Portable Vital Signs Monitor

Omicrom FT

Service Manual

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TO BE ENTERED BY LOCAL COMPANY OR AGENT

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1. INTRODUCTION

This Service Manual has been prepared for the maintenance and service of any of the various models of the Omicrom FT Portable Vital Signs Monitor.

The technical qualified personnel must read carefully and thoroughly this manual before performing any disassembly or maintenance procedure

The family of Omicrom FT monitors have several models that monitors different physiological signs. All models have a common base that contains a metallic chassis, an external plastic enclosure and two common boards that provide power supply and communications for the rest of boards. Each model includes different measurement boards as a function of the measured parameters. An essential documentation to use this Service Manual is the Operation Manual of the monitor, that provides complementary information.

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1.1. Quality, Reliability and Safety.

This equipment has been designed with an special emphasis on those aspects related with quality, reliability and safety, but RGB MEDICAL DEVICES will accept responsability for these aspects when the following conditions are met:

a) Electrical installations in which the monitor is to be used must comply with all regulations specified by the country in which the monitor is being used.

b) The monitor is used in accordance with the instructions for use provided by RGB MEDICAL DEVICES.

c) All maintenance, modification or repairment operations are carried out by qualified personnel authorised by RGB MEDICAL DEVICES.

d) Equipment installation must be carried out in accordance with local requirements regarding responsibility and warranty.

1.2. General Precautions.

Read the following precautions thoroughly before performing any of the disassembly procedures, because serious damage to the personnel or the equipment can result if the precautions are not strictly followed.

All service operations must be carried out by qualified personnel. Besides, these operations can only be performed by authorised personnel by RGB MEDICAL DEVICES.

Before cleaning the equipment, always switch it off and disconnect it from the AC power supply. Do not allow any liquid to enter the equipment case. Do not pour liquid on the equipment while cleaning. Never use any abrasive material to make the cleaning. Keep plugs and connectors meticulously clean and dry.

Do not expose the equipment to high humidity or heat.

Before starting with the disassembly procedure, the monitor must be turned off. It is necessary to remove the power cable and all signal cables.

The front panel of the monitor is vulnerable to scratching, so a rough handling can damage it.

When the monitor is reconnected and the power turned on without the plastic covers, it is necessary to be careful in order to avoid exposure to high voltage. In this case, do not power up the chassis on a conductive surface such as a bare metal table. Place the chassis on a non-conductive material.

In order **to avoid an electrostatic discharge**, it is necessary to use adequate protective means, such as antistatic surfaces and earthing means for technical personnel. In case of handling spare parts sensitive to discharges, handle these parts into their original package.

Normally, the measurement boards have a floating input section which is isolated from the remainder of the board. Never handle this section of the board, because the oil, dirt or dust deposited on these sections can cause leakage paths which can degrade floating circuit isolation and patient safety.

During the disassembly procedure, be sure to keep all screws, nuts, plastic spacers and other accessories for the posterior assembly of the monitor.

2. SERVICE INFORMATION

This chapter include several sections where different type of information for servicing the Omicrom FT monitors is included.

2.1. Monitor and accessories cleaning.

The *Omicrom FT* monitor and accessories must be kept clean on a routine basis, in accordance to the instructions provided here. To clean the monitor or their accessories it is necessary to disconnect the monitor from the AC Power and the different accessories from the monitor. After cleaning of the different parts of the equipment , always allow them dry thoroughly before use.

The outside of the monitor may be wiped clean with a cloth slightly dampened with mild detergent or normal hospital bactericides. Liquid must not be poured inside the equipment. It must not be cleaned with isopropyl alcohol or other dissolvents. Do not use abrasive agents. Avoid liquid entering inside the NIBP connector.

As a general rule, do not immerse the different cables and probes into water or any other liquid. Besides, the continued flexing of cables and wires during the use of the monitor or during the cleaning procedure could break the internal wires and, as a consequence, produce the failure of the monitor.

A very important aspect that must be considered is the cleaning procedure of the cuffs and hoses supplied with the unit. Care must be taken not to immerse these elements in any kind of liquid to avoid that the liquid enters them at any time. If this happens accidentally, then it may be dried by passing air through the cuff. The cuff can be cleaned by hand washing in warm soapy water.

Both the ECG cable and the electrode leads may be cleaned and disinfected by wiping with a 10% solution of household bleach or any other similar commercial product. Do not use alcohol, since it will attack the protective plastic cover of the cables causing them to undergo a premature erosion.

For the cleaning of sensors or cables, hold the sensor in one hand at the tip and wipe the sensor and cable towards the plug end. If excessive pressure is used, the covering will be stratched, which may break the internal wires and destroy the probe.

Do not boil or autoclave the monitor, the sensor or the cables, because it can be destroyed.

2.2. Technical specifications.

This section includes the technical specifications of Omicrom FT monitors. General specifications are valid for all models of Omicrom FT monitors. Specifications related to each vital sign are applicable according to the specific model. In this case, it is mentioned the code of the board that monitors the vital sign, because the specifications can vary according to the board used. The cross reference of the boards used into each model of Omicrom FT is included in Chapter 5 ("Schematics and spare parts list").

2.2.1. Classification according IEC601.

Type of Protection: Class I, internally powered.
Mode of Operation: Continuous.
Degree of Mobility: Portable.
Degree of Protection against Electric Shock: Types BF and CF.

Note. This monitor can not be used in the presence of flammable anaesthetics gases.

2.2.2. General Specifications.

External enclosure: ABS flame resistant.
Dimensions: 232 length x 208 width x 242 height (mm).
Weight: 4.8 kg.
Display: Electroluminescent display with very high contrast.
Viewing angle 160º.
Resolution 320 x 240 pixels.
Active area 120 x 90 mm
Keyboard: Power on/Power off key.
4 specific function keys.
5 soft keys.
Battery: Free maintenance lead acid battery 12 V - 2.1 Ah.
Size: 178 mm x 34 mm x 60 mm
Internal battery charger.
Maximum two hours of autonomy (it depends on model and active parameters).
Safety Standards:

- IEC601-1 (1988). Medical electrical equipment. General requirements for safety.
- IEC601-1-2 (1993). Medical electrical equipment. Part 1: General requirements for safety. Section 2: Collateral standard: Electromagnetic compatibility. Requirements and tests.
- IEC601-2-27 (1994). Medical electrical equipment. Part 2: Particular requirements for the safety of electrocardiographic monitoring equipment.
- IEC601-2-30 (1995). Medical electrical equipment. Part 2: Particular requirements for the safety of automatic cycling indirect blood pressure monitoring.

- IEC601-2-34(1994. Medical electrical equipment. Part 2: Particular requirements for the safety of direct blood pressure monitoring equipment.

2.2.3. Environmental Specifications.

Storage temperature:	20°C to 60°C
Operating temperature:	0°C to 40°C
Relative humidity:	5 % to 90%, non condensing
Altitude:	-300 m to 4,500 m

2.2.4. Electrical Specifications.

AC input voltage:	100-120 V~ / 200-240 V~
Input voltage frequency:	50 / 60 Hz
AC input power:	15 to 55 VA
AC fuses:	250 V/1.6 A Type T.
Earth leakage current:	< 100 µA

2.2.5. Electrocardiogram (ECG) Specifications.

Board P000PLAC20 - "ECG-R 280598 Rev. 03"

Patient Safety: Class I, type CF, protected against defibrillator (according IEC601).

Heart Rate: Range: 20-300 beats per minute
Resolution: 1 beat per minute
Accuracy: ± 2 %

Specific requirements: Input impedance: > 5 MΩ at 10Hz
DC offset voltage range: ± 0.6 V
System noise: < 30 µV

Signal Features: Bandwidth:

Diagnostic mode:	0.05 Hz to 100 Hz
Monitor mode:	0.5 Hz to 25 Hz
O.R. mode:	0.5 Hz to 25 Hz

Programmable gain:1 to 8 mV

Pacemaker detection and rejection:

Pulse duration:	0.1 to 2 ms
Pulse amplitude :	±2 to ±700 mV

Auxiliary Circuits: Calibration circuit.
Detection circuit of lead disconnection.
Detection circuit of cable disconnection.

Probe requirements: Three leads cable.

Available alarms: Internal failure.
Cable disconnection.
Lead disconnection.
Signal saturated.

2.2.6. Respiration specifications:

Board P000PLAC20 - "ECG-R 280598 Rev. 03"

Patient Safety:	Class I, type CF, protected against defibrillator (according IEC601).
Respiratory Rate:	Range: 0-150 breaths per minute. Resolution: 1 breath per minute. Accuracy: 2 breaths per minute.
Bandwidth:	0 to 3 Hz
Sensitive Range:	0.2 Ω to 15 Ω
Maximum impedance:	4 kΩ
Excitation Current:	< 400 µA at 62.5 kHz.
Auxiliary circuits:	Calibration circuit. Detection circuit of lead disconnection.
Probe requirements:	Three leads cable.
Available alarms:	Internal failure. Cable disconnection. Lead disconnection. Apnea alarm.

2.2.7. Non Invasive Arterial Pressure (NIBP) Specifications.

Board P000PLAC01 and P000PLAC10 - "TENSIOMETRO 230594 Rev. 01"

Patient Safety:	Class I, type BF (according IEC601).
Heart Rate:	Range: 40-250 pulses per minute. Resolution: 1 pulse per minute. Accuracy: ±3 %
Measurement Time:	Typical: 25 to 45 sec. Maximum: 120 seconds for adults. 90 seconds for neonates
Adults Measurement:	Systolic pressure range: 30 to 250 mmHg Diastolic pressure range: 10 to 218 mmHg Mean pressure range: 20 to 234 mmHg Overpressure limit: 315 mmHg
Neonates Measurement:	Systolic pressure range: 30 to 130 mmHg Diastolic pressure range: 10 to 114 mmHg Mean pressure range: 20 to 122 mmHg Overpressure limit: 165 mmHg
Measurement Accuracy:	Never superior to ±10 mmHg.
Auxiliary circuits:	Calibration circuit. Overpressure protection circuit.
Probe requirements:	Cuffs with one tube.
Available alarms:	Internal failure. Excessive measurement time. Excessive deflation time. Excessive inflation time. Excessive time at the same pressure step. Overpressure. Small air leakages. Weak signal.

2.2.8. Invasive Arterial Pressure (PRES) Specifications.

Board P000PLAC01 - "TENSIOMETRO 2030594 Rev. 01"

Patient Safety:	Class I, type CF, protected against defibrillator (according IEC601).
Number of channels:	One.
Measurement range:	-15 to 250 mmHg
Bandwidth:	0 to 15 Hz
Transducer sensitivity:	5 µV / V / mmHg
Heart Rate:	Range: 20-250 pulses per minute Resolution: 1 pulse per minute Accuracy: ±3%
Gain:	Accuracy: ±1 % Drift: 0.1 % per °C
Zero Adjustment Circuit:	Range: ±100 mmHg Accuracy: ±1 mmHg Drift: ±0.1 mmHg per °C
Auxiliary circuits:	Calibration circuit. Gain selection circuit. Zero adjustment circuit.
Probe requirements:	Connection Cable with electrical shielding.
Available alarms:	Internal failure. Cable disconnection. Change of the scale.

2.2.10. Pulse Oximetry (SpO_2) Specifications.

Board P000PLAC19 - "PULAIS 060498 Rev. 02"

Patient Safety:	Class I, type BF, protected against defibrillator (according IEC601).
Saturation Measurement:	Range: 40 -100 % Resolution: 1 % Accuracy: 85 to 100 % - ± 1.5 % 70 to 85 % - ± 2 %
Heart Rate:	Range: 30-250 pulses per minute Resolution: 1 pulse per minute Accuracy: ± 3 %
Auxiliary circuits:	Calibration circuit. Detection circuit of sensor disconnection.
Probe requirements:	BCI sensor or compatible.
Available alarms:	Internal failure. Cable or sensor disconnection. Sensor off patient. Insufficient light received. Interferences. Weak pulsatile signal. Patient movement.

2.2.11. Temperature (TEMP) Specifications.

Board P000PLAC04 - "CONTROTEMP 200695 Rev. 30"

Patient Safety:	Class I, type CF, protected against defibrillator (according IEC601).
Measurement Range:	15 to 45 °C / 59 to 113 °F
Resolution:	0.1 °C / 0.2 °F
Accuracy:	±0.1 °C (it is not included the probe tolerance).
Auxiliary circuits:	Calibration circuit.
Probe requirements:	YSI Series 400 Probes or compatibles.

2.2.12. Output Signals Specifications.

Board P000PLAC07 - "CONECTOR 130598 Rev. 03"

RS-232 output:	One channel. DB9 Male Connector. PC connection or External Printer connection. Electrically isolated.
RS-485 output:	Two optional channels. Electrically isolated.

2.2.13. Materials Specifications.

This section includes those components or parts whose specifications are essential to guarantee the patient safety from the electrical point of view.

AC Power Cord:	Female plug CEE22l. Male plug Schuko IEC. It must comply VDE / IEC standards.
AC Monitor Plug:	Module Filter according to IEC601. Two fuses incorporated. 1 pole rocker switch incorporated.
AC/DC Converter:	It must comply with IEC601 Standard. Isolation Voltage Input/Output >4000 V~. Universal Input Voltage 85-250 V~ / 48-64 Hz. Output voltage 15 VDC. Minimum Output Power 40 W.

2.2.14. Operating Specifications.

Sweep Speed:

The sweep speeds available are 12.5 mm/s and 25 mm/s.

Information by display:

The display can monitor the waveforms of ECG, NIBP, SpO_2, invasive pressure and respiration. The display shows the numeric value of each measured parameter. It shows all relevant information about each monitored sign.

Heart Rate Measurement:

From each pulsatile signal, the system detects the presence of a pulse and provides an acoustic and visual indication. The source of the heart rate showed is selected dynamically as a function of the active signs (if it is not in an alarm situation) according to the following priority criteria:

1) ECG
2) PRES1
3) PRES2
4) SpO_2
5) NIBP

Alarm detection system:

For each vital sign monitored there is an independent alarm detection system, that detects several alarm conditions.
The presence of an alarm situation is indicated by visual and acoustic means.
It is possible to disable the warnings for all signals at the same time.
It is possible to disable the alarms of each parameter in an independent way:
It is possible to select the patient alarm levels for each parameter. These levels can be stored to be used the next time the monitor is turned on.
The procedural alarms that can be detected have been specified in previous sections.

Trends Storage:

All parameters measured are stored periodically. The time period between consecutive storage is selectable by the user (options: 1, 2, 3, 5, 7, 10 and 15 minutes). According to the selected time period, the storage capacity varies between a minimum of 5 hours and a maximum of 72 hours.

Configuration Options:

Configurations options available depend on each model and can be stored to be used the next time that the monitor is turned on:

- Sweep speed: 12.5 or 25 mm/s.
- QRS beep: Enabled or disabled.
- Alarm sound: Enabled or disabled.
- Temperature measurement units: °C or °F.
- NIBP and ECG patient type: Child/adult or Neonate.
- Pacemaker rejection capability: Enabled or disabled.
- ECG operating mode: Diagnostic, monitor or O.R.

Battery autonomy indicator:

The level of charge of the battery is displayed at the bottom right part of the screen. The level of charge is measured each ten seconds. When there are approximately 15 minutes left before the battery is powerless, the 'Battery' LED indicator starts to flicker, thus indicating that it is necessary to power the monitor from the AC mains power. During this time period an alarm sound is activated and a transitory message is displayed in the screen, to show in a clear way this alarm condition. If this period is consumed, the equipment is self-disconnected to avoid a large discharge level which might be harmful to the battery.

2.3. Verification routines.

In this section it is explained the verification procedures that must be followed to ensure that the Omicrom FT monitor is performing well.

Any failure detected during the tests must be located and repaired. After this repairment, the monitor must be checked again completely before using it.

2.3.1. Daily verification routine.

Daily or each time the monitor is used, the operator must review the next points:

1. To inspect the monitor and the accessories and, if signs of damaged are detected, replace or not use the damaged items.
2. To clean the monitor and their accessories according the instructions given in section 2.1.
3. To inspect the AC power cord and, if signs of damage are detected, replace it with an original RGB part replacement.
4. To check the battery status. Power up the monitor from its internal battery and check the level of charge at the indicator placed at the bottom right part of the display. If the charge level is too low or if the 'Battery' LED is flashing, connect the monitor to the mains supply and switch on the rear panel mains power switch. Leave the monitor charging until the charge level reaches the maximum.
5. To check the monitor operation. The basic points to check are: graphical presentation by the display, adjustment of the parameters measured, selection of the configuration options and adjustment of patient alarm levels for each parameter. After checking these points, return all adjustments to the desired settings.

If any failure is detected during this daily verification, contact with qualified technical personnel authorized by RGB MEDICAL DEVICES for servicing the monitors.

2.3.2. Periodical verification routine.

This sections describes the verification routine that must be performed each six months by a qualified technician. Previously it must be done the daily verification routine describe at the previous section.

In order to carry out this verification, it is necessary to use the next auxiliary equipments:

- BioTek Simulator Model LionHeart 3 or equivalent.
- Pressure manometer.

In this section it is described the verification associated with each signal. Only it is necessary to carry out those verifications, according the Omicrom FT model (so each model monitors several signals). To verify each signal only it is necessary to activate the signal at the monitor.

Electrocardiogram signal verification.
Activate at the monitor the ECG signal and select a scale of 2 mV. Connect the ECG simulator (Lionheart 3) to the Omicrom FT using the standard cable.

Signal filter checking:

a) Select at simulator a 2 Hz square waveform with an amplitude of 1 mV and check that at monitor display the peak amplitude is 50% of monitoring area (all ECG modes).
b) Select at simulator a 4 Hz sinusoidal waveform with an amplitude of 1 mV and check that at monitor display the peak amplitude is 50% of monitoring area (all ECG modes).
c) Select at simulator a 10 Hz sinusoidal waveform with an amplitude of 1 mV and check that at monitor display the peak amplitude is 50% of monitoring area (all ECG modes).
d) Select at simulator a 0.5 Hz sinusoidal waveform. Select at the Omicrom FT the Diagnostic ECG mode and check that at monitor display the peak amplitude is 50% of monitoring area. Select at the Omicrom FT the Monitor or OR ECG mode and check that at monitor display the peak amplitude is 25% of monitoring area.
e) Select at simulator a 50 Hz sinusoidal waveform (or 60 Hz depending on AC mains supply frequency) with an amplitude of 1 mV and check that at monitor display a flat line appears (all ECG modes).

ECG signal verification:

a) Select at simulator an ECG waveform with and amplitude of 1 mV and a frequency of 80 bpm and check that at monitor display the QRS amplitude is 50% of monitoring area (all ECG modes).

QRS detection:

a) Select at simulator QRS detection signal of 0,5 mV, 70 ms and 80 bpm and check that the heart rate showed at monitor display is correct (all ECG modes).
b) Select at simulator QRS detection signal of 0,5 mV, 40 ms and 80 bpm. Select at Omicrom FT as Patient type neonates and check that the heart rate showed at monitor display is correct (all ECG modes).
c) Select at simulator QRS detection signal of 0,15 mV, 100 ms and 80 bpm and check that monitor does not detect any QRS (all ECG modes).

Signal gain:

a) Select at simulator an ECG waveform of 1mV and 80 bpm.
b) Select at monitor an ECG scale of 4 mV.
c) Check that the amplitude of the waveform at the monitor display is 25% of monitoring area.
d) Select at the monitor an ECG scale of 1 mV.
e) Check that the amplitude of the waveform at the monitor display is 100% of monitoring area.

Lead selection.

a) Select at simulator an ECG waveform of 1mV and 80 bpm.

b) Change the lead selected at the monitor and check that the selection is correct.

Pacer detection:

a) Enable at the Omicrom FT the pacemaker rejection capability. Select at simulator an asynchronous pacemaker with an amplitude of 0 2 mV and a duration of 0.2 ms.
b) Check at the monitor that the pacemaker indication appears on the screen and the heart rate is correct.
c) Select at simulator the option “Non capture pacemaker”.
d) Check at the Omicrom FT that the pacemaker indication appears on the screen but there is not QRS detection.
e) Select at the simulator a pulse amplitude of 200 mV and a pulse duration of 2 ms and repeat the steps b) to d).

ECG noise level:

a) Connect all ECG leads together.
b) Check that a flat line appears on the display (all ECG modes).

