM RF AMPLIFIER MODULE	1
SPW001000-01	RSP-750-48 SWITCHING POWER SUPPLY	2

4.5 DISPLAY BOARD (SEB0852AR1 Code)

- Component layout

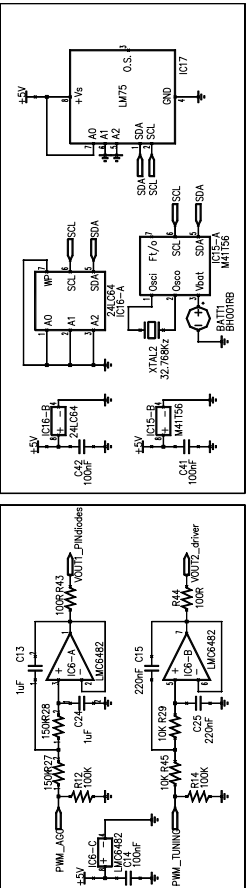
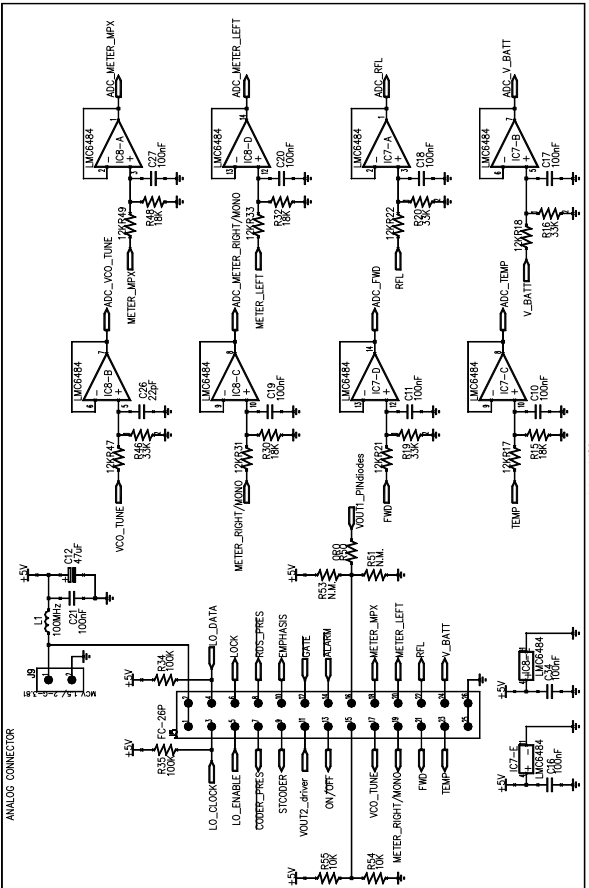
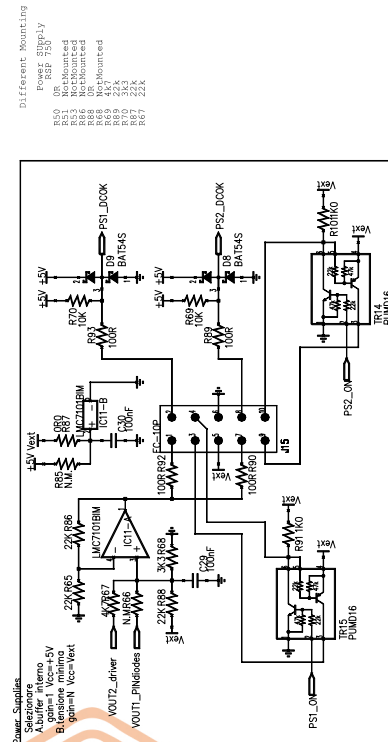
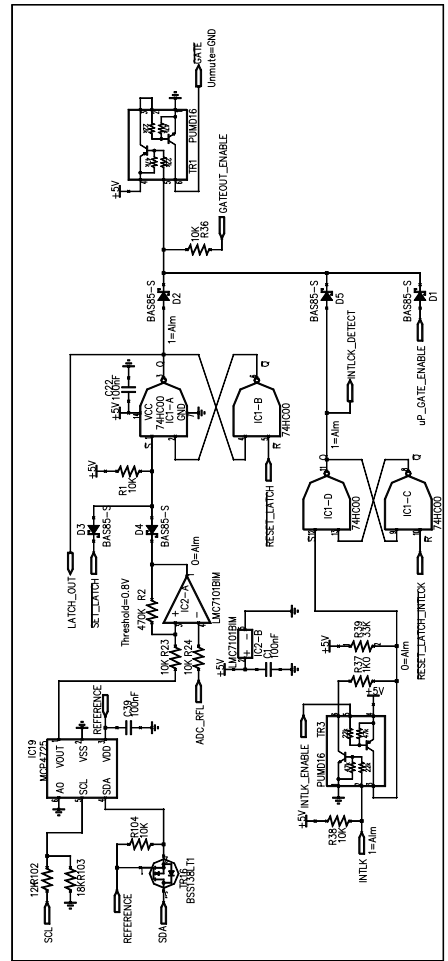
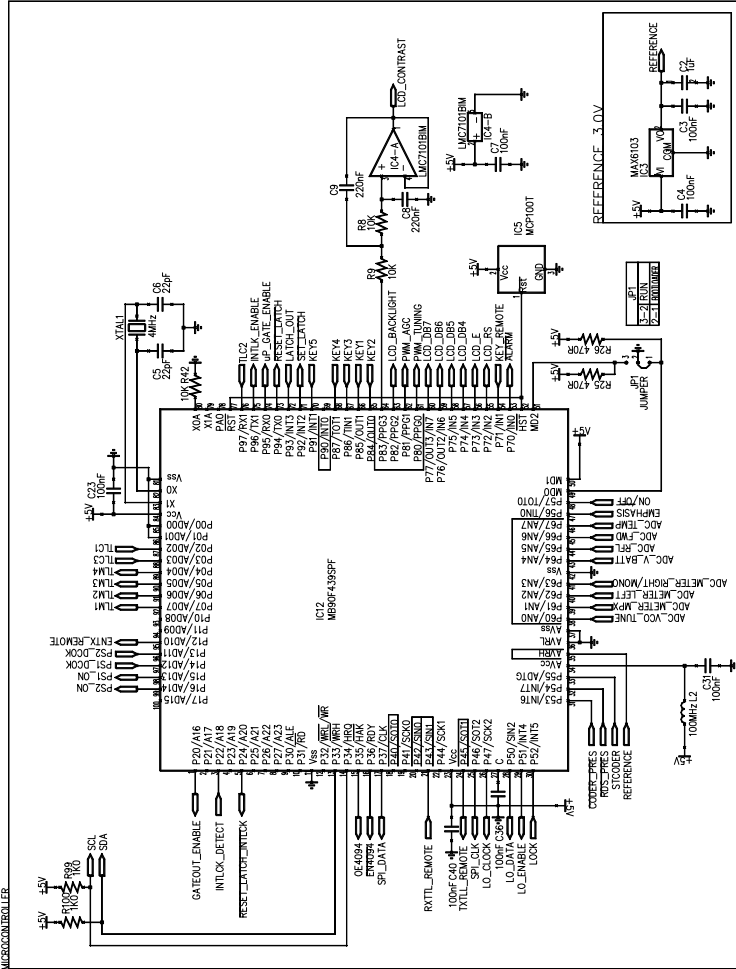


Component list

Code	Description	Qty.	Comps.
BATT BH001RB 3093_90	03093 03090 BATTERY HOLDER	1	BATT1
BZ AI-155 03705	03705 5VDC BUZZER	1	BZ1
CC 100nF-S 01065E	01065E Y5V 0805 CAPACITOR	32	C1, C3-4, C7, C10-11, C14, C16-22, C25-29, C31, C32-43
CC 1uF50V-SS	01077E SMD 0805 CAPACITOR	1	C2
CC 220nF-S 01069B	01069B Y5V 0805 CAPACITOR	6	C8-9, C13, C15, C23-24
CC 22pF-SS	01021A SMD 0805 CAPACITOR	4	C5-6, C44-45
CC 33nF-SS	01059A SMD 0805 CAPACITOR	1	C30
CE 47uF 16V-S	01636A TANT. ELET. SMD CAPACIT.	1	C12
D BAS85-S	03024 SMD SCHOTTKY DIODE	6	D1-5, D11
D BAT54S	03199 SMD SCHOTTKY DIODE	5	D6-10
DIS WH1602B-TMI-EPK	03073B 2x16 BLUE DISPLAY	1	LCD1
DL KPT-2012 MGC	03057A GREEN SMD LED DIODE	1	DL5
DL LEDB3	03058A 3mm BLUE LED DIODE	1	DL4
DL LEDR3 03058	03058 3mm RED LED DIODE	1	DL3
DL LEDY3 03051	03051 3mm YELLOW LED DIODE	2	DL1-2
IC 24LC64 04815	04815 SMD INTEG CIRCUIT	1	IC16
IC 74HC00-S 4762A	4762A SMD INTEG CIRCUIT	1	IC1
IC FM93C46M8-S	04785A SMD INTEG CIRCUIT	1	IC13
IC FT232BM-S	04086A SMD INTEG CIRCUIT	1	IC18
IC LM75-S 00668	00668 SMD INTEG CIRCUIT	1	IC17
IC LMC6482-S	04632 SMD INTEG CIRCUIT	1	IC6
IC LMC6484-S	04634 SMD INTEG CIRCUIT	2	IC7-8
IC LMC7101BIM	04638 SMD INTEG CIRCUIT	3	IC2, IC4, IC11
IC M41T56 04611	04611 SMD INTEG CIRCUIT	1	IC15
IC MAX3080-S 04770	04770 SMD INTEG CIRCUIT	1	IC10
IC MB90F439SPF-S	04570 SMD INTEG CIRCUIT	1	IC12
IC MC14094BD 04718	04718 SMD INTEG CIRCUIT	1	IC14
IC MPC100T-450I-TT	04608A SMD INTEG CIRCUIT	1	IC5
IC SN75176B-S 04720	04720 SMD INTEG CIRCUIT	1	IC9
J WITH VERTICAL USB	2787 USB PCB CONNECTOR	1	J8
J FC-10P 02697-02699	02697+02699 PCB CONNECTOR	4	J12-15
J FC-26P 02855-02854	02854+02855 PCB CONNECTOR	1	J5
J PAN3 02707	02707 PCB CONNECTOR	4	J1-2, J6-7
J PAN3 N. M.	N. M. PCB CONNECTOR	2	J10-11
JU JUMP2 02739-02742	02739+02742 PAN2 MALE CONNECT.	1	JP2
JU JUMP3 02707-02742	02707+02742 PAN3 MALE CONNECT.	1	JP1
R 0805 N. M.	N. M. RES 1/8W 5% SMD 0805	3	R50, R69, R88
R 0R0-SS	00001A RES 1/4W 5% SMD 0805	1	R86
R 100K-S 00065C	00065C RES 1/4W 5% SMD 0805	6	R12, R14, R36-37, R65-66
R 100R-S 00029B	00029B RES 1/4W 5% SMD 0805	10	R43-44, R79-81, R85, R90-91, R93-94
R 10K-S 00053C	00053C RES 1/4W 5% SMD 0805	34	R1, R3-9, R24, R26, R29-31, R38-40, R42, R45, R51, R53-55, R59-60, R67, R71-73, R77-78, R83, R84, R97, R99
R 1206 N. M.	N. M. RES 1/4W 5% SMD 1206	1	R10
R 120K-SS	00066B RES 1/4W 1% SMD 0805	1	R89
R 120R-S 00030A	00030A RES 1/4W 5% SMD 1206	1	R11
R 12K-S 00054C	00054C RES 1/4W 5% SMD 0805	9	R17-18, R21-23, R33, R35, R47, R49
R 150R-SS	00031C RES 1/4W 5% SMD 0805	1	R63
R 15K-S 00055C	00055C RES 1/4W 5% SMD 0805	1	R68
R 18K-S 00056A	00056A RES 1/4W 5% SMD 0805	8	R15-16, R19-20, R32, R34, R46, R48
R 1K0-S 00041C	00041C RES 1/4W 5% SMD 0805	10	R13, R41, R58, R61, R70, R87, R92, R100-102
R 1K5-SS	00043C RES 1/4W 5% SMD 0805	3	R64, R76, R82
R 27R-S 00022C	00022C RES 1/4W 5% SMD 0805	2	R74-75
R 2K2-S 00045C	00045C RES 1/4W 5% SMD 0805	1	R96
R 330R-SS	00035D RES 1/4W 1% SMD 0805	3	R52, R56-57
R 33K-S 00059C	00059C RES 1/4W 5% SMD 0805	1	R25
R 470K-SS	00073B RES 1/4W 5% SMD 0805	1	R2
R 470R-S 00037C	00037C RES 1/4W 5% SMD 0805	4	R27-28, R95, R98
R 47K-S 00061C	00061C RES 1/4W 5% SMD 0805	1	R62
SW SWITCH KWS00107	1 WAY 2 POSITION SWITCH	1	SW1
T CLOCHE	CLOCHE WITH 5 BUTTON	1	T1
TR BSS138LT1-S	04104A LF POWER MOSFET N	5	TR3, TR5-8
XTAL 4MHz-S 05101A	05101A QUARTZ	1	XTAL1
XTAL 6MHz-S	CXS00006 QUARTZ	1	XTAL3
PN1739AR1	PRINTED CIRCUIT BOARD	1	



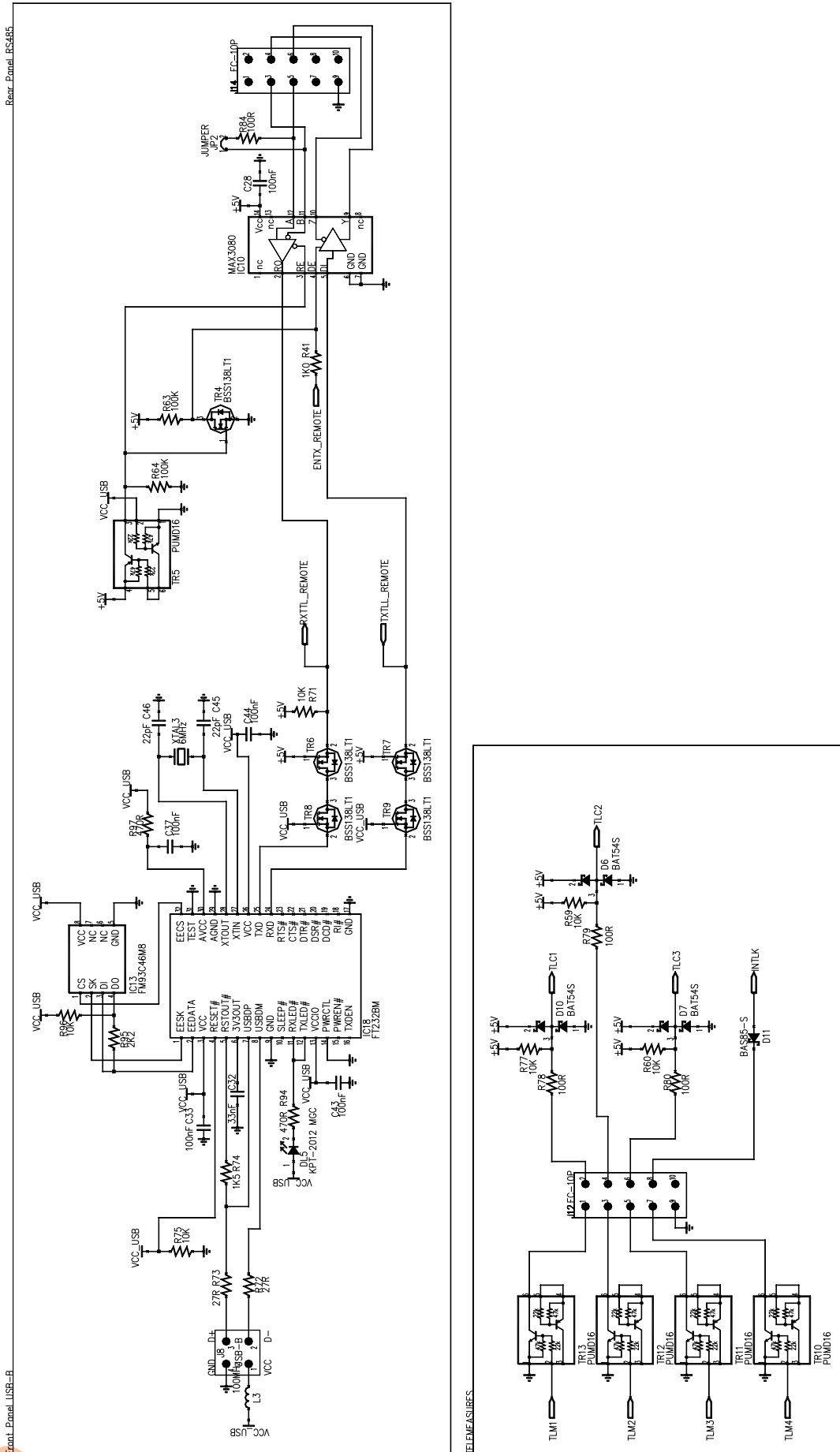
Electric diagram 1/3 - Microcontroller



Different Mounting

R50	OR	RSIP	753
R53			
R56			
R58			
R66			
R68			
R76			
R78			
R86			
R88			
R96			
R98			

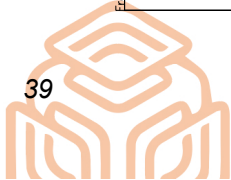
Electric diagram 2/3 - Serial and TLM



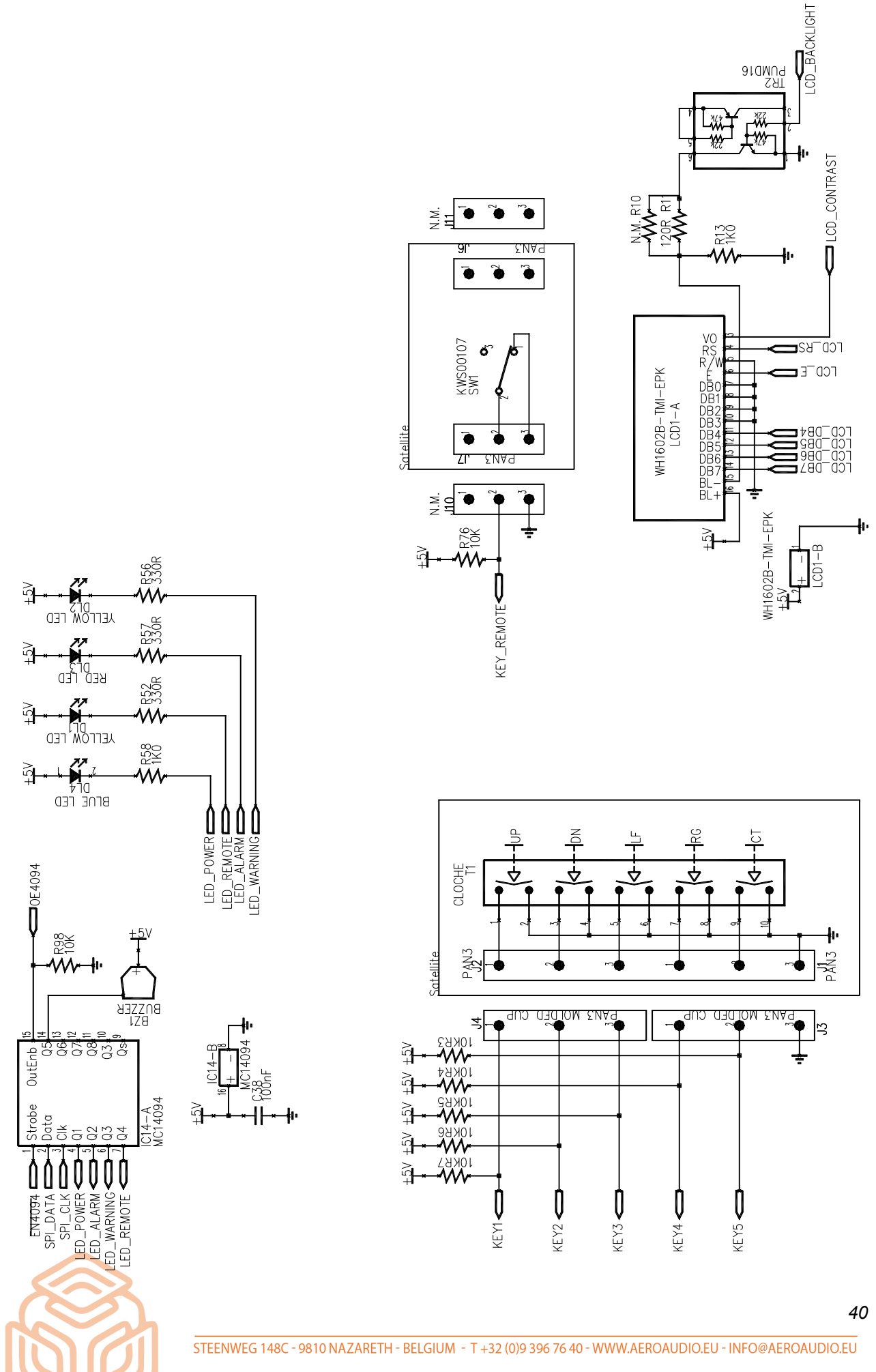
Rear_Pannel_USB485

Front_Pannel_USB-B

TELEMEASURES



Electric diagram 3/3 - Display



4.6 FM MODULATOR BOARD (SEB0859AR0 Code)

DESCRIPTION

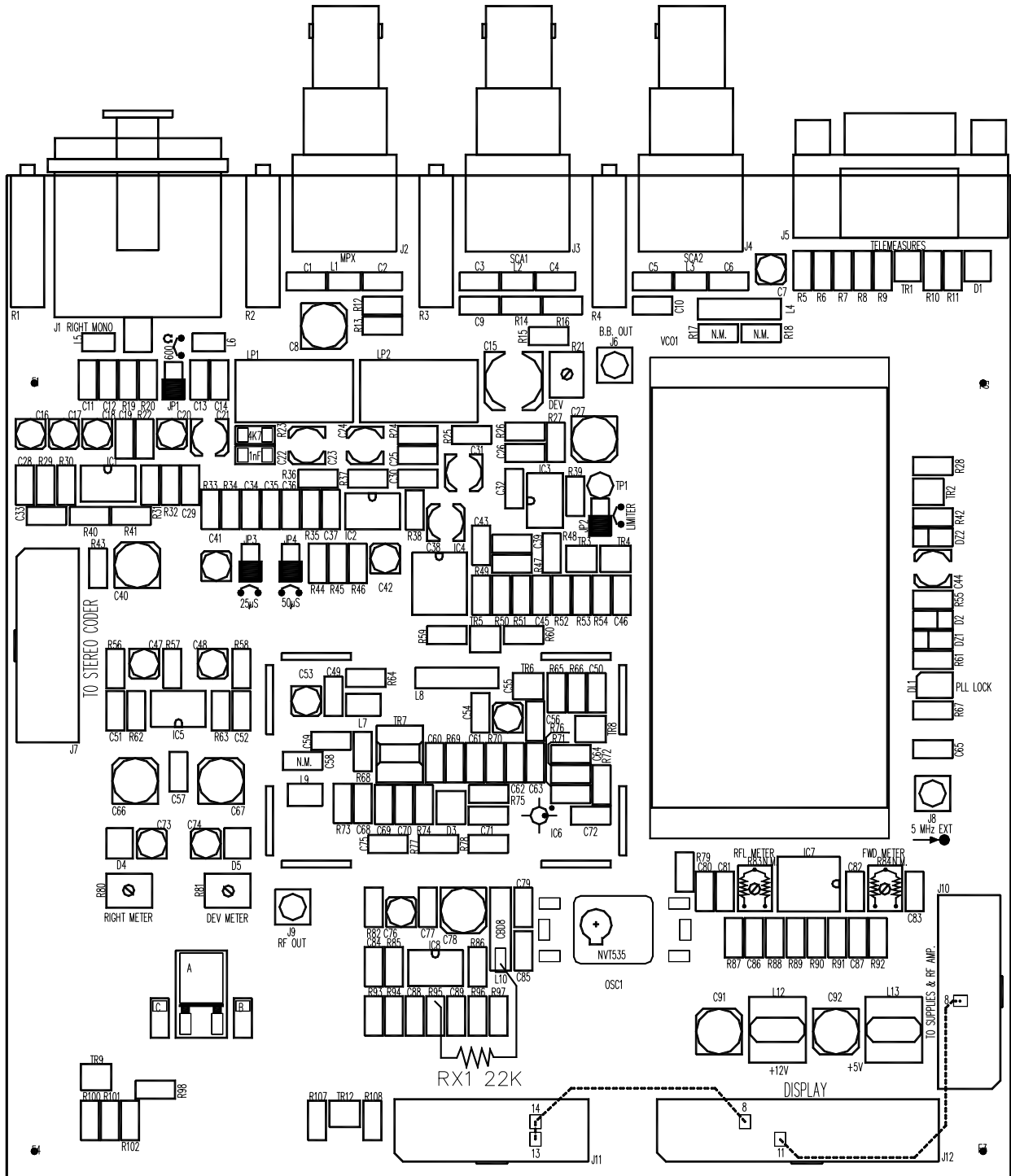
The board contains the stages needed to condition the audio MONO or RIGHT signals and modulate in frequency a synthesised oscillator. It provides an output radio frequency signal in the II-VHF band, to drive the final amplification stage. The various sections are analysed below:

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 of high frequencies. The time constant is chosen between 25μ and 50μ microseconds by means of two jumpers (JP3-4). When they are both enabled they give 75μ s (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).



- 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.