ECG alarms:

a) Disconnect the ECG cable and check that Omicrom FT shows an alarm message indicating “Cable off”.
b) With the ECG cable connected to the Omicrom FT and all ECG leads placed at the simulator, disconnect each one of the leads independently and check that Omicrom FT shows an alarm message indicating “Lead off”.
c) Disconnect the three leads and check that the same message is shown.
d) With all cables and leads connected, select at simulator a normal QRS with an amplitude of 1 mV and at the Omicrom FT the 1mV ECG scale. Check that Omicrom FT shows an alarm message indicating “Signal saturated”.
e) Select at simulator an ECG waveform with a heart rate of 120 bpm. Change the alarm levels at Omicrom FT to check that the patient alarms are being activated correctly.

Respiration signal verification.

Activate at the monitor the respiration signal and connect the respiration simulator (Lionheart 3) to the Omicrom FT using the standard cable..

Respiratory rate:

a) Select at simulator a respiratory waveform of 15 rpm and with an amplitude of 1 Ohm.
b) Select at monitor a signal size of 2X.
c) Check that respiratory rate showed at monitor display is correct.

Base impedance:

a) Select at simulator a respiratory waveform of 15 rpm with an amplitude of 1 Ohm.
b) Select at monitor a signal size of 2X.
c) Select at simulator a base impedance of 500 Ohms
d) Check that respiratory rate showed at monitor display is correct.

e) Select at simulator a base impedance of 1000 Ohms
f) Check that respiratory rate showed at monitor display is correct.

Signal gain:

a) Select at simulator a respiratory waveform of 15 rpm with an amplitude of 1 Ohm.
b) Select at monitor a signal size of 2X.
c) Check that at monitor display the signal amplitude is 50% of monitoring area.
d) Select at monitor a signal size of 5X.
e) Check that at monitor display the signal amplitude is 20% of monitoring area.

Invasive pressure signal verification.

Activate at the Omicrom FT the invasive pressure signal and connect the pressure simulator (Lionheart 3) using the special cable supplied with the simulator.

Previously, it is necessary to calibrate the zero of the pressure measurement, so you must select at simulator the zero calibration option and follow the zero adjustment procedure described in the Omicrom FT Operation Manual.

Pressure measurement:

a) Select at simulator a static pressure of -10 mmHg.
b) Select at the Omicrom FT a negative pressure scale and check that the pressure values showed at Omicrom FT display are correct.
c) Select the maximum scale at the Omicrom FT.
d) Select at simulator a static pressure of 50 mmHg.
e) Check that the pressure values showed at Omicrom FT display are correct.
f) Select at simulator a static pressure of 150 mmHg.
g) Check that the pressure values showed at Omicrom FT display are correct.
h) Select at simulator a static pressure of 240 mmHg.
i) Check that the pressure values showed at Omicrom FT display are correct.
j) Select at simulator a pressure waveform of 120/0 mmHg.
k) Check that the pressure values showed at Omicrom FT display are correct.

Cardiac rate measurement.

a) Select at the Omicrom FT the maximum pressure scale.
b) Select at simulator a pressure waveform of 120/0 mmHg and 80 bpm.
c) Check that the heart rate measurement showed at the Omicrom FT display is correct.
d) Select at simulator a pressure waveform of 120/0 mmHg and 160 bpm.
e) Check that the heart rate measurement showed at the Omicrom FT display is correct.

Invasive pressure alarms:

a) Disconnect the cable from the Omicrom FT and check that Omicrom FT shows an alarm message indicating “Cable off”.
b) Change the invasive pressure alarm levels at Omicrom FT to check that the patient alarms are being activated correctly.

Pulse oximetry signal verification.
Activate the pulse oximetry signal at the Omicrom FT.

Saturation measurement.
a) Clip the sensor on to the finger.
b) Check that the saturation value showed at Omicrom FT display is between 92% and 98% (this is a normal value for a healthy adult person).
c) Check that the heart rate measurement showed at the display is correct. The actual heart rate can be measured manually over the wrist.

Alarm system verification.
a) Do not clip the sensor on to the finger and check that Omicrom FT shows an alarm message indicating “Sensor off patient”.
b) Place an opaque means between the emitter and the receiver of the sensor and check that Omicrom FT shows a message indicating “Insufficient light”.
c) Change the saturation alarm levels at Omicrom FT to check that the patient alarms are being activated correctly.

Temperature signal verification.
Connect the temperature simulator (Lionheart 3) to the Omicrom FT using the special cable supplied with the simulator. To check that the readings of the Omicrom FT are correct it must be considered the accuracy of the simulator.

Signal activation / disactivation.
a) Connect the temperature probe and check at Omicrom FT display that a numeric value appears at temperature field.
b) Disconnect the temperature probe and check at Omicrom FT display that temperature field is blanked.

Temperature measurement.
a) Connect the temperature probe at Omicrom FT.
b) Select at simulator a temperature of 24 ºC and check that the temperature value showed at Omicrom FT display is correct.
c) Select at simulator a temperature of 37 ºC and check that the temperature value showed at Omicrom FT display is correct.
d) Select at simulator a temperature of 40 ºC and check that the temperature value showed at Omicrom FT display is correct.

Temperature alarms:
a) Change the temperature alarm levels at Omicrom FT to check that the patient alarms are being activated correctly.

Non invasive pressure signal verification.

Activate the non invasive pressure signal at the Omicrom FT (for some models, it is necessary to disactivate previously the invasive pressure signal) and activate the displaying of the oscillating pressure at the cuff.

Inflation pressure.

a) Using a T connector, connect the Omicrom FT, the pressure manometer and a cuff, that must be wrapped around a rigid cylinder which is approximately the same size as an arm.
b) Initiate the pressure measurement at the Omicrom FT.
c) Check that the inflation pressure is approximately 160 mmHg for adults and 100 mmHg for neonates.

Small air leakage verification.

a) Using a T connector, connect the Omicrom FT, the pressure manometer and a cuff, that must be wrapped around a rigid cylinder which is approximately the same size as an arm.
b) Initiate the pressure measurement at the Omicrom FT.
c) Do not stop the measurement procedure.
d) Check that the waveform monitored is flat during all pressure steps.
e) Check that the pressure value at each step is accurate.
f) Finally, check that the pressure is below 10 mmHg and that the Omicrom FT generates a weak signal alarm, so there are not air leakages.

Overpressure cut-out.

a) Using a T connector, connect the Omicrom FT, the pressure manometer and a cuff, that must be wrapped around a rigid cylinder which is approximately the same size as an arm.
b) Initiate the pressure measurement at the Omicrom FT.
c) When the cuff pressure is maximum, you have to produce manually an overpressure higher than 300 mmHg. Check that the safety system that protect against overpressure is operating and the pressure is limited.

Pressure measurement.

a) Place the cuff correctly around the upper arm and initiate a normal measurement.
b) Check that the cuff inflation is correct.
c) When the measurement finishes, check that the cuff is deflated completely and the pressure values are showed at Omicrom FT display.
d) Check that the pressure values measured can be considered as correct and that consecutive measurements are repeatable.

Non invasive pressure alarms:

a) With no cuff connected initiate a measurement and check that Omicrom FT shows an alarm message indicating “Inflation timeout” after 45 seconds (20 for neonates).
b) With the cuff wrapped around a rigid cylinder initiate a measurement and check that Omicrom FT shows an alarm message indicating “Weak signal”.

c) Change the non invasive pressure alarm levels at Omicrom FT to check that the patient alarms are being activated correctly.

Verification of auxiliary operating aspects.
This section includes a general verification of some characteristics of the Omicrom FT.

Physical checking of the Omicrom FT.

a) Check the external enclosure.
b) Check any label missing.
c) Check the correct operation of LEDS at the Omicrom FT.
d) Check the correct operation of all keys.
e) Check the correct operation of the display and inspect possible damages.

Alarm levels.

a) Check that all selectable options operate correctly.
b) Check the correct operation of the quick adjustment of patient alarm levels.
c) Check that alarms of each parameter can be enabled or disabled independently.

2.4. Alarm messages.

In this section it is included a detailed explanation of the different message alarms that can be shown by the Omicrom FT.

2.4.1. Initial self-test.

When the Omicrom FT is powered on, it is made a self-test for some seconds. If some failure is detected at anyone of the measurement boards it is indicated at the display and the relating measurements are not available. In this case two type of failure can be detected:

1) INTERNAL FAILURE	There is a failure during the self-testing and auto-calibration of the measurement.
2) COMMUNICATION FAILURE	It is not possible to communicate with the board.

2.4.2. ECG messages.

During the normal operation of Omicrom FT monitor, it can show several alarm messages regarding the ECG signal (P000PLAC20 board). These messages are:

1) INTERNAL FAILURE	The self calibration has failed or it is not possible to communicate with the ECG board.
2) CABLE OFF	The ECG cable is disconnected from the ECG board.
3) LEAD OFF	There is one or more ECG leads disconnected. If there is only one lead disconnected and it is not active the ECG waveform can be displayed.
4) SIGNAL SATURATED	The ECG signal is saturated at the ECG scale selected, so the QRS detection system can failure. To solve the problem select a higher scale at Omicrom FT monitor.
5) NO QRS DETECTION	There is no detection of the QRS complex.

2.4.3. SpO_2 messages.

During the normal operation of Omicrom FT monitor, it can show several alarm messages regarding the SpO_2 signal (P000PLAC19 board). These messages are:

1) INTERNAL FAILURE	The self calibration has failed or it is not possible to communicate with the SpO_2 board.
2) CABLE OFF	The SpO_2 cable is disconnected from the SpO_2 board. The same message is used if the sensor is disconnected.
3) SENSOR OFF PATIENT	The SpO_2 sensor is not placed on the patient finger. This failure is detected with the finger type sensor, but with other type of sensors this message could not be shown.
4) INSUFFICIENT LIGHT	The level of light received by the photodiode is too low. This failure can be caused by a bad sensor position or a failure of the excitation circuit of the LED diodes in the sensor
5) INTERFERENCES	The sensor is receiving a high level of ambient light and the measurement is not reliable. Check the placing of the sensor.
6) WEAK SIGNAL	The pulsatile signal received by the sensor is too low, so it is not possible to compute a reliable saturation measurement.
7) PATIENT MOVEMENT	The patient is moving, so the pulse detection system is failing to detect the real pulses of the patient and it is not possible to compute a reliable saturation measurement.
8) SATURAT. RANGE ERROR	The computed saturation value is out of the range of measurement (the measured value is below 40% of O_2 saturation).

2.4.4. NIBP messages.

During the normal operation of Omicrom FT monitor, it can show several alarm messages regarding the NIBP signal (P000PLAC01 board). These messages are:

1) INTERNAL FAILURE	The self calibration has failed or it is not possible to communicate with the NIBP board.
2) INFLATION TIMEOUT	The time of inflation has exceeded 45 seconds for adults or 20 seconds for neonates.
3) STEP TIMEOUT	During the measurement the Omicrom FT has been trying to detect two valid pulses at the same pressure step during 30 seconds for adults or 20 seconds for neonates.
4) MEASUREMENT TIMEOUT	The Omicrom FT monitor has been trying to measure the pressure during more than 2 minutes for adults or 90 seconds for neonates.
5) WEAK SIGNAL	The pulses of pressure detected at the cuff are too low and it is not possible to obtain a valid measurement.
6) AIR LEAKAGE	Three consecutive times the Omicrom FT has detected a small air leakage in the system, so the measurement cannot be obtained.
7) DEFLATION FAILURE	During the deflation of the cuff there has been a failure, so the security valve is opened and the cuff deflated.
8) OVERPRESSURE	The overpressure detection system has actuated because the cuff pressure has been higher than the overpressure limit . The overpressure limit is 315 mmHg for adults and 165 mmHg for neonates.

2.4.5. Invasive pressure messages.

During the normal operation of Omicrom FT monitor, it can show several alarm messages regarding the IBP signal (P000PLAC01 board). These messages are:

1) INTERNAL FAILURE	The self calibration has failed or it is not possible to communicate with the IBP board.
2) CABLE OFF	The pressure transducer cable is disconnected from the IBP board.
3) CHANGE THE SCALE	This message only it is shown when it is selected the optimum scale level and the pressure signal is saturated. Select the adequate fix scale or select

again the optimum scaling.

2.4.6. Respiration messages.

During the normal operation of Omicrom FT monitor, it can show several alarm messages regarding the respiration signal (P000PLAC20 board). These messages are:

1) INTERNAL FAILURE	The self calibration has failed or it is not possible to communicate with the respiration board.
2) CABLE OFF	The ECG cable is disconnected from the respiration board.
3) LEAD OFF	The LL lead or RA lead or both leads are disconnected.
4) APNEA ALARM	No breath has been detected during the apnea alarm period selected.

2.4.7. System messages.

These are an special type of alarm messages that can produce a total system bad performance, so when it is detected the normal operation is suspended and a alarm screen is shown to indicate the type of failure. In this case it is necessary to turn off the monitor and power on again. If the failure is repetitive contact RGB MEDICAL DEVICES.

1) INTERNAL FAILURE F01	Illegal software opcode loaded at the display board microprocessor (P000PLAC14 board).
2) INTERNAL FAILURE F02	Bad RAM addressing at the digital section of the display board (P000PLAC14 board).
3) INTERNAL FAILURE F03	Memory error at the controtemp board (P000PLAC04 board).
4) INTERNAL FAILURE F04	Illegal software opcode loaded in the controtemp board microprocessor (P000PLAC04 board).
5) INTERNAL FAILURE F05	Bad RAM addressing at the digital section of the controtemp board (P000PLAC04 board).

3. MONITOR INSTALLATION AND ADJUSTMENTS

This section includes instructions for the correct installation of Omicrom FT monitors.

By installation we mean the correct monitor power on procedure, because it is not necessary to perform any specific installation operation. This section only describes the step that the user must follow to use the monitor.

3.1. Unpacking

Before opening the carton, inspect it carefully for any signs of damage. Remove the monitor *Omicrom FT* from the carton as well as the accessories and inspect them carefully to detect any damage or loss. Normally, the items that must be found in the box are:

Omicrom FT monitor.
ECG cord with three leads.
Pulse Oximetry extensor cable.
Reusable Pulse Oximetry clip sensor.
NIBP extension tube.
Adult size cuff for NIBP.
Power supply cord.
Operation Manual.

The list of accessories can vary depending on the Omicrom FT models. This list does not include the optional accessories that may have been selected and which may also be included in the box. If an item is missing or damaged, call RGB MEDICAL DEVICES by mail, fax or telephone.

Retain all shipping materials for inspection by the carrier in case of shipping damage or for reshipment, if necessary, to RGB MEDICAL DEVICES.

3.2. Monitor installation.

For normal use, *Omicrom FT* can be placed on a horizontal surface; four feet are attached to the base of the monitor to provide a firm placement. It can also be attached to a vertical or horizontal bar using the adapters that are supplied as optional accessories.

Check that the fuses placed into the monitor are of the correct rating and type.

Connect the equipotential earth terminal to the potential equalization conductor of the electrical installation where the monitor is going to be placed, if this conductor is available or if it is a mandatory requirement.

Finally, plug AC Power Cord into the male plug placed at the rear part of the monitor and plug the other side into a female plug of the electrical installation, that must have three wires to guarantee the right monitor earthing.

It must be considered the different cables that must be connected to the monitor and provide clearance for the front attached connectors, hoses, cables and sensors for the different parameters so that connections are not subject to strain at any time. In the rear part of the equipment, the power cord and communications cable may be connected. The communication connector is labelled as PC-COM, and the cord is optionally provided.

Cable and patient's sensor connections are as follows:

- The temperature probe is connected to the ¼" phone jack at the front lower left-hand side of the Omicrom FT.
- The NIBP monitoring pneumatic hose connector is connected to the front lower right-hand side of Omicrom FT. Connect the hose by plugging-in and gently pressing the male connector into this female connector. This is a security type of connector that cannot be disconnected by pulling the cable, thus preventing an accidental disconnection. Disconnect the cable by gently pulling the connector outer ring.
- Pulse oximetry uses a security type of connector (black color code) that cannot be disconnected by pulling the cable, thus preventing accidental disconnection. To guarantee the proper connection, different guides are used for this connector. To disconnect the Pulse oximetry connector, gently pull the rear grey part of the connector.
- A Nicolay type connector is used for ECG (green color code) and invasive pressure (orange color code) measurements that cannot be disconnected by pulling the cable, thus preventing accidental disconnection. To ensure the correct connection, different guides are used for each connector. To disconnect the cable gently pull the connector body.

During the installation stage, it is necessary to make sure that the air vents placed in the rear part of the chassis are unobstructed, to allow for heat dissipation.

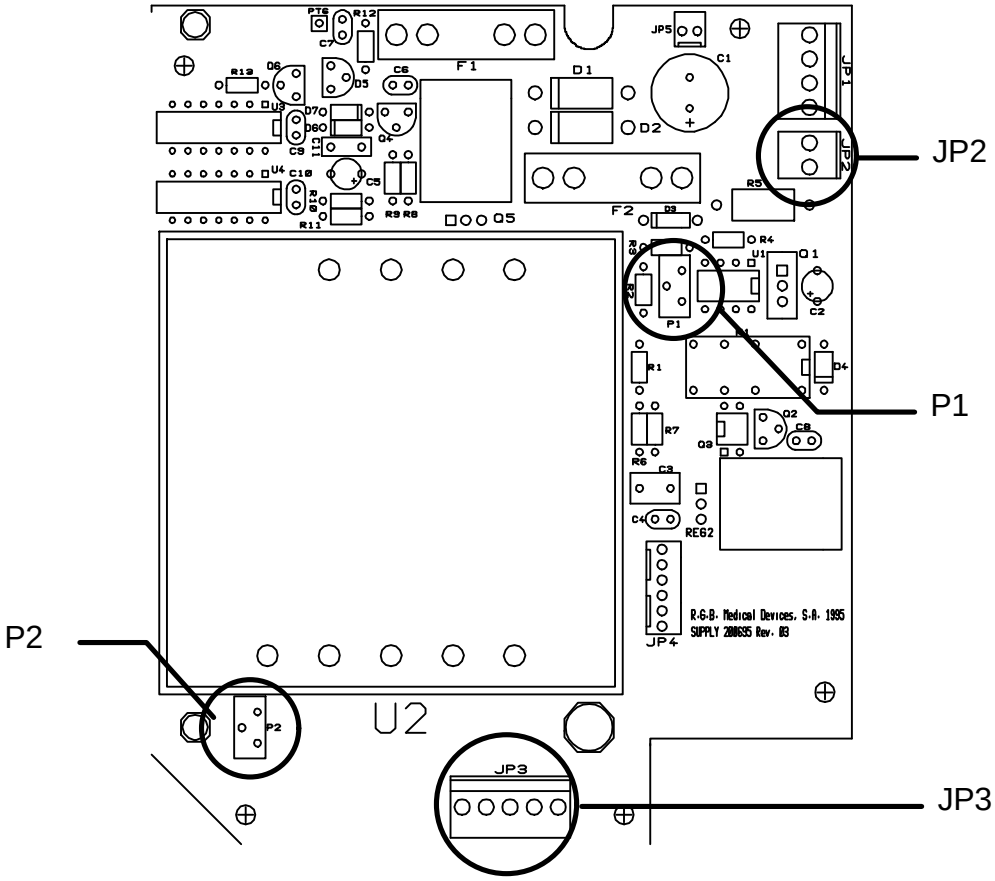
After receiving the monitor, it is not necessary to perform any selection or adjustment monitor.

3.3. Adjustments and option jumpers.

This section describes the different adjustments that can be made and the use of the jumpers placed at the several boards included into the Omicrom FT monitor.

To make these operations it is necessary to disassembly the Omicrom FT according the instructions given in chapter 4.