Component layout

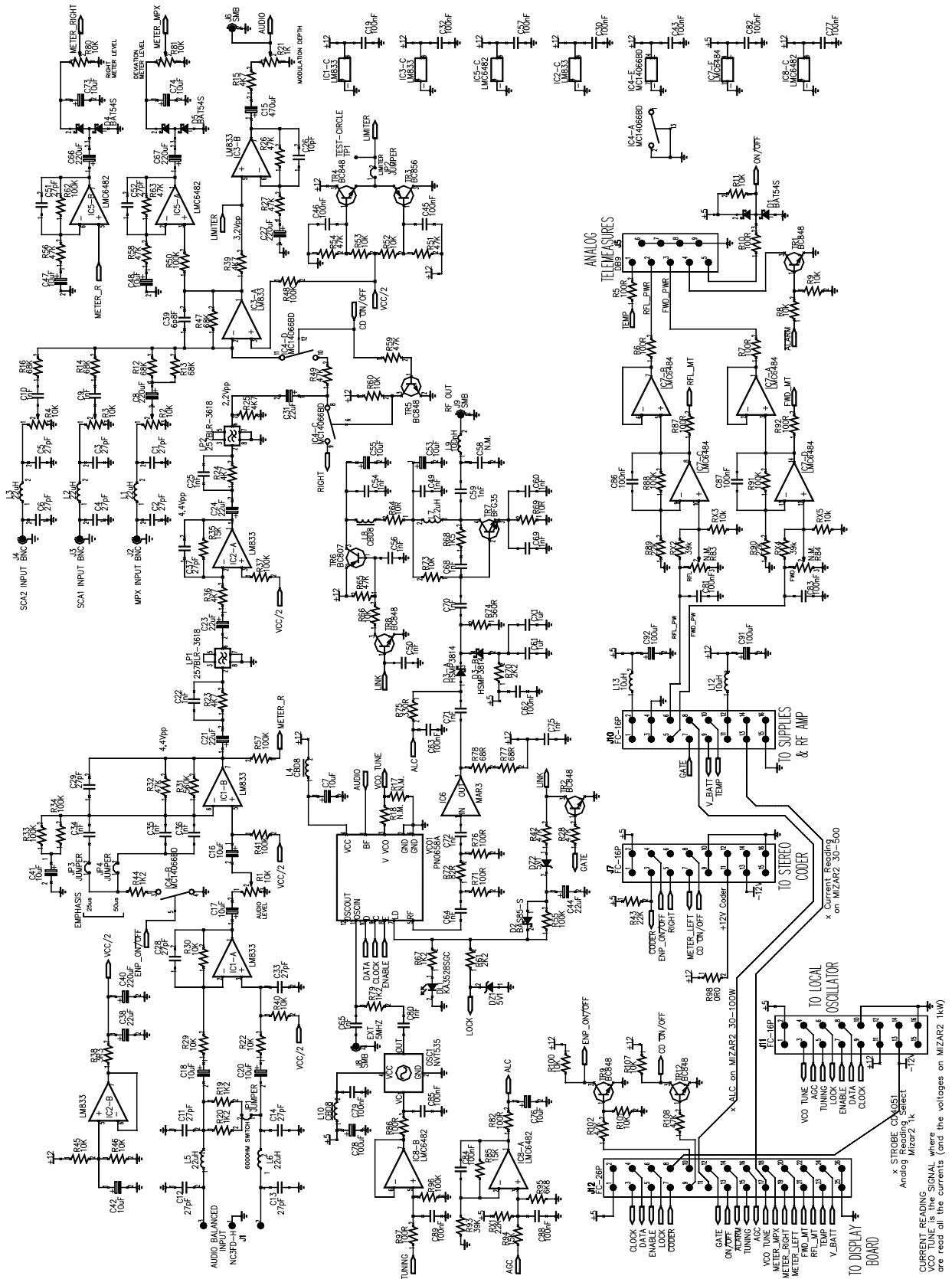


Component list

Code	Description	Qty.	Comps.
257BLR-3618N 05010	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, C60-61, 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, C74, 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 SCHOTTKY DIODE	1	D2
D BAT54S	03199 SMD SCHOTTKY DIODE	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 90° PCB XLR FEMALE SOCKET	1	J1
J SMB-PCB 2PIN 02516	02516 PCB CONNECTOR	3	J6, J8-9
JU JUMP2 02739-02742	02739+02742 PAN2 MALE CONNECT.	4	JP1-4
OSC NVT535 05168	05168 TCXO	1	OSC1
PN0658A SCH0007AR0	SCH0007AR0 VCO FM INTEGRATED	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
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, R52-53, 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, R59, 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

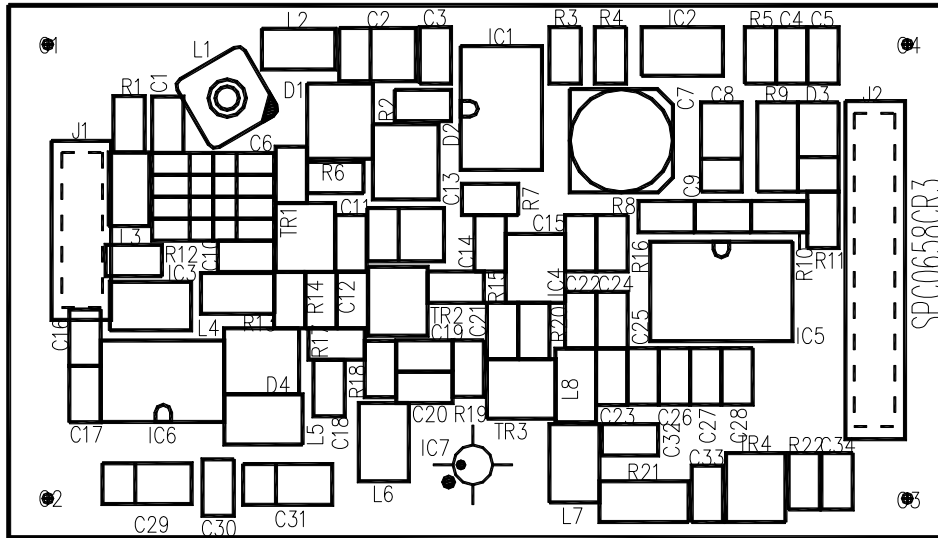


Electric diagram 1/1



4.6.1 VCO BOARD (SEB0007BR0 Code)

Component layout

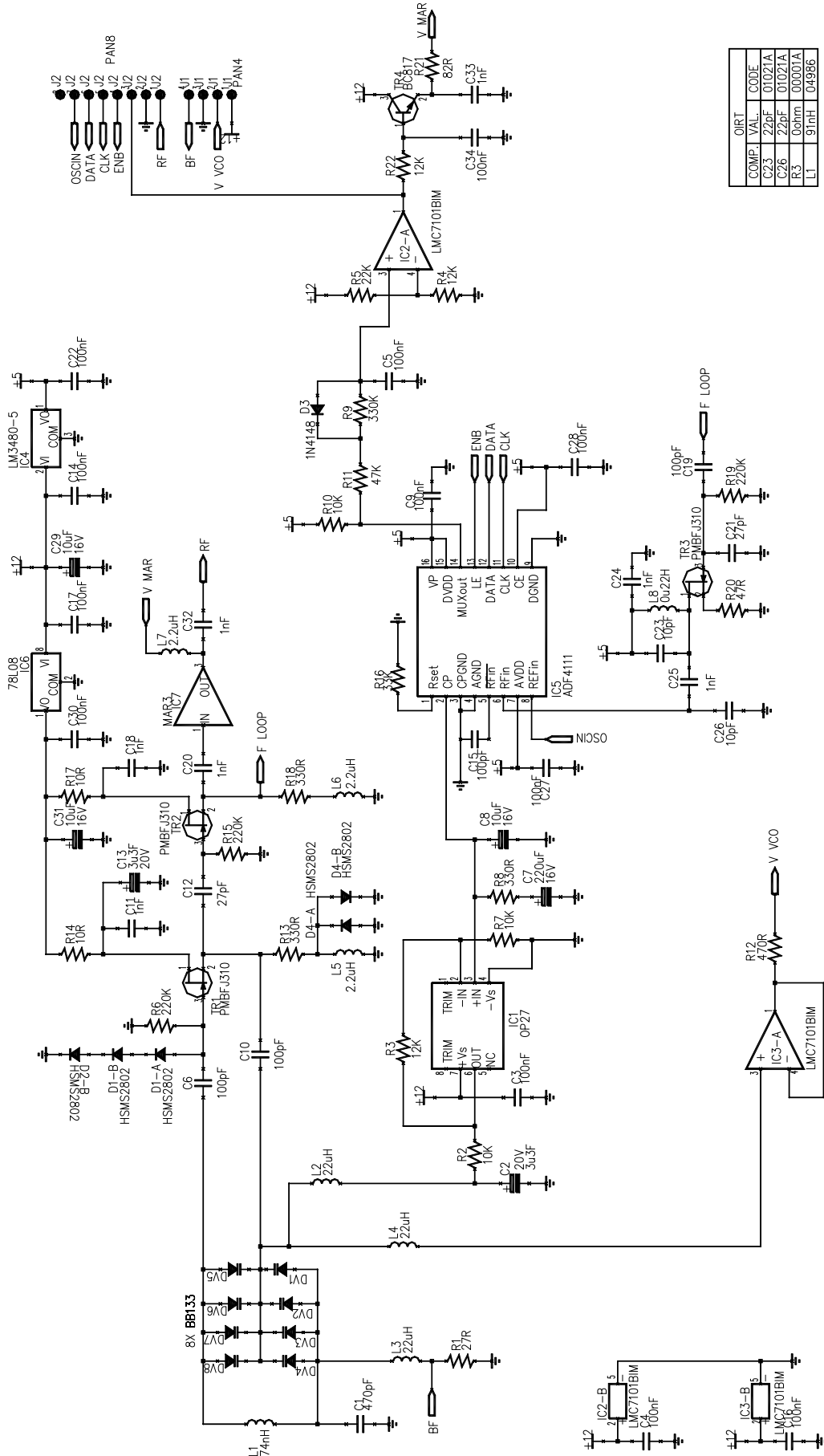


Component list

Code	Description	Qty.	Comps.
CC 100nF-S 01065E	01065E Y5V 0805 CAPACITOR	12	C3-5, C9, C14, C16-17, C22, C27-28, C30, C34
CC 100pF-S 01092C	01092C SMD 0805 CAPACITOR	4	C6, C10, C15, C19
CC 10pF-S 01086A	01086A SMD 0805 CAPACITOR	2	C23, C26
CC 1nF-S 01096A	01096A SMD 0805 CAPACITOR	7	C11, C18, C20, C24-25, C32-33
CC 27pF-S 01090A	01090A SMD 0805 CAPACITOR	2	C12, C21
CC 470pF-S 01095B	01095B SMD 0805 CAPACITOR	1	C1
CE 10uF16V-S 01626B N. U.	TANTALIUM ELET. SMD CAPACITOR	3	C8, C29, C31
CE 220uF16V-S	01824A ELET. SMD CAPACITOR	1	C7
CE 3u3F20V-S	01640 TANT. ELET. SMD CAPACIT.	2	C2, C13
D 1N4148-S 03002	03002 SMD DIODE	1	D3
D HSMS2802 03207	03207 SMD DIODE	3	D1-2, D4
DV BB133 03220	03220 SMD VARICAP DIODE	8	DV1-8
IC 78L08-S 04303A	04303A SMD VOLTAGE REGULATOR	1	IC6
IC ADF4111-S	04090 SMD INTEG CIRCUIT	1	IC5
IC LM3480-5	4301C SMD VOLTAGE REGULATOR	1	IC4
IC LMC7101BIM	04638 SMD INTEG CIRCUIT	2	IC2-3
IC MAR3 04367	04367 SMD INTEG CIRCUIT	1	IC7
IC OP27-S	04835 LF SMD INTEG CIRCUIT	1	IC1
IND 0u22H-S 05090	05090 INDUCTOR	1	L8
IND 22uH-S 5023D	5023D INDUCTOR	3	L2-4
IND 2u2H-S 05020A	05020A INDUCTOR	3	L5-7
IND E558HN-74nH	04987 INDUCTOR	1	L1
J PAN4 02710	02710 PCB CONNECTOR	1	J1
J PAN8 02716	02716 PCB CONNECTOR	1	J2
R 10K-S 00053C	00053C RES 1/4W 5% SMD 0805	3	R2, R7, R10
R 10R-S 00017B	00017B RES 1/4W 5% SMD 0805	2	R14, R17
R 12K-S 00054C	00054C RES 1/4W 5% SMD 0805	3	R3-4, R22
R 220K-S 00069C	00069C RES 1/4W 5% SMD 0805	3	R6, R15, R19
R 22K-S 00057C	00057C RES 1/4W 5% SMD 0805	1	R5
R 27R-S 00022C	00022C RES 1/4W 5% SMD 0805	1	R1
R 330K-S 00071A	00071A RES 1/4W 5% SMD 1206	1	R9
R 330R-S 00035C	00035C RES 1/4W 5% SMD 0805	3	R8, R13, R18
R 33K-S 00059C	00059C RES 1/4W 5% SMD 0805	1	R16
R 470R-S 00037C	00037C RES 1/4W 5% SMD 0805	1	R12
R 47K-S 00061C	00061C RES 1/4W 5% SMD 0805	1	R11
R 47R-S 00025B	00025B RES 1/4W 5% SMD 0805	1	R20
R 82R-S 00028A	00028A RES 1/4W 5% SMD 1206	1	R21
TR BC817 03454	03454 NPN SMD TRANSISTOR	1	TR4
TR PMBFJ310 04105A	04105A NFET SMD TRANSISTOR	3	TR1-3
SPC0658CR3	PRINTED CIRCUIT BOARD	1	



Electric Diagram – VCO and PLL integrated



OIRT	COMP	VAL	CODE
	C23	22pF	01021A
	C26	22pF	01021A
	R3	06mm	00001A
	L1	91nH	04986



4.7 30/100W FM RF AMPLIFIER MODULE (SFM0065AR1 Code)¹

DESCRIPTION

The SFM0065A amplifier module is designed to amplify the FM modulated carriers in the 87 - 108MHz band, and can provide an output of both 30W and 100W CW depending on the power supply level.

In the input section of the module there is a 9dB π attenuator. In order to obtain the desired gain, the amplifier is made up by two gain stages: the pilot stage uses a BLT50 MOSFET, while the final stage uses a MRF6V2150N LDMOS. The output power is controlled first from the input power level up to 25dBm, and then from the control voltage level.

Amplifier module includes a gate switch-off protection circuit in case of failure and a thermal compensation circuit that guarantees a constant gate voltages with temperature variation, both of them integrated in the amplifier board.

The output of the module is completed by a very selective low-pass filter to attenuate the level of the harmonics and spurious signals, and by two high-directivity directional couplers needed to sample part of the Forward and Reflected Power in order to measure their levels. The module also includes the interface board to gather the power supplies and all power readings into one point. The module includes too a coupler for a monitoring signal that is available from the front panel by a BNC connector and a temperature sensor.

TECHNICAL CHARACTERISTICS	
Frequency Range	87 – 108MHz
Output Power	30W / 100W CW
Gain	20dB \pm 1dB / 25dB \pm 1dB
Power Supply Voltage	+12Vdc (BLT50) +27Vdc / +48Vdc (MRF6V2150N)
RF Input Connector	SMB Female
RF Input Impedance	50 Ω
RF Output Connector	N Female
RF Output Impedance	50 Ω

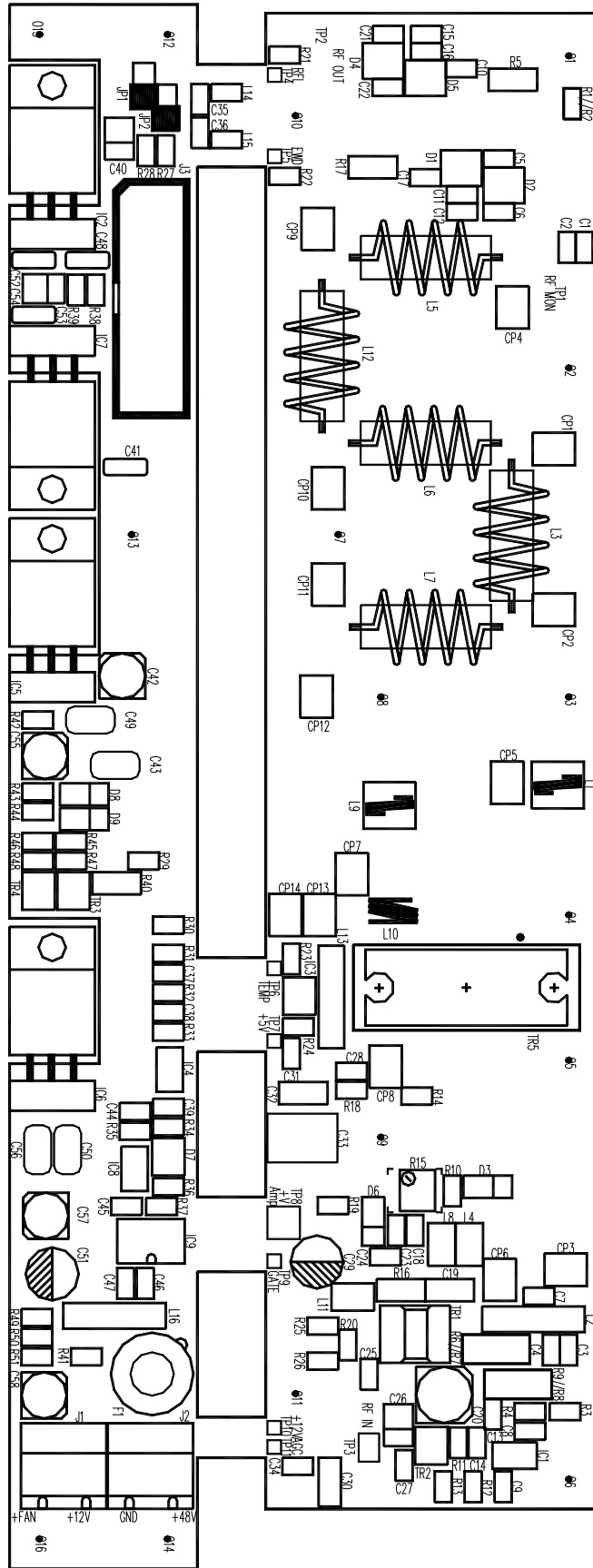
Component list

Code	Description	Qty.
02248/01	N FEMALE FLANGE CONNECTOR	1
02514	SMB CONNECTOR PANEL MOUNT	1
02515	SMB CONNECTOR	1
05042	INDUCTOR	1
08502	RG316 50 Ω CABLE	0.10
DET2513R1P	HEAT SINK	1
DET2514R1P	HEAT SINK PLACE	1
SCA0189R1F	0.5mm BRASS BOX	1
SEB0846AR1	30/100W FM RF AMPLIFIER BOARD	1

¹ Present in AEROTX50 model ⁴⁷



Component layout

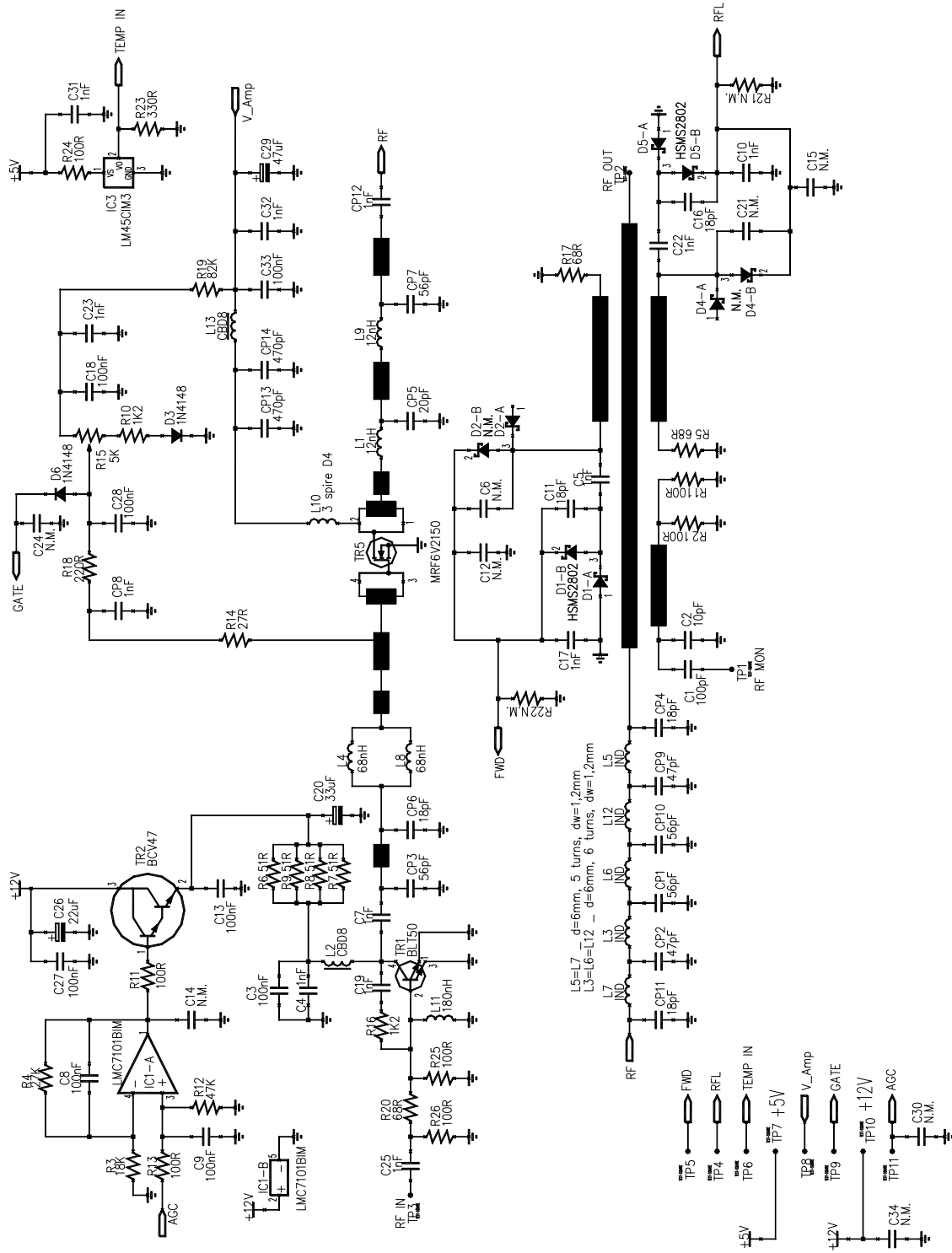


Component list

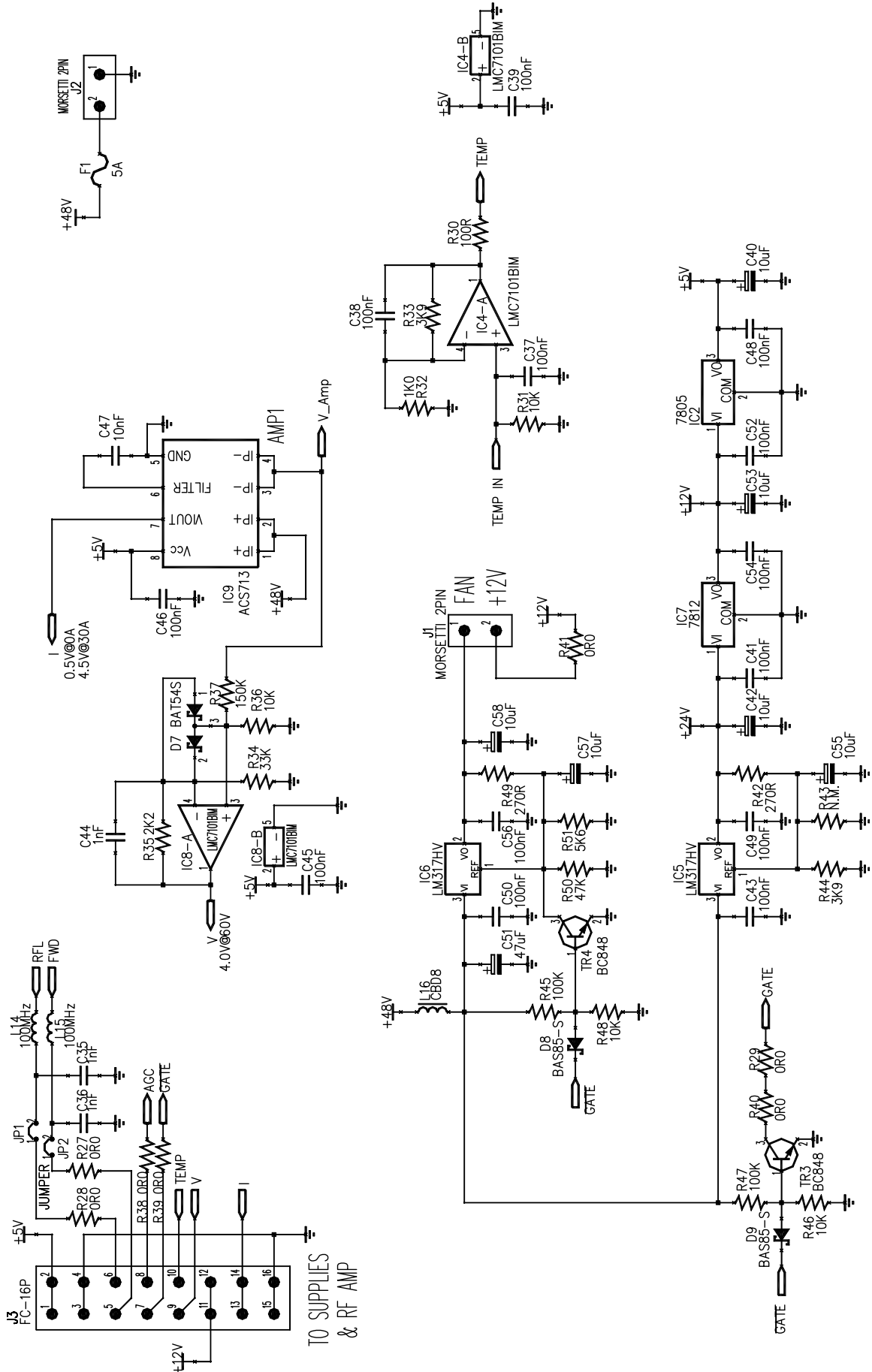
Code	Description	Qty.	Comps.
CC 0805 N. M.	N. M. Y5V 0805 CAPACITOR	7	C6, C12, C14-15, C21, C24, C34
CC 100nF-S 01065E	01065E Y5V 0805 CAPACITOR	12	C3, C8-9, C13, C18, C27-28, C37-39, C45-46
CC 100nF_AVX_100V	01065I CERAMIC CAPACITOR	8	C41, C43, C48-50, C52, C54, C56
CC 100nF-1000V-S 2220	01065H SMD1210 CAPACITOR	1	C33
CC 100pF-S 01092C	01092C SMD 0805 CAPACITOR	1	C1
CC 10nF-S 01053A	01053A SMD 0805 CAPACITOR	1	C47
CC 10pF-S 01086A	01086A SMD 0805 CAPACITOR	1	C2
CC 1206 NOT MOUNTED	NOT MOUNTED SMD 1206 COND	1	C30
CC 18pF-SS	01089A SMD 0805 CAPACITOR	2	C11, C16
CC 1nF-S 01096	01096 SMD 1206 CAPACITOR	2	C19, C32
CC 1nF-S 01096A	01096A SMD 0805 CAPACITOR	12	C4-5, C7, C10, C17, C22-23, C25, C31, C35, C36, C44
CE 10uF20V-CASE B-S	01626B TANT. ELET. SMD CAPACIT.	2	C40, C53
CE 10uF35V-S 01778A	01778A ELET. SMD CAPACITOR	4	C42, C55, C57-58
CE 22uF16V-S-T	01631B TANT. ELET. SMD CAPACIT.	1	C26
CE 33uF25V-S 01785A	01785A ELET. SMD CAPACITOR	1	C20
CE 47uF50V 01791	01791 ELET. CAPACITOR	2	C29, C51
CP 18pF-S	01121A CHIP CHB	3	CP4, CP6, CP11
CP 1nF-S	01145 CHIP CHB	2	CP8, CP12
CP 20pF-S	01123 CHIP CHB	1	CP5
CP 470pF-S	01143 CHIP CHB	2	CP13-14
CP 47pF-S	01130 CHIP CHB	2	CP2, CP9
CP 56pF-S	01132 CHIP CHB	4	CP1, CP3, CP7, CP10
D 1N4148-S 03002	03002 SMD DIODE	2	D3, D6
D BAS85-S	03024 SMD SCHOTTKY DIODE	2	D8-9
D BAT54S	03199 SMD SCHOTTKY DIODE	1	D7
D HSMS2802 03207	03207 SMD DIODE	2	D1, D5
FUSE 5A MICRO FUSE	FUS00009+FUS00006 FUSE-HOLDER	1	F1
IC 7805 04315	04315 VOLTAGE REGULATOR	1	IC2
IC 7812 04321	04321 VOLTAGE REGULATOR	1	IC7
IC ACS713ELCTR-30A-T-S	ICT0065SAX LF SMD INTEG CIRCUIT	1	IC9
IC LM317HV	04340A INTEG CIRCUIT	2	IC5-6
IC LM45CIM3_S	00672 LF SMD INTEG CIRCUIT	1	IC3
IC LMC7101BIM	04638 SMD INTEG CIRCUIT	3	IC1, IC4, IC8
IND 180nH-S 05093	05093 INDUCTOR	1	L11
IND 3 SP_D4_d0.8mm-S	05042 INDUCTOR	1	L10
IND CBD8 05072	05072 INDUCTOR	3	L2, L13, L16
J FC-16P 02701-02700	02701+02700 PCB CONNECTOR	1	J3
J SCREWCONN2 02853	02853 PCB SCREW CONNECTOR	2	J1-2
JU JUMP2 02739-02742	02739+02742 PAN2 MALE CONNECT.	2	JP1-2
R 0805 N. M.	N. M. RES 1/8W 5% SMD 0805	3	R21-22, R43
R 0R0-S 00001	00001 RES 1/4W 5% SMD 1206	1	R40
R 0R0-SS	00001A RES 1/4W 5% SMD 0805	6	R27-29, R38-39, R41
R 100K-S 00065C	00065C RES 1/4W 5% SMD 0805	2	R45, R47
R 100R-S 00029B	00029B RES 1/4W 5% SMD 0805	8	R1-2, R11, R13, R24-26, R30
R 10K-S 00053C	00053C RES 1/4W 5% SMD 0805	4	R31, R36, R46, R48
R 150K-SS	00067B RES 1/4W 5% SMD 0805	1	R37
R 18K-S 00056A	00056A RES 1/4W 5% SMD 0805	1	R3
R 1K0-S 00041C	00041C RES 1/4W 5% SMD 0805	1	R32
R 1K2-S	RES 1/4W 5% SMD 1206	1	R16
R 1K2-SS	00042B RES 1/4W 5% SMD 0805	1	R10
R 220R-SS	00033D RES 1/4W 5% SMD 0805	1	R18
R 270R-S 00034B	00034B RES 1/4W5% SMD 0805	2	R42, R49
R 27K-SS	00058C RES 1/4W 5% SMD 0805	1	R4
R 27R-S 00022C	00022C RES 1/4W 5% SMD 0805	1	R14
R 2K2-S 00045C	00045C RES 1/4W 5% SMD 0805	1	R35
R 330R-S 00035C	00035C RES 1/4W 5% SMD 0805	1	R23
R 33K-S 00059C	00059C RES 1/4W 5% SMD 0805	1	R34
R 3K9-SS	00048C RES 1/4W SMD 0805	2	R33, R44
R 47K-S 00061C	00061C RES 1/4W 5% SMD 0805	2	R12, R50
R 51R-1W-S	00220A RES 1W 5% SMD 2512	4	R6-9
R 5K6-S 00050C	00050C RES 1/4W 5% SMD 0805	1	R51
R 68R-S 00027A	00027A RES 1/4W 5% SMD 1206	2	R5, R17
R 68R-SS	00027B RES 1/4W 5% SMD 0805	1	R20
R 82K-SS	00064B RES 1/4W 5% SMD 0805	1	R19
RV 5K0-M-H/S	00822 SMD VARIABLE RESISTOR	1	R15
TR BC848 03457	03457 NPN SMD TRANSISTOR	2	TR3-4
TR BCV47	03465 NPN SMD DARLINGTON TR.	1	TR2
SPC1737AR2	PRINTED CIRCUIT BOARD	1	



Electric Diagram 1/2 - RF Module



Electric Diagram 2/2 - Interface



4.8 300W FM RF AMPLIFIER MODULE (SFM0076AR0 Code)²

DESCRIPTION

The SFM0076A amplifier module is designed to amplify the FM modulated carriers in the 87 - 108MHz band, and can provide an output of 300W CW.

In order to obtain the desired gain, the amplifier is made up by two gain stages: the pilot stage uses a MRF6V2010 MOSFET, while the final stage uses a BLF174XR LDMOS.

In the input section of the module there is a 4dB pi attenuator and between the driver stage and the final stage there is a 20W 3dB attenuator.

The output power regulation is made by controlling the power level of the input signal of the module. Amplifier module includes a gate switch-off protection circuit in case of failure and a thermal compensation circuit that guarantees a constant gate voltages with temperature variation, both of them integrated in the amplifier board. The output of the module is completed by a very selective low-pass filter to attenuate the level of the harmonics and spurious signals, and by two high-directivity directional couplers needed to sample part of the Forward and Reflected Power in order to measure their levels.

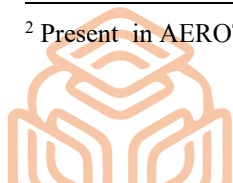
The module includes too a coupler for a monitoring signal that is available from the front panel by a BNC connector and a temperature sensor.

TECHNICAL CHARACTERISTICS	
Frequency Range	87 – 108MHz
Output Power	300W CW
Power Supply Voltage	+48Vdc
Bias Current	MRF6V2010 with Vdd = +36V: 30mA
Bias Current	BLF174XR with Vdd = +48V: 50mA
RF Input Connector	SMB Female
RF Input Impedance	50Ω
RF Output Connector	7/16"
RF Output Impedance	50Ω

Component list

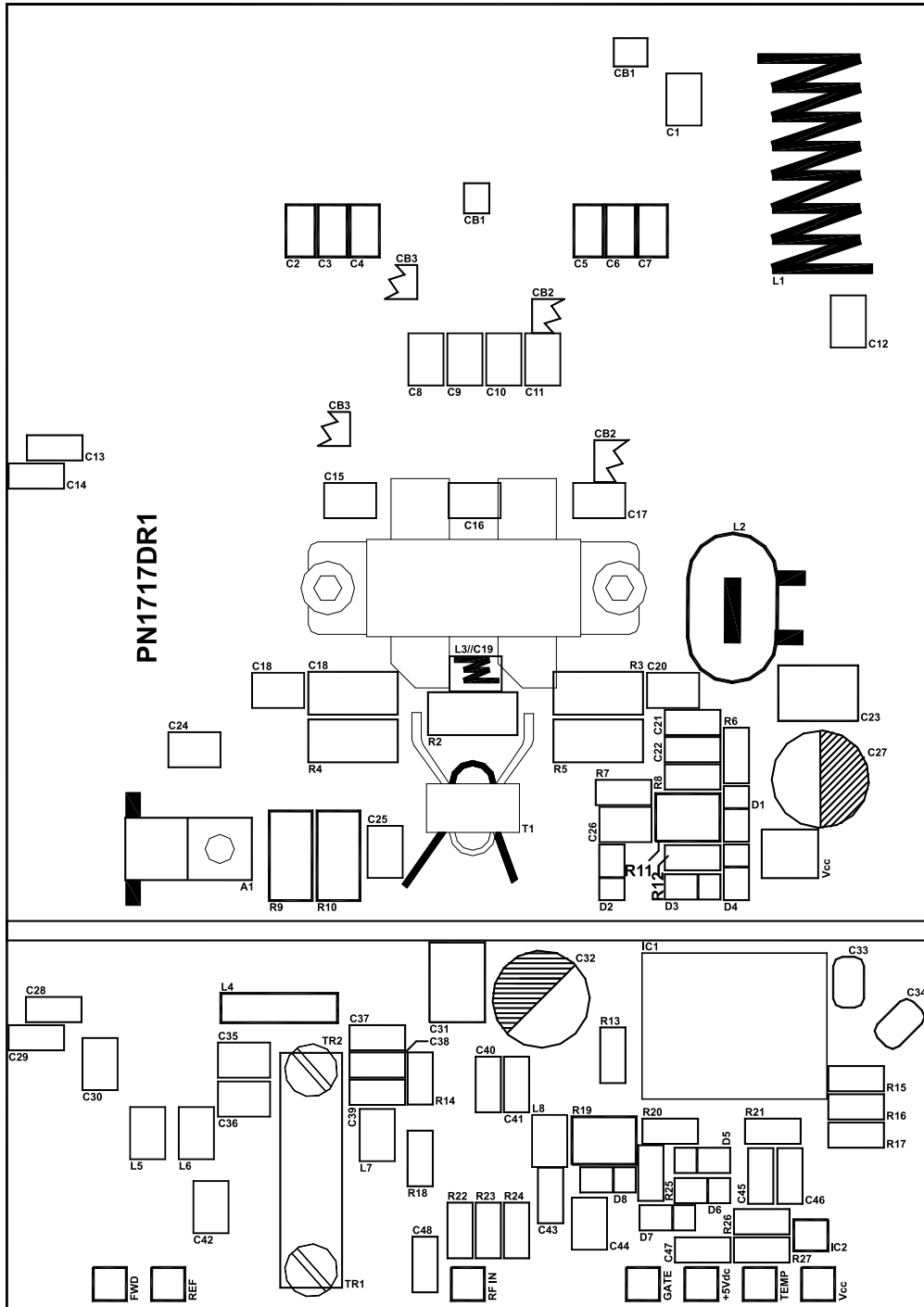
Code	Description	Qty.
01403	BYPASSING CAPACITOR	5
02402	7/16" FEMALE CONNECTOR	1
02514	SMB CONNECTOR PANEL MOUNT	1
02518	SMB CONNECTOR FOR RG174	1
05042	INDUCTOR	1
07543	6A FUSE-HOLDER PCB MOUNT	1
08502	RG316 50Ω CABLE	0.15
DET2478R4P	HEAT SINK	1
DET2508R0P	REAR SIDE AMPLIFIER MODULE	1
HYB0004SFX	SCI 1202F-054 EMI-FILTER	1
SFG0060AR0	INTERFACE MODULE	1
SCA0184R2F	0.5mm BRASS BOX	1
SEB0817AR2	500W FM RF AMPLIFIER BOARD	1
SEB0818AR1	FILTER AND DIRECT. COUPLER	1

² Present in AEROTX300 model



4.8.1 300W FM RF AMPLIFIER BOARD (SEB0817AR2 Code)

Component layout

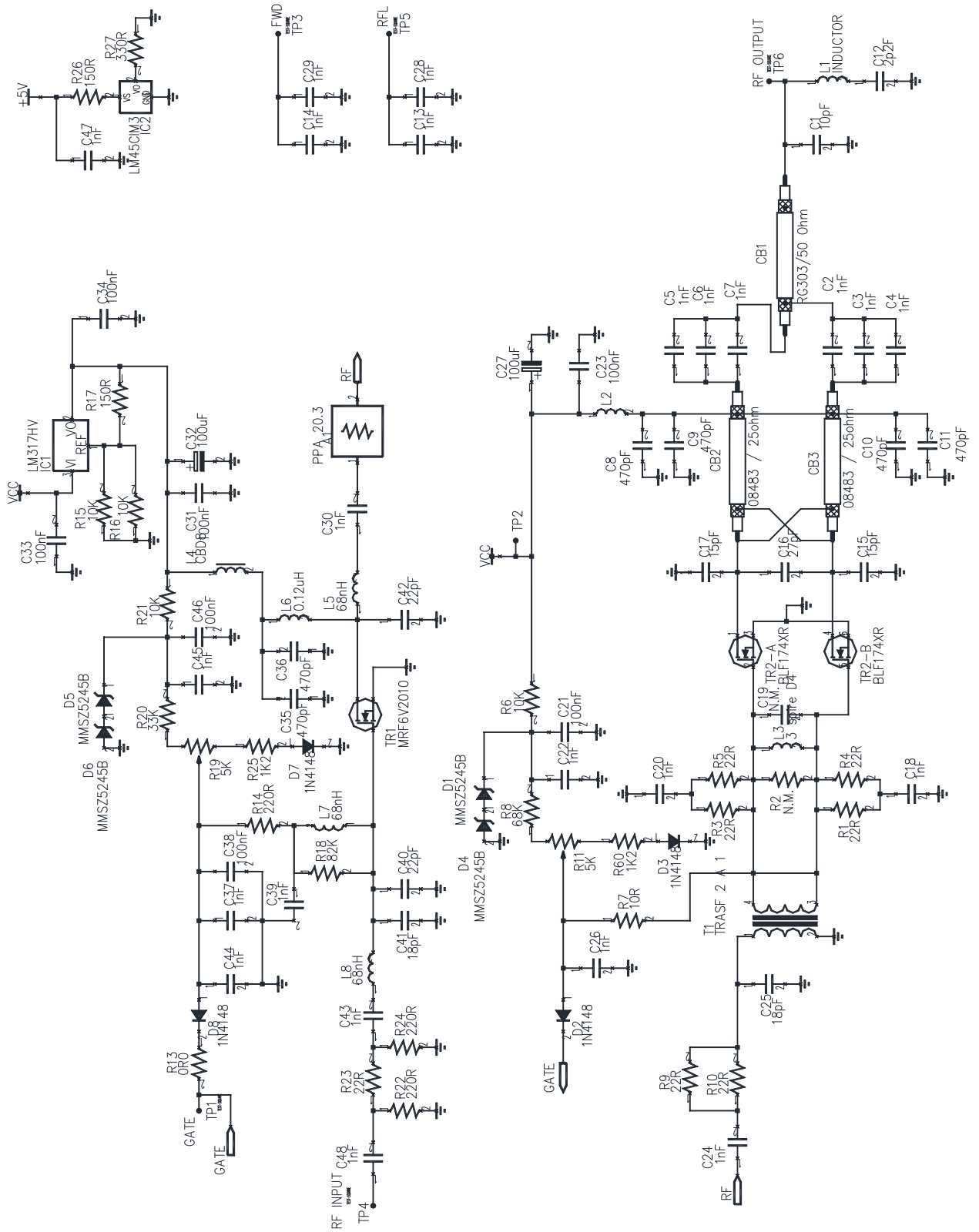


Component list

Code	Description	Qty.	Comps.
08483	RG316 25Ω CABLE	2	120mm
ATT PPA 20.3-3dB 20W	00435 3dB 20W RF ATTENUATOR	1	A1
CB RG316 25 Ohm	08483 RF CABLE	2	CB2, CB3
CB RG303 50 Ohm	08503 RF CABLE	1	CB1
CC 100nF-1000V-S 2220	01065H SMD1210 CAPACITOR	2	C23, C31
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	3	C21, C38, C46
CC 100nF_AVX_100V	01065I CERAMIC CAPACITOR	2	C33-34
CC 18pF-S 01089	01089 SMD 1206 CAPACITOR	1	C41
CC 1nF-S 01096	01096 SMD 1206 CAPACITOR	11	C13-14, C22, C28-29, C37, C39, C43, C45, C47-48
CC 22pF-S 01090	01090 SMD 1206 CAPACITOR	1	C40
CE 100uF100V	01795B ELET. CAPACITOR	2	C27, C32
CP 10pF-S	01117 CHIP CHB	1	C1
CP 15pF-S	01121 CHIP CHB	2	C15, C17
CP 18pF-S	01121A CHIP CHB	1	C25
CP 1n300V-F-S	CSQ01000 CHIP CHB	6	C2-7
CP 1nF-S	01145 CHIP CHB	6	C18, C20, C24, C26, C30, C44
CP 22pF-S	01125 CHIP CHB	1	C42
CP 27pF-S	01146 CHIP CHB	1	C16
CP 2p2F-S	CSQ00022 CHIP CHB	1	C12
CP 470pF-S	01143 CHIP CHB	6	C8-11, C35-36
CP CHB N. M.	N. M. CHB	1	C19
D 1N4148-S 03002	03002 SMD DIODE	4	D2-3, D7-8
DZ MMSZ5245B 03135	03135 SMD ZENER DIODE	4	D1, D4-6
IC LM317HV	04340A INTEG CIRCUIT	1	IC1
IC LM45CIM3_S	00672 LF SMD INTEG CIRCUIT	1	IC2
IND 0u12H 05017A	05017A INDUCTOR	1	L6
IND 0u6H	INDUCTOR	1	L2
IND 3 SP_D4_d0.8mm-S	05042 INDUCTOR	1	L3
IND CBD8 05072	05072 INDUCTOR	1	L4
PSW768200	0.8mm SILVERED WIRE	0.05	
PSW768500	0.35mm SILVERED WIRE	0.35	
R 0R0-S 00001	00001 RES 1/4W 5% SMD 1206	1	R13
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	4	R6, R15-16, R21
R 10R-S 00017A	00017A RES 1/4W 5% SMD 1206	1	R7
R 150R-S 00031A	00031A RES 1/4W 5% SMD 1206	2	R17, R26
R 1K2-1%-S 00042A	00042A RES 1/4W 1% SMD 1206	2	R25, R60
R 220R-S 00033A	00033A RES 1/4W 5% SMD 1206	3	R14, R22, R24
R 22R-1W-S	00387 RES 1W 5% SMD 2512	6	R1, R3-5, R9-10
R 22R-S 00021A	00021A RES 1/4W 5% SMD 1206	1	R23
R 2512 N. M.	N. M. RES SMD 2512 - W	1	R2
R 330R-S 00035B	00035B RES 1/4W 5% SMD 1206	1	R27
R 33K-S 00059A	00059A RES 1/4W 5% SMD 1206	1	R20
R 68K-S 00063A	00063A RES 1/4W 5% SMD 1206	1	R8
R 82K-S 00064A	00064A RES 1/4W 5% SMD 1206	1	R18
RV 5K0-M-H/S	00822 SMD VARIABLE RESISTOR	2	R11, R19
TR MRF6V2010	LD MOS TRANSITOR	1	TR1
TR BLF174XR	LD MOS TRANSITOR	1	TR2
TRAS F 3 A 1 - RF	05064+08504+C0171 TRANSFORMER	1	T1
SPC1717DR1	PRINTED CIRCUIT BOARD	1	

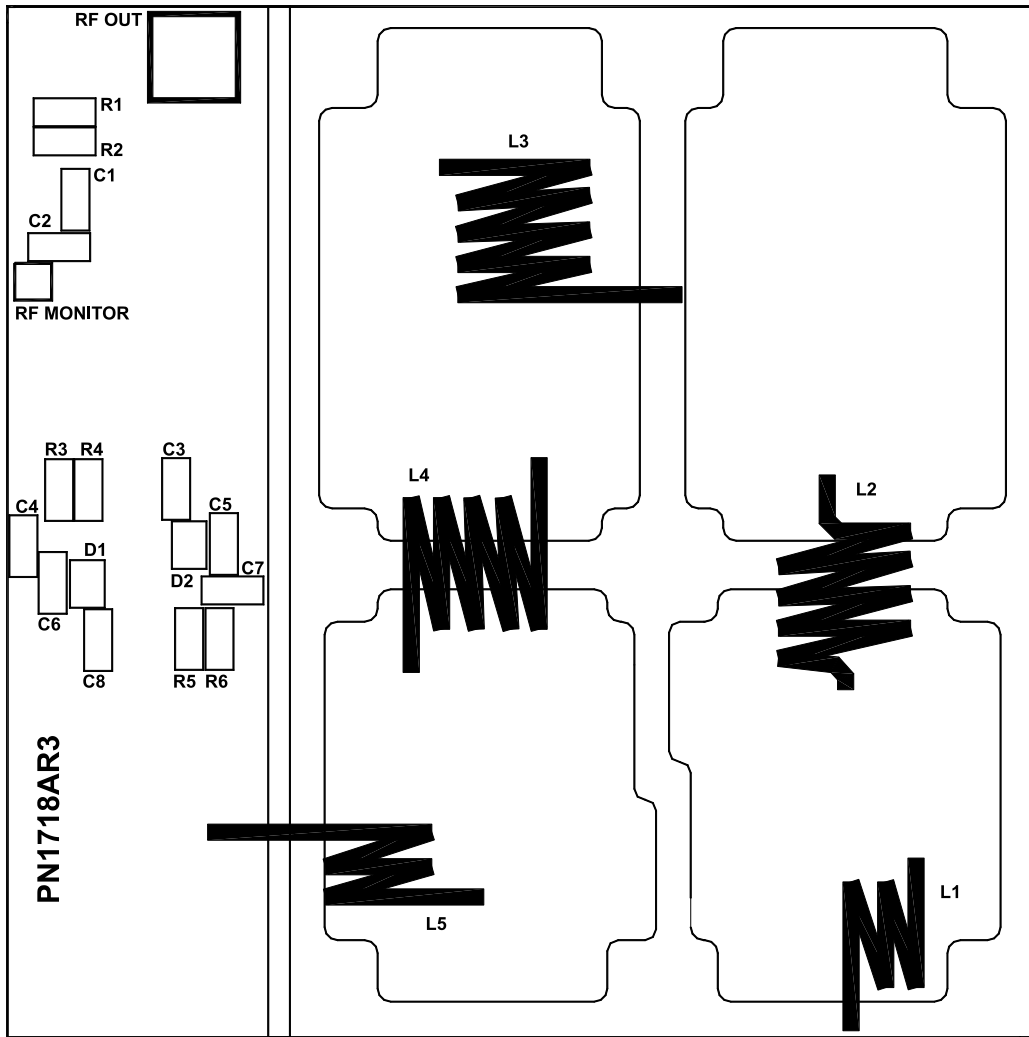


Electric diagram 1/1



4.8.2 FILTER AND DIRECTIONAL COUPLER (SEB0818AR1 Code)

Component layout

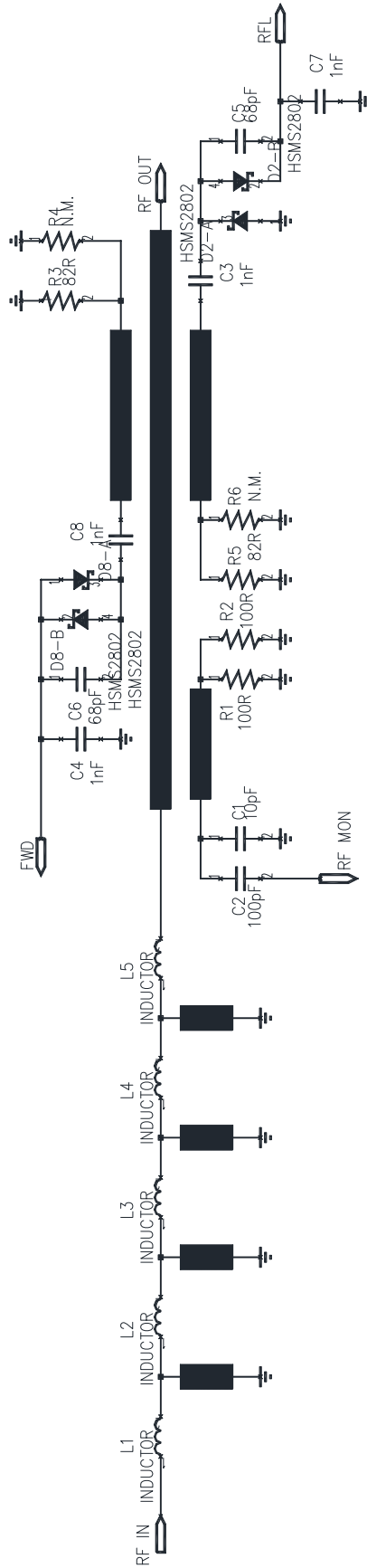


Component list

Code	Description	Qty.	Comps.
CC 100pF-S 01092C	01092C SMD 0805 CAPACITOR	1	C2
CC 10pF-S 01086A	01086A SMD 0805 CAPACITOR	1	C1
CC 1nF-S 01096A	01096A SMD 0805 CAPACITOR	4	C3-4, C7-8
CC 68pF-S 01027A	01027A SMD 1206 CAPACITOR	2	C5-6
D HSMS2802 03207	03207 SMD DIODE	2	D2, D8
PSW768600	2.0mm SILVERED WIRE	1	
R 100R-S 00029B	00029B RES 1/4W 5% SMD 0805	2	R1-2
R 1206 N. M.	N. M. RES 1/4W 5% SMD 1206	2	R4, R6
R 82R-S 00028A	00028A RES 1/4W 5% SMD 1206	2	R3, R5
SPC1718AR3	PRINTED CIRCUIT BOARD	1	

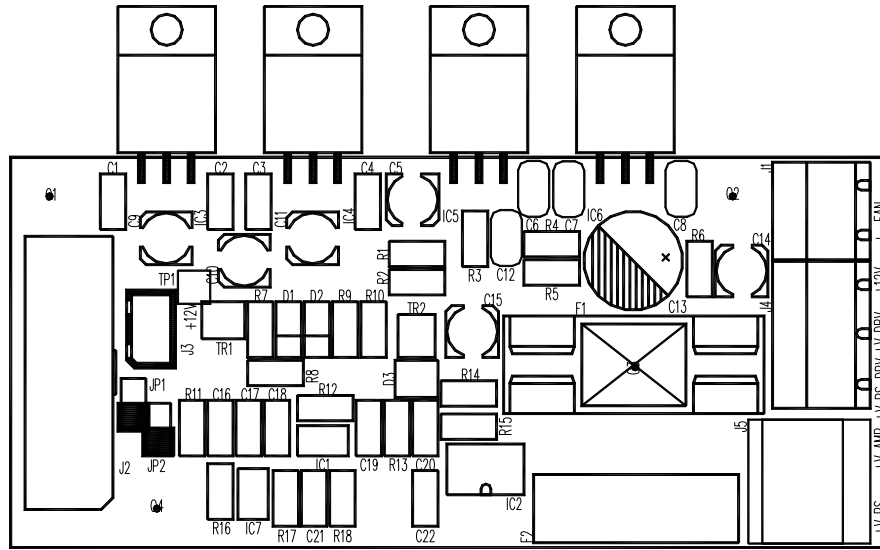


Electric diagram 1/1



4.8.3 INTERFACE MODULE (SFG0060AR0 Code)

Component layout

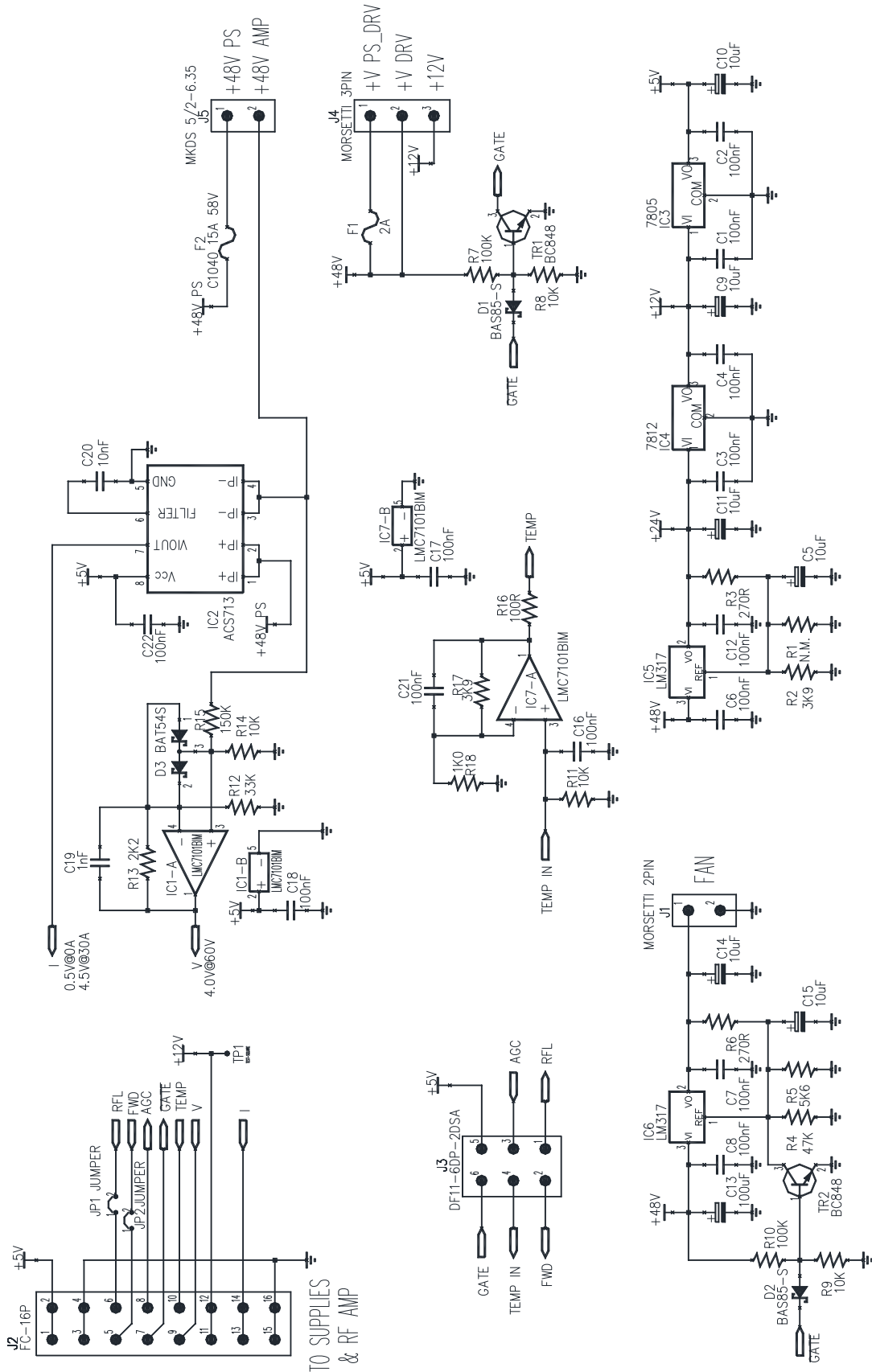


Component list

Code	Description	Qty.	Comps.
04315	LM 7805 VOLTAGE REGULATOR	1	
04321	LM 7812 VOLTAGE REGULATOR	1	
04340A	LM 317HVT VOLTAGE REGULATOR	2	
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	9	C1-4, C16-18, C21-22
CC 100nFAVX 01065A	01065A CERAMIC CAPACITOR	4	C6-8, C12
CC 10nF-S 01053B	01053B SMD 1206 CAPACITOR	1	C20
CC 1nF-S 01096	01096 SMD 1206 CAPACITOR	1	C19
CE 100uF100V	01795B ELET. CAPACITOR	1	C13
CE 10uF35V-S 01778A	01778A ELET. SMD CAPACITOR	6	C5, C9-11, C14-15
D BAS85-S	03024 SMD SCHOTTKY DIODE	2	D1-2
D BAT54S	03199 SMD SCHOTTKY DIODE	1	D3
DET2516AR1P	SUPPORT FOR INTERFACE BOARD	1	
FUSE 2A-PCB 7543	7543 FUSE-HOLDER WITH FUSE	1	F1
FUSE OMEGA C1040	FUS00015+FUS00018	1	F2
IC 7805 04315	04315 VOLTAGE REGULATOR	1	IC3
IC 7812 04321	04321 VOLTAGE REGULATOR	1	IC4
IC ACS713ELCTR-30A-T-S	ICT0065SAX LF SMD INTEG CIRCUIT	1	IC2
IC LM317 04340	04340 INTEG CIRCUIT	2	IC5-6
IC LMC7101BIM	04638 SMD INTEG CIRCUIT	2	IC1, IC7
J CON MKDS 5_2-6.35	02909 PCB CONNECTOR	1	J5
J FC-16P 02701-02700	02701+02700 PCB CONNECTOR	1	J2
J SCREWCONN2 02853	02853 PCB SCREW CONNECTOR	1	J1
J SCREWCONN3 02860	02860 PCB SCREW CONNECTOR	1	J4
JU JUMP2 02739-02742	02739+02742 PAN2 MALE CONNECT.2	2	JP1-2
R 100K-S 00065A	00065A RES 1/4W 5% SMD 1206	2	R7, R10
R 100R-1%-S 00029D	00029D RES 1/4W 1% SMD 1206	1	R16
R 10K-1%-S 00053B	00053B RES 1/4W 1% SMD 1206	2	R11, R14
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	2	R8-9
R 1206 N. M.	N. M. RES 1/4W 5% SMD 1206	1	R1
R 150K-1%-S	RES 1/4W 1% SMD 1206	1	R15
R 1K0-1%-S 00041B	00041B RES 1/4W 1% SMD 1206	1	R18
R 270R-S 00034A	00034A RES 1/4W5% SMD 1206	2	R3, R6
R 2K2-1%-S 00045B	00045B RES 1/4W 1% SMD 1206	1	R13
R 33K-1%-S 00059B	00059B RES 1/4W 1% SMD 1206	1	R12
R 3K9-1%-S 00048B	00048B RES 1/4W 1% SMD 1206	2	R2, R17
R 47K-S 00061A	00061A RES 1/4W 5% SMD 1206	1	R4
R 5K6-S 00050A	00050A RES 1/4W 5% SMD 1206	1	R5
TR BC848 03457	03457 NPN SMD TRANSISTOR	2	TR1-2
SPC1740AR3	PRINTED CIRCUIT BOARD	1	



Electric diagram 1/1



TO SUPPLIES & RF AMP



4.9 500W FM RF AMPLIFIER MODULE (SFM0057BR1 Code)³

DESCRIPTION

The SFM0057B amplifier module is designed to amplify the FM modulated carriers in the 87 - 108MHz band, and can provide an output of 500W CW.