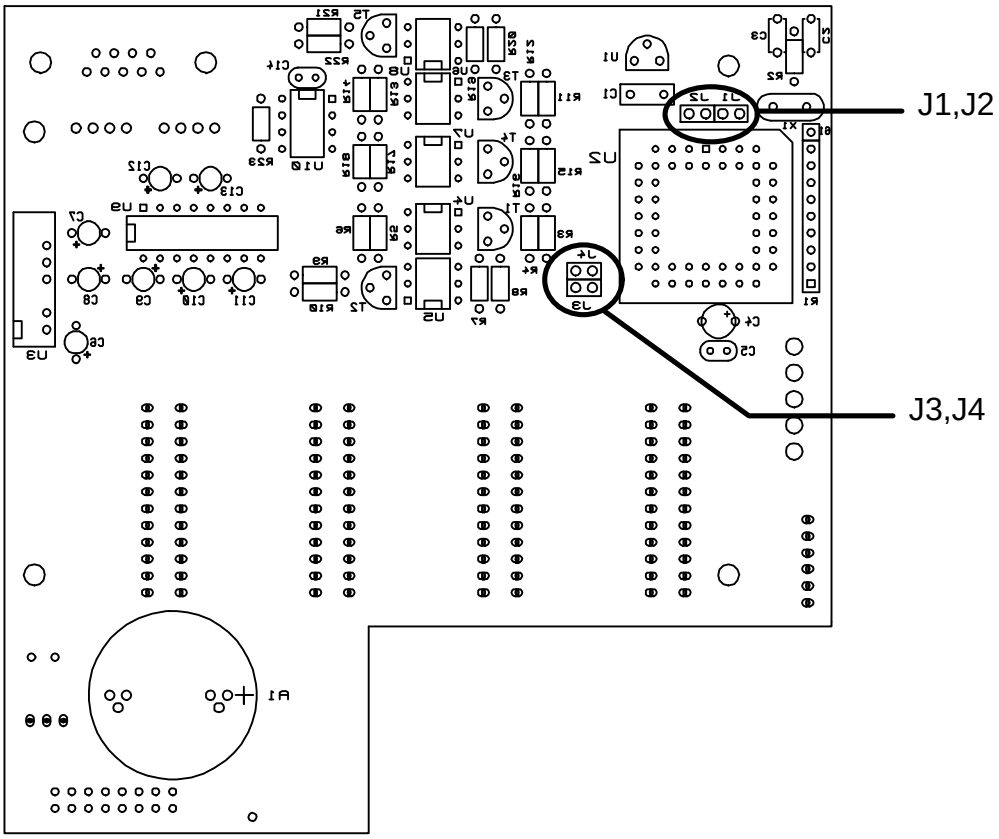
3.3.1. Supply board (P000PLAC05 Internal code).



There are two available adjustments:

1) Potentiometer P1 is used to adjust the battery charging voltage. This voltage must be between 13.5 V and 13.8 V and it can be measured between the pin 1 and pin 2 of JP2.
2) Potentiometer P2 is used to adjust the supply voltage of +5V. A value of +5V $\pm$ 0.1V is valid. This voltage can be measured between pin 4 and pin 3 of JP3.

3.3.2. Base board (P000PLAC07 Internal Code)



The function of the jumpers in this board are:

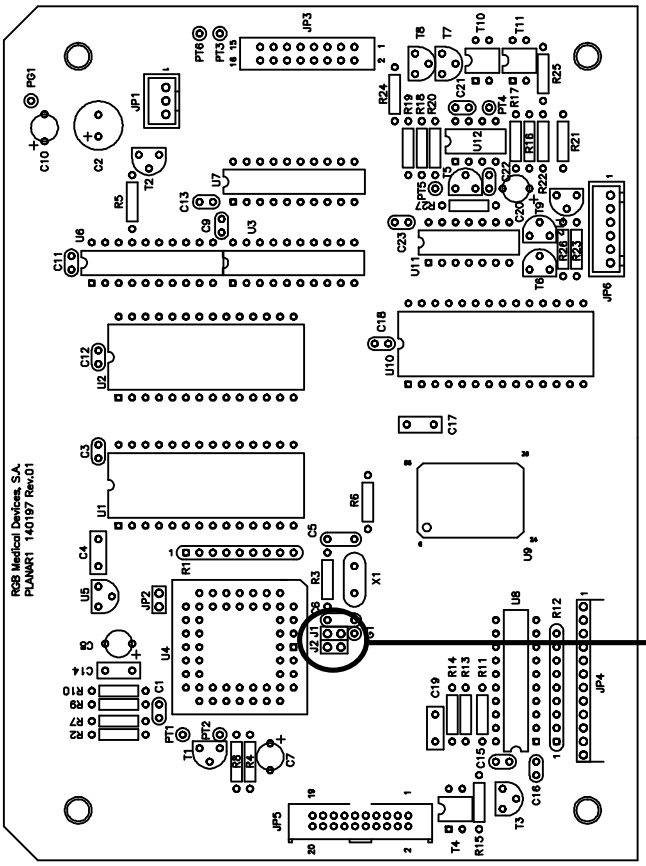
1) Jumpers J1 and J2 are used to select the operation mode of 68HC11 microcontroller.

J1	J2	Function
Open	Open	Expanded multiplexed mode - Standard
Open	Closed	Special test mode
Closed	Open	Single chip mode
Closed	Closed	Special bootstrap mode

2) Jumpers J3 and J4 are used to select the addressing of the external RS232.

J3	J4	Function
Open	Open	RS232 interface from main board (P000PLAC04 board) - Standard
Closed	Closed	RS232 interface from a measurement board (only valid when there is only one measurement board installed)

3.3.3. Display board (P000PLAC14 Internal Code)

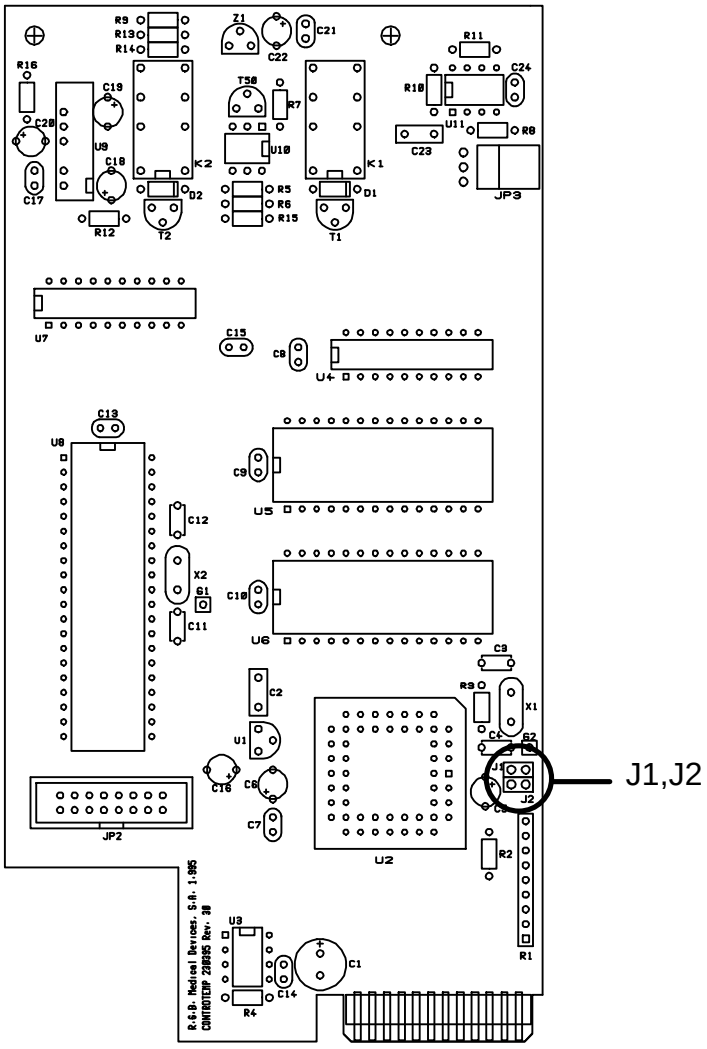


The function of the jumpers in this board are:

1) Jumpers J1 and J2 are used to select the operation mode of 68HC11 microcontroller.

J1	J2	Function
Open	Open	Expanded multiplexed mode (Standard)
Open	Closed	Special test mode
Closed	Open	Single chip mode
Closed	Closed	Special bootstrap mode

3.3.4. Main board (P000PLAC04 Internal Code)

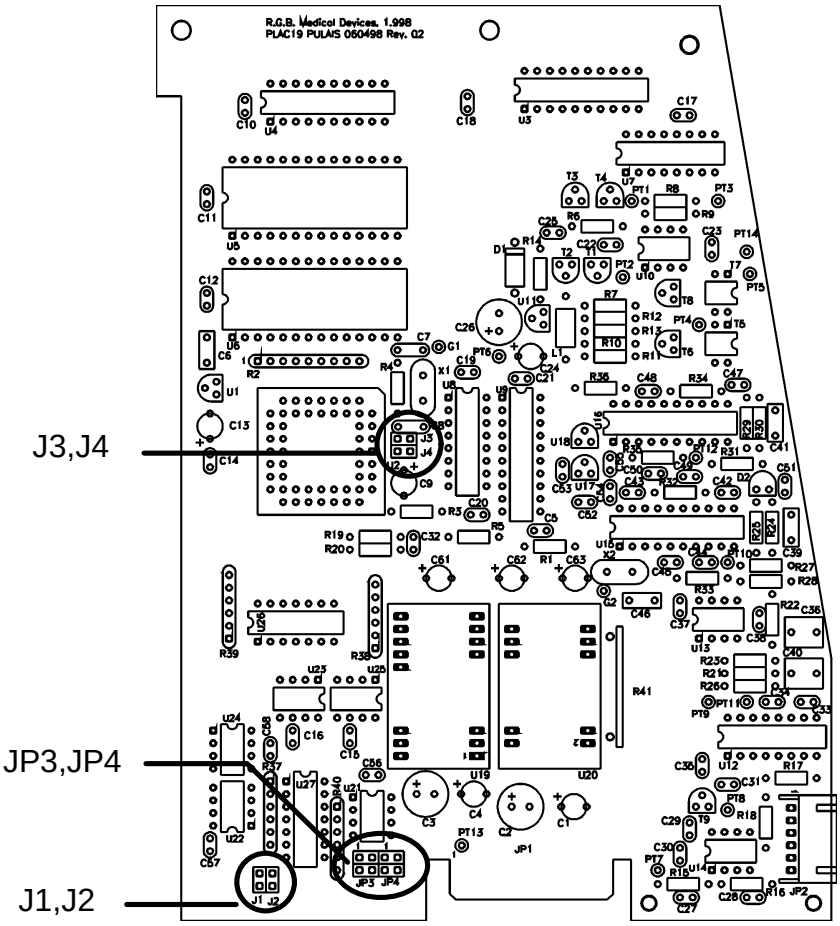


The function of the jumpers in this board are:

1) Jumpers J1 and J2 are used to select the operation mode of 68HC11 microcontroller.

J1	J2	Function
Open	Open	Expanded multiplexed mode (Standard)
Open	Closed	Special test mode
Closed	Open	Single chip mode
Closed	Closed	Special bootstrap mode

3.3.5. Pulsioximeter board (P000PLAC19 Internal Code)



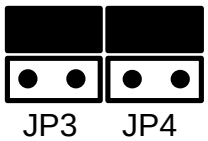
The function of the jumpers in this board are:

1) Jumpers J1 and J2 are used to enable the SPI external communication from the board and their standard position is open.

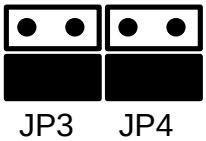
2) Jumpers J3 and J4 are used to select the operation mode of 68HC11 microcontroller.

J3	J4	Function
Open	Open	Expanded multiplexed mode (Standard)
Open	Closed	Special test mode
Closed	Open	Single chip mode
Closed	Closed	Special bootstrap mode

3) Jumpers JP3 (for RxD)and JP4 (for TxD) are used to select the serial communication with the board via RS485 or TTL.

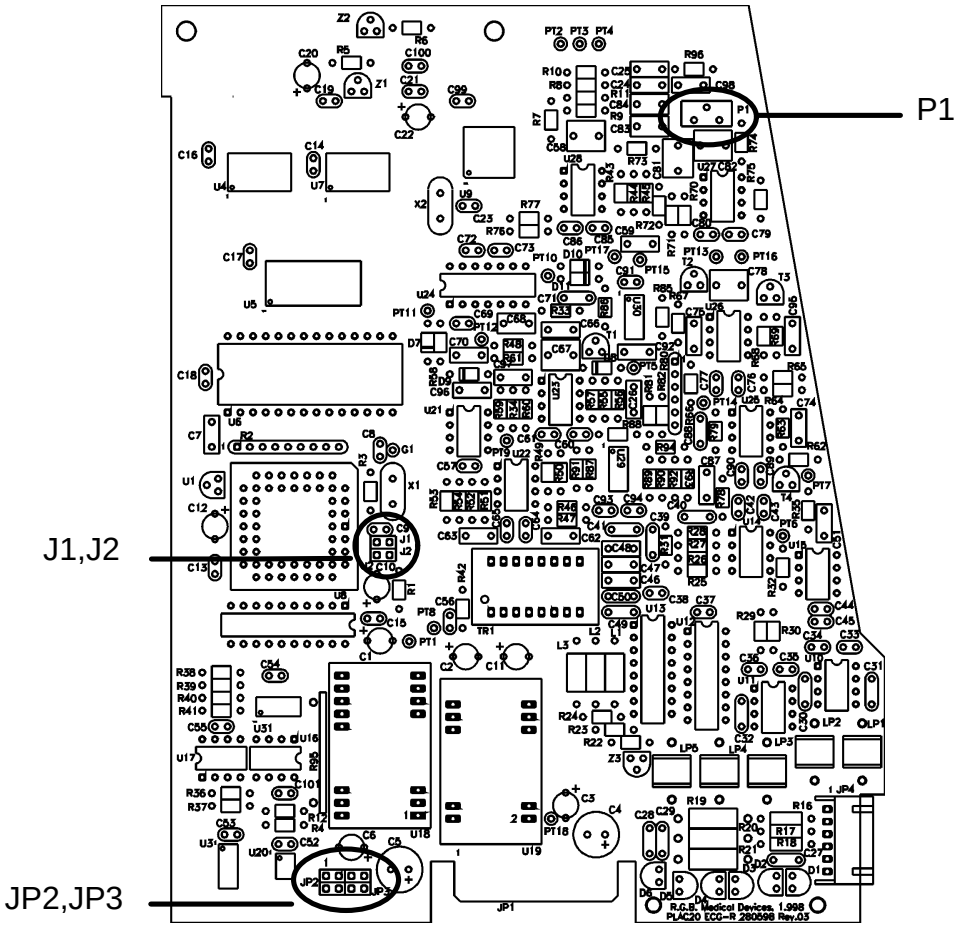


RS485
(Standard)



TTL

3.3.6. ECG and respiration board (P000PLAC20 Internal Code)



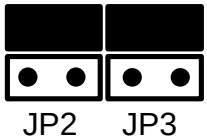
The potentiometer P1 is used to adjust the notch filter (50 or 60 Hz). The signal can be watched in PT3 with an oscilloscope.

The function of the jumpers in this board are:

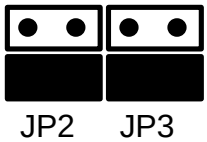
1) Jumpers J1 and J2 are used to select the operation mode of 68HC11 microcontroller.

J1	J2	Function
Open	Open	Expanded multiplexed mode (Standard)
Open	Closed	Special test mode
Closed	Open	Single chip mode
Closed	Closed	Special bootstrap mode

2) Jumpers JP2 (for RxD)and JP3 (for TxD) are used to select the serial communication with the board via RS485 or TTL.

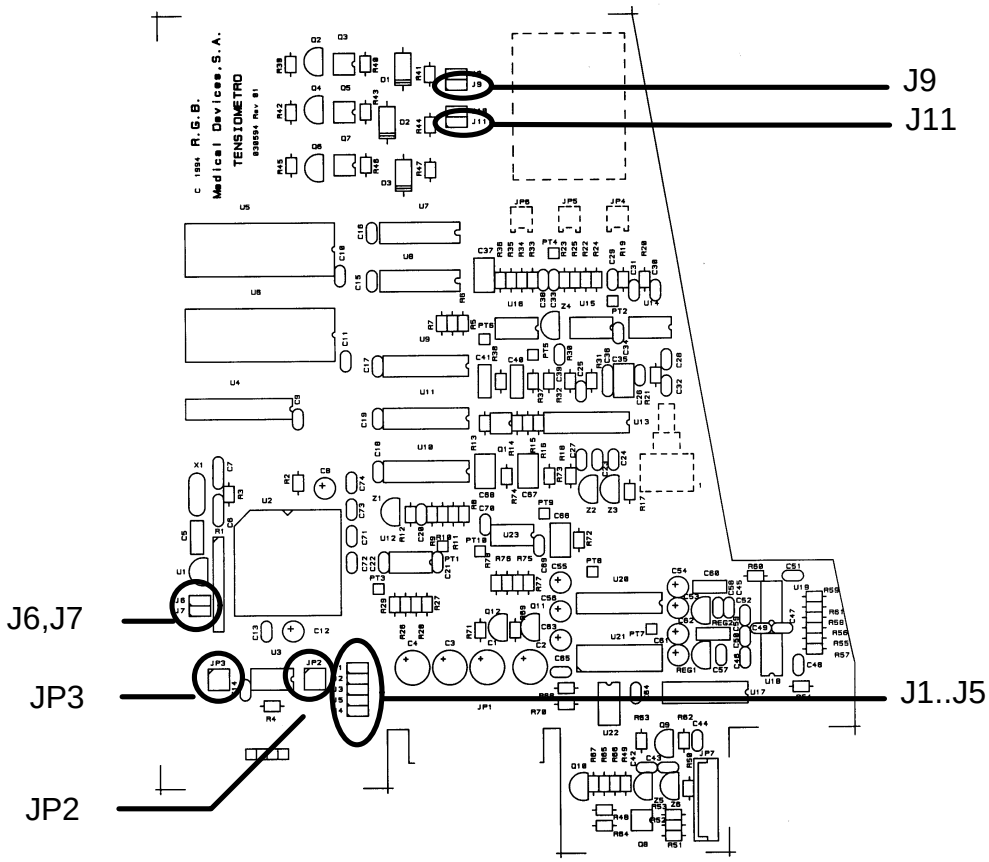


RS485
(Standard)



TTL

3.3.7. NIBP and IBP board (P000PLAC01 Internal Code)



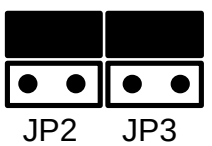
The function of the jumpers in this board are:

1) Jumpers J1 to J5 are used to enable the SPI external communication from the board and their standard position is open.

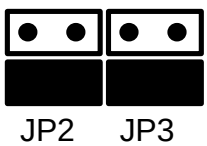
2) Jumpers J6 and J7 are used to select the operation mode of 68HC11 microcontroller.

J6	J7	Function
Open	Open	Expanded multiplexed mode (Standard)
Open	Closed	Special test mode
Closed	Open	Single chip mode
Closed	Closed	Special bootstrap mode

3) Jumpers JP2 (for RxD)and JP3 (for TxD) are used to select the serial communication with the board via RS485 or TTL.



TTL



RS485
(Standard)

4) Jumpers J9 and J11 are used to select a voltage supply of 24V for the electrovalves and they must be closed.

4. DISASSEMBLY AND REASSEMBLY

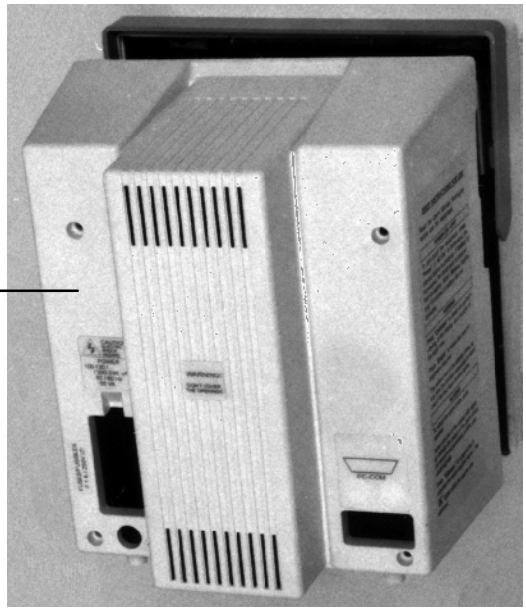
This chapter includes the instructions for the disassembly of the equipment. Unless otherwise stated at the text, reassembly is the reverse of the disassembly procedure.

During the disassembly procedure, be sure to keep all screws, nuts, plastic spacers and other accessories for the posterior assembly of the monitor. Furthermore, note the position and type of all these pieces. The photographs will be used to indicate the internal codes used for de different components and pieces.

4.1. Back Cover Removal

a) Undo and remove the four screws (1) on the back cover.