In order to obtain the desired gain, the amplifier is made up by two gain stages: the pilot stage uses a MRF6V2010 MOSFET, while the final stage uses a BLF174XR LDMOS.

In the input section of the module there is a 4dB pi attenuator and between the driver stage and the final stage there is a 20W 3dB attenuator.

The output power regulation is made by controlling the power level of the input signal of the module. Amplifier module includes a gate switch-off protection circuit in case of failure and a thermal compensation circuit that guarantees a constant gate voltages with temperature variation, both of them integrated in the amplifier board. The output of the module is completed by a very selective low-pass filter to attenuate the level of the harmonics and spurious signals, and by two high-directivity directional couplers needed to sample part of the Forward and Reflected Power in order to measure their levels.

The module includes too a coupler for a monitoring signal that is available from the front panel by a BNC connector and a temperature sensor.

TECHNICAL CHARACTERISTICS	
Frequency Range	87 – 108MHz
Output Power	500W CW
Gain	35dB \pm 1dB
Power Supply Voltage	+48Vdc
Bias Current	MRF6V2010 with Vdd = +36V: 30mA
Bias Current	BLF174XR with Vdd = +48V: 50mA
RF Input Connector	SMB Female
RF Input Impedance	50 Ω
RF Output Connector	7/16"
RF Output Impedance	50 Ω

Component list

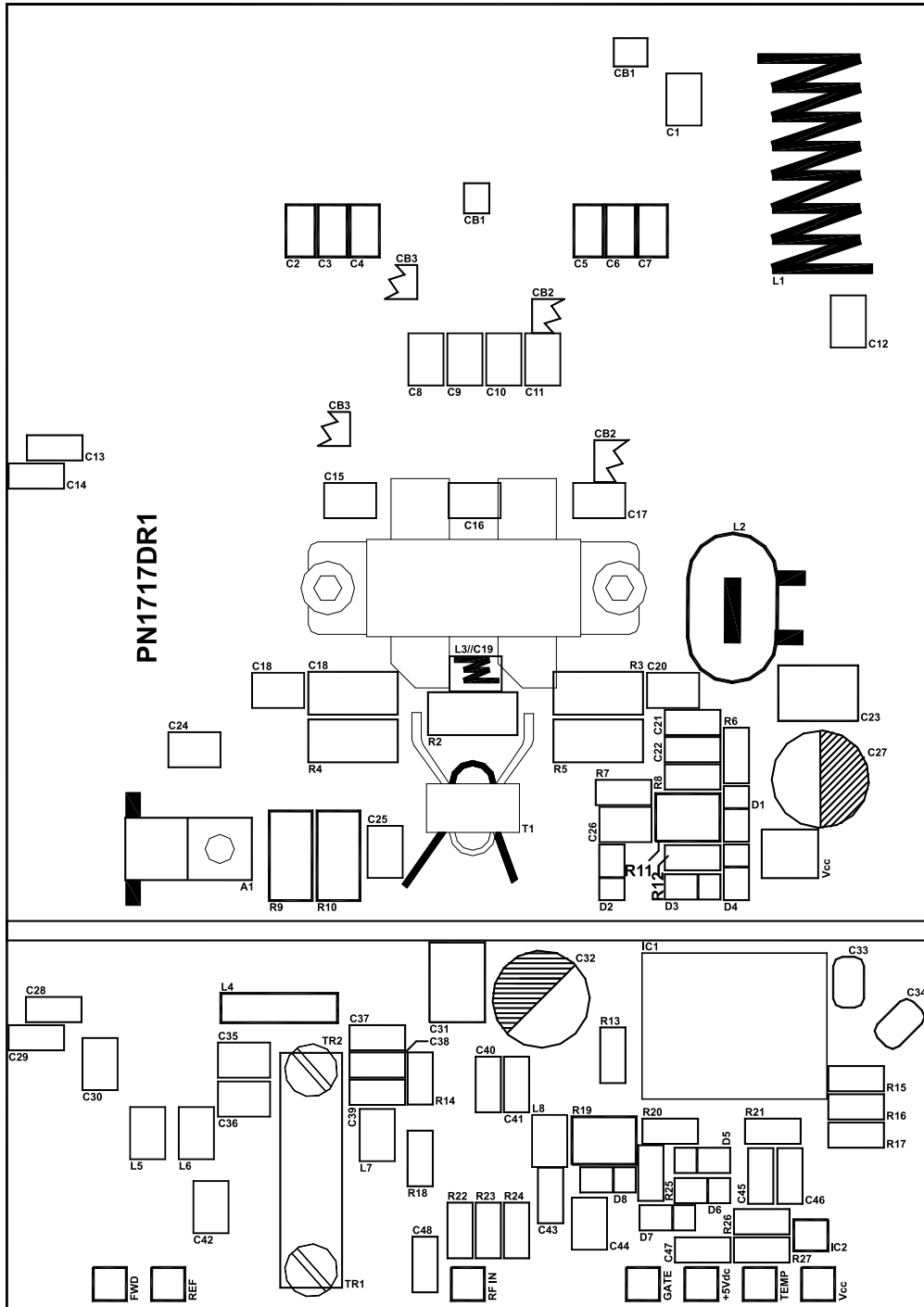
Code	Description	Qty.
PCP140300	BYPASSING CAPACITOR	5
CCN240200	7/16" FEMALE CONNECTOR	1
CCN251400	SMB CONNECTOR PANEL MOUNT	1
CCN251500	SMB CONNECTOR	1
PIN504200	INDUCTOR	1
CCB850200	RG316 50 Ω CABLE	0.15
MHT2478R4P	HEAT SINK	1
MMA2482E0P	MRF6V2010 COPPER BAR	1
MMA2508R0P	REAR SIDE AMPLIFIER MODULE	1
PCP0004SFX	SCI 1202F-054 EMI-FILTER	1
SFG0060AR0	INTERFACE MODULE	1
MBX0184R2F	0.5mm BRASS BOX	1
SEB0817AR2	500W FM RF AMPLIFIER BOARD	1
SEB0818AR1	FILTER AND DIRECT. COUPLER	1
RCB030200	6 PIN CONNECTOR FOR SP-480-48	1
PCB790700	MICA FOR T0220	1
PRE791000	PASSING FOT T0220	1

³ Present in AEROTX500 model



4.9.1 500W FM RF AMPLIFIER BOARD (SEB0817AR2 Code)

Component layout

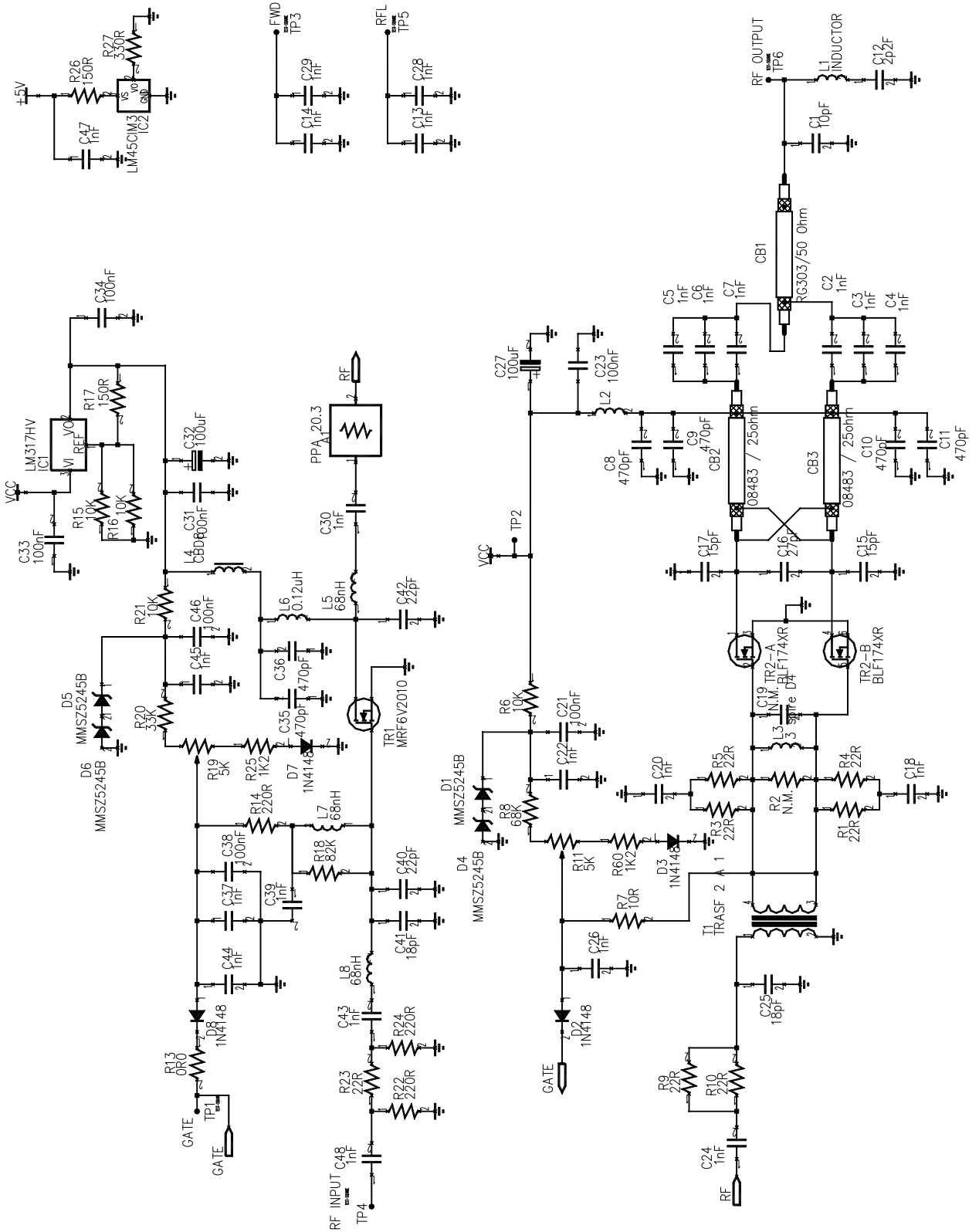


Component list

Code	Description	Qty.	Comps.
08483	RG316 25W CABLE	2	120mm
ATT PPA 20.3-3dB 20W	00435 3dB 20W RF ATTENUATOR	1	A1
CB RG316 25 Ohm	08483 RF CABLE	2	CB2, CB3
CB RG303 50 Ohm	08503 RF CABLE	1	CB1
CC 100nF-1000V-S 2220	01065H SMD1210 CAPACITOR	2	C23, C31
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	3	C21, C38, C46
CC 100nF_AVX_100V	01065I CERAMIC CAPACITOR	2	C33-34
CC 18pF-S 01089	01089 SMD 1206 CAPACITOR	1	C41
CC 1nF-S 01096	01096 SMD 1206 CAPACITOR	11	C13-14, C22, C28-29, C37, C39, C43, C45, C47-48
CC 22pF-S 01090	01090 SMD 1206 CAPACITOR	1	C40
CE 100uF100V	01795B ELET. CAPACITOR	2	C27, C32
CP 10pF-S	01117 CHIP CHB	1	C1
CP 15pF-S	01121 CHIP CHB	2	C15, C17
CP 18pF-S	01121A CHIP CHB	1	C25
CP 1n300V-F-S	CSQ01000 CHIP CHB	6	C2-7
CP 1nF-S	01145 CHIP CHB	6	C18, C20, C24, C26, C30, C44
CP 22pF-S	01125 CHIP CHB	1	C42
CP 27pF-S	01146 CHIP CHB	1	C16
CP 2p2F-S	CSQ00022 CHIP CHB	1	C12
CP 470pF-S	01143 CHIP CHB	6	C8-11, C35-36
CP CHB N. M.	N. M. CHB	1	C19
D 1N4148-S 03002	03002 SMD DIODE	4	D2-3, D7-8
DZ MMSZ5245B 03135	03135 SMD ZENER DIODE	4	D1, D4-6
IC LM317HV	04340A INTEG CIRCUIT	1	IC1
IC LM45CIM3_S	00672 LF SMD INTEG CIRCUIT	1	IC2
IND 0u12H 05017A	05017A INDUCTOR	1	L6
IND 0u6H	INDUCTOR	1	L2
IND 3 SP_D4_d0.8mm-S	05042 INDUCTOR	1	L3
IND CBD8 05072	05072 INDUCTOR	1	L4
R 0R0-S 00001	00001 RES 1/4W 5% SMD 1206	1	R13
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	4	R6, R15-16, R21
R 10R-S 00017A	00017A RES 1/4W 5% SMD 1206	1	R7
R 150R-S 00031A	00031A RES 1/4W 5% SMD 1206	2	R17, R26
R 1K2-1%-S 00042A	00042A RES 1/4W 1% SMD 1206	2	R25, R60
R 220R-S 00033A	00033A RES 1/4W 5% SMD 1206	3	R14, R22, R24
R 22R-1W-S	00387 RES 1W 5% SMD 2512	6	R1, R3-5, R9-10
R 22R-S 00021A	00021A RES 1/4W 5% SMD 1206	1	R23
R 2512 N. M.	N. M. RES SMD 2512 - W	1	R2
R 330R-S 00035B	00035B RES 1/4W 5% SMD 1206	1	R27
R 33K-S 00059A	00059A RES 1/4W 5% SMD 1206	1	R20
R 68K-S 00063A	00063A RES 1/4W 5% SMD 1206	1	R8
R 82K-S 00064A	00064A RES 1/4W 5% SMD 1206	1	R18
RV 5K0-M-H/S	00822 SMD VARIABLE RESISTOR	2	R11, R19
TR MRF6V2010	LDMOS TRANSITOR	1	TR1
TR BLF174XR	LDMOS TRANSITOR	1	TR2
TRASF 3 A 1 - RF	05064+08504+C0171 TRANSFORMER	1	T1
SPC1717DR1	PRINTED CIRCUIT BOARD	1	

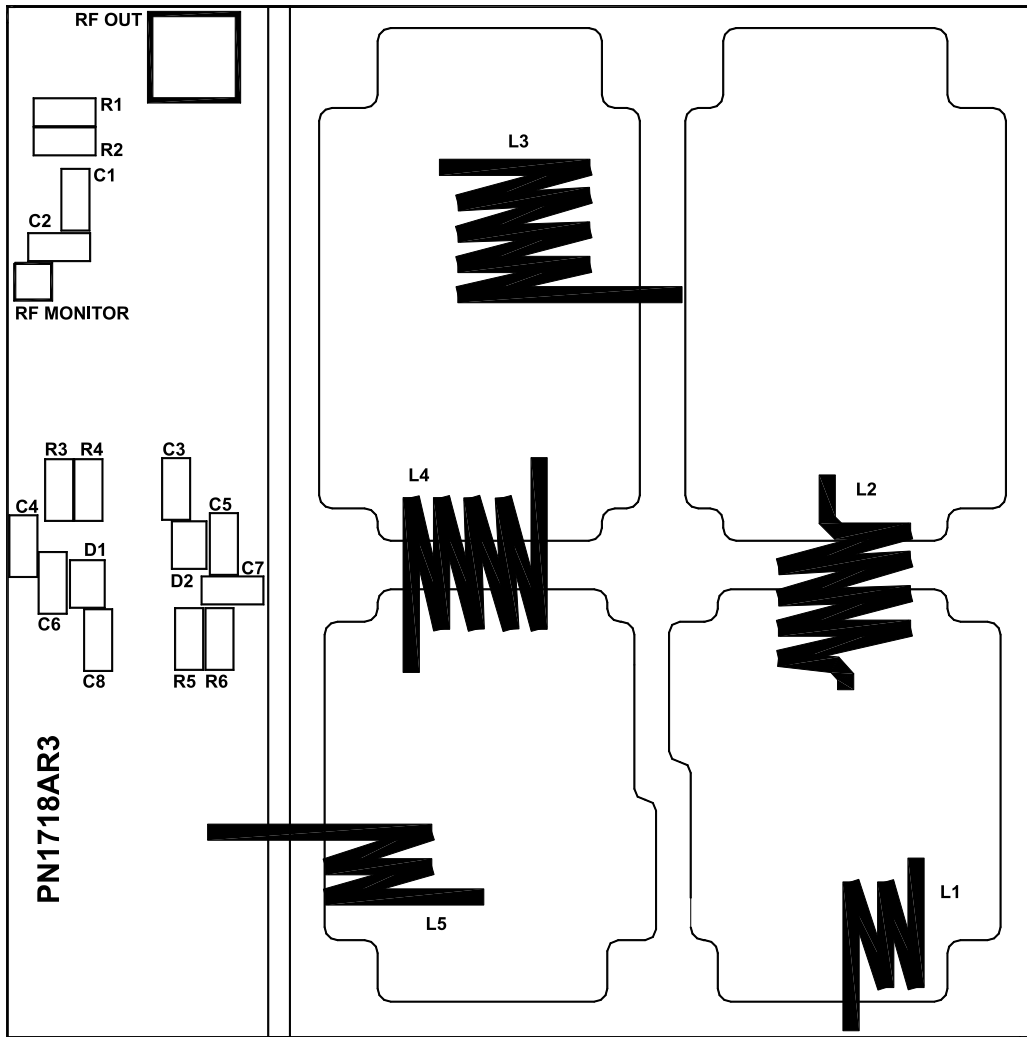


Electric diagram 1/1



4.9.2 FILTER AND DIRECTIONAL COUPLER (SEB0818AR1 Code)

Component layout

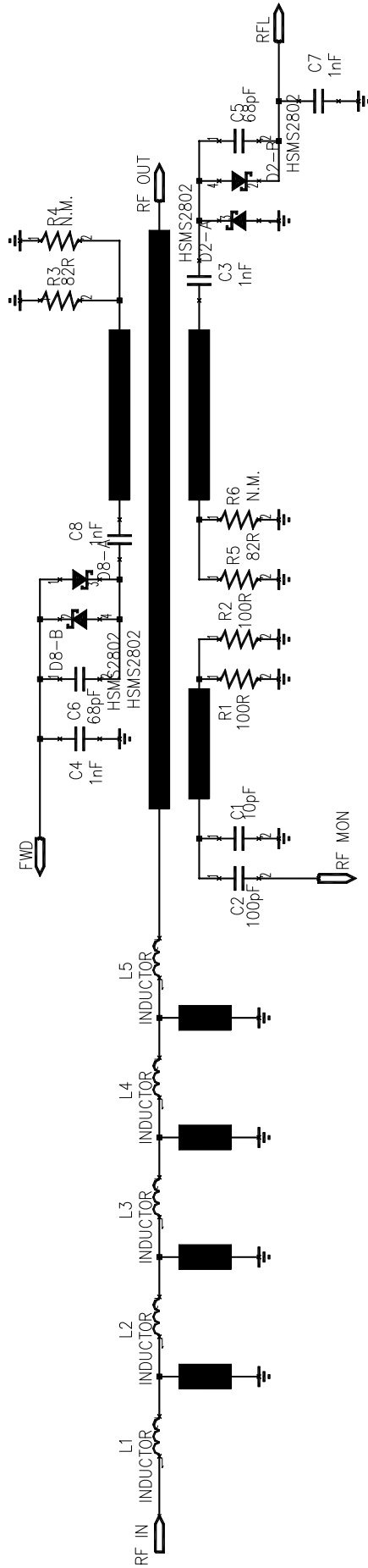


Component list

Code	Description	Qty.	Comps.
CC 100pF-S 01092C	01092C SMD 0805 CAPACITOR	1	C2
CC 10pF-S 01086A	01086A SMD 0805 CAPACITOR	1	C1
CC 1nF-S 01096A	01096A SMD 0805 CAPACITOR	4	C3-4, C7-8
CC 68pF-S 01027A	01027A SMD 1206 CAPACITOR	2	C5-6
D HSMS2802 03207	03207 SMD DIODE	2	D2, D8
R 100R-S 00029B	00029B RES 1/4W 5% SMD 0805	2	R1-2
R 1206 N. M.	N. M. RES 1/4W 5% SMD 1206	2	R4, R6
R 82R-S 00028A	00028A RES 1/4W 5% SMD 1206	2	R3, R5
SPC1718AR3	PRINTED CIRCUIT BOARD	1	

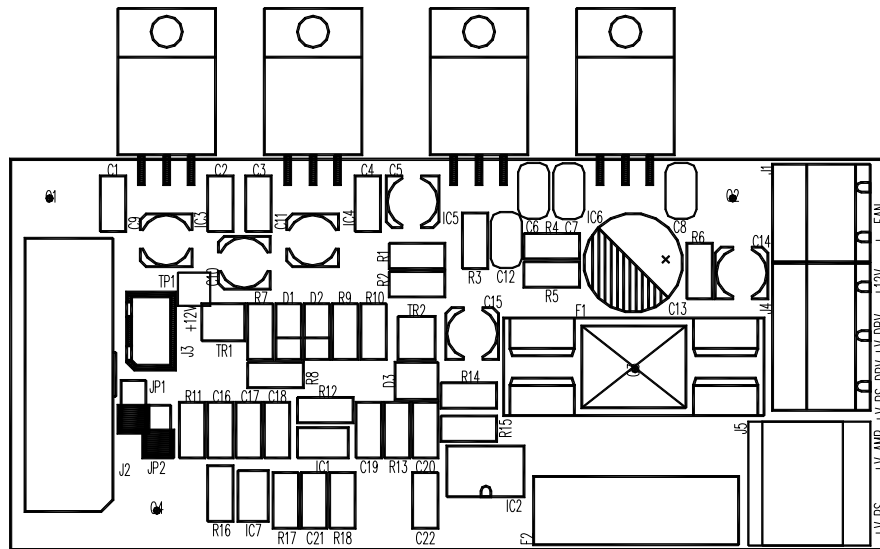


Electric diagram 1/1



4.9.3 INTERFACE MODULE (SFG0060AR0 Code)

Component layout

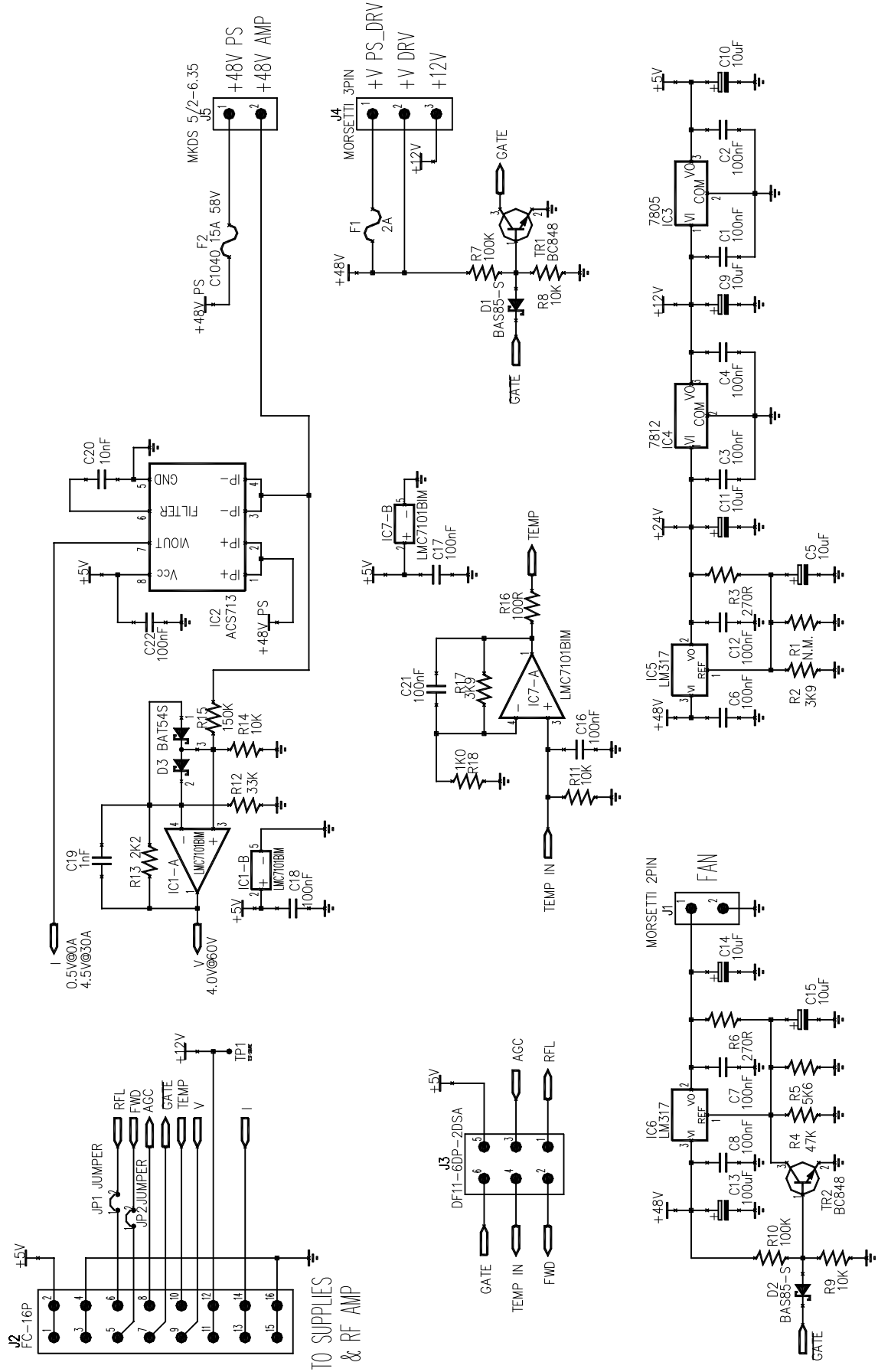


Component list

Code	Description	Qty.	Comps.
04315	LM 7805 VOLTAGE REGULATOR	1	
04321	LM 7812 VOLTAGE REGULATOR	1	
04340A	LM 317HVT VOLTAGE REGULATOR	2	
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	9	C1-4, C16-18, C21-22
CC 100nFAVX 01065A	01065A CERAMIC CAPACITOR	4	C6-8, C12
CC 10nF-S 01053B	01053B SMD 1206 CAPACITOR	1	C20
CC 1nF-S 01096	01096 SMD 1206 CAPACITOR	1	C19
CE 100uF100V	01795B ELET. CAPACITOR	1	C13
CE 10uF35V-S 01778A	01778A ELET. SMD CAPACITOR	6	C5, C9-11, C14-15
D BAS85-S	03024 SMD SCHOTTKY DIODE	2	D1-2
D BAT54S	03199 SMD SCHOTTKY DIODE	1	D3
DET2516AR1P	SUPPORT FOR INTERFACE BOARD	1	
FUSE 2A-PCB 7543	7543 FUSE-HOLDER WITH FUSE	1	F1
FUSE OMEGA C1040	FUS00015+FUS00018	1	F2
IC 7805 04315	04315 VOLTAGE REGULATOR	1	IC3
IC 7812 04321	04321 VOLTAGE REGULATOR	1	IC4
IC ACS713ELCTR-30A-T-S	ICT0065SAX LF SMD INTEG CIRCUIT	1	IC2
IC LM317 04340	04340 INTEG CIRCUIT	2	IC5-6
IC LMC7101BIM	04638 SMD INTEG CIRCUIT	2	IC1, IC7
J CON MKDS 5_2-6.35	02909 PCB CONNECTOR	1	J5
J FC-16P 02701-02700	02701+02700 PCB CONNECTOR	1	J2
J SCREWCONN2 02853	02853 PCB SCREW CONNECTOR	1	J1
J SCREWCONN3 02860	02860 PCB SCREW CONNECTOR	1	J4
JU JUMP2 02739-02742	02739+02742 PAN2 MALE CONNECT.2	2	JP1-2
R 100K-S 00065A	00065A RES 1/4W 5% SMD 1206	2	R7, R10
R 100R-1%-S 00029D	00029D RES 1/4W 1% SMD 1206	1	R16
R 10K-1%-S 00053B	00053B RES 1/4W 1% SMD 1206	2	R11, R14
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	2	R8-9
R 1206 N. M.	N. M. RES 1/4W 5% SMD 1206	1	R1
R 150K-1%-S	RES 1/4W 1% SMD 1206	1	R15
R 1K0-1%-S 00041B	00041B RES 1/4W 1% SMD 1206	1	R18
R 270R-S 00034A	00034A RES 1/4W5% SMD 1206	2	R3, R6
R 2K2-1%-S 00045B	00045B RES 1/4W 1% SMD 1206	1	R13
R 33K-1%-S 00059B	00059B RES 1/4W 1% SMD 1206	1	R12
R 3K9-1%-S 00048B	00048B RES 1/4W 1% SMD 1206	2	R2, R17
R 47K-S 00061A	00061A RES 1/4W 5% SMD 1206	1	R4
R 5K6-S 00050A	00050A RES 1/4W 5% SMD 1206	1	R5
TR BC848 03457	03457 NPN SMD TRANSISTOR	2	TR1-2
SPC1740AR3	PRINTED CIRCUIT BOARD	1	



Electric diagram 1/1



4.10 1000W FM RF AMPLIFIER MODULE (SFM0066AR1 Code)⁴

DESCRIPTION

Amplifier module SFM0066A is composed of one 10W driver followed by two 650W LDMOS devices. Combining system is a lumped elements Wilkinson one both for the input and for the output with oversized unbalanced power dummy loads. The amplifier module includes too a very selective low-pass filter to reject harmonics guaranteeing a maximum spurious within the normative. It is followed by a directional coupler with a high directivity used for forward and reflected power reading. Driver and amplifier modules include a gate switch-off protection circuit in case of failure and a thermal compensation circuit that guarantees a constant gate voltages with temperature variation, both of them integrated in each amplifier board. The module is provided with a temperature sensor that is located in the splitter board.

TECHNICAL CHARACTERISTICS	
Frequency Range	87 – 108MHz
Output Power	1000W CW
Gain	35dB \pm 1dB
Power Supply Voltage	+48Vdc
Bias Current	MRF6V2010 with Vdd = +36V: 30mA
Bias Current	BLF174XR with Vdd = +48V: 50mA
RF Input Connector	SMB Female
RF Input Impedance	50 Ω
RF Output Connector	7/16"
RF Output Impedance	50 Ω

Component list

Code	Description	Qty.
PRE045400	1GHz 100 Ω 500W RESISTOR	1
PCP140800	BYPASSING CAPACITOR	7
CCN240200	7/16" FEMALE CONNECTOR	1
CCN251500	SMB CONNECTOR	2
PSW768600	2mm SILVERED WIRE	1
PCB790700	MICA FOR TO220	3
PRE791000	PASSING FOR TO220	3
CCB850220	RG316 50 Ω CABLE	0.3
MHT2024R9P	HEAT-SINK	1
MMA2025R2P	LEFT SIDE DETAIL	1
MMA2026R5P	RIGHT SIDE DETAIL	1
MMA2027R2P	MIDDLE SIDE DETAIL	1
MMA2029R3P	FRONT SIDE DETAIL	1
MMA2030R3P	OUT SIDE DETAIL	1
MCV2031R2P	RF AMPLIFIER MODULE COVER	1
PCP0004SFX	EMI-FILTER	2
SFG0052AR0	DIRECTIONAL COUPLER MODULE	1
SPC1563BR1	2 WAY FM COMBINER	1
SPC1566AR5	BANDPASS FILTER	1
SPC1652AR1	PRINTED CIRCUIT BOARD	1
SEB0704AR1	2 WAY FM DIVIDER AND DIR. COUP.	1
SEB0708CR0	INTERFACE BOARD	1
SEB0777AR1	10W FM RF DRIVER BOARD	1
SEB0821CR1	600W FM RF AMPLIFIER BOARD	2
PRE0444A0	100 Ω 30W RESISTOR	1
ASD388800	MRF6V2010N 10W LDMOS TRANS.	1

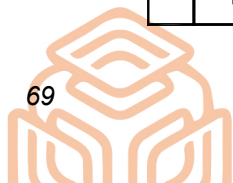
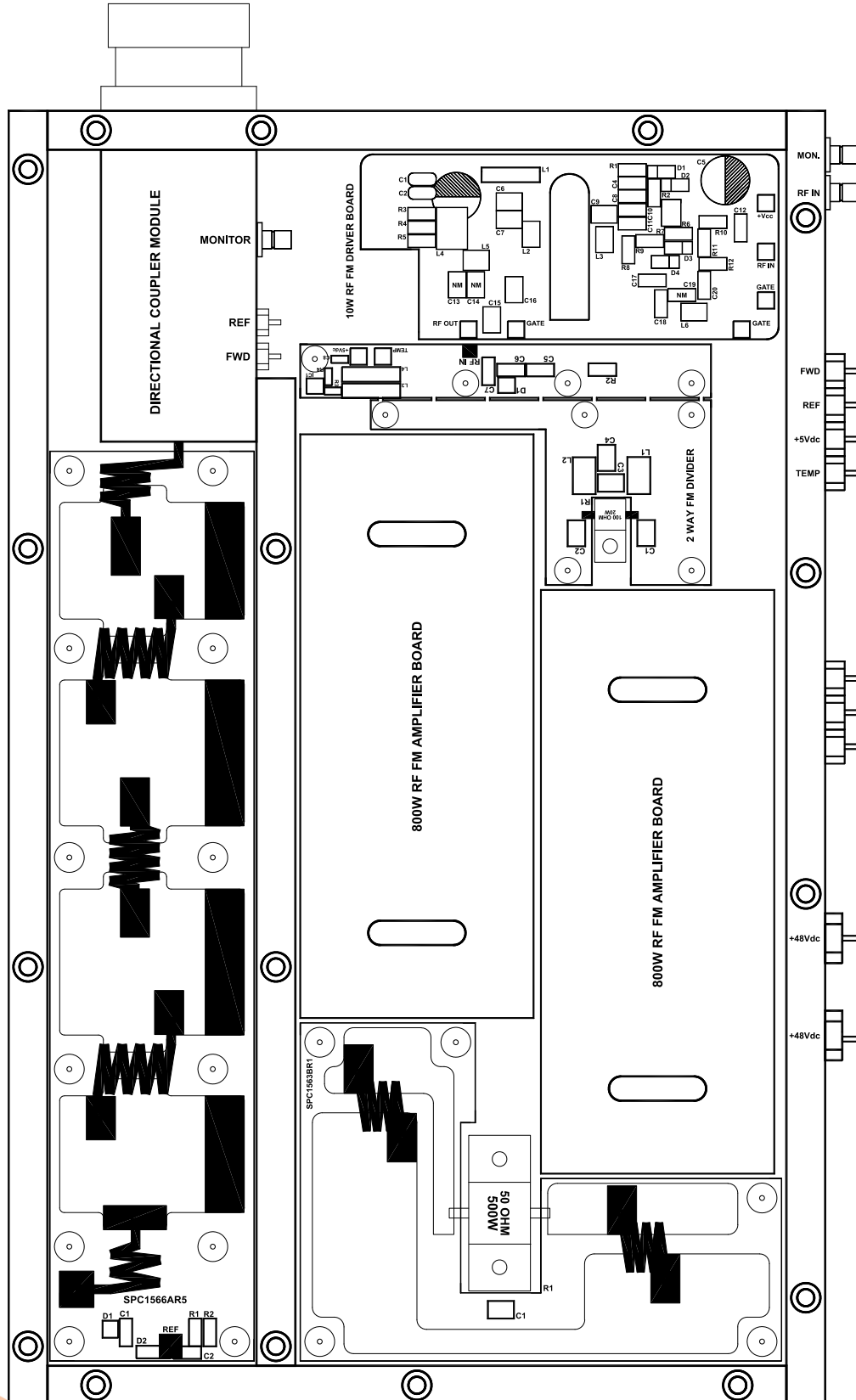
⁴ Present in AEROTX1000 model



AEROTX FM TRANSMITTERS

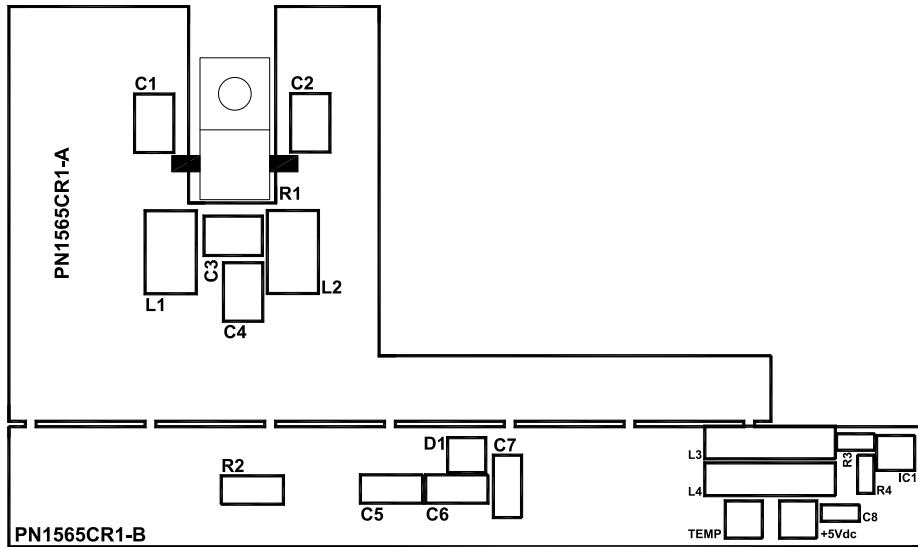
CVR4340A0	LM 317HVT VOLTAGE REGULATOR	1
MMA2189R0P	TEFLON RING	1
MMA2482R0P	TRANSISTOR COPPER BAR	1
PCP111300	8.2pF CHIP CAPACITOR	1
ASD413700	BLF174XR TRANSISTOR	2

Component layout



4.10.1 2-WAYS FM DIVIDER (SEB0704AR1 Code)

Component layout

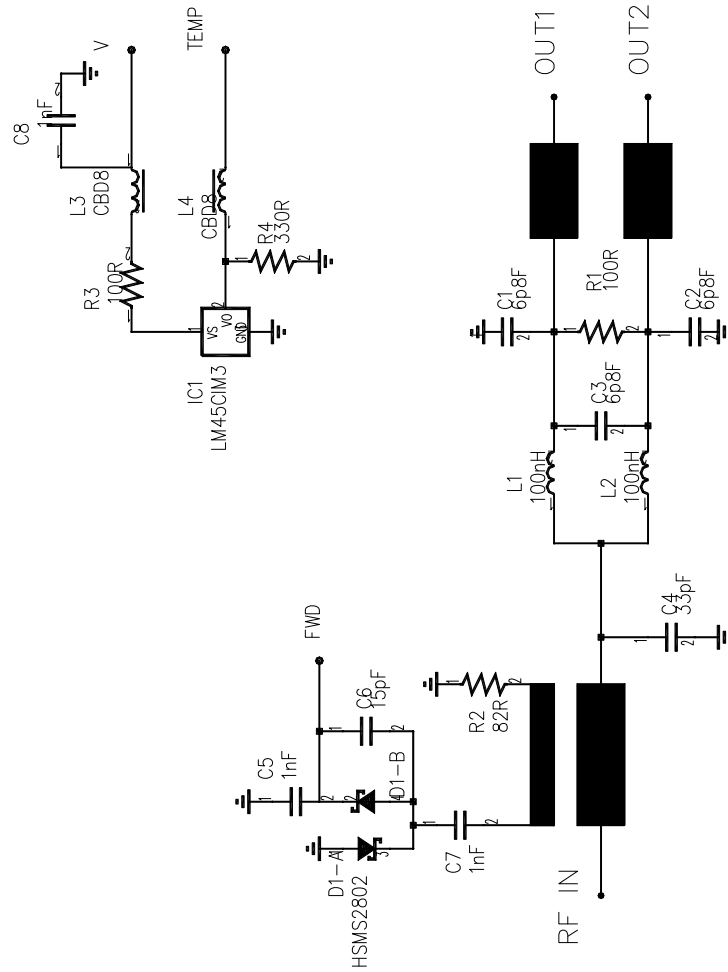


Component list

Code	Description	Qty.	Comps.
CC 100nF-S 01065E	01065E Y5V 0805 CAPACITOR	1	C8
CC 1nF-2%-S 01041D	01041D SMD 1206 CAPACITOR	2	C5, C7
CC 15pF-S 01019	01019 SMD 1206 CAPACITOR	1	C6
CP 33pF-S	01127 CHIP CHB	1	C4
CP 6p8F-S	01111 CHIP CHB	3	C1-3
D HSMS2802 03207	03207 SMD DIODE	1	D1
IC LM45CIM3_S	00672 LF SMD INTEG CIRCUIT	1	IC1
IND 100nH-1812SMS-R10	BOB1812100NH INDUCTOR	2	L1-2
IND CBD8 05072	05072 INDUCTOR	2	L3-4
R 100R 20W	00444 100Ω 20W RF TERMINATION	1	R1
R 100R-S 00029B	00029B RES 1/4W 5% SMD 0805	1	R3
R 330R-SS	00035D RES 1/4W 1% SMD 0805	1	R4
R 82R-S 00028A	00028A RES 1/4W 5% SMD 1206	1	R2
SPC1565CR1C	PRINTED CIRCUIT BOARD	1	

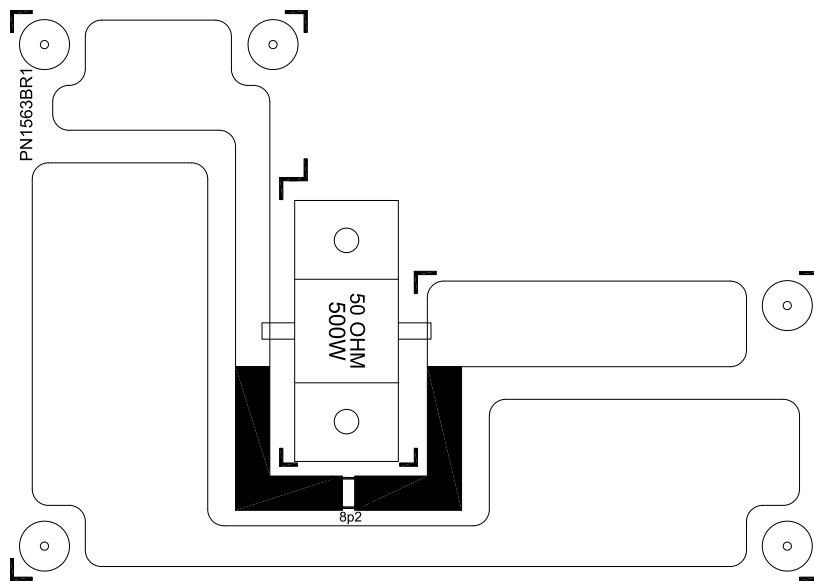


Electric diagram 1/1



4.10.2 2-WAYS FM COMBINER (SPC1563BR1 Code)

Component layout



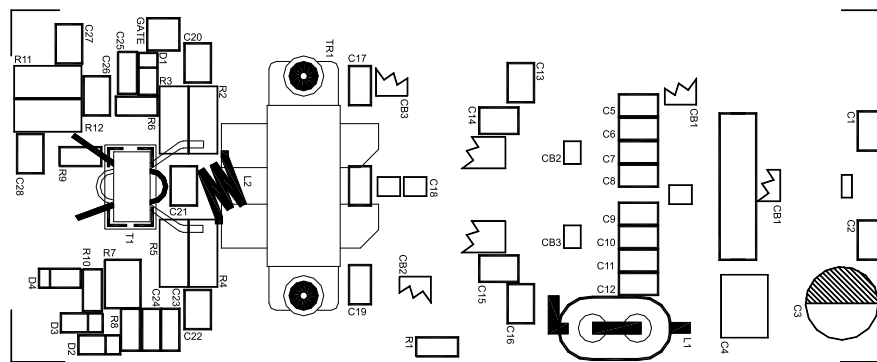
4.10.4 650W FM RF AMPLIFIER BOARD (SEB0821CR1 Code)

DESCRIPTION

The amplifier board SCH0821C employs a single 6th generation LDMOS transistor of Freescale, BLF174XR, that permits to reach the output power of 650W with a high gain and a typical drain efficiency of 80%. It includes also a gate switch-off protection circuit in case of failure and a thermal compensation circuit that guarantees a constant gate voltage with temperature variation.

TECHNICAL CHARACTERISTICS	
Frequency Range	87 – 108MHz
Output Power	650W
Gain at Nominal Power	21dB ±1
BIAS Voltage / Current	+48Vdc / 50mA

Component layout



Component list

Code	Description	Qty.	Comps.
CB RG303 50 Ohm	08503 RF CABLE	1	CB1
CC 100nF-1000V-S 2220	01065H SMD1210 CAPACITOR	1	C4
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	2	C23, C25
CC 1nF-S 01096	01096 SMD 1206 CAPACITOR	1	C24
CE 100uF100V	01795B ELET. CAPACITOR	1	C3
CP 15pF-S	01121 CHIP CHB	2	C17, C19
CP 18pF-S	01121A CHIP CHB	1	C27
CP 1n300V-F-S	CSQ01000 CHIP CHB	6	C6-11
CP 1nF-S	01145 CHIP CHB	4	C20, C22, C26, C28
CP 27pF-S	01146 CHIP CHB	1	C18
CP 470pF-S	01143 CHIP CHB	4	C13-16
CP 6p8F-S	01111 CHIP CHB	1	C1
CP CHB N. M.	N. M. CHB	4	C2, C5, C12, C21
D 1N4148-S 03002	03002 SMD DIODE	2	D1, D4
DZ MMSZ5245B 03135	03135 SMD ZENER DIODE	2	D2-3
IND 3 SP_D4_d0.8mm-S	05042 INDUCTOR	1	L2
R 0R0-S 00001	00001 RES 1/4W 5% SMD 1206	1	R6
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	1	R1
R 10R-S 00017A	00017A RES 1/4W 5% SMD 1206	1	R9
R 1K2-1%-S 00042A	00042A RES 1/4W 1% SMD 1206	1	R10
R 22R-1W-S	00387 RES 1W 5% SMD 2512	6	R2-5, R11-12
R 68K-S 00063A	00063A RES 1/4W 5% SMD 1206	1	R8
RV 5K0-M-H/S	00822 SMD VARIABLE RESISTOR	1	R7
TRASF 3 A 1 - RF	05064+08504+C0171 TRANSF. RF	1	T10
SPC1720AR3	PRINTED CIRCUIT BOARD	1	



4.10.5 10W FM RF AMPLIFIER BOARD (SEB0777AR1 Code)

DESCRIPTION

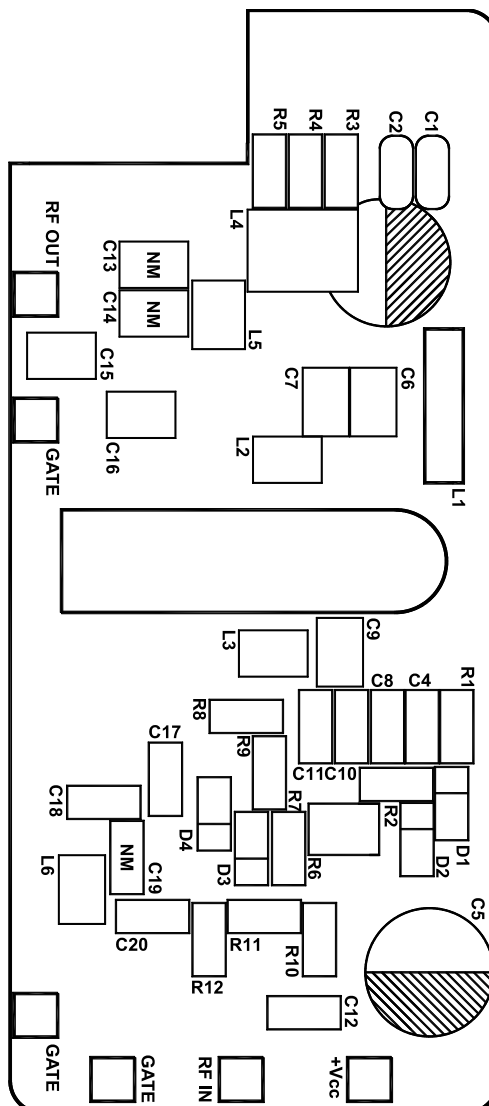
The driver board SEB0777A employ a 10W MOSFET of Freescale, MRF6V2010, that permits to drive the amplifier stage that follow them.

They include also a gate switch-off protection circuit in case of failure and a thermal compensation circuit that guarantees a constant gate voltage with temperature variation.

For the voltage supply of the drivers, it is added on the boards one voltage regulator that fix the maximum voltage supply to 30V.

TECHNICAL CHARACTERISTICS	
Frequency Range	87 – 108MHz
Output Power	10W
Gain at Nominal Power	15dB ±1
BIAS Voltage / Current	+30Vdc / 30mA

Component layout

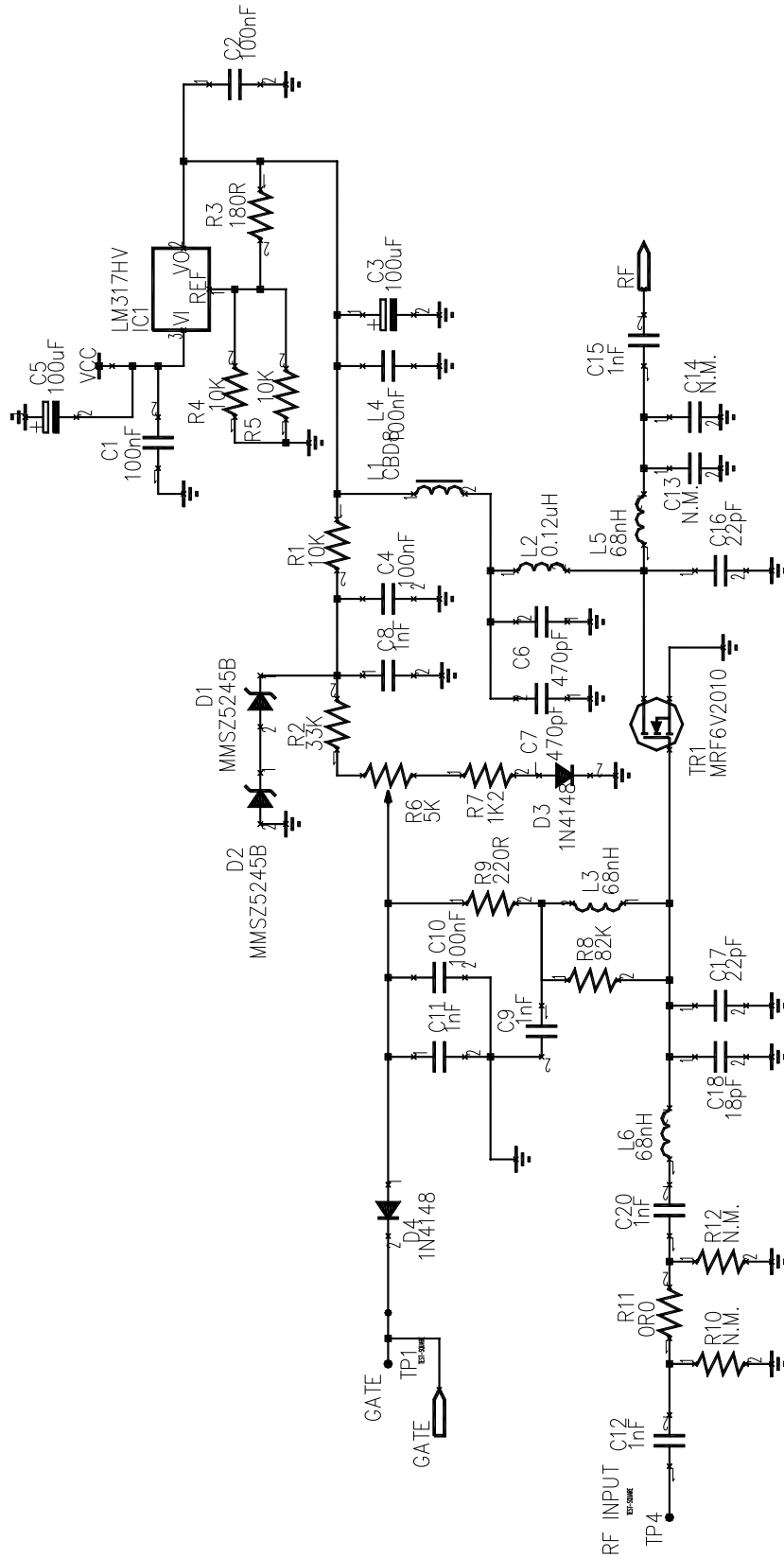


Component list

Code	Description	Qty.	Comps.
CC 100nF-1000V-S 2220	01065H SMD2220 CAPACITOR	1	L4
CC 100nF-S 01065C	01065C Y5V 1206 CAPACITOR	2	C4, C10
CC 100nF_AVX_100V	01065I CERAMIC CAPACITOR	2	C1-2
CC 18pF-S 01089	01089 SMD 1206 CAPACITOR	1	C18
CC 1nF-S 01096	01096 SMD 1206 CAPACITOR	4	C8, C11-12, C20
CC 22pF-S 01090	01090 SMD 1206 CAPACITOR	1	C17
CE 100uF100V	01795B ELET. CAPACITOR	2	C3, C5
CP 1nF-S	01145 CHIP CHB	2	C9, C15
CP 22pF-S	01125 CHIP CHB	1	C16
CP 470pF-S	CHIP CHB	2	C6-7
CP CHB N. M.	N. M. CHB	2	C13-14
D 1N4148-S 03002	03002 SMD DIODE	2	D3-4
DZ MMSZ5245B 03135	03135 SMD ZENER DIODE	2	D1-2
IC LM317HV	04340A INTEG CIRCUIT	1	IC1
IND 0u12H 05017A	05017A INDUCTOR	1	L2
IND 68nH-S	BOB1210068NH INDUCTOR	3	L3, L5-6
IND CBD8 05072	05072 INDUCTOR	1	L1
R 0R0-S 00001	00001 RES 1/4W 5% SMD 1206	1	R11
R 10K-S 00053A	00053A RES 1/4W 5% SMD 1206	3	R1, R4-5
R 1206 N. M.	N. M. RES 1/4W 5% SMD 1206	2	R10, R12
R 180R-S 00032A	00032A RES 1/4W 5% SMD 1206	1	R3
R 1K2-1%-S 00042A	00042A RES 1/4W 1% SMD 1206	1	R7
R 220R-S 00033A	00033A RES 1/4W 5% SMD 1206	1	R9
R 33K-S 00059A	00059A RES 1/4W 5% SMD 1206	1	R2
R 82K-S 00064A	00064A RES 1/4W 5% SMD 1206	1	R8
RV 5K0-M-H/S	00822 SMD VARIABLE RESISTOR	1	R6
TR MRF6V2010-S	03888 LDMOS TRANSISTOR	1	TR1
SPC1585DR2	PRINTED CIRCUIT BOARD	1	