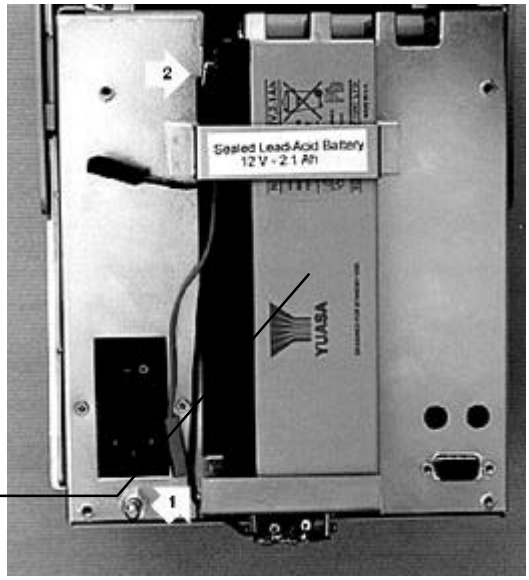
b) Separate the back cover from the equipment pulling from it.



C000CARC02

4.2. Battery

a) Disconnect the connectors: the lower positive (1) and the upper negative (2).

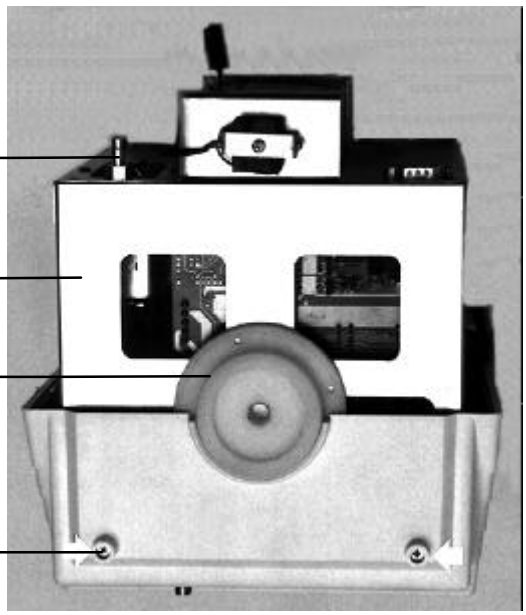


Assembly:
Place the battery in the rear chassis with the negative connector (black) (2) in the top and the positive connector (red) (1) in the bottom. Connect the battery cables with the correct polarity.

C000BATE01

4.3. Front cover

a) Remove the two screws on the bottom part of the cover that fasten the two feet.



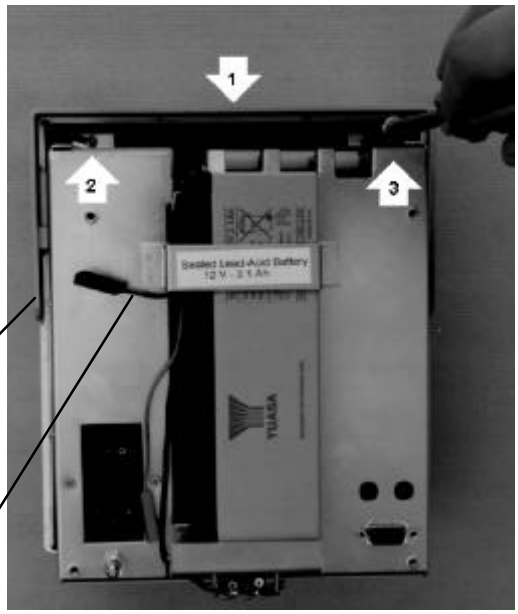
C000TOMA01

C000CHAS01

C000PIE001

C000PATA01

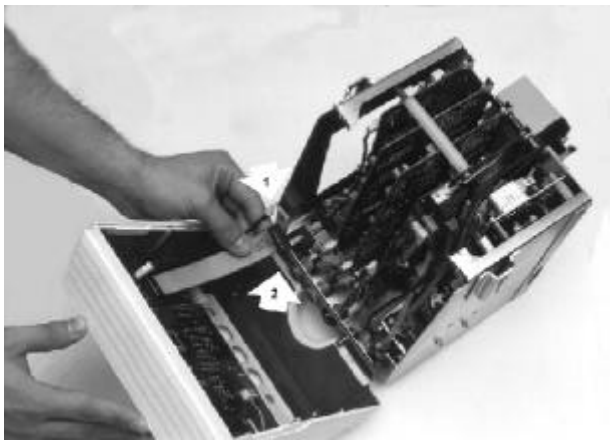
b) Remove the two nuts (2 and 3) of the upper rims of the metallic chassis.



Assembly:
Place the ground wire in the left screw (2) and fasten it with one spring washer and one nut. Place one spring washer and a nut in the right screw (3).

c) Remove the metallic handle (1).

d) Disconnect the two cables (1) (2) from the Connector Board.

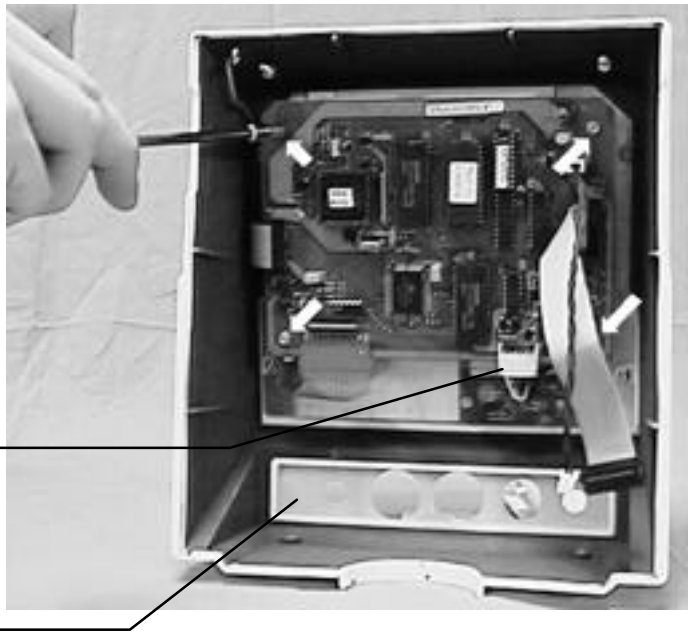


4.4. Front Panel

a) Disconnect the Interface-display cable (1), the keyboard cable (2), and the LED's board cable (3).

b) Remove the four nuts and the spring washers that fasten the display board (P000PLAC14 Internal Code).

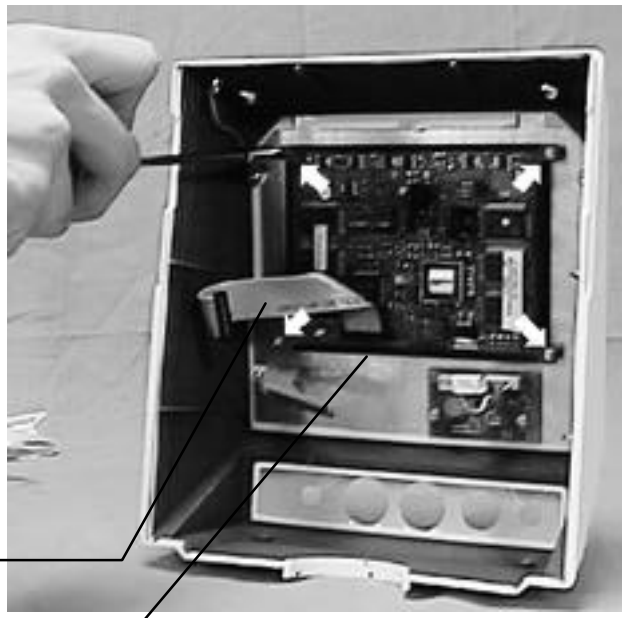
<u>Assembly:</u>
Make sure that you place the four spring washers.



c) Remove the board by pulling out it from the four hexagonal metallic spacers.

Assembly:
Before placing the display board it is necessary to mount the four hexagonal metallic spacers (15 mm length).

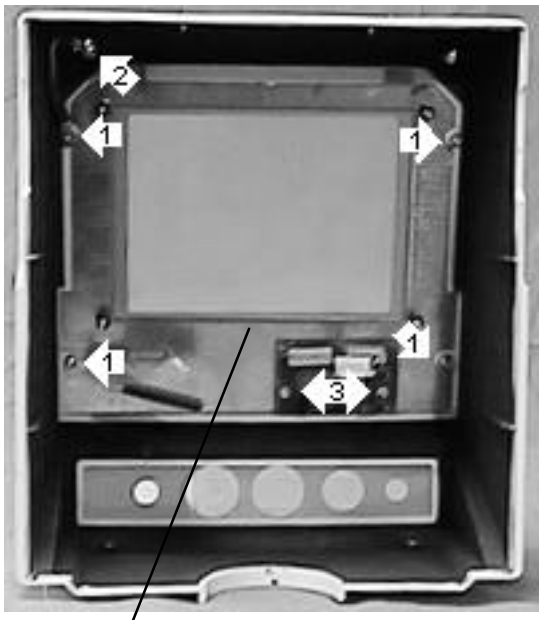
d) To separate the electroluminescent display (C000DISP02 Internal Code), remove the four nuts and the spring washers that fasten it.



Assembly:
Place the four plastic spacers in the screws mounted in the keyboard cover and the display over these spacers. After that, fasten the display with four nuts.

e) To separate the LED's board, remove the two nuts (3) and spring washers. Under this board there are two nylon nuts placed as spacers.

Take out the keyboard cover removing the nuts (1) and disconnecting the ground wire (2).

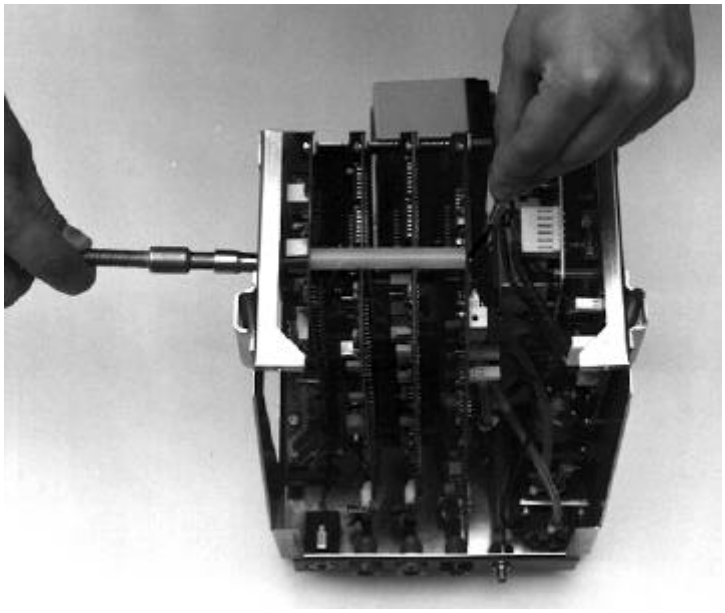


Assembly:
Place the keyboard cover in the plastic cover and fasten it with four nuts with spring washers. Place the ground wire (2) to the upper left side screw (1) fastening it with a nut.

C000CARA03 /04 / 07 / 09 / 10 / 11

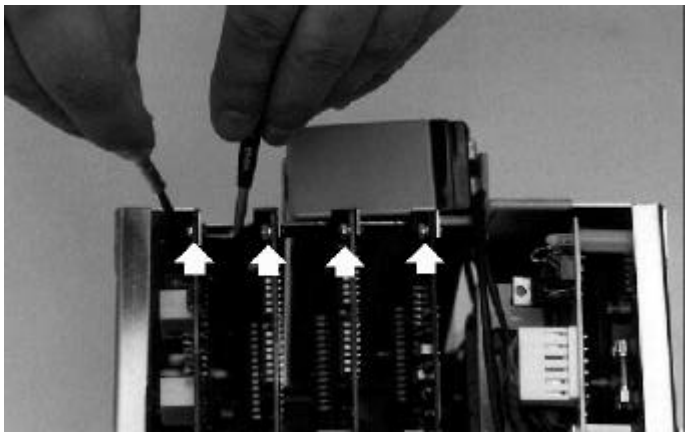
4.5. Measurement boards fastening.

a) Remove the nuts of the stainless steel studding. Remove the nylon spacer and take out the stainless steel studdings with the spacer tube.

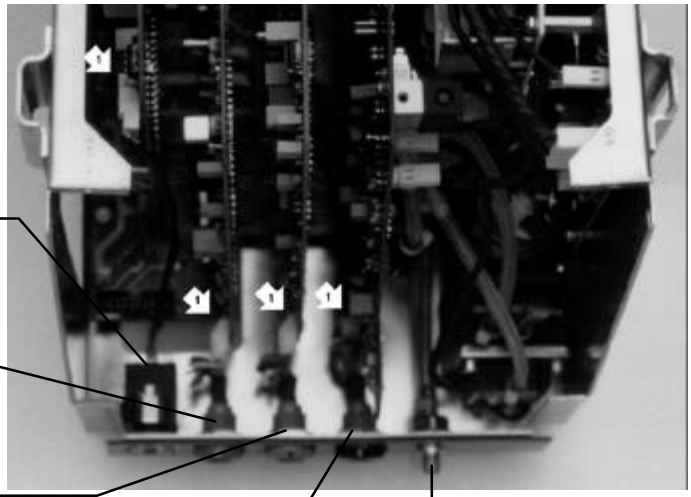


Assembly:
Insert the stainless steel studding in the upper holes of the board and in the side hole of the metallic chassis, but place before one spacer tube between the Controtemp Board (P000PLAC04 Internal Code) and the chassis. Place two spring washers and screw in two nuts in the stainless steel studding. Place the Board Spacer (C000SEPA05 Internal Code) and tighten all the nuts.

b) Remove the nuts with the screws with its washers that are fastening the boards to the metallic chassis. For the Controtemp board (P000PLAC04 Internal Code) it is mandatory to use a nylon screw and a nylon nut.



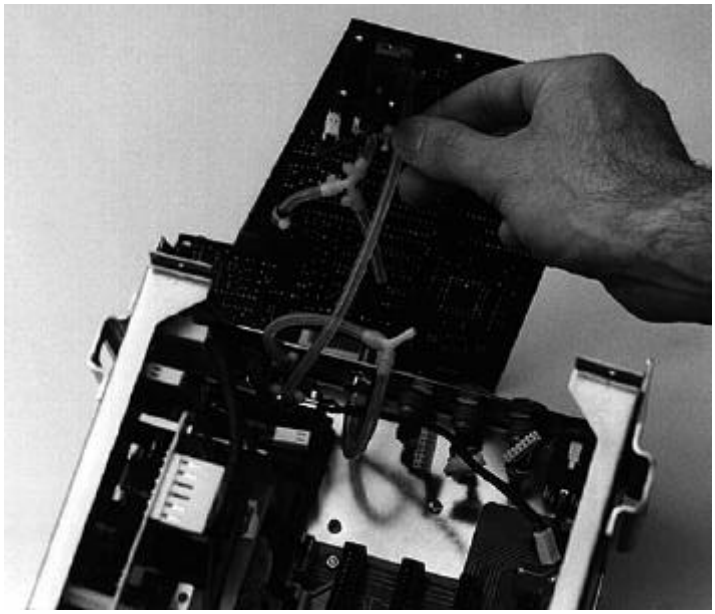
c) Remove the connectors of the signals (1) in order to finally take the boards out.



4.6. NIBP Board (P000PLAC01 Internal Code)

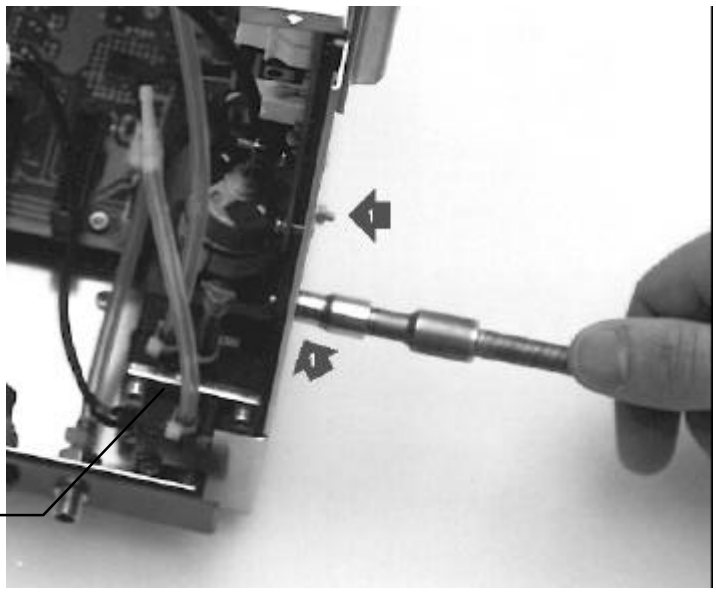
a) After performing the procedures of the previous section, disconnect the two cables that come from the pressure switch (1) and the pump (2).

b) Disconnect the electrovalve tube that come from the pump and the upper tube of the lower Y. Take out the board.



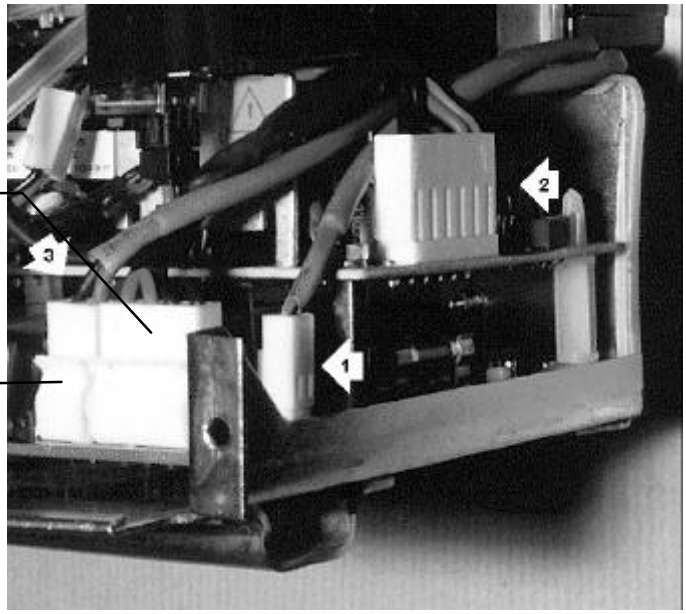
4.7. Pump (C000BOMB01 Internal Code).

a) To fasten the pump it is used a metallic clamp where the pump is placed by pressure. This metallic clamp is fastened to the chassis using a screw and a nut. Between the chassis and the metallic clamp it is placed a antivibration mount.

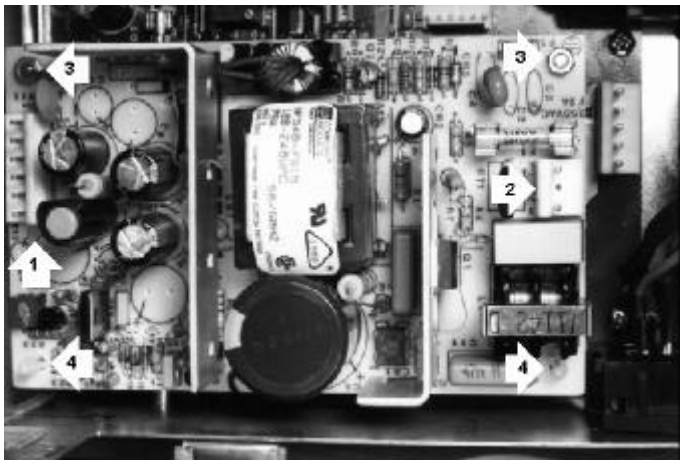


4.8. AC/DC Board (C000ACDC01 Internal Code)

a) Disconnect the AC/DC-Supply cable (2) and the Battery cable (3).



b) Disconnect the AC/DC-Line Filter cable (2) and remove the two nuts (3) with its washers. Remove the board, bringing it out from the plastic hook spacer (4).



Assembly:
Replace the two spacers in the screws of the chassis (in the right side of the chassis - 3 -). Place the AC/DC Board making sure that the plastic hook spacers (4)tighten well.