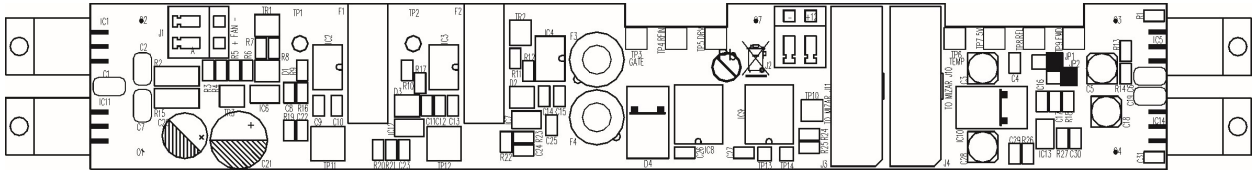


Electric diagram 1/1



4.10.6 INTERFACE BOARD (SEB0708CR0 Code)

Component layout

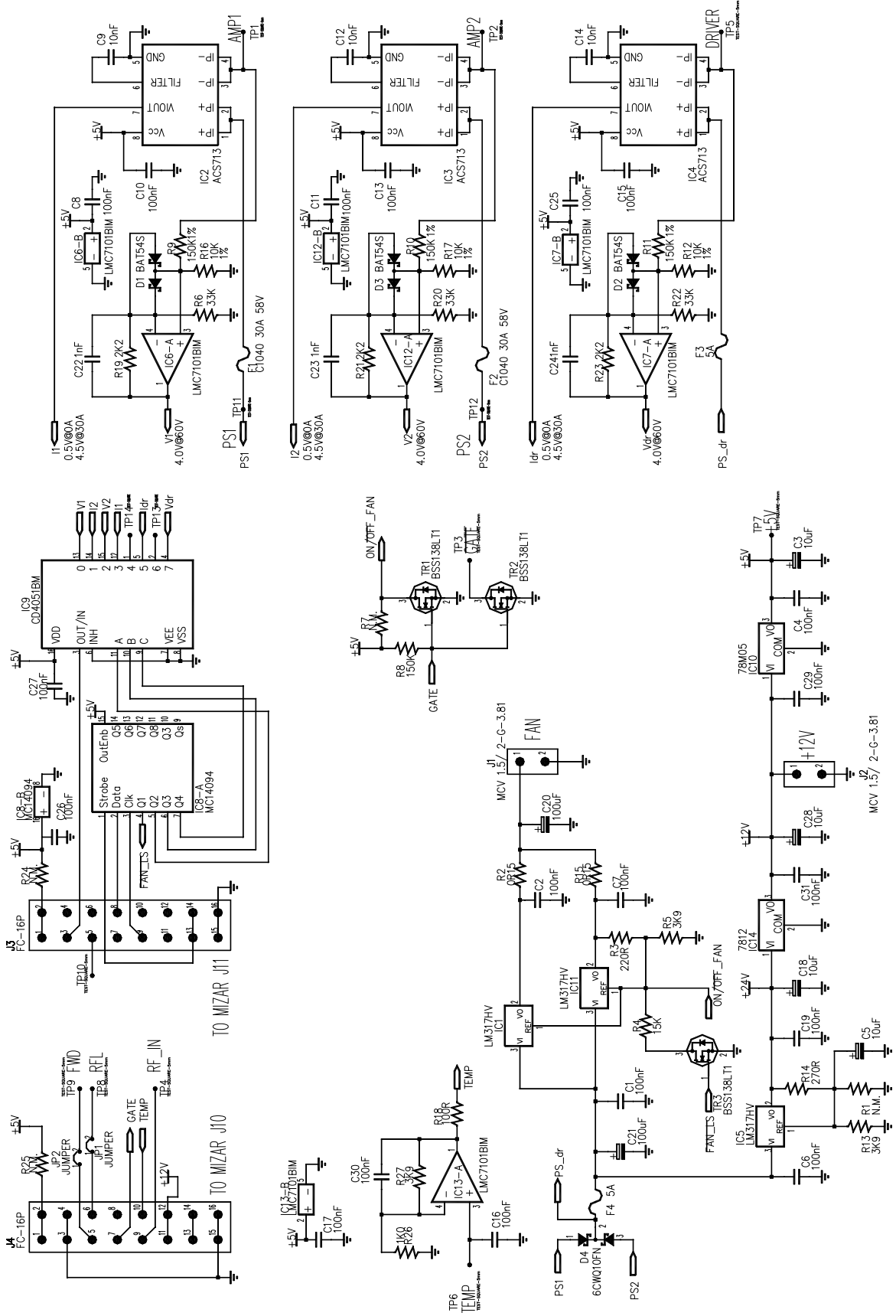


Component list

Code	Description	Qty.	Comps.
CC 100nF-S 01065E	01065E Y5V 0805 CAPACITOR	14	C4, C8, C10-11, C13, C15-17, C25-27, C29-31
CC 100nFAVX 01065A	01065A CERAMIC CAPACITOR	3	C1, C6, C19
CC 100nF_AVX_100V	01065I CERAMIC CAPACITOR	2	C2, C7
CC 10nF-S 01053A	01053A SMD 0805 CAPACITOR	3	C9, C12, C14
CC 1nF-S 01096A	01096A SMD 0805 CAPACITOR	3	C22-24
CE 100uF100V	01795B ELET. CAPACITOR	1	C21
CE 100uF50V 01795	01795 ELET. CAPACITOR	1	C20
CE 10uF35V-S 01778A	01778A ELET. SMD CAPACITOR	4	C3, C5, C18, C28
D 6CWQ10FN	03026 2x3.5A DIODE SCHOTTKY	1	D4
D BAT54S	03199 SMD SCHOTTKY DIODE	3	D1-3
FUSE 5A MICRO FUSE	FUS00009+FUS00006 FUSE-HOLD.	2	F3-4
FUSE OMEGA C1040	FUS00022+FUS00019 FUSE-HOLD.	2	F1-2
IC 7812 04321	04321 VOLTAGE REGULATOR	1	IC14
IC 78M05 04301B	04301B SMD VOLTAGE REGULAT.	1	IC10
IC ACS713ELCTR-30A-T-S	ICT0065SAX LF SMD INTEG CIRCUIT	3	IC2-4
IC CD4051BM-S	04615 SMD INTEG CIRCUIT	1	IC9
IC LM317HV	04340A INTEG CIRCUIT	3	IC1, IC5, IC11
IC LMC7101BIM	04638 SMD INTEG CIRCUIT	4	IC6-7, IC12-13
IC MC14094BD 04718	04718 SMD INTEG CIRCUIT	1	IC8
J FC-16P 02701-02700	02701+02700 PCB CONNECTOR	2	J3-4
JU JUMP2 02739-02742	02739+02742 PAN2 MALE CONNEC.	2	JP1-2
R 0805 N. M.	N. M. RES 1/8W 5% SMD 0805	3	R1, R7, R24
R 0R0-SS	00001A RES 1/4W 5% SMD 0805	1	R25
R 0R15-1W-S	00405 RES 1W 5% SMD 2512	2	R2, R15
R 100R-S 00029B	00029B RES 1/4W 5% SMD 0805	1	R18
R 10K-S 00053C	00053C RES 1/4W 5% SMD 0805	3	R12, R16-17
R 150K-SS	00067B RES 1/4W 5% SMD 0805	4	R8-11
R 15K-S 00055C	00055C RES 1/4W 5% SMD 0805	1	R4
R 1K0-S 00041C	00041C RES 1/4W 5% SMD 0805	1	R26
R 220R-SS	00033D RES 1/4W 5% SMD 0805	1	R3
R 270R-S 00034B	00034B RES 1/4W5% SMD 0805	1	R14
R 2K2-S 00045C	00045C RES 1/4W 5% SMD 0805	3	R19, R21, R23
R 33K-S 00059C	00059C RES 1/4W 5% SMD 0805	3	R6, R20, R22
R 3K9-SS	00048C RES 1/4W SMD 0805	3	R5, R13, R27
TR BSS138LT1-S	04104A LF POWER MOSFET N	3	TR1-3
SPC1610CR3	PRINTED CIRCUIT BOARD	1	



Electric diagram 1/1

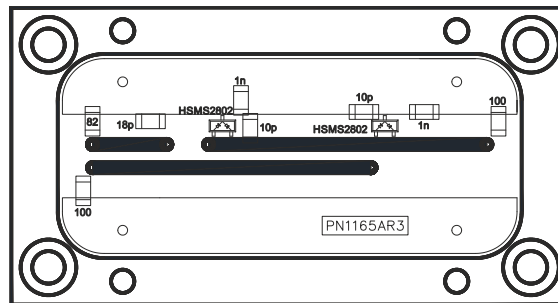


4.10.7 DIRECTIONAL COUPLER MODULE (SFG0052AR0 Code)

DESCRIPTION

The module SFG0052A is a high directivity directional coupler used for Forward and Reflected power reading. It includes also an output RF monitor.

Component layout



Component list

Code	Description	Qty.
PRE0028A0	82Ω 1206 SMD RESISTOR	1
PRE0029A0	100Ω 5% 1206 SMD RESISTOR	2
PCP1041D0	1nF 1206 SMD CAPACITOR	2
PCP108600	10pF MULTITURN CHIP CAPACITOR	2
PCP108900	18pF MULTITURN CHIP CAPACITOR	1
PCP140800	BYPASSING CAPACITOR	2
PDI0320700	HSMS-2802-TR1G DIODE	2
MMA2034R0P	DIRECTIONAL COUPLER	1
MCV2036R0P	COVER	1
MMA2052R1P	BRASS LINE	1
MMA2124R0P	TEFLON RING	2
SPC1165AR3	DIRECTIONAL COUPLER PCB	1



4.11 POWER TUNING PROCEDURE

- **Power calibration procedure:** put the transmitter at 98MHz, in MANUAL mode, with a wattmeter connected on RF output line. Set the output power at 50W up to read 50W on the wattmeter (for the MIZAR2 300, 500 and 1000, you must read, on the wattmeter, respectly, 300W, 500W and 1000W).
- **Forward power tuning:** 'MENU SETUP' Setting/ Power Calibration / FWD Tune Increase the value of the number (numeric value) in the left side of the screen up to read, on the right side, 50W for the MIZAR50. If you have a MIZAR2 300, 500 or 1000, you must increase the value of the number in the left side of the screen up to read, on the right side, respectly, 300W, 500W and 1000W. Confirm.
- **Reflected power tuning:** 'MENU SETUP' Setting/ Power Calibration / RFL Tune In the left side of the screen, set the same number that you have inserted of the FWD tune, respectly for the MIZAR2 50, 300W, 500W and 1000W. Confirm
- **Go on 'FWD Adjust Table':** put the transmitter at 88MHz, confirm and increase the value of the number in the left side of the screen up to read, on the right side, 50W for the MIZAR50. If you have a MIZAR2 300, 500 or 1000, you must increase the value of the number in the left side of the screen up to read, on the right side, respectly, 300W, 500W and 1000W. Confirm.
Repeat this same operation at the frequencies: 93MHz, 103MHz e 108MHz.
- **Low Pwr calibr:** this is the low power tune setting: this parameter must be set at 10% of the nominal power of the transmitter. The value is expressed in step points (divisions). Typical values (negatives) must be between -50 and -10 steps. After the setting, you should read on the wattmeter the correct value of the nominal power (10%). If you have a MIZAR300, you should read 30W.



4.12 LRS-150F SWITCHING POWER SUPPLY (SPW015800 Code)⁵



DESCRIPTION

LRS-150F series is a 150W signal-output enclosed type power supply with 30mm of low profile design.

Adopting the full range 85 – 264VAC input, the entire series provides an output voltage line of 5V, 12V, 15V, 24V, 36V and 48V.

In addition to the high efficiency up to 90%, the design of metallic mesh case enhances the heat dissipation of LRS-

150F that the whole series operates from -30°C through 70°C under air convection without a fan.

Delivering an extremely low no load power consumption (less than 0.5W), it allows the end system to easily meet the worldwide energy requirement. LRS-150F has the complete protection functions and 5G anti-vibration capability; it is complied with the international safety regulations such as TUV EN60950-1, EN60335-1, EN61558-1/-2-16, UL60950-1 and GB4943. LRS-150F series serves as a high price-to-performance power supply solution for various industrial applications.

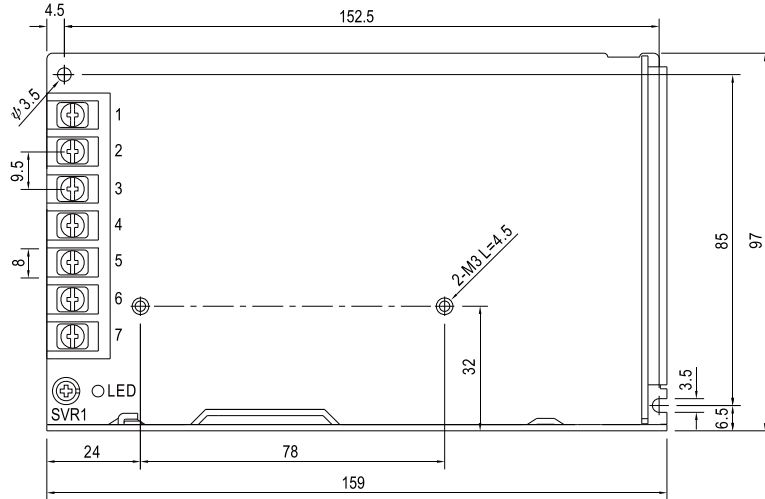
MAIN FEATURES

- Universal AC input / Full range
- Withstand 300VAC surge input for 5 second
- No load power consumption < 0.5W
- Miniature size and 1U low profile
- High operating temperature up to 70°C
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- Compliance to IEC/EN 60335-1 (PD3) and IEC/EN61558-1, 2-16 for household appliances
- Operating altitude up to 5000 meters
- Withstand 5G vibration test
- High efficiency, long life and high reliability
- LED indicator for power on
- 100% full load burn-in test

⁵ Present in AEROTX50 model



MECHANICAL SPECIFICATION



Terminal Pin No. Assignment

Pin No.	Assignment	Pin No.	Assignment
1	AC/L	4,5	DC OUTPUT -V
2	AC/N	6,7	DC OUTPUT +V
3	FG \perp		



TECHNICAL CHARACTERISTICS

MODEL		LRS-150F-5	LRS-150F-12	LRS-150F-15	LRS-150F-24	LRS-150F-36	LRS-150F-48
OUTPUT	DC VOLTAGE	5V	12V	15V	24V	36V	48V
	RATED CURRENT	22A	12.5A	10A	6.5A	4.3A	3.3A
	CURRENT RANGE	0 ~ 22A	0 ~ 12.5A	0 ~ 10A	0 ~ 6.5A	0 ~ 4.3A	0 ~ 3.3A
	RATED POWER	110W	150W	150W	156W	154.8W	158.4W
	RIPPLE & NOISE (max.) Note.2	100mVp-p	150mVp-p	150mVp-p	200mVp-p	200mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	4.5 ~ 5.5V	10.2 ~ 13.8V	13.5 ~ 18V	21.6 ~ 28.8V	32.4 ~ 39.6V	43.2 ~ 52.8V
	VOLTAGE TOLERANCE Note.3	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION Note.4	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION Note.5	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	500ms, 30ms/230VAC 500ms, 30ms/115VAC at full load					
HOLD UP TIME (Typ.)	16ms/230VAC 12ms/115VAC at full load						
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC					
	FREQUENCY RANGE	47 ~ 63Hz					
	EFFICIENCY (Typ.)	85%	87.5%	89%	89%	89%	90%
	AC CURRENT (Typ.)	2.8A/115VAC 1.6A/230VAC					
	INRUSH CURRENT (Typ.)	COLD STAR 60A/230VAC					
	LEAKAGE CURRENT	<0.75mA / 240VAC					
PROTECTION	OVER LOAD	110 ~ 140% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	5.75 ~ 6.75V	13.8 ~ 16.2V	18.75 ~ 21.75V	28.8 ~ 33.6V	41.4 ~ 48.6V	55.2 ~ 64.8V
	OVER TEMPERATURE	Shut down o/p voltage, re-power on to recover					
ENVIRONMENT	WORKING TEMP.	-30 ~ +70°C (Refer to "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, 5G 10min./1cycle, 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 7)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1, EN60335-1, EN61558-1/-2-16, CCC GB4943 approved					
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC I/P-FG:2KVAC O/P-FG:1.25KVAC					
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH					
	EMC EMISSION	Compliance to EN55022 (CISPR22), GB9254 Class B, EN55014, EN61000-3-2,-3					
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN61000-6-2 (EN50082-2), heavy industry level, criteria A					
OTHERS	MTBF	648.6K hrs min. MIL-HDBK-217F (25°C)					
	DIMENSION	159*97*30mm (L*W*H)					
	PACKING	0.48Kg ; 30pcs/15.4Kg/0.75CUFT					



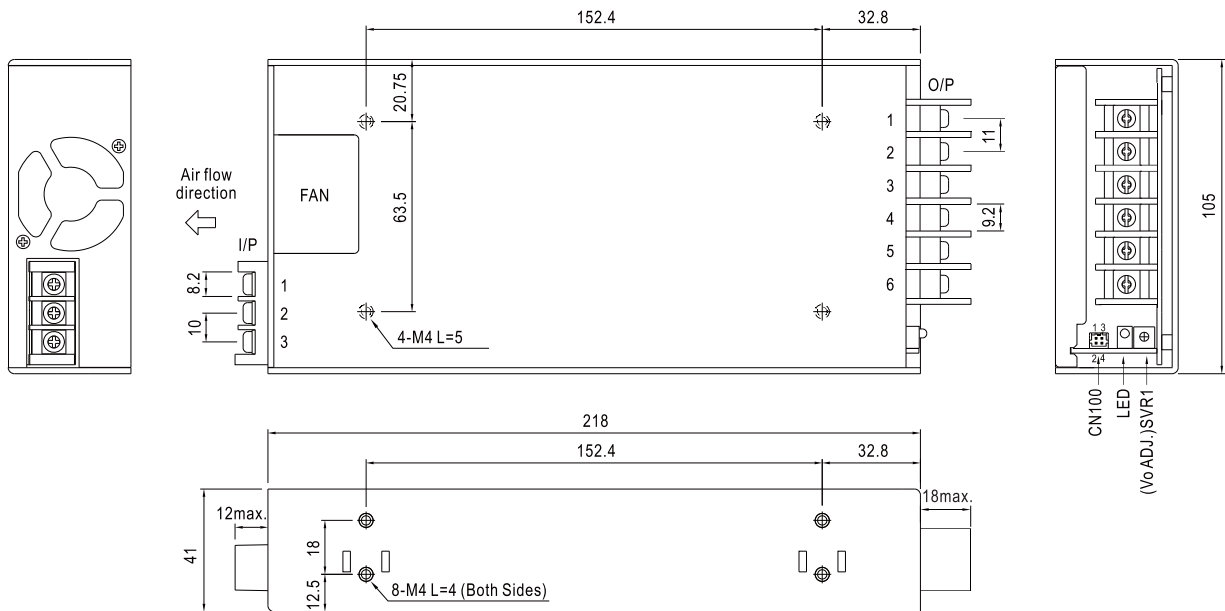
4.13 HRP-450 SWITCHING POWER SUPPLY (SPW002000-01 Code)⁶



MAIN FEATURES

- Universal AC input/Full range
- Built-in active PFC function, PF > 0.95
- High efficiency up to 89.5%
- Withstand 300VAC surge input for 5 seconds
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Built-in constant current limiting circuit
- Built-in cooling Fan ON/OFF control
- Built-in DC OK signal
- Built-in remote sense function

MECHANICAL SPECIFICATION



AC Input Terminal Pin No. Assignment

Pin No.	Assignment
1	AC/L
2	AC/N
3	FG \perp

DC Output Terminal Pin No. Assignment

Pin No.	Assignment
1-3	-V
4-6	+V

Connector Pin No. Assignment(CN100) : HRS DF11-4DP-2DS or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	DC-OK	HRS DF11-4DS or equivalent	HRS DF11-**SC or equivalent
2	GND		
3	+S		
4	-S		

⁶ Present in AEROTX300 model⁸³



TECHNICAL CHARACTERISTICS

MODEL		HRP-450-3.3	HRP-450-5	HRP-450-7.5	HRP-450-12	HRP-450-15	HRP-450-24	HRP-450-36	HRP-450-48	
OUTPUT	DC VOLTAGE	3.3V	5V	7.5V	12V	15V	24V	36V	48V	
	RATED CURRENT	90A	90A	60A	37.5A	30A	18.8A	12.5A	9.5A	
	CURRENT RANGE	0 ~ 90A	0 ~ 90A	0 ~ 60A	0 ~ 37.5A	0 ~ 30A	0 ~ 18.8A	0 ~ 12.5A	0 ~ 9.5A	
	RATED POWER	297W	450W	450W	450W	450W	451.2W	450W	456W	
	RIPPLE & NOISE (max.)	80mVp-p	80mVp-p	100mVp-p	120mVp-p	150mVp-p	150mVp-p	240mVp-p	240mVp-p	
	VOLTAGE ADJ. RANGE	2.8 ~ 3.8V	4.3 ~ 5.8V	6.8 ~ 9V	10.2 ~ 13.8V	13.5 ~ 18V	21.6 ~ 28.8V	28.8 ~ 39.6V	40.8 ~ 55.2V	
	VOLTAGE TOLERANCE	±2.0%	±2.0%	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.3%	±0.3%	±0.2%	±0.2%	±0.2%	
	LOAD REGULATION	±1.0%	±1.0%	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	
	SETUP, RISE TIME	1000ms, 100ms/230VAC 2500ms, 100ms/115VAC at full load								
HOLD UP TIME (Typ.)	16ms/230VAC 16ms/115VAC at full load									
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC								
	FREQUENCY RANGE	47 ~ 63Hz								
	POWER FACTOR (Typ.)	PF>0.95/230VAC PF>0.99/115VAC at full load								
	EFFICIENCY (Typ.)	80%	83%	86.5%	88%	89%	88%	89%	89.5%	
	AC CURRENT (Typ.)	5A/115VAC 2.4A/230VAC								
	INRUSH CURRENT (Typ.)	35A/115VAC 70A/230VAC								
	LEAKAGE CURRENT	<1.5mA / 240VAC								
PROTECTION	OVERLOAD	105 ~ 135% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed								
	OVER VOLTAGE	3.96 ~ 4.62V	6 ~ 7V	9.4 ~ 10.9V	14.4 ~ 16.8V	18.8 ~ 21.8V	30 ~ 34.8V	41.4 ~ 48.6V	57.6 ~ 67.2V	
	OVER TEMPERATURE	Shut down o/p voltage, recovers automatically after temperature goes down Protection type : Shut down o/p voltage, re-power on to recover								
FUNCTION	DC OK SIGNAL	PSU turn on : 3.3 ~ 5.6V ; PSU turn off : 0 ~ 1V								
	FAN CONTROL (Typ.)	Load 20±10% or RTH2≥50°C Fan on								
ENVIRONMENT	WORKING TEMP.	-40 ~ +70°C (Refer to "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, 5G 10min./1cycle, 60min. each along X, Y, Z axes								
SAFETY & EMC	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved								
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC								
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH								
	EMC EMISSION	Compliance to EN55022 (CISPR22) Class B, EN61000-3-2,-3								
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN61000-6-2,heavy industry level, criteria A								
OTHERS	MTBF	139.9K hrs min. MIL-HDBK-217F (25°C)								
	DIMENSION	218*105*41mm (L*W*H)								
	PACKING	1.19Kg; 12pcs/15.3Kg/0.82CUFT								



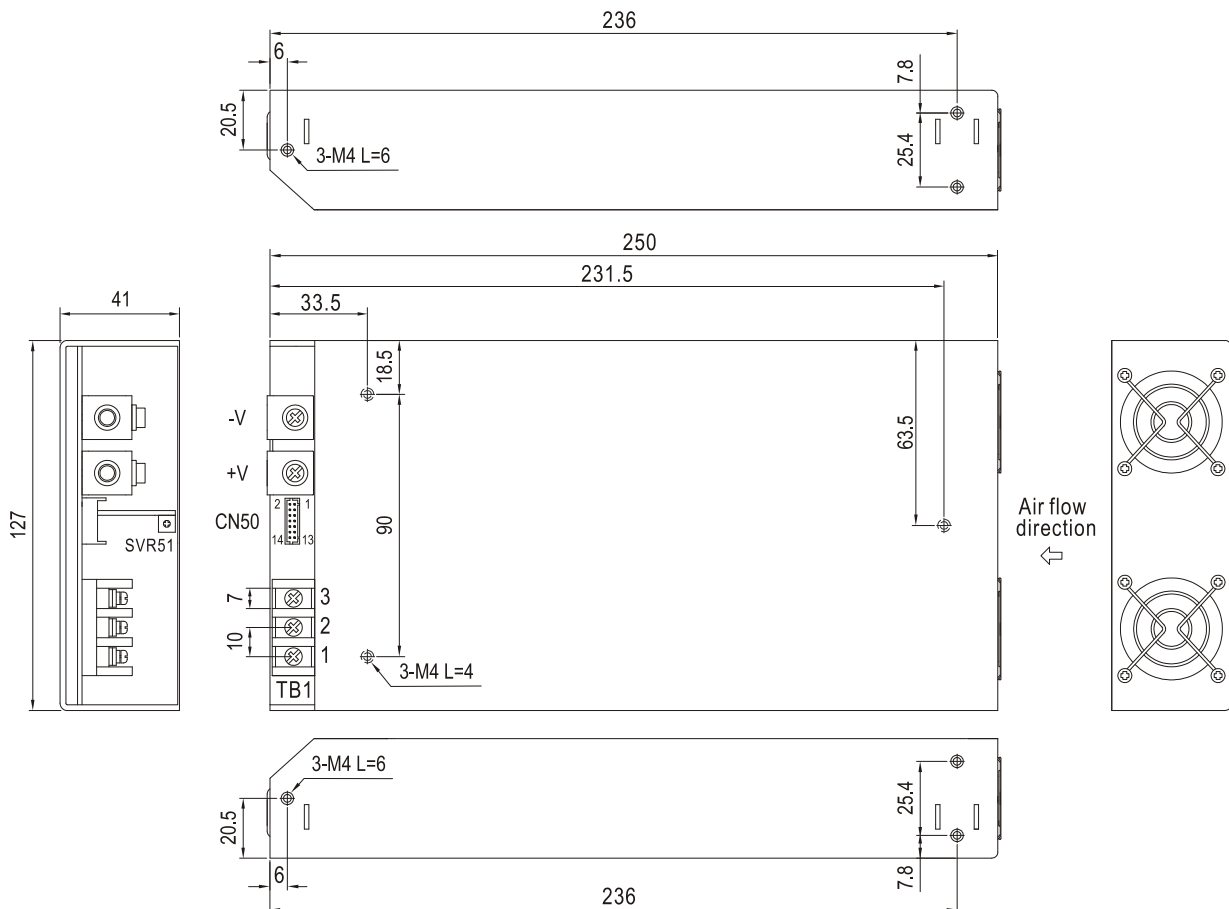
4.14 RSP-750 SWITCHING POWER SUPPLY (SPW001000-01 Code)⁷



MAIN FEATURES

- Universal AC input/Full range
- AC input active surge current limiting
- High efficiency up to 92%
- Built-in 12V/0.1A auxiliary power
- Built-in active PFC function, PF > 0.97
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Output voltage can be trimmed between 40~110% by 2~5.5VDC external control signal
- Output current can be trimmed between 40~110% by 2~5.5VDC external control signal
- Forced air cooling by built-in DC with fan speed control function
- High power density 9.44W/inch³
- 1U low profile 41mm
- DC OK signal
- Built-in remote ON-OFF control
- Built-in remote sense function

MECHANICAL SPECIFICATION



⁷ Present in AEROTX500 and AEROTX1000 models **85**

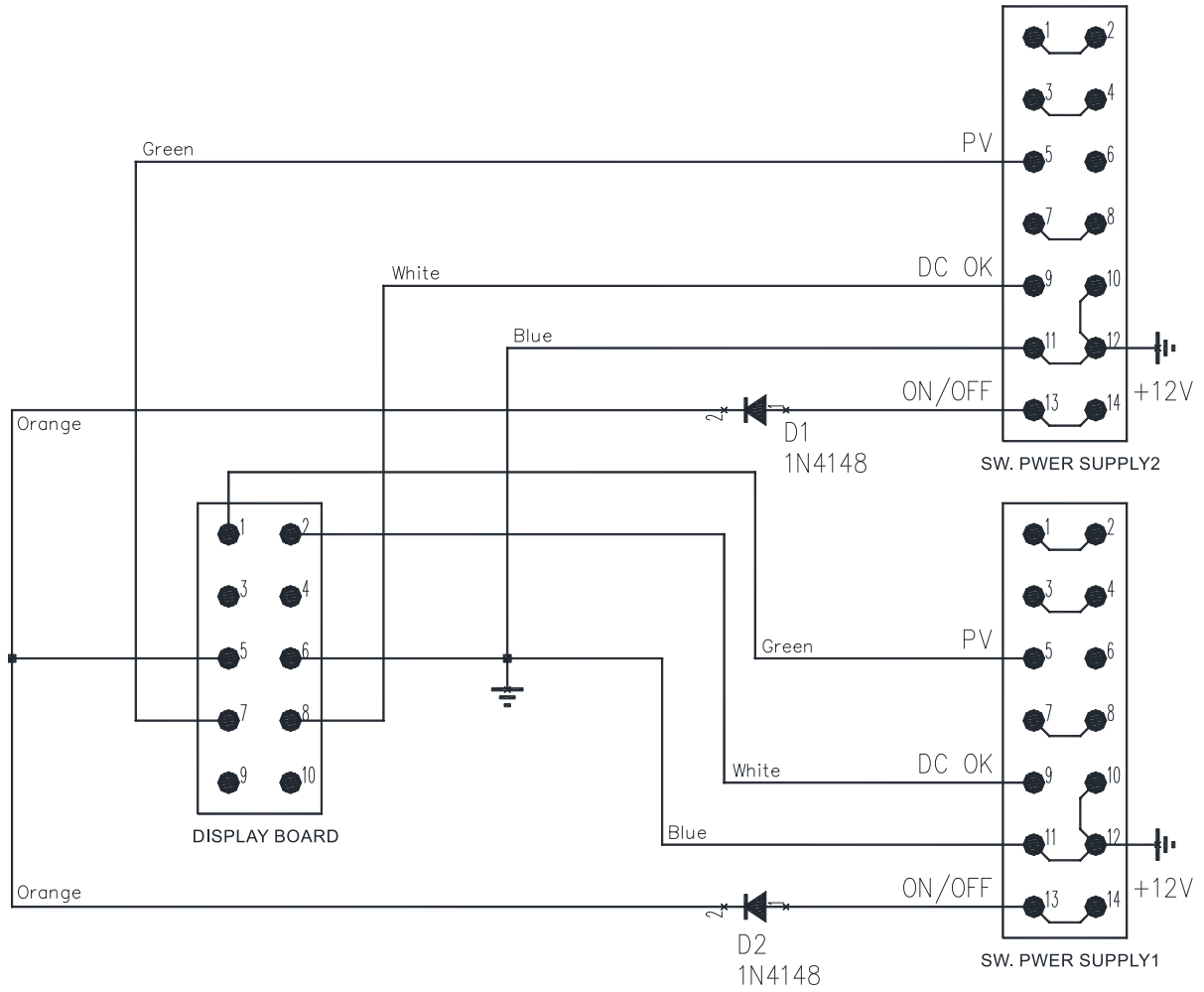


TECHNICAL CHARACTERISTICS

MODEL		RSP-750-5	RSP-750-12	RSP-750-15	RSP-750-24	RSP-750-27	RSP-750-48
OUTPUT	DC VOLTAGE	5V	12V	15V	24V	27V	48V
	RATED CURRENT	100A	62.5A	50A	31.3A	27.8A	15.7A
	CURRENT RANGE	0 ~ 100A	0 ~ 62.5A	0 ~ 50A	0 ~ 31.3A	0 ~ 27.8A	0 ~ 15.7A
	RATED POWER	500W	750W	750W	751.5W	750.6W	753.6W
	RIPPLE & NOISE (max.)	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	4.75 ~ 5.5V	10 ~ 13.5V	13.5 ~ 16.5V	20 ~ 26.4V	24 ~ 30V	43 ~ 55V
	VOLTAGE TOLERANCE	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±2.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	1000ms, 50ms at full load					
HOLD UP TIME (Typ.)	16ms/230VAC 16ms/115VAC at full load						
INPUT	VOLTAGE RANGE	90 ~ 264VAC		127 ~ 370VDC			
	FREQUENCY RANGE	47 ~ 63Hz					
	POWER FACTOR (Typ.)	0.97/230VAC		0.98/115VAC at full load			
	EFFICIENCY (Typ.)	82%	87%	89%	90.5%	90.5%	92%
	AC CURRENT (Typ.)	5V: 5.6A/115VAC		2.8A/230VAC		12V-48V: 8.2A/115VAC 3.9A/230VAC	
	INRUSH CURRENT (Typ.)	25A/115VAC		40A/230VAC			
LEAKAGE CURRENT	<2mA/240VAC						
PROTECTION	OVERLOAD	105 ~ 125% rated output power Protection type: Constant current limiting, recovers automatically after fault condition is removed					
	OVER VOLTAGE	5.75 ~ 6.75V	13.8 ~ 16.8V	17 ~ 20.5V	27.6 ~ 32.4	31 ~ 36.5V	56.6 ~ 66.2V
	OVER TEMPERATURE	85°C ±5°C (TSW2) detect on heatsink of o/p diode; 80°C ±5°C (TSW1) detect on heatsink of power transistor Protection type: Shut down o/p voltage, recovers automatically after temperature goes down					
FUNCTION	AUXILIARY POWER (AUX)	12V@0.1A; tolerance: ±10%					
	REMOTE ON/OFF CONTROL	Power on: short between on/off (pin13) & 12V-AUX (pin14) on CN50 Power off: open between on/off (pin13) & 12-AUX (pin14) on CN50					
	DC OK SIGNAL	The TTL signal out, PSU turn on = 0 ~ 1V; PSU turn off = 3.3 ~ 5.6V					
	OUTPUT VOLTAGE TRIM	Adjustment of output voltage is possible between 40 ~ 110% by 2 ~ 5.5VDC external control signal					
	OUTPUT CURRENT TRIM	Adjustment of output current is between 40 ~ 110% by 2 ~ 5.5VDC external control signal					
ENVIRONMENT	WORKING TEMP.	-30 ~ +70°C (Refer to '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, 60min, each along X, Y, Z axes					
SAFETY & EMC	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved					
	WITHSTAND VOLTAGE	I/P-O/P: 3KVAC		I/P-FG: 2KVAC		O/P-FG: 0.5KVAC	
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG: 100M Ohms / 500VDC / 25°C / 70% RH					
	EMC EMISSION	Compliance to EN55022 (CISPR22); EN61000-3-2,-3					
	EMC IMMUNITY	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-2, EN61204-3, heavy industry level, criteria A					
OTHERS	MTBF	120.8Khrs min.		MIL-HDBK-217F (25°C)			
	DIMENSION	250*127*41mm (L*W*H)					
	PACKING	1.64kg; 6pcs/10.8kg/1.1CUFT					



RSP-750 FM Dual control cable (RCB023300-02 Code)



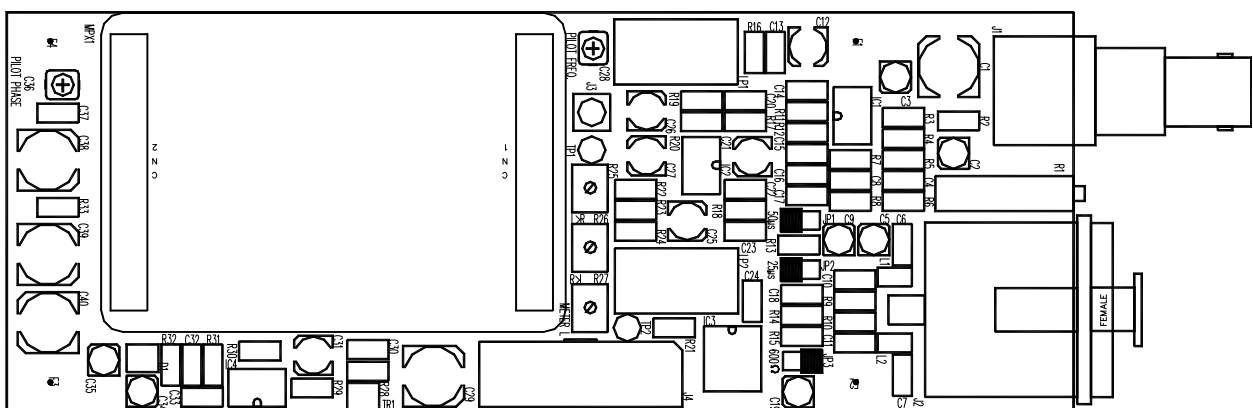
4.15 STEREO CODER OPTION (CKT002300 Code)

DESCRIPTION

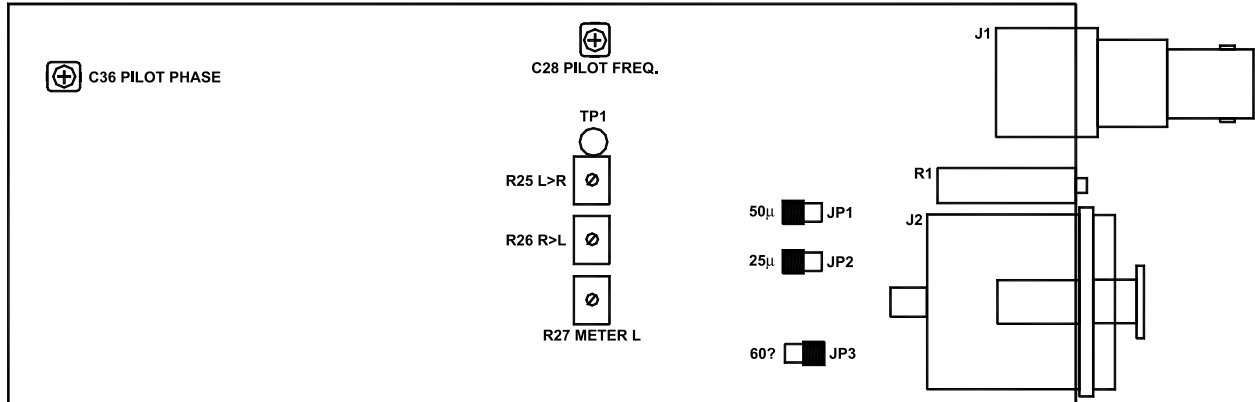
The board contains the stages needed for the conditioning of the Left channel audio signal and for realising the stereo encoding in compliance with the standard ITU racc. 450. The Right signal is provided through the connection to the Mother board. The various sections are analysed below:

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 enabled 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.

- Component layout



- Calibration procedure



- Calibration instrument list

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

- Interface and setting layout

COMPONENT	DESCRIPTION
R1	LEFT Audio input level
R25	Adjust LEFT on RIGHT signal crosstalk
R26	Adjust RIGHT on LEFT signal crosstalk
R27	Indication of the LEFT signal deviation on the display
C28	Adjust the 19kHz pilot tone frequency
C36	Adjust 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

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.

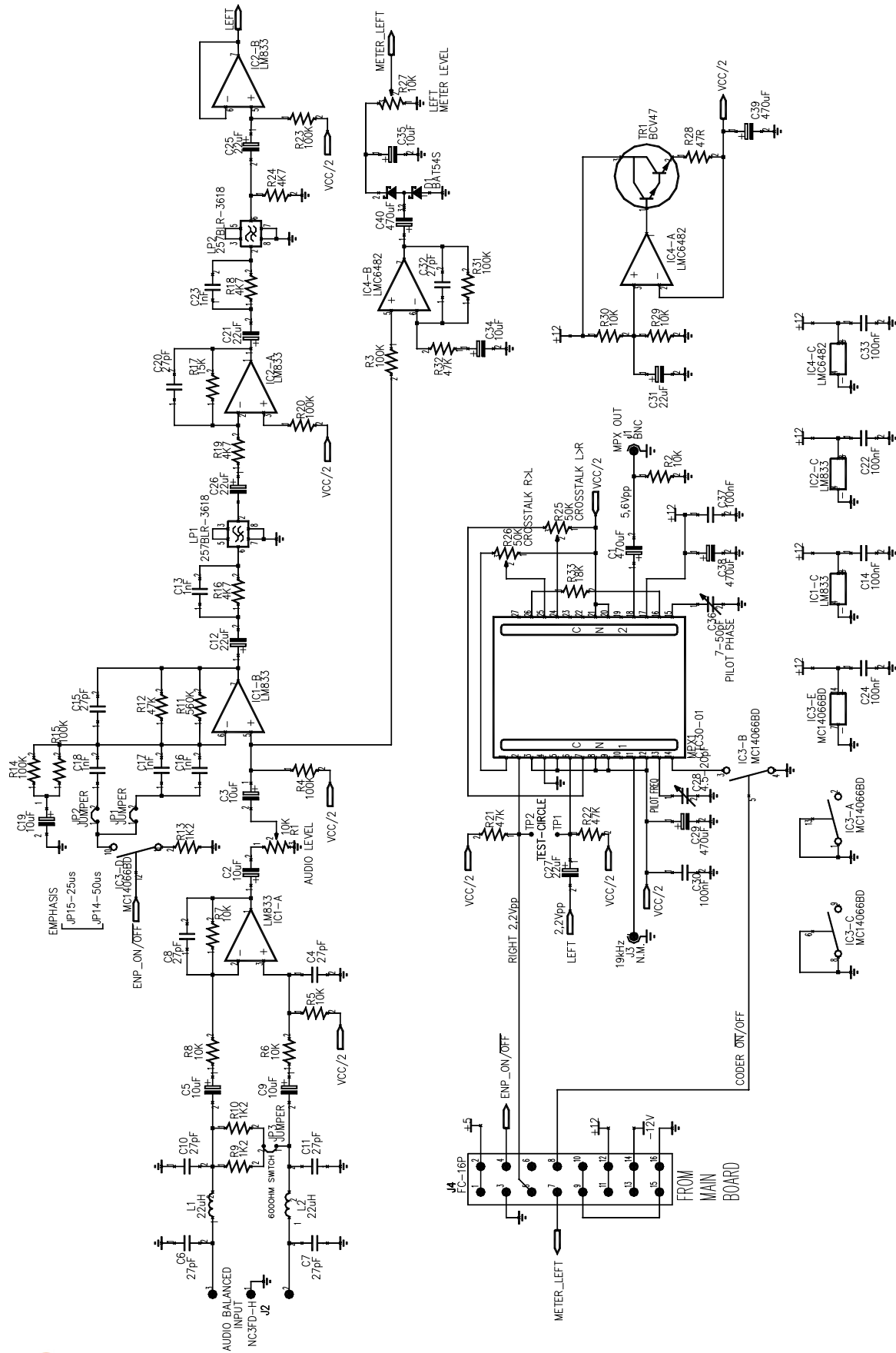
- Check the crosstalk between the two channels and act on **C36**, **R25** and **R25** to bring it to the nominal levels.

Component list

Code	Description	Qty.	Comps.
257BLR-3618N 05010	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 SCHOTTY DIODE	1	D1
IC LM833-S 04643A	04643A SMD INTEG CIRCUIT	2	IC1-2
IC LMC6482-S	04632 SMD INTEG CIRCUIT	1	IC4
IC MC14066BD-S 4708B	4708B SMD INTEG CIRCUIT	1	IC3
IND 22uH-S 5023D	5023D INDUCTOR	2	L1-2
J BNC-90G-PCB SHIELD	02034A PCB SHIELDED CONNec.	1	J1
J FC-16P 02701-02700	02701+02700 PCB CONNECTOR	1	J4
J NC3FD-H 02862	02862 90° XLR FEMALE PCB CONN.	1	J2
J SMB-PCB N. M.	N. M. SMB PCB CONNECTOR	1	J3
JU JUMP2 02739-02742	02739+02742 PAN2 MALE CONNECT.	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
TR BCV47	03465 NPN SMD TRANSISTOR	1	TR1

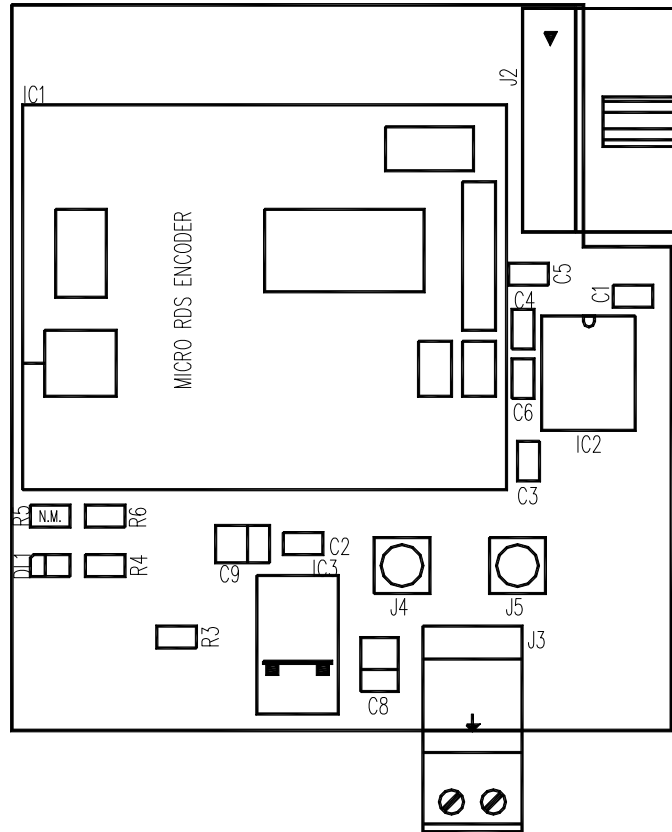


• Electric diagram 1/1



4.16 RDS BOARD OPTION (CKT011000 Code)

- Component layout

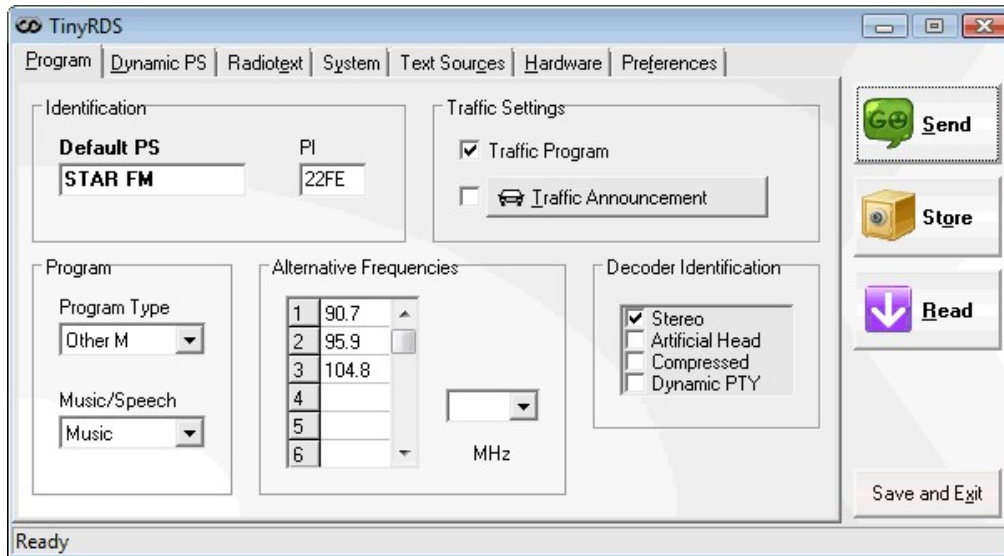


Component list

Code	Description	Qty.
CCN269900	10-WAYS FEMALE CONNECTOR	1
CCN269500	DB9 FEM. CONN. FOR IU008059	1
PCB7990A0	10 POLES FLAT CABLE	0.4
CCN251300	90° SMB CONNECTOR	3
CCB850200	RG316 50Ω CABLE	0.7
CCN251800	SMB CONNECTOR FOR RG174	1



• SOFTWARE CONFIGURATION



1. INSTALLATION

- Download and run the installation exe file.
- Select the setup language and finish the installation using the 'Next' button.
- In the case of USB connection install the USB driver now. Pure RS232 connection or parallel port connection requires no additional driver.
- Make sure the RDS encoder is connected, powered and well configured, all connectors are seated completely and where possible, use screws to fix the connection.
- Run the TinyRDS application, go to Hardware card and select appropriate hardware type, communication port and communication parameters. Confirm by the 'Update' button.

Note for old devices using parallel port connection: The application still supports writing to hardware parallel ports. Appropriate device driver is installed at runtime.

To do this you need administrator privileges. In Windows Vista and later, using UAC, you can run the InstallDriver.exe in the application folder to install the parallel port driver appropriate for your OS.

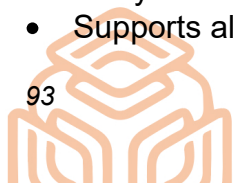
2. MINIMUM REQUIREMENTS

- An RDS encoder based on MRDS1322 or MRDS192 chip
- Pentium 133 MHz, 64 MB RAM
- Serial, parallel or USB port (or 3rd party Virtual COM Port driver)
- Windows 98 or later

3. 3-PURPOSE AND FEATURES

The TinyRDS is a default control application for your RDS encoder.

- Supports all basic RDS services



- Supports a fixed set of Radiotexts
- 'Text sources' tool can update Dynamic PS or Radiotext by actual text
- produced by your broadcast automation system or similar external application
- Supports Clock-Time and Date (CT)
- Very simple to use

4. APPLICATION CONTROL

4.1 Main buttons

Send

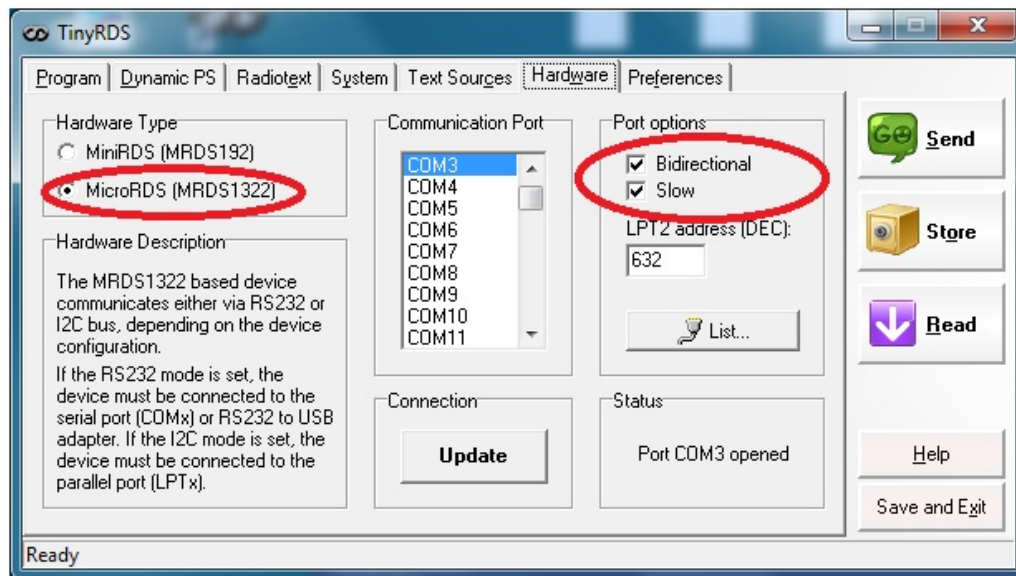
Sends the data to the RDS encoder. That data will be used for the transmission until power off. Use this button also for confirm of RDS services settings, e.g. when changed Dynamic PS mode.

Store

Stores the data into the EEPROM memory so the data will be available also after next power-up or reset.

Read

Reads actual data from the RDS encoder. This button is allowed only in bidirectional communication mode.



- On the FM transmitter, enable the SCA input from display.
- Configure the Hardware sheet with the follow options:
 - Hardware type: MicroRDS (MRDS1322)
 - Port options:
 1. Bidirectional (Flag ON)
 2. Slow (Flag ON)
- Set the communication serial port COM(X) with your PC.
- Set the speed port.



4.2 Program Page

Default PS

Static name of the program service, which is displayed by RDS receivers by default in order to inform the listener what program service is being broadcast by the station to which the receiver is tuned. Usually this is your station name. The RDS standard permits max. 8 character long name.

PI (Program Identification)

Four hexadecimal digits. This information consists of a code enabling the receiver to distinguish between countries, areas in which the same program is transmitted, and the identification of the program itself. The PI can never start with zero (0)!

Traffic Program

A flag to indicate that the tuned program carries traffic announcements.

Traffic Announcement

An on/off switching signal to indicate when a traffic announcement is on air. You may control it using the button or leave the box unchecked and control the flag using external switch connected to the RDS encoder.

Program Type

Specifies the current program type.

Music/Speech

A two-state signal to provide information on whether music or speech is being broadcast.

Alternative Frequencies

List of alternative frequencies. Up to 15 items allowed.

Decoder Identification

Indicates which possible operating mode is appropriate for use with the broadcast audio. Check the items which explicitly correspond to your broadcast equipment.

4.3 Dynamic PS

Dynamic PS (DPS) is defined as using of the station name for showing of sequential information. Up to 72 characters long text message to be displayed on receiver instead of static PS name.

Four display modes (0-3) are available. The user can insert the text manually from the keyboard or configure the 'Text sources' automation tool for Dynamic PS. The result can be immediately visible due to Preview feature.

Note: Using the dynamic PS is restricted in some countries and it's fully prohibited by the RDS standard! The manufacturer is not responsible for incompetent use of this feature. Consider of using Radiotext instead of Dynamic PS. Some receivers may not display the dynamic/scrolling PS properly for reasons that lie entirely on their side. Commercial receivers produced in last years usually support Radiotext.



Enabled

Enables or disables the Dynamic PS, including all related functions.

Dynamic PS

Mode Selects one of four possible display modes for the Dynamic PS text loop. Mode 0 is a 'raw' mode as it uses a fixed 8 character cells. A separate field is dedicated for this mode. For other modes, the text is entered as a single text line, the encoder processes the text automatically.

Scrolling PS Speed

Sets high or low speed of scrolling PS transmission, applied in DPS mode 1 and 3. The high speed does not work on some receivers, especially car radios, or under bad reception conditions. The reason is absolutely outside the RDS encoder and comes out from the fact that scrolling PS has never been included in the RDS standard. Due to this the high speed is not recommended.

Label Period

A period between two strings, applied in DPS Mode 0 and 2.

Delay between text loops

Specifies the time between two repeats of the Dynamic PS text loops. Static PS is displayed during this time. If the maximum value is set, the Dynamic PS will be displayed only once - when changed.

4.4 Radiotext

This refers to text transmissions, primarily addressed to consumer home receivers or mobile receivers, which would be equipped with suitable display facilities. The text can be up to 64 characters long. Some receivers do not support the Radiotext (RT) service.

Enabled

Enables or disables the Radiotext, including all related functions. *Note: If Radiotext is disabled, the encoder sends no 2A groups.*

Radiotext messages

A set of Radiotexts. To get the RT working, at least one line must be filled by some text and that line must be selected. If 'Text sources' tool is enabled for the Radiotext, the text appears in the first line.

Type

Radiotext type A and B are equal. On most receivers, a changing of the type completely clears previous Radiotext while leaving the type unchanged causes the new message to rewrite all letters as they are received. Some receivers keep RT A and RT B in separated memory space.

Send next RT after

Allows switching between more Radiotexts using predefined time period. Empty messages will be omitted. The feature may be combined with reading the RT from file. You may also select the Radiotext manually.



Toggle RT type automatically

Controls the RT type automatically (recommended). Toggles the RT type any time a new Radiotext is sent to the encoder.

4.5 System

Clock-Time and Date (CT)

Starts/Stops the Clock-Time and Date transmission (CT). The time and date information is taken from PC system clock. Needs the TinyRDS application to be running.

Subcarrier Phase Shift

Fixes the relative phase shift between the pilot tone and the RDS signal. The value serves only as a scale, it may not provide real phase shift value. Has a sense only if Clock Source is set to Auto.

PLL Lock Range (MRDS192 only)

Specifies the maximum PLL lock range for the pilot signal. The PLL will never lock to any signals outside this range and stays stable in any situation. If high quality stereo encoder is used, you may set $\pm 2\text{Hz}$ value. Default value is $\pm 5\text{Hz}$.