4.9. Supply Board (P000PLAC05 Internal Code)

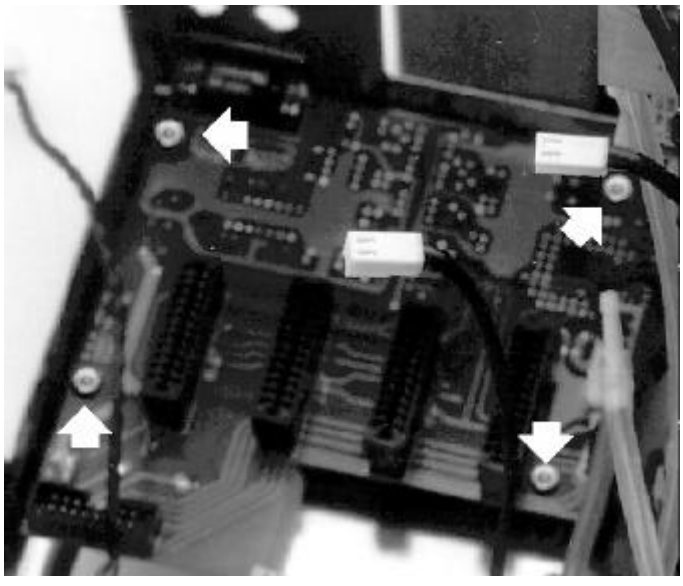
a) Disconnect the cables that comes from the Connector Board (P000CABL03 and P000CABL04 Internal Codes).

b) Unscrew from the board the five screws that are fastening it to the metallic chassis and take the board out. It is mandatory to use nylon screws for the two upper screws.

Assembly:
Replace two plastic hook spacers on the Supply Board in the two foreseen holes for this matter.

4.10. Connector Board (P000PLAC07 Internal Code)

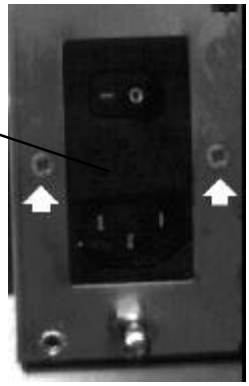
a) Remove the four nuts from the board subjection to the metallic chassis. Remove also the two nuts (placed outside of the metallic chassis) of the Sup-D-9 connector. Take out the board.



Assembly:
Replace the spacers in the four screws that are in the metallic chassis basis. Replace in the chassis hole the metallic cover of the Sub-D 9 connector.

4.11. Power Line Filter

a) Remove the two screws and the nuts with the spring washers.



b) Dismantle the ground wire unscrewing the ground nut.

Assembly:
Replace the ground wire in the chassis ground socket fastening it with a nut

5. SCHEMATICS AND SPARE PARTS LIST

This chapter includes the schematics of the printed circuit boards used into the Omicrom FT monitors and the spare parts list.

The PCB codes are the internal codes used in RGB MEDICAL DEVICES and they must be used to order these boards as spare parts.

There are boards used into all models. These are:

- P000PLAC04 (“CONTROTEMP 230395 Rev. 30”). Main board that controls the communications between boards.
- P000PLAC05 (“SUPPLY 200695 Rev. 03”). DC/DC Converter board.
- P000PLAC07 (“CONECTOR 130598 Rev. 03”). Base board used to interconnect the other boards.
- P000PLAC14 (“PLANAR1 140197 Rev. 01”). Board that controls the Planar display.
- P000PLAC15 (“LEDFT 140197 Rev. 01”). Board with the LED’s.

The other boards are used to measure several vital signs and are used for each model according to the next table:

Board	A50	A31	A30	A21	A11
P000PLAC01 (NIBP and IBP)	√				
P000PLAC10 (NIBP)		√	√		
P000PLAC19 (Pulse Oximetry)	√	√	√	√	
P000PLAC20 (ECG and Respiration)	√	√		√	√

5.1. Programmable devices.

The boards with microcontroller use an EPROM where the software program is stored and, in some cases, use a PAL for the addressing. In this section it is included the information about the versions and options available for each board.

P000PLAC01 BOARD.

- U2 EPROM Code “T0000-00102 / 020798 Rev. 02”.

P000PLAC10 BOARD.

- U2 EPROM Code “T0000-00202 / 020798 Rev. 02”.

P000PLAC14 BOARD.

- U4 EPROM Code “D0000-00002 / 020798 Rev. 02”.

- U6 PAL Code “DM-16X8-01”.

P000PLAC20 BOARD.

- U2 EPROM Code “E0000-00102 / 020798 Rev. 02”. Option with respiration measurement and for AC frequency of 50 Hz.
- U2 EPROM Code “E0000-00202 / 020798 Rev. 02”. Option with respiration measurement and for AC frequency of 60 Hz.
- U2 EPROM Code “E0000-00302 / 020798 Rev. 02”. Option without respiration measurement and for AC frequency of 50 Hz.
- U2 EPROM Code “E0000-00402 / 020798 Rev. 02”. Option without respiration measurement and for AC frequency of 60 Hz.
- U8 PAL Code “EM-16X8-02”.

P000PLAC19 BOARD.

- U2 EPROM Code “S0000-00002 / 020798 Rev. 02”.
- U3 PAL Code “SM-16X8-01”.
- U9 PAL Code “SA-16X8-01”.

P000PLAC04 BOARD.

- U2 EPROM Code “M1150-10202 / 020798 Rev. 02”. A50 Omicrom FT model in spanish language.
- U2 EPROM Code “M1150-20202 / 020798 Rev. 02”. A50 Omicrom FT model in english language.
- U2 EPROM Code “M1150-30202 / 020798 Rev. 02”. A50 Omicrom FT model in french language.
- U2 EPROM Code “M1150-40202 / 020798 Rev. 02”. A50 Omicrom FT model in german language.
- U2 EPROM Code “M1150-50202 / 020798 Rev. 02”. A50 Omicrom FT model in italian language.
- U2 EPROM Code “M1131-10202 / 020798 Rev. 02”. A31 Omicrom FT model in spanish language.
- U2 EPROM Code “M1131-20202 / 020798 Rev. 02”. A31 Omicrom FT model in english language.
- U2 EPROM Code “M1131-30202 / 020798 Rev. 02”. A31 Omicrom FT model in french language.
- U2 EPROM Code “M1131-40202 / 020798 Rev. 02”. A31 Omicrom FT model in german language.
- U2 EPROM Code “M1131-50202 / 020798 Rev. 02”. A31 Omicrom FT model in italian language.
- U2 EPROM Code “M1030-10202 / 020798 Rev. 02”. A30 Omicrom FT model in spanish language.
- U2 EPROM Code “M1030-20202 / 020798 Rev. 02”. A30 Omicrom FT model in english language.
- U2 EPROM Code “M1030-30202 / 020798 Rev. 02”. A30 Omicrom FT model in french language.
- U2 EPROM Code “M1030-40202 / 020798 Rev. 02”. A30 Omicrom FT model in german language.
- U2 EPROM Code “M1030-50202 / 020798 Rev. 02”. A30 Omicrom FT model in italian language.

- U2 EPROM Code “M1121-10202 / 020798 Rev. 02”. A21 Omicrom FT model in spanish language.
- U2 EPROM Code “M1121-20202 / 020798 Rev. 02”. A21 Omicrom FT model in english language.
- U2 EPROM Code “M1121-30202 / 020798 Rev. 02”. A21 Omicrom FT model in french language.
- U2 EPROM Code “M1121-40202 / 020798 Rev. 02”. A21 Omicrom FT model in german language.
- U2 EPROM Code “M1121-50202 / 020798 Rev. 02”. A21 Omicrom FT model in italian language.
- U2 EPROM Code “M1121-10202 / 020798 Rev. 02”. A11 Omicrom FT model in spanish language.
- U2 EPROM Code “M1111-20202 / 020798 Rev. 02”. A11 Omicrom FT model in english language.
- U2 EPROM Code “M1111-30202 / 020798 Rev. 02”. A11 Omicrom FT model in french language.
- U2 EPROM Code “M1111-40202 / 020798 Rev. 02”. A11 Omicrom FT model in german language.
- U2 EPROM Code “M1111-50202 / 020798 Rev. 02”. A11 Omicrom FT model in italian language.
- U7 PAL Code “MM-16X8-02”.

5.2. Spare parts list.

This section includes the spare parts list for all Omicrom FT monitors models. First of all, it is included the list of the more important spare parts that are not mounted in any board and, after that, it is included the list of components of each board. In this case, it is included the PCB schematic and the spare parts list.

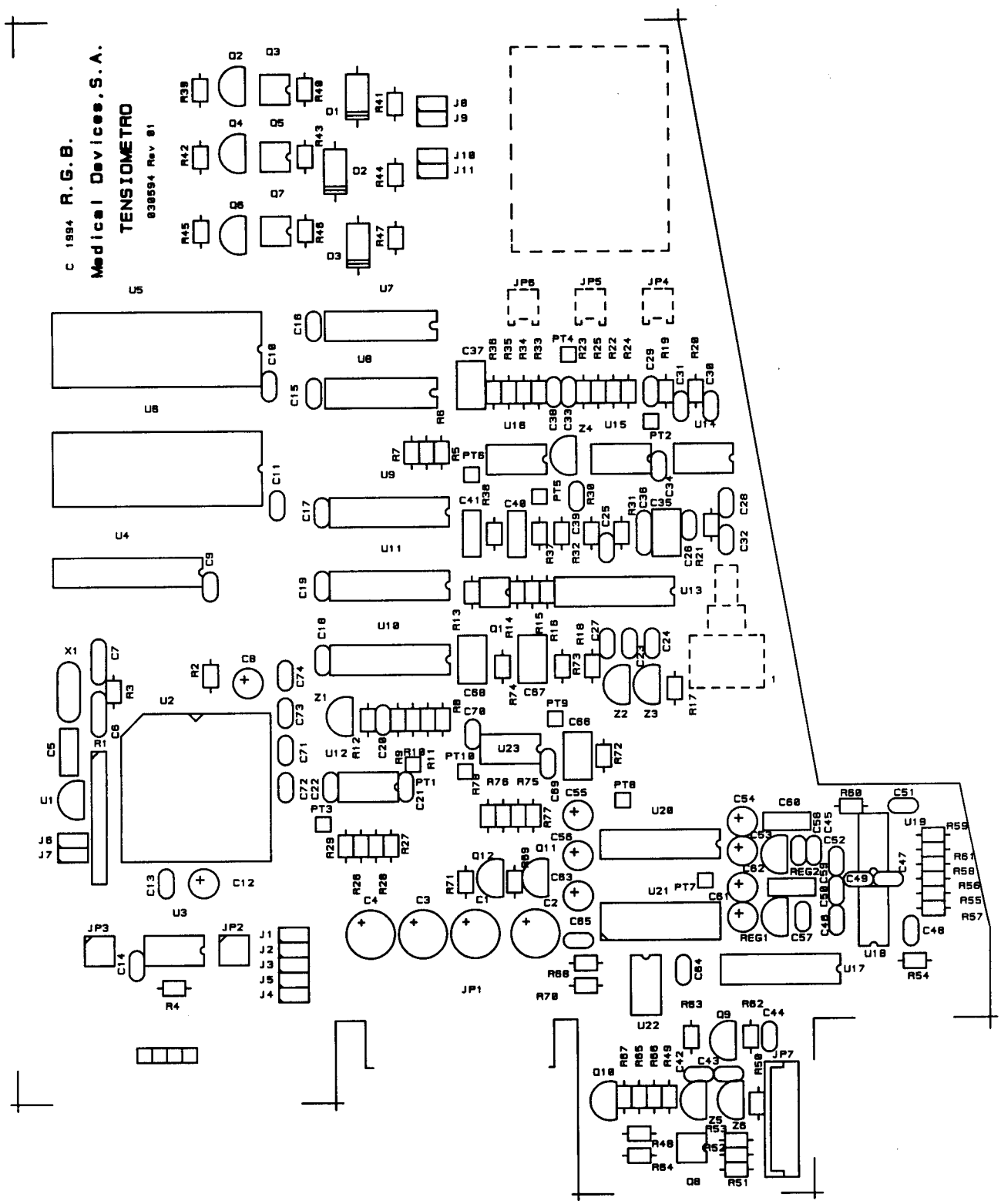
5.2.1. General spare parts list.

Some of the codes included in this list are indicated in the chapter 4.

Code	Description
C000CHAS01	Metallic chassis
C000CARC01	Front plastic cover
C000CARC02	Rear plastic cover
C000ASA001	Monitor handle
C000PATA01	Plastic foot
C000PIE001	Nylon chassis base
C000CHAP08	Connector metallic base
C000SEPA05	Multi-board spacer
C000CARA03	International RGB keyboard
C000CARA04	RGB keyboard spanish language
C000CARA07	RGB keyboard english language
C000CARA09	RGB keyboard french language
C000CARA10	RGB keyboard italian language
C000CARA11	RGB keyboard german language
C000PEGA25	Connector area cover A31, A21 and A30 models
C000PEGA32	Connector area cover A50 model
C000PEGA34	Connector area cover A11 model
C000BATE01	Lead acid battery 12 V 2.1 Ah
C000ACDC01	AC/DC converter GMP40-15
C000DISP02	EL320.240.36 Planar display
P000PLAC01	NIBP + IBP board
P000PLAC04	Controtemp board
P000PLAC05	Supply board
P000PLAC07	Conector board
P000PLAC10	NIBP board
P000PLAC14	Planar display board

Code	Description
P000PLAC15	LED's board
P000PLAC19	Pulse oximeter board
P000PLAC20	ECG + Respiration board
P000FILT01	AC input filter
C000TOMA01	Equipotential connector
P000CABL01	SUP-AC/DC 6x3.96
P000CABL02	SUP-BATTERY 2x3.96
P000CABL03	SUP-BASE 5x3.96
P000CABL04	SUP-BASE 6x2.50
P000CABL08	INTE-LED 6x2.50
P000CABL10	Temperature connector CONT-TEMP 3x2.50
P000CABL18	Planar display cable
P000CABL20	Display board signal cable
P000CABL27	IBP Connector PRESSURE-NIBP 7x2.50
P000CABL25	SpO2 Connector PUL-PULSIO 6x2.50
P000CABL50	Display board supply cable 3x2.50
P000CABL26	ECG connector ELEC-ELECTRO R 6x2.50
C000RACO04	NIBP screwed connector
C000BOMB01	NIBP pressure pump
C000ABRA01	NIBP pump handle
C000VALV06	NIBP check valve
C000SWPR02	NIBP overpressure switch
P000VALV03	NIBP electrovalve set
C000GOMA01	Pump muffle elastic band
C000PEGA01	Warning label english language
C000PEGA02	Warning label spanish language
C000PEGA39	Warning label french language
C000PEGA40	Warning label german language
C000PEGA41	Warning label italian language

5.2.2. P000PLAC01 Part list.



P000PLAC01

POS.	CANT.	REFERENCIA	CÓDIGO	VALOR	/
1	1	* C76	C000CONM02	10nF	
2	3	* D4,* D5,* D6	C000DIOD04	1N5819	
3	11	R10,R11,R24,R25,R35,R60, R61,R66,R72,* R79,* R80	C000RES501	10K	
4	4	C1,C2,C3,C4	C000CONE02	220uF	
5	1	C5	C000CONP03	47nF	
6	2	C6,C7	C000CONM01	15pF	
7	6	C8,C12,C53,C54,C55,C56	C000CONT01	1uF	
8	48	C9,C10,C11,C13,C14,C15, C16,C17,C18,C19,C20,C21, C22,C23,C24,C25,C26,C27, C28,C29,C30,C31,C32,C33, C34,C38,C39,C42,C43,C44, C45,C46,C47,C48,C49,C50, C51,C52,C57,C58,C64,C65, C69,C70,C71,C72,C73,C74	C000CONM03	100nF	
9	3	C35,C37,C67	C000CONP07	470nF	
10	1	C36	C000CONC05	1n8	
11	4	C40,C41,C59,C60	C000CONP06	330nF	
12	3	C61,C62,C63	C000CONT03	10uF	
13	1	C66	C000CONP08	1uF 10%	
14	1	C68	C000CONP05	220nF	
15	3	D1,D2,D3	C000DIOD01	1N4007	
16	6	J1,J2,J3,J4,J5,J11	JUMPER2		
17	3	J6,J7,J9	C000CNRG11	JUMPER2	
18	1	J8	C000CNRG05	SWNEONATO	
19	1	J10	C000CNRG05	SWADULTO	
20	1	JP1	BordePCB		
21	2	JP2,JP3	C000CNRG11	JUMP2X2	
22	1	JP4	C000CNRG05	VALVULA1	
23	1	JP5	C000CNRG05	VALVULA2	
24	1	JP6	C000CNRG05	BOMBA	
25	1	JP7	C000CNRG10	P.INVASIVA	
26	1	P1	C000TRAF01	26PCCFA	
27	10	PT1,PT2,PT3,PT4,PT5,PT6, PT7,PT8,PT9,PT10	C000CNRG13	PIN	
28	1	Q1	C000TMOS03	IRFD120	
29	6	Q2,Q4,Q6,Q9,Q11,Q12	C000TBIP02	BC546	
30	4	Q3,Q5,Q7,Q8	C000TMOS01	IRFD9120	
31	1	Q10	C000TBIP03	BC556	
32	1	R1	C000RESS02	10K	
33	5	R2,R56,R57,R58,R59	C000RES401	1K	
34	1	R3	C000RES801	10M	
35	1	R4 *	C000RES301	100	
36	3	R5,R6,R7	C000RES418	1K5	
37	1	R8	C000RES469	5K11	

P000PLAC01

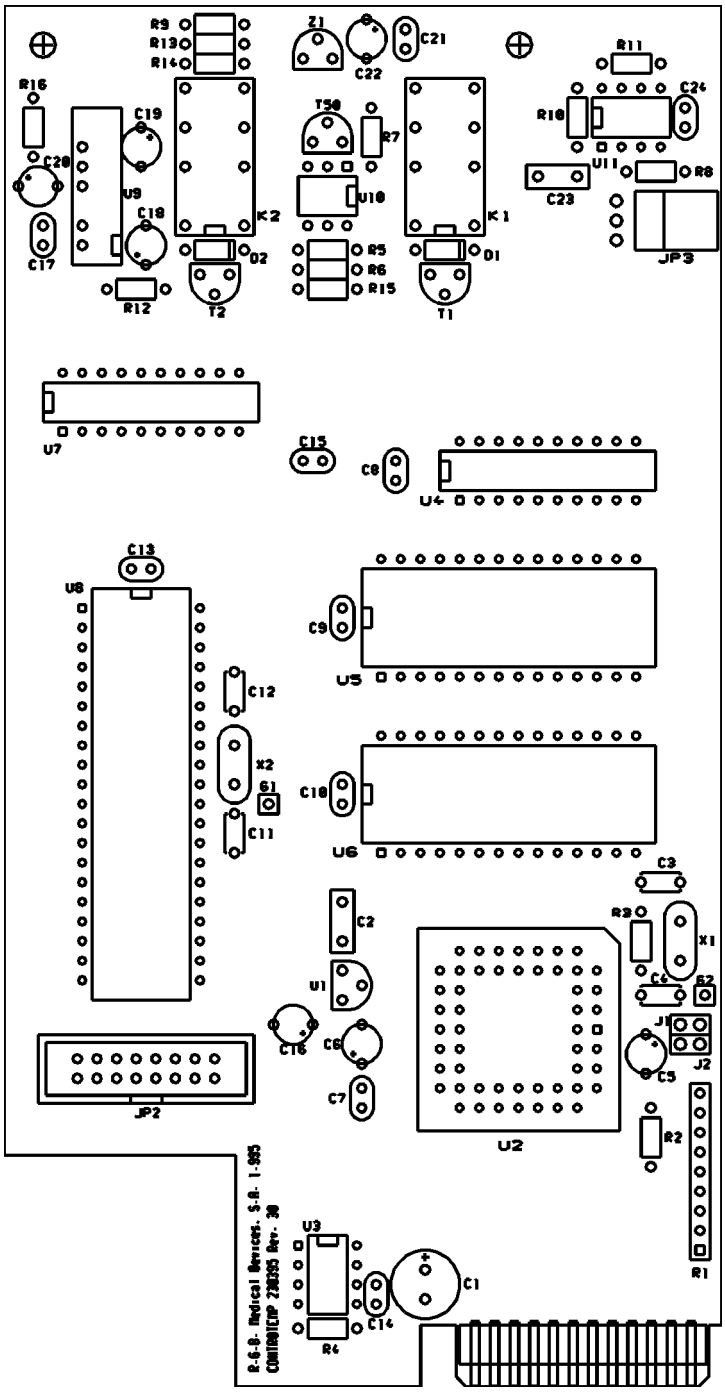
POS.	CANT.	REFERENCIA	CÓDIGO	VALOR	/
38	3	R9,R36,R69	C000RES539	24K9	
39	4	R12,R22,R23,R70	C000RES434	2K21	
40	9	R13,R39,R42,R45,R62,R63, R64,R65,R67	C000RES601	100K	
41	2	R14,R16	C000RESS04	43K2 0.1%	
42	1	R15	C000RESS03	200 0.1%	

43	2	R17,R18	C000RES451 3K32
44	1	R19	C000RES373 560
45	3	R20,R21,R55	C000RES466 4K7
46	1	R26	C000RES521 16K2
47	2	R27,R28	C000RES547 30K1
48	1	R29	C000RES483 7K15
49	1	R30	C000RES651 332K
50	2	R31,R32	C000RES701 1M
51	2	R33,R68	C000RES386 750
52	1	R34	C000RES568 49K9
53	2	R37,R38	C000RES580 66K5
54	5	R40,R43,R46,R73,R74	C000RES551 33K2
55	3	R41,R44,R47	C000RES201 10
56	1	R48	C000RES566 47K
57	2	R49,R50	C000RES310 124
58	2	R51,R53	C000RESS05 100K 0.1%
59	1	R52	03C000RESS 200 0.1%
60	1	R54	C000RES330 200
61	1	R71	C000RES585 75K
62	1	R75	C000RES522 16K5
63	2	R76,R77	C000RES606 113K
64	1	R78	C000RES480 6K65
65	1	REG1	C000REGU02 78L05
66	1	REG2	C000REGU03 79L05
67	1	U1	C000RSE01 MC34064P
68	1	U2	C000MICRO02 68HC11
69	1	U3	C000CMUD03 SN75176
70	1	U4	C000LOGI03 74HC373
71	1	U5	C000RAM001 SRAM 32Kx8
72	1	U6	C000EPRO01 EPROM 64Kx8
73	1	U7	C000LOGI01 74HC00
74	1	U8	C000LOGI02 74HC02
75	2	U9,U10	C000LOGI08 4094
76	1	U11	C000CDTA01 AD557
77	5	U12,U14,U15,U16,U23	C000AMPO01 AD648
78	2	U13,U17	C000SWTA01 DG212
79	1	U18	C000AMPO04 OP200
80	1	U19	C000AMPO02 AD548
81	1	U20	C000AMPA01 ISO122P
82	1	U21	C000DCDC04 NMA1212S

P000PLAC01

POS.	CANT.	REFERENCIA	CÓDIGO	VALOR /
83	1	U22	C0000PTO03 HCPL2530	
84	1	X1	C000CRYS02 12MHz	
85	3	Z1,Z5,Z6	C000VREF02 LM385-2V5	
86	2	Z2,Z3	C000VREF03 LM336-5V	
87	1	Z4	C000VREF01 LM385-1V2	/

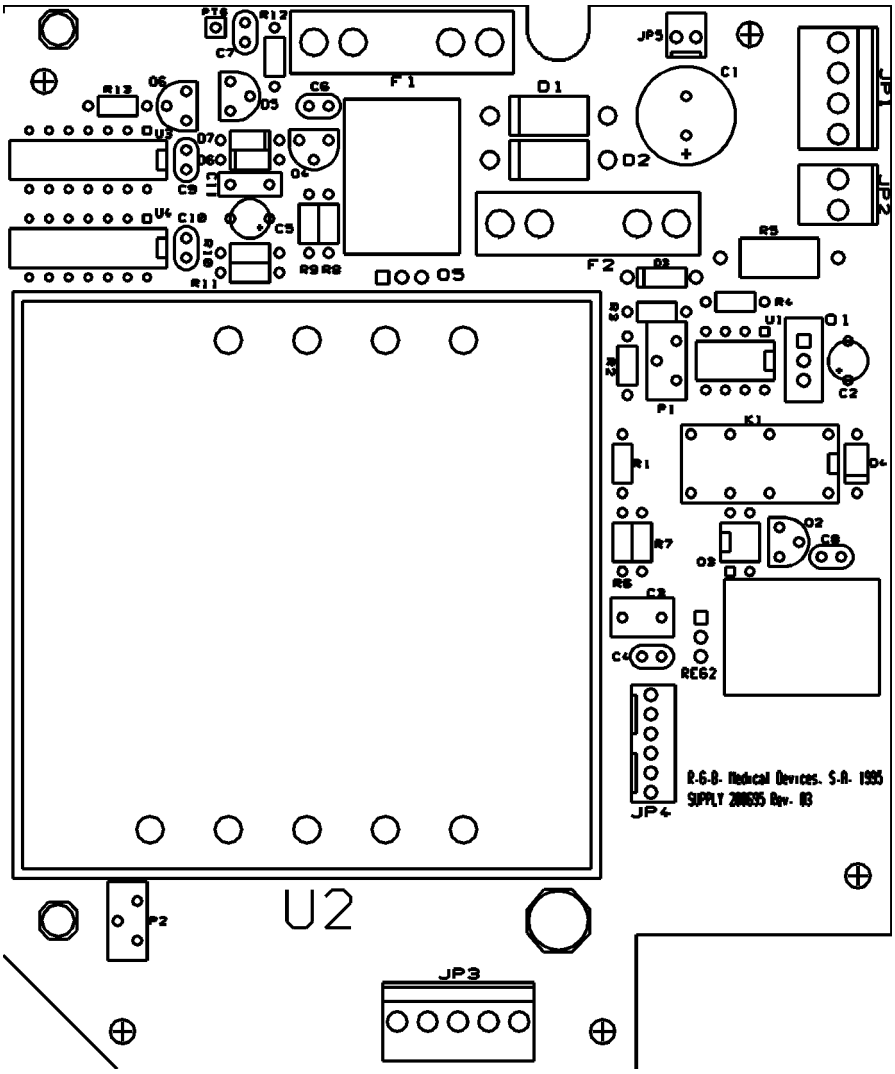
5.2.3. P000PLAC04 Part list.



P000PLAC04

POS.	QTY.	REFERENCE	CODE	VALUE	/
1	1	C1	C000CONE02	220uF	
2	1	C2	C000CONP03	47nF	
3	3	C3,C4,C11	C000CONM01	15pF	
4	2	C5,C6	C000CONT01	1uF	
5	9	C7,C8,C9,C10,C13,C14,C15, C17,C21	C000CONM03	100nF	
6	1	C12	C000CONC01	4,7pF	
7	5	C16,C18,C19,C20,C22	C000CONT03	10uF	
8	1	C23	C000CONP04	100nF-MKT	
9	1	C24	C000CONM02	10nF	
10	2	D1,D2	C000DIOD03	1N4148	
11	2	G1,G2	C000CNRG13	PIN	
12	2	J1,J2	C000CNRG11	JUMPER2	
13	1	JP1	BordePCB		
14	1	JP2	PUERTOS		
15	1	JP3	C000CNRG06	T1	
16	2	K1,K2	C000RELE01	RELE DPDT 5V	
17	1	R1	C000RESS02	10K	
18	3	R2,R11,R16	C000RES401	1K	
19	1	R3	C000RES801	10M	
20	1	R4	C000RES301	100	
21	4	R5,R8,R12,R15	C000RES501	10K	
22	1	R6	C000RES601	100K	
23	1	R7	C000RES355	365	
24	1	R9	C000RES386	750	
25	1	R10	C000RES447	3K01	
26	1	R13	C000RES002	2K26 0.1%	
27	1	R14	C000RES001	1K21 0.1%	
28	3	T1,T2,T3	C000TBIP02	BC546	
29	1	U1	C000RSET01	MC34064P	
30	1	U2	C000MICRO02	68HC11	
31	1	U3	C000CMUD03	SN75176	
32	1	U4	C000LOGI03	74HC373	
33	1	U5	C000RAM001	SRAM 32Kx8	
34	1	U6	C000EPRO01	EPROM 64Kx8	
35	1	U7	C000PAL001	PAL18P8	
36	1	U8	C000CMUD01	68681	
37	1	U9	C000DCDC01	HPR103	
38	1	U10	C000OPTO01	CNY17-3	
39	1	U11	C000TIME01	TLC555	
40	1	X1	C000CRYS02	12MHz	
41	1	X2	C000CRYS03	3.6864MHz	
42	1	Z1	C000VREF02	LM385-2V5	/

5.2.4. P000PLAC05 Part list.

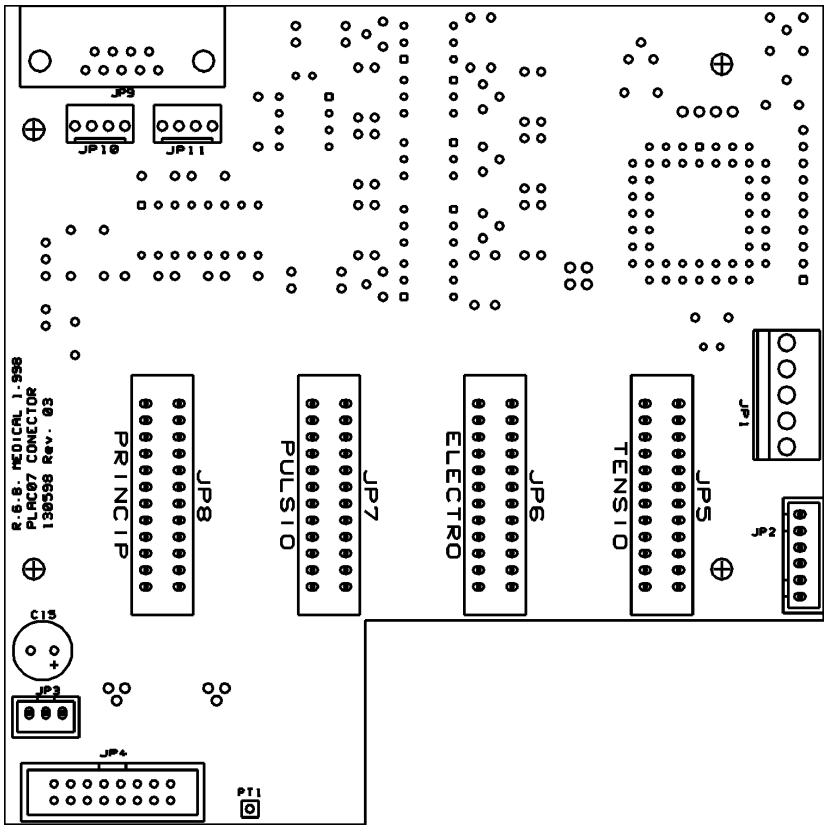


P000PLAC05

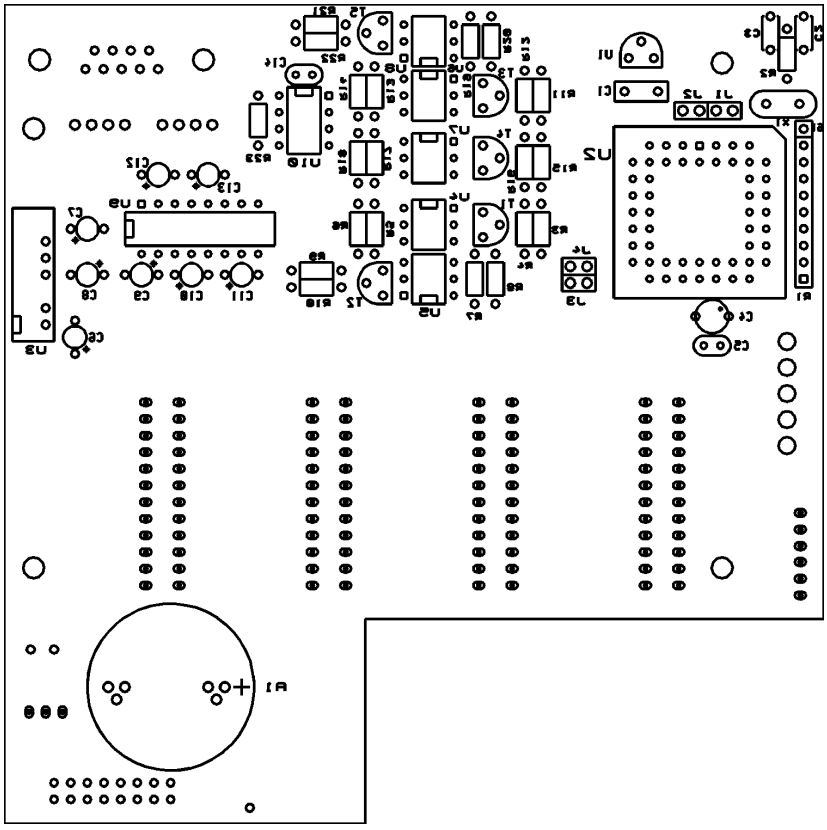
POS.	QTY.	REFERENCE	CODE	VALUE	/
1	4	* D8,* D9,* D10,* D11	C000DIOD01	1N4007	
2	2	D3,* D12	C000DIOD04	1N5819	
3	1	C1	C000CONE03	1000uF	
4	1	C2	C000CONT03	10uF	
5	1	C3	C000CONP06	330nF	
6	1	C5	C000CONT01	1uF	
7	4	C6,C8,C9,C10	C000CONM03	100nF	
8	1	C7	C000CONE01	100uF	
9	1	C11	C000CONP04	100nF	
10	2	D1,D2	C000DIOD02	1N5821	
11	3	D4,D6,D7	C000DIOD03	1N4148	
12	1	D5	C000VREF03	LM336-5V	
13	1	F1	C000FUSI02	4A T	
14	1	F2	C000FUSI01	500mA T	
15	1	JP1	C000CNRG02	LINEA	
16	1	JP2	C000CNRG01	BATERIA	
17	1	JP3	C000CNRG03	SUPPLY	
18	1	JP4	C000CNRG04	DISPLAY	
19	1	JP5	RES-5W		
20	1	K1	C000RELE02	RELE DPDT 12V	
21	2	P1,P2	C000POTE02	10K	
22	1	PT6	C000CNRG13	P.TEST	
23	1	Q1	C000TBIP01	BD437	
24	2	Q2,Q4	C000TBIP02	BC546	
25	1	Q3	C000TMOS01	IRFD9120	
26	1	Q5	C000TMOS02	IRF9540	
27	1	Q6	C000TDAR01	2N6427	
28	1	R1	C000RES386	750	
29	1	R2	C000RES473	5K62	
30	1	R3	C000RES568	49K9	
31	1	R4	C000RES264	45,2	
32	1	R5	C000RESM01	2,2 1/2W	
33	3	R6,R9,R13	C000RES601	100K	
34	2	R7,R8	C000RES651	332K	
35	1	R10	C000RES556	47K5	
36	1	R11	C000RES501	10K	
37	1	R12	C000RES469	5K11	
38	1	REG2	C000REGU04	7812	
39	1	U1	C000REGU05	ICL7663	
40	1	U2	C000DCDC03	NFC25	
41	1	U3	C000LOGI05	4013	
42	1	U4	C000LOGI04	4093	/

5.2.5. P000PLAC07 Part list.

Component side



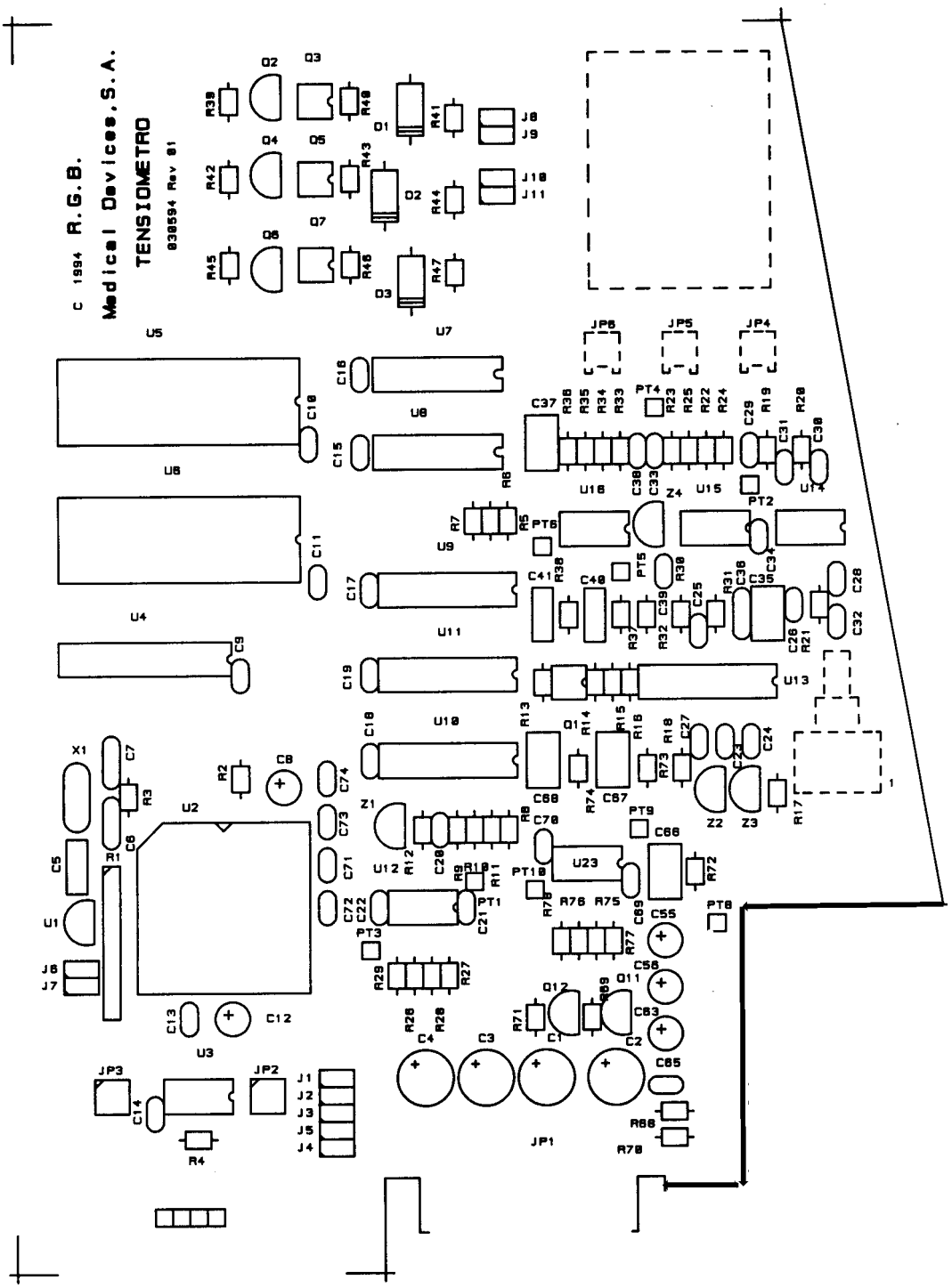
Solder side



P000PLAC07

POS.	QTY.	REFERENCE	CODE	VALUE	/
1	1	A1	C000PITP01	PITO	
2	1	C1	C000CONP03	47nF	
3	2	C2,C3	C000CONM01	15pF	
4	1	C4	C000CONT01	1uF	
5	2	C5,C14	C000CONM03	100nF	
6	8	C6,C7,C8,C9,C10,C11,C12, C13	C000CONT03	10uF	
7	1	C15	C000CONE02	220uF	
8	1	G1	C000CNRG13	PIN	
9	2	J1,J2	C000CNRG11	JUM	
10	2	J3,J4	C000CNRG11	JUMP2D	
11	1	JP1	C000CNRG03	SUPPLY	
12	1	JP2	C000CNRG09	TODISP	
13	1	JP3	C000CNRG16	V+5+12D	
14	1	JP4	C000CNMA01	DISPLAY	
15	1	JP5	C000CNHE02	TENSIO	
16	1	JP6	C000CNHE02	ELECTRO	
17	1	JP7	C000CNHE02	PULSIO	
18	1	JP8	C000CNHE02	PRINCIP	
19	1	JP9	C000CNMA02	RS232	
20	1	JP10	PUMP2		
21	1	JP11	PUMP1		
22	1	PT1	C000CNRG13	PUNTO TEST	
23	1	R1	C000RESS02	10K	
24	1	R2	C000RES801	10M	
25	5	R3,R10,R11,R15,R22	C000RES539	24K9	
26	3	R4,R12,R16	C000RES359	402	
27	5	R5,R8,R13,R17,R20	C000RES601	100K	
28	5	R6,R7,R14,R18,R19	C000RES434	2K21	
29	1	R9	C000RES366	475	
30	1	R21	C000RE366	475	
31	1	R23	C000RES501	10K	
32	5	T1,T2,T3,T4,T5	C000TBIP03	BC556	
33	1	U1	C000RSET01	MC34064P	
34	1	U2	C000MICRO02	68HC11	
35	1	U3	C000DCDC01	HPR103	
36	5	U4,U5,U6,U7,U8	C000OPTO01	CNY17-3	
37	1	U9	C000CMUD02	TC232	
38	1	U10	C000CMUD03	SN75176	
39	1	X1	C000CRYS02	12MHz	/