Cyclic User Defined Group

The user may add one RDS group with any content to the RDS stream. This group is cyclically transmitted approx. twice per second. Insert the content in hexadecimal format. This feature is intended mainly for advanced users or experimental purposes. It may be used for example to include ECC code. Do not enable if you are not sure what you're doing!

Reset

Resets the RDS encoder RDS data will be read from internal EEPROM.

Read Status

Reads the RDS encoder's Status byte. Allows to detect if the connection to the encoder is working. Includes information about pilot tone, dynamic PS transmission and TA.

Switch Off

Switches off the RDS carrier. Doesn't affect the communication, the encoder stays powered and responding.

Switch On

Switches on the RDS carrier if previously switched off.

4.6 Hardware

Hardware Type

Selects the device type. Follow the device documentation for more details. *Note: Since the MRDS192 is obsolete, most of current products are the MRDS1322 based.*

Communication Port

Select the port where the RDS encoder is connected. It may be a virtual serial port as well.

List

Shows list of serial/parallel ports installed in your system.

Bidirectional

Select this item to allow connection diagnostics, data verify and data reading back.

Slow

Low speed option. Tick if there's some communication problem. For RS232 mode (MRDS1322 only), this item effectively selects between 19200 and 2400 bps.

LPT2 address

Allows entering a non-standard parallel port address for parallel port connection.

Connection Update

Establishes a connection based on actual configuration.

4.7 Preferences

Skin Picture and Font Color

You may insert your own BMP picture to the application, showed on the first page. You may also change the font color. To clear the skin, enter a non-existing file name.

UTC Offset

Your local time offset.

Summertime Offset

Your summertime offset, usually 1.

Always on Top

Keeps the application window on top so it is not overlapped by other windows.

High Priority

Assigns the application high priority. Not recommended if broadcast automation system is running on the same PC.

Confirm Exit

Enables a confirmation dialogue box showing any time the user tries to exit the application.

PTY Coding Allows showing

Allows showing correct PTY names in application depending on broadcast area.

5. TEXT-SOURCES

This tool can update Dynamic PS, Radiotext or both by actual text produced by your broadcast automation system or similar external application.

The text processing scheme is as follows:



Reading from file _ Characters cutting _ Processing Options _ (Adding prefix).

To get it working, set all parameters, then check the From file box. Dynamic PS and/or Radiotext must be Enabled.

5.1 Dynamic PS, Radiotext

From file

If enabled, reads the text from specified text file. This can be for example "now-playing" file, music log file etc. Wildcards ("*" and "?") are supported as well (the most actual file found will be read).

Next time the file will be read again when the text changes.

Send on change

Sends data to the RDS encoder when the text source file changes. Enabled by default.

Read from

Determines from which line the text has to be read.

Cut characters from beginning/end

Cuts redundant or unwanted characters from the text.

Prefix

Prefix placed before the text, for example "Now playing: ".

5.2 Options

ANSI Character code conversion

Affects how national characters are converted before sending to RDS encoder. The middle option is recommended as it ensures readability of national characters on all receivers using conversion to similar characters from basic set.

DPS Mode 0 Justification

Text justification for the Dynamic PS. Applies only if mode 0 is selected. Fill with - Character used to fill the free space around the words.

6. ANNEXES

6.1 Setting Basic RDS Data

Before getting on-air with the RDS signal, you will need to decide on the settings to be used. The following RDS services should be set as the first.

6.1.1 PI (Program Identification)

This is very important information that enables the receiver to distinguish between countries, areas in which the same program is transmitted, and the identification of the program itself. The code is not intended for direct display and is assigned to each individual



radio program, to enable it to be distinguished from all other programs. The PI code consists of four characters (hexadecimal numbers).

Important notes: If the station has only one transmitter, second PI digit must be zero (x0xx). Meaning of some PI digits may be different for US RBDS.

The first character identifies country:

0	Cannot be assigned!	8	PS, BG, LV, PT
1	DE, GR, MA, IE, MD	9	AL, DK, LI, LB, SI
2	DZ, CY, CZ, TR, EE	A	AT, GI, IS
3	AD, SM, PL, MK	B	HU, IQ, MC, HR
4	IL, CH, VA	C	MT, GB, LT
5	IT, JO, SK	D	DE, LY, YU
6	BE, FI, SY, UA	E	RO, ES, SE
7	RU, LU, TN, NL	F	EG, FR, NO, BY, BA

The second character identifies program type in terms of area coverage:

0	Local	Local program transmitted via a single transmitter only during the whole transmitting time.
1	International	The same program is also transmitted in other countries.
2	National	The same program is transmitted throughout the country.
3	Supra-regional	The same program is transmitted throughout a large part of the country.
4 to F	Regional	The program is available only in one location or region over one or more frequencies, and there exists no definition of its frontiers.

The third and fourth characters are used to clearly identify different stations within the area of coverage.

Important note: Factory default PI value is FFFF and it's needed to change it as soon as possible to avoid the situation that two different stations with common area of coverage have the same PI. For each station in the same location the unique PI must be assigned. Stations that carry different program must be unambiguously identified by the last two PI digits. In other case they are recognized as one station by car radios, regardless of any other service settings. If the broadcaster hasn't received the 4-digit PI from regulatory office, he must choose such number that is not in conflict with other stations in the location. Set your final PI as soon as possible!

6.1.2 PS (Program Service name)

The PS name is max. 8 character long radio station name that will be shown most of the time on the radio display.



6.1.3 PTY (Program Type)

The PTY code defines the type of the programme broadcast within 31 possibilities. This code could be used for search tuning.

6.1.4 TP (Traffic Program)

This is a flag to indicate that the tuned program carries traffic announcements. The TP flag should only be set on programs which dynamically switch on the TA identification during traffic announcements. The flag shall be taken into account during automatic search tuning.

6.1.5 MS (Music/Speech)

This is a two-state signal to provide information on whether music or speech is being broadcast. The signal would permit receivers to be equipped with two separate volume controls, one for music and one for speech, so that the listener could adjust the balance between them to suit his individual listening habits.

6.1.6 AF (Alternative Frequencies)

The Alternative Frequencies are used to tell receivers what frequencies they can receive the radio station on. This facility is particularly useful in the case of car and portable radios. For this to work, each transmitter must have RDS with the same PI code. *Important note: If second PI digit is set to zero (x0xx), this indicates that the station has only one transmitter and the AF list is ignored on most receivers.*

6.2 Software Troubleshooting

The RDS encoder uses simple connection and has been designed to make its use as easy and painless as possible. However, success depends upon several settings and things working together correctly. While correcting problems is usually quite simple, the difficulty lays in knowing where to look. This section is designed to assist you in determining the cause of problems that may occur when establishing a communication with the PC software, so they can be fixed quickly.

6.2.1 How to verify the connection to the RDS encoder?

In case of some troubles it may be important to check if the RDS encoder receives data from the computer. The easiest way how to check the connection is clicking on the "Read Status" button on "System" card in the Windows software. Correct connection will result in pop-up a message window with status information whereas incorrect connection is indicated by a "!Ready" message in the bottom line of the application.

Note that "Bidirectional" option must be enabled on "Hardware" card for this test.



6.2.2 What to check if the connection does not work?

- Is the RDS encoder really connected to the port selected? Typically there are more ports installed in the system (modem, mobile phone, IrDA port, Bluetooth etc.) - opening of these ports is usually possible, however it results in no success. User should ensure that the serial port desired is enabled in BIOS Setup. No other configuration of the port is required, the software does that itself.
- Is the RDS encoder connected to a power supply? Connecting a power supply is required prior to communicating with the unit.
- Is there right Communication mode selected on the encoder? Some RDS encoders allow selection of communication mode. See the product manual for more details. A power off/on cycle is required after changing the communication mode.
- Is there right communication speed selected in the software (MRDS1322 only)? The speed can be selected on "Hardware" card, by item "Slow". Enabling this item, the encoder is expected to communicate on 2400 bps (mode 2), otherwise 19200 bps is expected (mode 0 and 1).
- Is there right hardware type selected in the software? The software supports two types of hardware. Make sure the right device is selected on "Hardware" card.
- Is the communication cable wired right? If the cable is a Do-It-Yourself job, please check the wiring several times.



4.17 ETHERNET BOARD OPTION (CKT0048LO0 Code)

Ethernet control using SNMP and HTTP

Equipment have **192.168.0.1** as factory IP address (subnet mask 255.255.255.0). If needed, the user can turn back to the factory IP address using the front panel “Reset IP address” command.

- **IP configuration and PC connection**

-Reset the IP configuration by front panel control. This way the device IP address will be 192.168.0.1;

-Set the PC IP configuration:

1. **IP address:** 192.168.0.x (x = 2...254).
2. **Subnet mask:** 255.255.255.0.
3. **Gateway:** do not use gateway for direct connection.
4. **DNS:** do not use DNS.
5. **Firewall:** set the firewall properly for free out/incoming EKAUpdETHer connections.

-Use an ethernet cable (either cross or patch) to directly connect PC to device;

-If a proxy is used, disable it for the browser.

- **Web control: operations**

The web control makes the user read/modify every device and communication parameter.

The login data are:

USERNAME	PASSWORD (changeable)	MODE
admin	admin	read / write
user	user	read only

Using the web interface the user can control the devices present in the site.

The web interface is divided into three parts:

- Device menu bar (on top).
- Site menu (on the left).
- The content of the selected page (the main side of the page)



Here is an example showing a page of the web site embedded in the equipment:

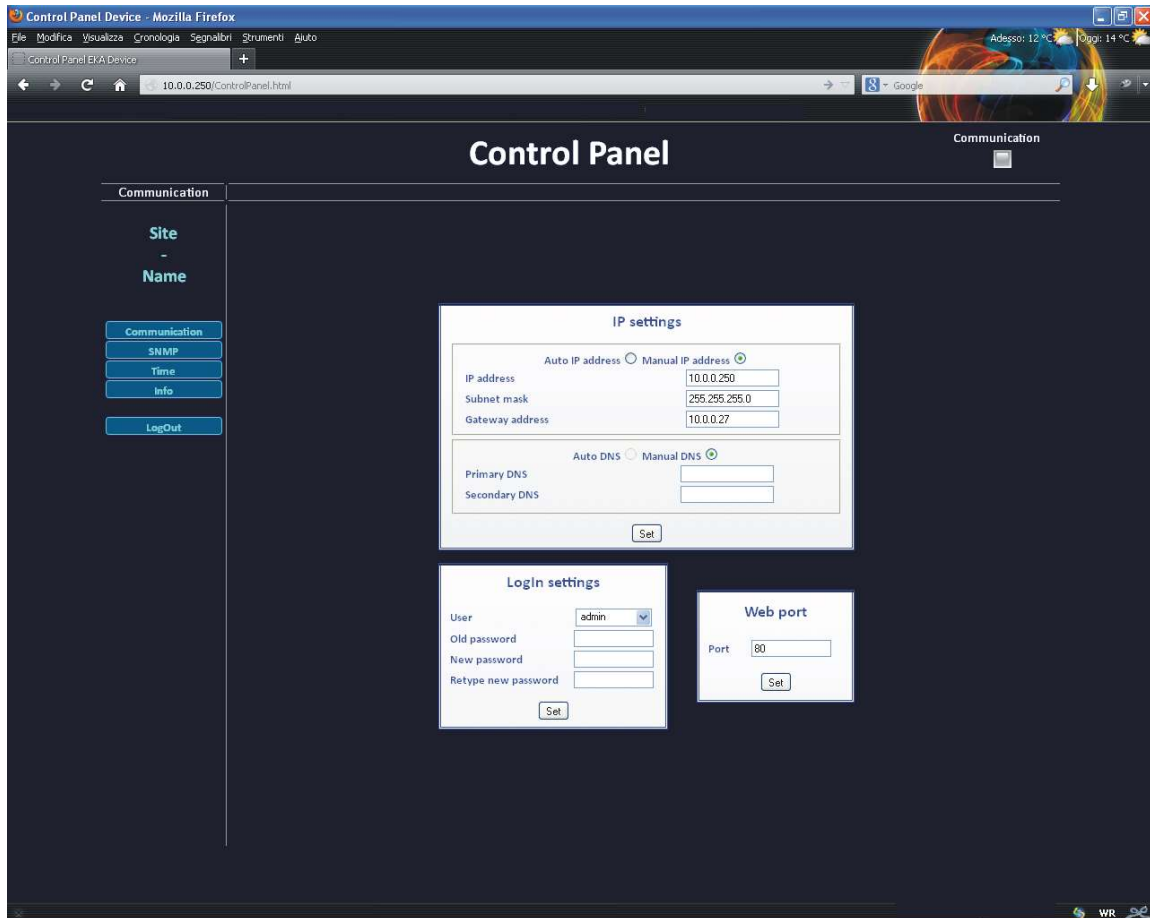


Image 1: Web interface example

If the controlled site is provided of FULL web control (not only SNMP), the site menu shows the devices included in the site. Any device is linked to a button. When a device button is pressed the device parameters are provided to be read/written. In fact, when the user presses a device button, the device menu bar is populated. Using this bar is possible to display any page of the selected device.

- **SNMP control: software configuration to read device parameters¹**

- Use a browser to download the needed mib files from <http://192.168.0.1/mib>;
- Install the software.
- Open the software and click File→Load MIB.
- Choose the downloaded mib files.
- In the main view of the software, fill the fields:
 1. **Host:** device IP address (192.168.0.1);
 2. **Port:** 161;
 3. **Community:** public;
 4. **Write Community:** private;
- Now choose a node from the tree-view on the left.



- Click Operations→GET to read the selected parameter.

- **Software configuration to write device parameters⁸**

- Choose the parameter from the tree-view.
- Fill the field **Set Value** with the desired value.
- Click Operations→SET.

- **Other operations**

Using the web interface⁹ (<http://192.168.0.1>), the user can change some base parameters of the communication board:

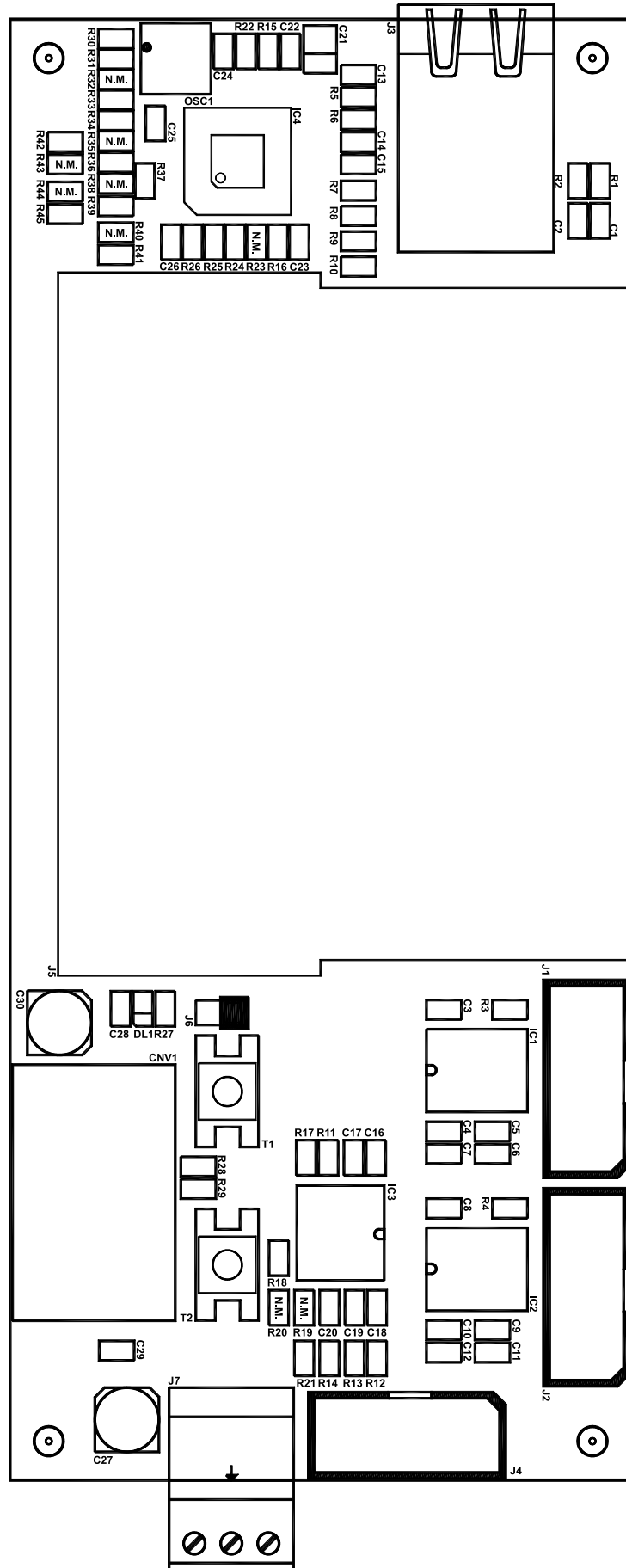
- **Communication:** IP parameters and password for **admin** and **user**.
- **SNMP:** agent listening addresses, trap and inform destinations, read-only/read-write community names, local parameters.

⁸ Here we refer to "Manage Engine MibBrowser Free Tool" (<http://www.manageengine.com/products/mibbrowser-free-tool/index.html>).

⁹ Default login data are admin:admin (read/write mode) and user:user (read only mode). Passwords can be changed.

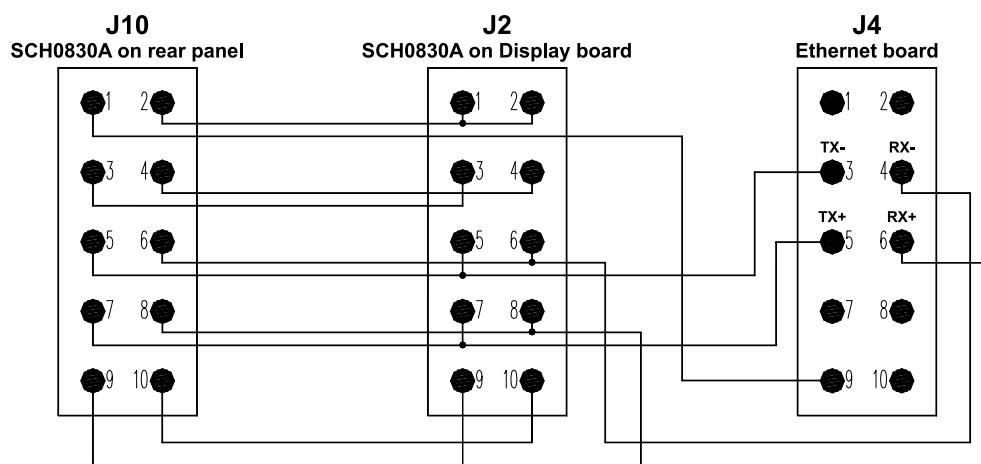
- Component layout (SEB0675AR1 Code)





- Ethernet board wiring



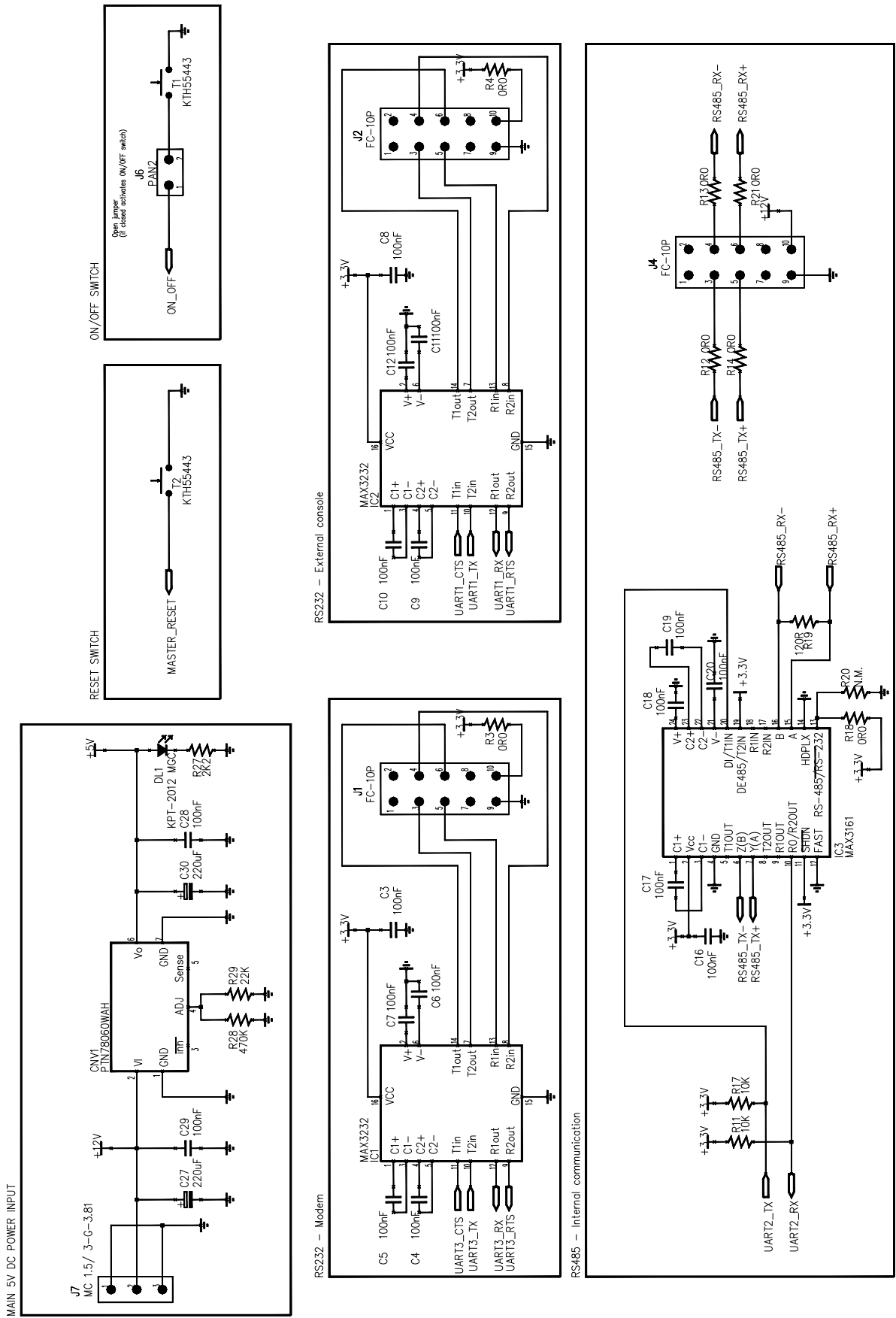


Component list

Code	Description	Qty.	Comps.
CC 100nF-S 01065E	01065E Y5V 0805 CAPACITOR	24	C1-12, C14-20, C22-23, C25, C28-29
CC 10nF-S 01053A	01053A SMD 0805 CAPACITOR	3	C13, C24, C26
CE 10uF20V-CASE B-S	01626B TANT. ELET. SMD CAPACIT.	1	C21
CE 220uF16V LOW ESR	01796B ELET. SMD CAPACITOR	2	C27, C30
CNV DC-DC PTN78060WAH	04872A 3A SWITCHING	1	CNV1
DL KPT-2012 MGC	03057A GREEN LED DIODE	1	DL1
IC DP83848C-S	ICT0082SAX INTEG CIRCUIT	1	IC4
IC MAX3161-S	04770A INTEG CIRCUIT	1	IC3
IC MAX3232-S	ICT0058SEX INTEG CIRCUIT	2	IC1-2
J CONN 10033853-052FSLF	02998 PCB SODIMM CONNECTOR	1	J5
J FC-10P 02697-02699	02697+02699 PCB CONNECTOR	3	J1-2, J4
J PAN2 02739	02739 PCB CONNECTOR	1	J6
J PHOENIX MC	02917+02911 90° PCB CONNECTOR	1	J7
J SOCKET 90° RJ45	02874C PCB CONNECTOR	1	J3
OSC TCXO	CXT00011 TCXO 50.0MHz	1	OSC1
R 0805 N. M.	N. M. RES 1/8W SMD 0805	9	R20, R23, R30, R32, R35, R38R40, R43-44
R 0R0-SS	00001A RES 1/4W SMD 0805	7	R3-4, R12-14, R18, R21
R 10K-S 00053C	00053C RES 1/4W SMD 0805	4	R11, R16-17, R31
R 120R-SS	00030C RES 1/4W SMD 0805	1	R19
R 1K5-SS	00043C RES 1/4W SMD 0805	1	R22
R 22K-S 00057C	00057C RES 1/4W SMD 0805	1	R29
R 2K2-S 00045C	00045C RES 1/4W SMD 0805	8	R5-6, R27, R34, R39, R41-42, R45
R 330R-S 00035C	00035C RES 1/4W SMD 0805	2	R1-2
R 470K-SS	00073B RES 1/4W SMD 0805	1	R28
R 47R-S 00025B	00025B RES 1/4W SMD 0805	6	R24-26, R33, R36-37
R 49R9-SS	00219 RES 1/8W SMD 0805	4	R7-10
R 4K7-S 00049C	00049C RES 1/4W SMD 0805	1	R15
SMD 4.5X9MM KTH55443	SWT0014QXX PUSH BUTTON	2	T1-2
PN1581AR2B	PRINTED CIRCUIT BOARD	1	

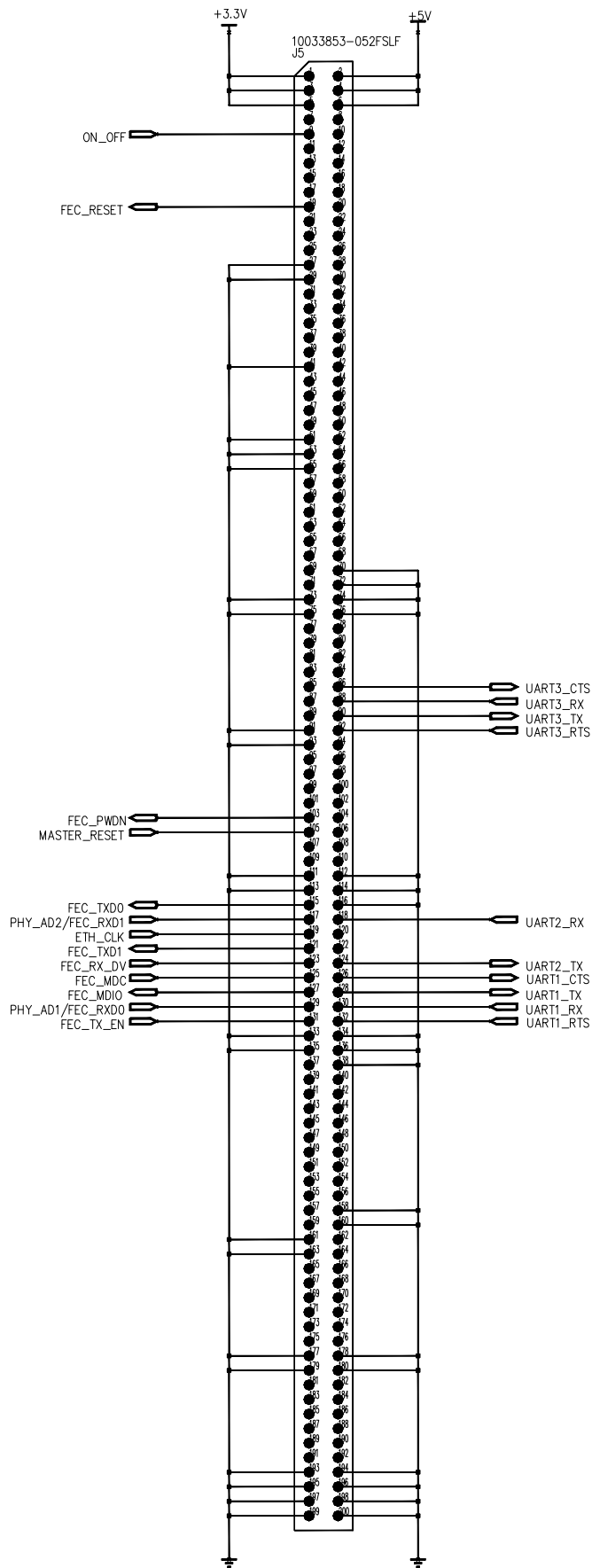
- Electric diagram 1/3 – RS232/RS485 – Power supply/Reset/ONOFF





- Electric diagram 2/3 – ETHERNET





4.18 AES/EBU OPTION (CKT011300 Code)



- Component layout