5.2.6. P000PLAC10 Part list.



P000PLAC10

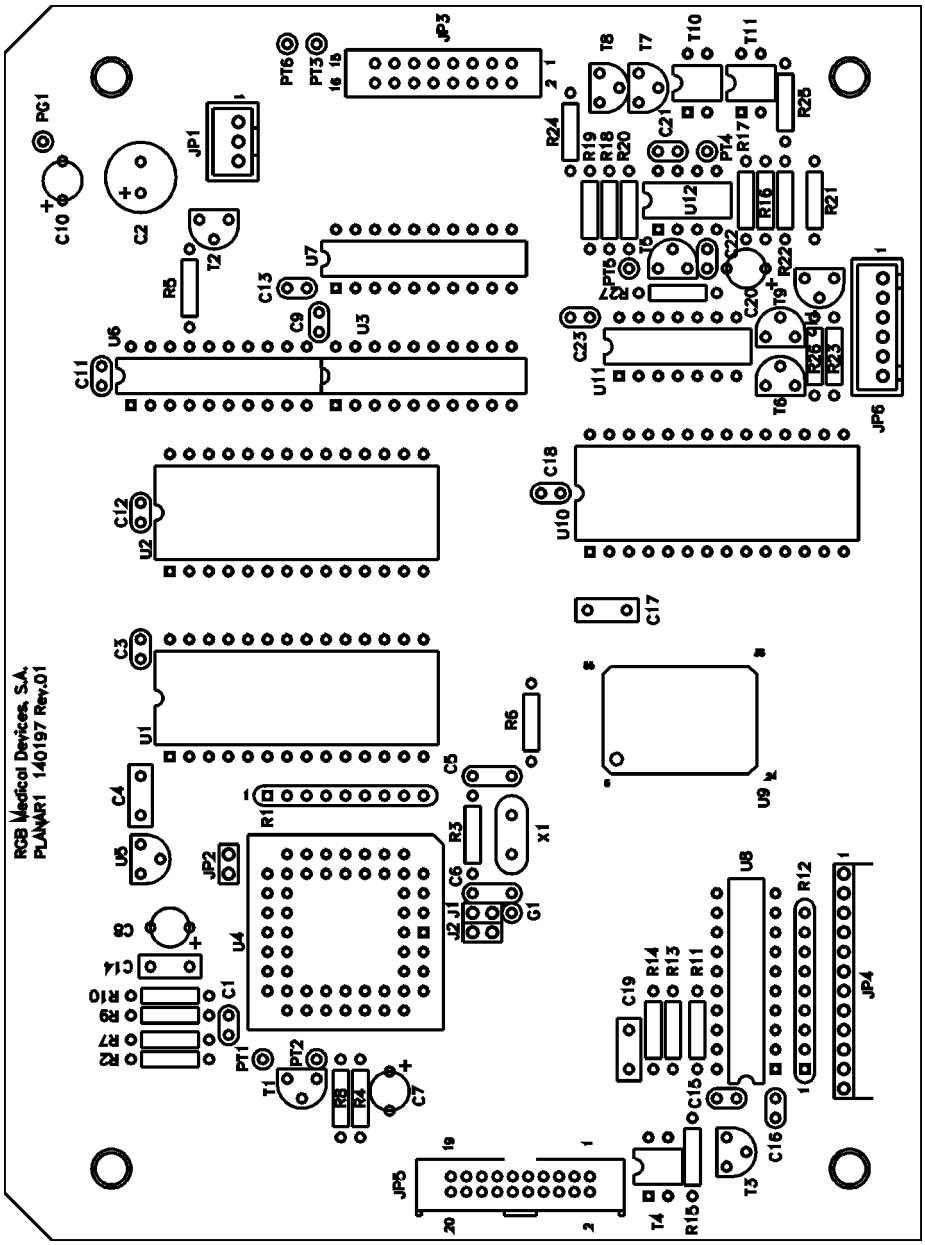
POS.	QTY.	REFERENCE	CODE	VALUE	/
1	1	* C76	C000CONM02	10nF	
2	2	* D4,* D5	C000DIOD04	1N5819	
3	7	R10,R11,R24,R25,R35, * R79,* R80	C000RES501	10K	
4	4	C1,C2,C3,C4	C000CONE02	220uF	
5	1	C5	C000CONP03	47nF	
6	2	C6,C7	C000CONM01	15pF	
7	2	C8,C12	C000CONT01	1uF	
8	31	C9,C10,C11,C13,C14,C15, C16,C17,C18,C19,C20,C21, C22,C23,C24,C25,C26,C27, C28,C29,C30,C31,C32,C33, C34,C38,C39,C71,C72,C73, C74	C000CONM03	100nF	
9	2	C35,C37	C000CONP07	470nF	
10	1	C36	C000CONC05	1n8	
11	2	C40,C41	C000CONP06	330nF	
12	3	D1,D2,D3	C000DIOD01	1N4007	
13	6	J1,J2,J3,J4,J5,J11	JUMPER2		
14	3	J6,J7,J9	C000CNRG11	JUMPER2	
15	1	J8	C000CNRG05	SWNEONATO	
16	1	J10	C000CNRG05	SWADULTO	
17	1	JP1	BordePCB		
18	2	JP2,JP3	C000CNRG11	JUMP2X2	
19	1	JP4	C000CNRG05	VALVULA1	
20	1	JP5	C000CNRG05	VALVULA2	
21	1	JP6	C000CNRG05	BOMBA	
22	1	P1	C000TRAF01	26PCCFA	
23	6	PT1,PT2,PT3,PT4,PT5,PT6	C000CNRG13	PIN	
24	1	Q1	C000TMOS03	IRFD120	
25	3	Q2,Q4,Q6	C000TBIP02	BC546	
26	3	Q3,Q5,Q7	C000TMOS01	IRFD9120	
27	1	R1	C000RESS02	10K	
28	1	R2	C000RES401	1K	
29	1	R3	C000RES801	10M	
30	1	R4 *	C000RES301	100	
31	3	R5,R6,R7	C000RES418	1K5	
32	1	R8	C000RES469	5K11	
33	2	R9,R36	C000RES539	24K9	
34	3	R12,R22,R23	C000RES434	2K21	
35	4	R13,R39,R42,R45	C000RES601	100K	
36	2	R14,R16	C000RESS04	43K2 0.1%	
37	1	R15	C000RESS03	200 0.1%	
38	2	R17,R18	C000RES451	3K32	
39	1	R19	C000RES373	560	
40	2	R20,R21	C000RES466	4K7	

P000PLAC10

POS.	QTY.	REFERENCE	CODE	VALUE	/
41	1	R26	C000RES521	16K2	
42	2	R27,R28	C000RES547	30K1	
43	1	R29	C000RES483	7K15	
44	1	R30	C000RES651	332K	
45	2	R31,R32	C000RES701	1M	
46	1	R33	C000RES386	750	
47	1	R34	C000RES568	49K9	

48	2	R37,R38	C000RES580 66K5
49	3	R40,R43,R46	C000RES551 33K2
50	3	R41,R44,R47	C000RES201 10
51	1	U1	C000RSE01 MC34064P
52	1	U2	C000MICRO02 68HC11
53	1	U3	C000CMUD03 SN75176
54	1	U4	C000LOGI03 74HC373
55	1	U5	C000RAM001 SRAM 32Kx8
56	1	U6	C000EPRO01 EPROM 64Kx8
57	1	U7	C000LOGI01 74HC00
58	1	U8	C000LOGI02 74HC02
59	2	U9,U10	C000LOGI08 4094
60	1	U11	C000CDTA01 AD557
61	4	U12,U14,U15,U16	C000AMPO01 AD648
62	1	U13	C000SWTA01 DG212
63	1	X1	C000CRYS02 12MHz
64	1	Z1	C000VREF02 LM385-2V5
65	2	Z2,Z3	C000VREF03 LM336-5V
66	1	Z4	C000VREF01 LM385-1V2 /

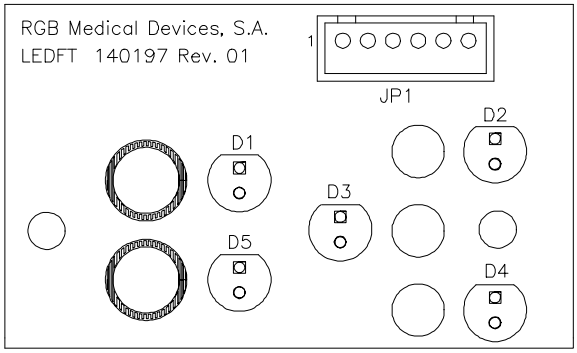
5.2.7. P000PLAC14 Part list.



P000PLAC14

POS.	QTY.	REFERENCE	CODE	VALUE	/
1	12	C1,C3,C9,C11,C12,C13,C15, C16,C18,C21,C22,C23	C000CONM03	100nF	
2	1	C2	C000CONE04	2200uF	
3	1	C4	C000CONP03	47nF	
4	2	C5,C6	C000CONM01	15pF	
5	2	C7,C8	C000CONT01	1uF	
6	1	C10	C000CONT03	10uF	
7	1	C14	C000CONP04	100nF	
8	2	C17,C19	C000CONP07	470nF	
9	1	C20	C000CONT02	4,7uF	
10	4	G1,PG1,PT2,PT3	C000CNRG13	PIN	
11	2	J1,J2	C000CNRG11	JUMPER2	
12	1	JP1	C000CNRG16	V+5	
13	1	JP2	V+5		
14	1	JP3	EXTERIOR		
15	1	JP4	C000CNRG12	TECLADO	
16	1	JP5	C000CNMA06	DISPLAY	
17	1	JP6	C000CNRG06	LEDS	
18	4	PT1,PT4,PT5,PT6	C000CNRG13	PUNTO TEST	
19	1	R1	C000RES002	10K	
20	2	R1,R12	C000RESS02	10K	
21	2	R2,R11	C000RES566	47K	
22	1	R3	C000RES801	10M	
23	2	R4,R19	C000RES401	1K	
24	8	R5,R7,R8,R14,R15,R20,R24, R27	C000RES501	10K	
25	1	R6	C000RES301	100	
26	1	R9	C000RES593	90K9	
27	2	R10,R13	C000RES568	49K9	
28	2	R16,R18	C000RES601	100K	
29	3	R17,R21,R22	C000RES651	332K	
30	2	R23,R26	C000RES330	200	
31	1	R25	C000RES434	2K21	
32	9	T1,T2,T3,T5,T6,T7,T8,T9, T12	C000TBIP02	BC546	
33	3	T4,T10 *,T11	C000TMOS01	IRFD9120	
34	2	U1,U10	C000RAM001	SRAM 32Kx8	
35	1	U2	C000EPRO01	EPROM 64Kx8	
36	2	U3,U7	C000LOGI03	74HC373	
37	1	U4	C000MICRO02	68HC11	
38	1	U5	C000RSET01	MC34064P	
39	1	U6	C000PAL001	PAL18P8	
40	1	U8	C000LOGI09	74HC245A	
41	1	U9	C000CDIS01	SED1330	
42	1	U11	C000LOGI07	74HC4066	
43	1	U12	C000COMP01	LM393	
44	1	X1	C000CRYS04	10MHz	/

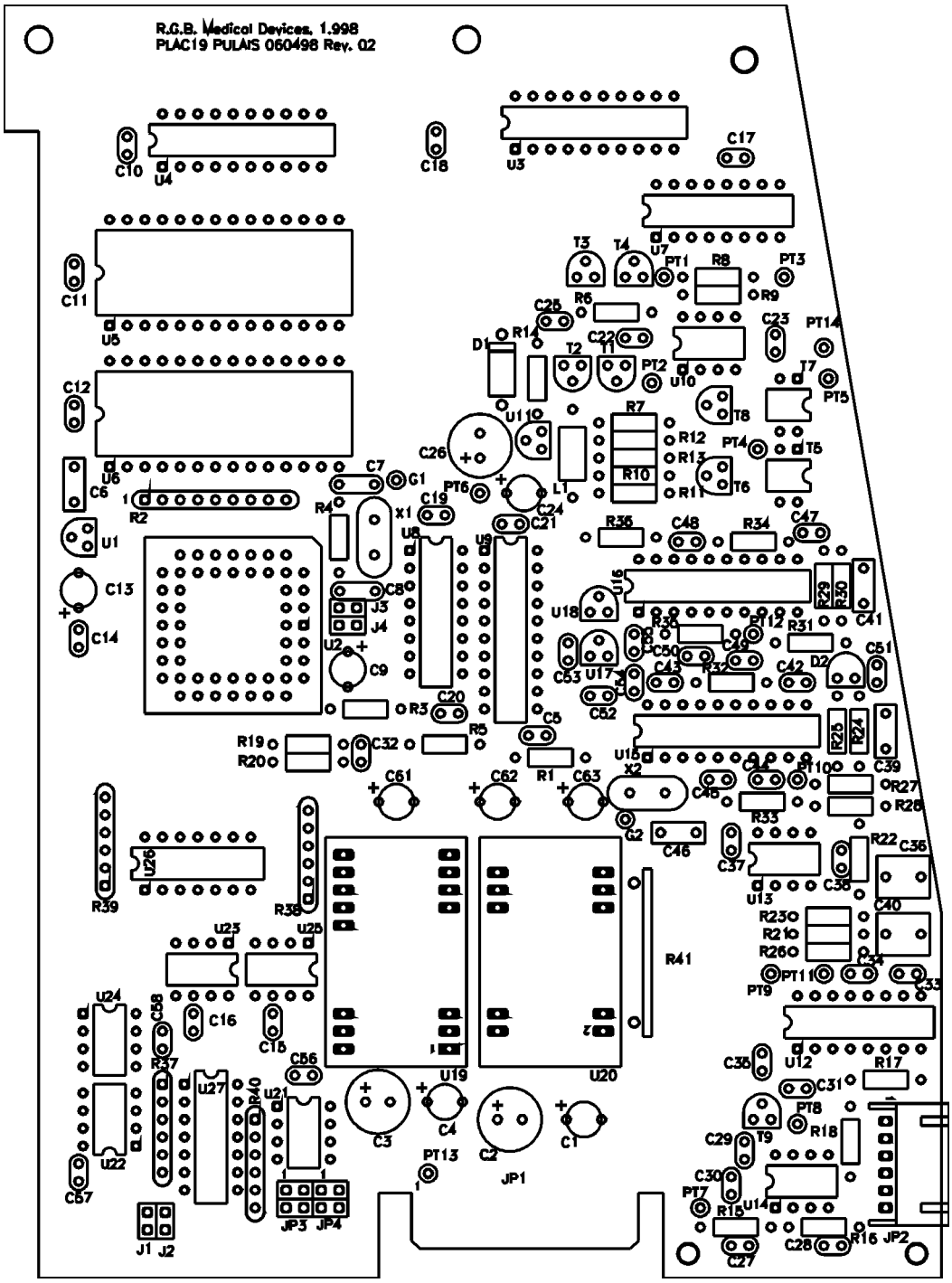
5.2.8. P000PLAC15 Part list.



P000PLAC15

POS.	QTY.	REFERENCE	CODE	VALUE	/
1	1	D1	C000LED006	AMARILLO SILENCE	
2	1	D2	C000LED002	VERDE RED	
3	1	D3	C000LED002	VERDE BATERIA	
4	1	D4	C000LED003	AMARILLO BATERIA	
5	1	D5	C000LED005	ROJO ALARMA	
6	1	JP1	C000CNRG04	ENTRADA	/

5.2.9. P000PLAC19 Part list.



P000PLAC19

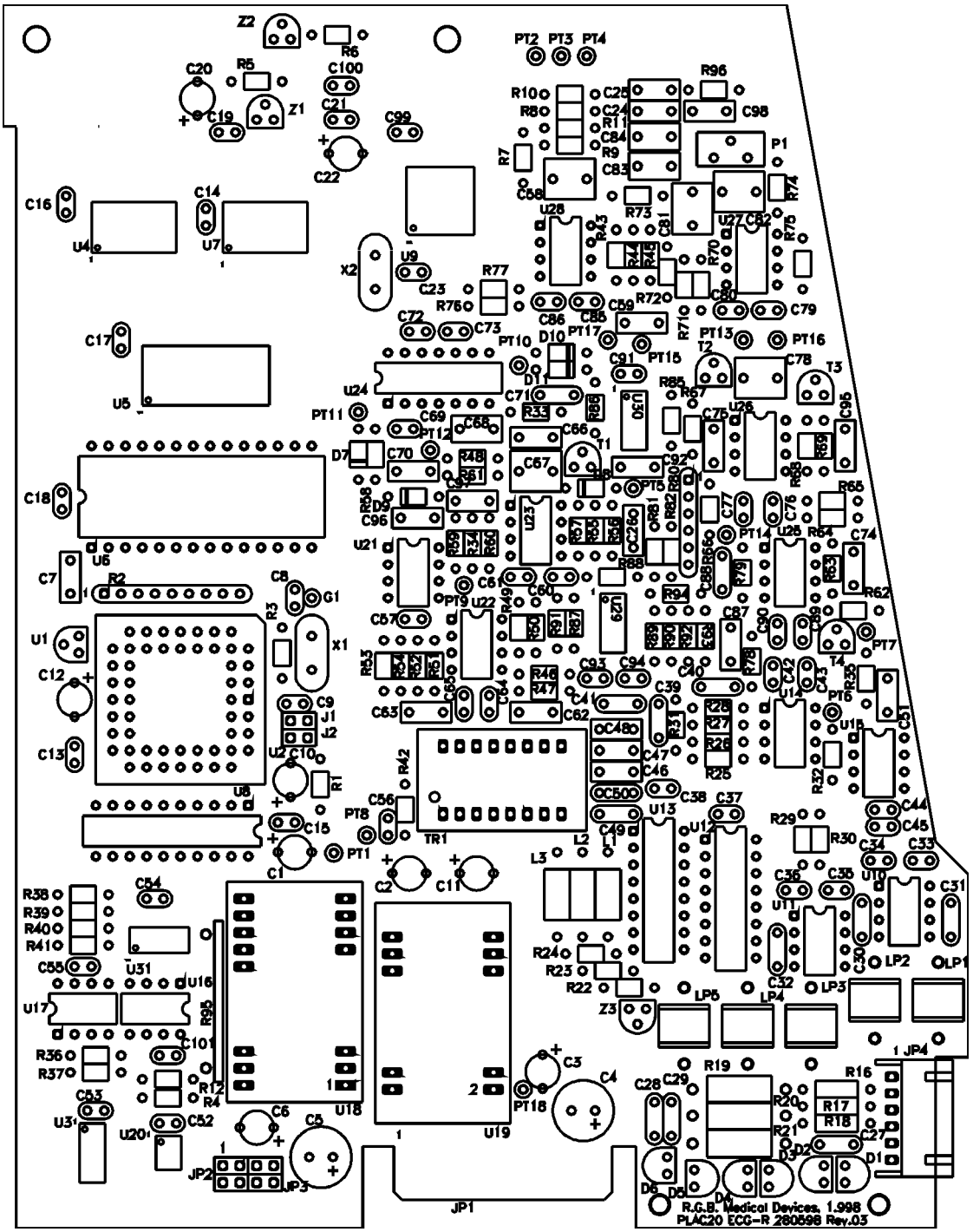
POS.	QTY.	REFERENCE	CODE	VALUE /
1	5	C1,C4,C61,C62,C63	C000CONT03	10uF
2	2	C2,C3	C000CONE02	220uF
3	38	C5,C10,C11,C12,C14,C15, C16,C17,C18,C19,C21,C22, C23,C25,C29,C30,C31,C32, C33,C34,C35,C37,C38,C42, C43,C44,C45,C47,C48,C49, C50,C52,C53,C54,C55,C56, C57,C58	C000CONM03	100nF
4	1	C6	C000CONP03	47nF
5	5	C7,C8,C27,C28,C46	C000CONM01	15pF
6	3	C9,C13,C24	C000CONT01	1uF
7	2	C20,C51	C000CONM02	10nF
8	1	C26	C000CONE01	100uF
9	2	C36,C40	C000CONP08	1uF
10	2	C39,C41	C000CONP04	100nF
11	1	D1	C000ZENE01	7V5 1W
12	1	D2	C000VREF04	TC05-2V5
13	16	G1,PT1,G2,PT2,PT3,PT4, PT5,PT6,PT7,PT8,PT9,PT10, PT11,PT12,PT13,PT14	C000CNRG13	PIN
14	4	J1,J2,J3,J4	C000CNRG11	JUMPER2
15	1	JP1	BordePCB	
16	1	JP2	C000CNRG06	SPO2
17	2	JP3,JP4	C000CNRG11	HEADER2X2
18	1	L1	C000BOBI01	47uH
19	3	R1,R5,R28	C000RES601	100K
20	1	R2	C000RESS02	10K
21	1	R3	C000RES401	1K
22	1	R4	C000RES801	10M
23	4	R6,R8,R21,R26 *	C000RES473	5K62
24	6	R7,R9,R32,R33,R34,R35	C000RES201	10
25	2	R10,R12	C000RES551	33K2
26	2	R11,R13	C000RES501	10K
27	1	R14	C000RES239	24,9
28	3	R15,R16,R18	C000RES651	332K
29	2	R17,R36	C000RES301	100
30	1	R19	C000RES580	66K5
31	3	R20,R24,R29	C000RES561	42K2
32	2	R22,R31	C000RES539	24K9
33	1	R23	C000RES568	49K9
34	2	R25,R30	C000RES515	14K
35	1	R27	C000RES530	20K
36	1	R38	C000RESS03	470
37	2	R39,R40	C000RESS04	1K
38	1	R41	C000RESP03	1G 3KV

P000PLAC19

POS.	QTY.	REFERENCE	CODE	VALUE /
39	5	T1,T2,T3,T4,T9	C000TMOS04	VNO610
40	2	T5,T7	C000TMOS01	IRFD9120
41	2	T6,T8	C000TBIP02	BC546

42	1	U1	C000RSET01 MC34064P
43	1	U2	02C000MICR 68HC11
44	2	U3,U9	C000PAL001 PALCE16V8
45	1	U4	C000LOGI03 74HC373
46	1	U5	C000RAM001 SRAM 32Kx8
47	1	U6	C000EPRO01 EPROM 64Kx8
48	1	U7	C000CDTA01 AD557
49	1	U8	C000LOGI06 74HC4020
50	3	U10,U13,U14	C000AMPO03 AD712
51	1	U11	C000REGU01 LM317L
52	1	U12	C000SWTA01 DG212
53	2	U15,U16	C000CATD02 AD7703
54	1	U17	C000REGU02 78L05
55	1	U18	C000REGU03 79L05
56	1	U19	C000DCDC05 EC2A01NH
57	1	U20	C000DCDC06 EC3A15H
58	1	U21	C000CMUD03 SN75176
59	3	U22,U23,U24	C000OPTO04 HCPL2630
60	1	U25	C000OPTO05 6N137
61	2	U26,U27	C000LOGI10 74HC04
62	1	X1	C000CRYS02 12MHz
63	1	X2	C000CRYS03 3.6864MHz /

5.2.10. P000PLAC20 Part list.



P000PLAC20

POS.	QTY.	REFERENCE	CODE	VALUE /
1	7	C1,C2,C3,C6,C11,C20,C22	C000CONT03	10uF
2	2	C4,C5	C000CONE02	220uF
3	2	C7,C92	C000CONP03	47nF
4	2	C8,C9	C000CONM01	15pF
5	2	C10,C12	C000CONT01	1uF
6	45	C13,C14,C15,C16,C17,C18, C19,C21,C23,C33,C34,C35, C36,C37,C38,C42,C43,C44, C45,C52,C53,C54,C55,C57, C60,C61,C64,C65,C69,C72, C73,C76,C77,C79,C80,C85, C86,C89,C90,C91,C93,C94, C99,C100,C101	C000CONM03	100nF
7	3	C24,C26,C98	C000CONP05	220nF
8	6	C25,C62,C63,C66,C74,C75	C000CONP04	100nF
9	4	C27,C28,C29,C41	C000CONM04	120p
10	4	C30,C31,C32,C71	C000CONC05	1n8
11	2	C39,C40	C000CONC04	470p
12	3	C46,C47,C48	C000CONP09	4,7nF 250V
13	2	C49,C50	C000CONC06	220pF 1KV
14	4	C51,C68,C83,C84	C000CONP07	470nF
15	1	C56	C000CONM02	10nF
16	5	C58,C67,C78,C81,C82	C000CONP08	1uF
17	1	C59	C000CONP11	10nF
18	2	C70,C87	C000CONP02	33nF
19	1	C88	C000CONM05	330pF
20	3	C95,C96,C97	C000CONP01	4,7nF
21	6	D1,D2,D3,D4,D5,D6	C000DIOD06	JPAD50
22	5	D7,D8,D9,D10,D11	C000DIOD03	1N4148
23	19	G1,PT1,PT2,PT3,PT4,PT5, PT6,PT7,PT8,PT9,PT10, PT11,PT12,PT13,PT14,PT15, PT16,PT17,PT18	C000CNRG13	PIN
24	2	J1,J2	C000CNRG11	JUMPER2
25	1	JP1	BordePCB	
26	2	JP2,JP3	C000CNRG11	JUMP2X2
27	1	JP4	C000CNRG06	ECG
28	3	L1,L2,L3	C000BOBI01	47uH
29	5	LP1,LP2,LP3,LP4,LP5	C000DIOD05	CG90L
30	1	P1	C000POTE01	2K
31	10	R1,R4,R5,R12,R40,R41,R49, R50,R54,R56	C000RES401	1K
32	1	R2	C000RESS02	10K
33	2	R3,R35	C000RES801	10M
34	14	R6,R8,R10,R29,R32,R52, R62,R63,R64,R65,R66,R71,		

P000PLAC20

POS.	QTY.	REFERENCE	CODE	VALUE /
		R72,R96		
35	3	R7,R9,R11	C000RES515	14K
36	3	R16,R17,R18	C000RESM03	300K 1/2W

37	3	R19,R20,R21	C000RESM06	33M
38	5	R22,R57,R69,R86,R91	C000RES630	200K
39	4	R23,R44,R45,R76	C000RES668	499K
40	1	R24	C000RES330	200
41	6	R25,R26,R33,R42,R88,R93	C000RES601	100K
42	5	R27,R28,R47,R53,R74	C000RES434	2K21
43	1	R30	C000RES585	75K
44	2	R31,R34	C000RES301	100
45	4	R36,R37,R38,R39	C000RES366	475
46	2	R43,R90	C000RES568	49K9
47	1	R46	C000RES473	5K62
48	2	R48,R79	C000RES651	332K
49	4	R51,R58,R61,R73	C000RES451	3K32
50	1	R55	C000RES730	2M
51	1	R59	C000RES418	1K5
52	1	R60	C000RES447	3K01
53	1	R67	C000RES751	3M3
54	1	R68	C000RES469	5K1
55	3	R70,R75,R87	C000RES518	15K
56	2	R77,R92	C000RES701	1M
57	1	R78	C000RES386	750
58	1	R80	C000RESS05	100K
59	2	R81,R82	C000RES466	4K7
60	2	R85,R94	C000RES559	40K2
61	1	R89	C000RES530	20K
62	1	R95	C000RESP03	1G 3KV
63	4	T1,T2,T3,T4	C000JFET01	J177
64	1	TR1	C000TRAF02	APC16101
65	1	U1	C000RSET01	MC34064P
66	1	U2	C000MICR02	68HC11
67	3	U3,U30,U31	C000LOGI12	74HC00
68	2	U4,U7	C000LOGI11	74HC373
69	1	U5	C000RAM002	SRAM 32Kx8
70	1	U6	C000EPRO01	EPROM 64Kx8
71	1	U8	C000PAL001	PALCE16V8
72	1	U9	C000CATD04	HI7188IN
73	3	U10,U11,U15	C000AMPO01	AD648
74	2	U12,U13	C000MULT02	DG509
75	1	U14	C000AMPI01	INA114
76	2	U16,U17	C000OPTO04	HCPL2630
77	1	U18	C000DCDC05	EC2A01NH
78	1	U19	C000DCDC06	EC3A15H
79	1	U20	C000CMUD06	SN75176

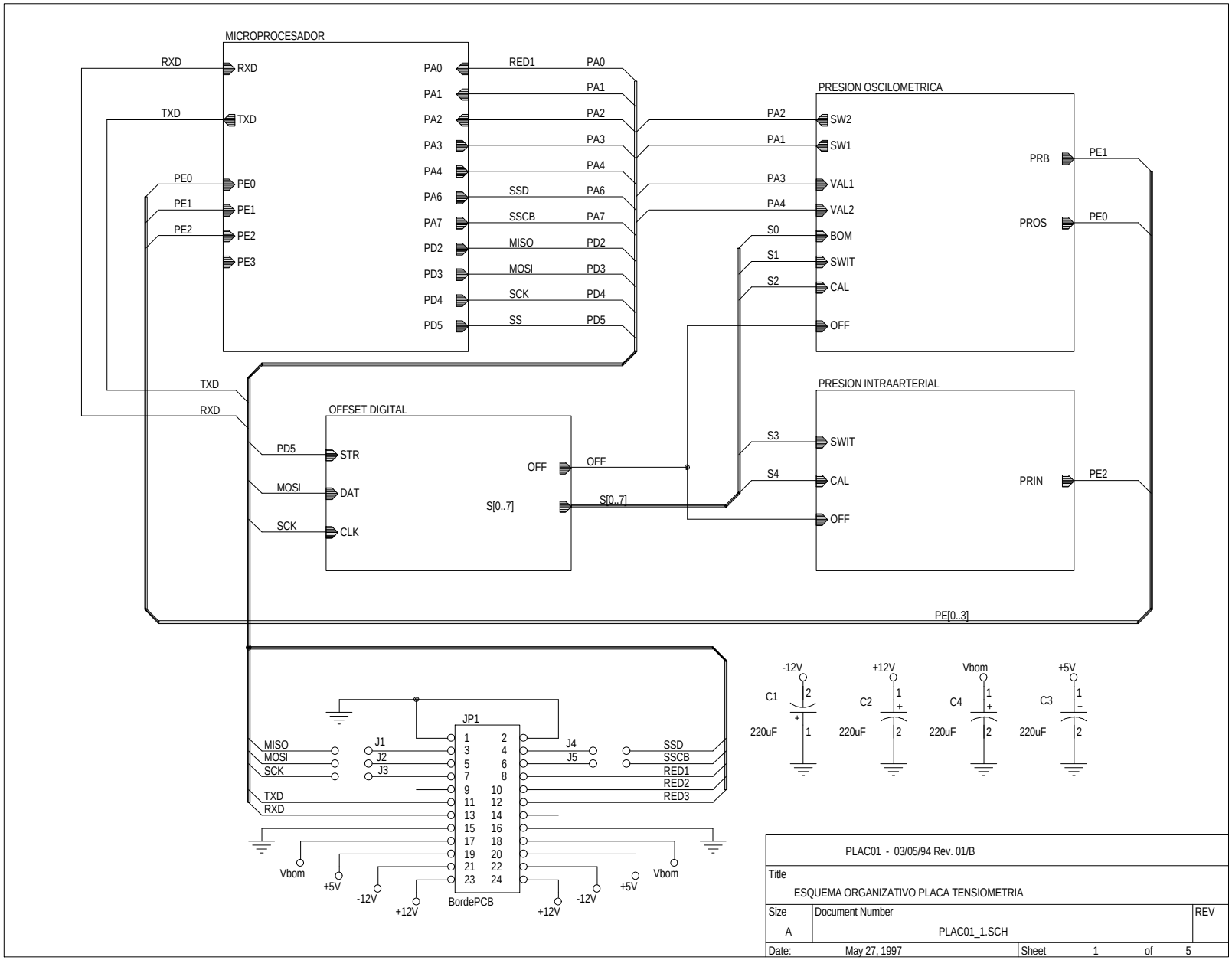
P000PLAC20

POS.	**QTY.**	**REFERENCE**	**CODE**	**VALUE**	**/**
80	1	U21	C000CRYS06	IQEXO	
81	6	U22,U23,U25,U26,U27,U28	C000AMPO03	AD712	
82	1	U24	C000CRMS02	AD637	
83	1	U29	C000COMP02	LM339	
84	1	X1	C000CRYS02	12MHz	
85	1	X2	C000CRYS03	3.6864MHz	
86	1	Z1	C000VREF03	LM336-5V	
87	2	Z2,Z3	C000VREF02	LM385-2V5	/

5.3. Board schematics.

This section includes the schematics of all the boards that can be used into Omicrom FT monitors.

5.3.1. P000PLAC01 Schematics.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TXD
PE0
PE1
PE2
PE3
PA0
PA1
PA2
PA3
PA4
PA6
PA7
PD2
PD3
PD4
PD5
RED1
SSD
SSCB
MISO
MOSI
SCK
SS
PRESION OSCILOMETRICA
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SW1
VAL1
VAL2
BOM
SWIT
CAL
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PROS
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STR
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PRIN
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J1
J2
J3
J4
J5
RED2
RED3
BordePCB
-12V
+12V
Vbom
+5V
C1
C2
C3
C4
220uF
PLAC01 - 03/05/94 Rev. 01/B
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May 27, 1997
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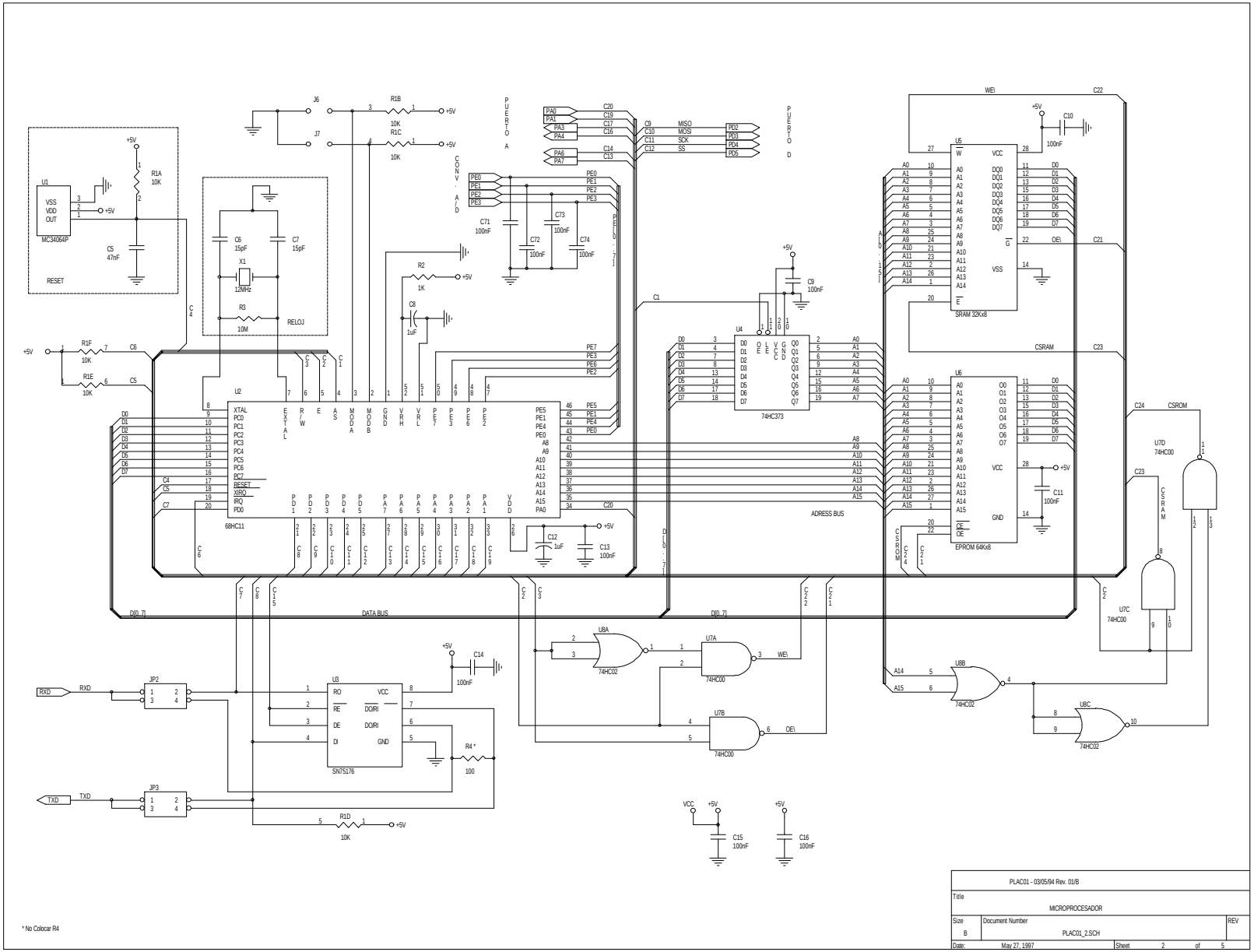
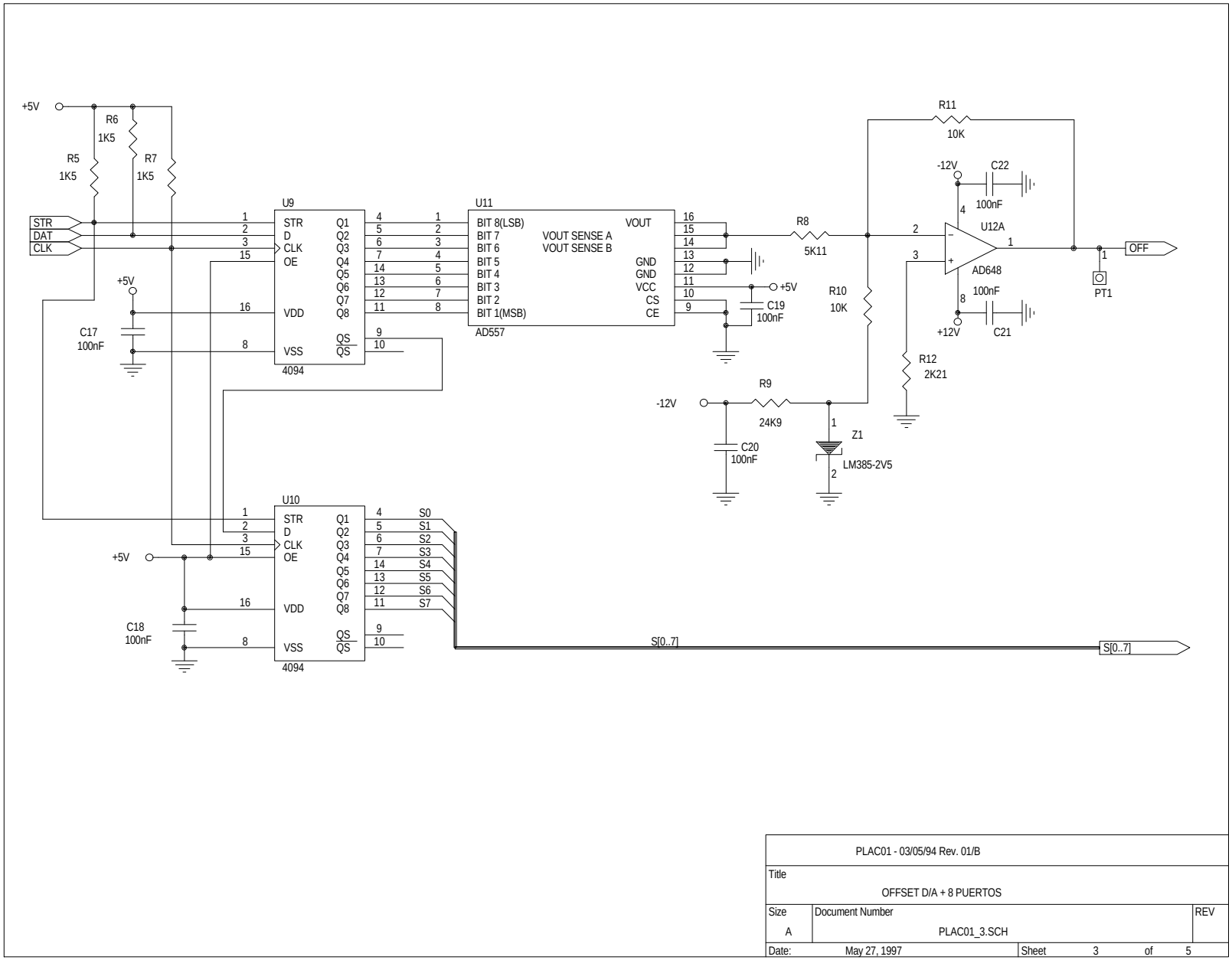
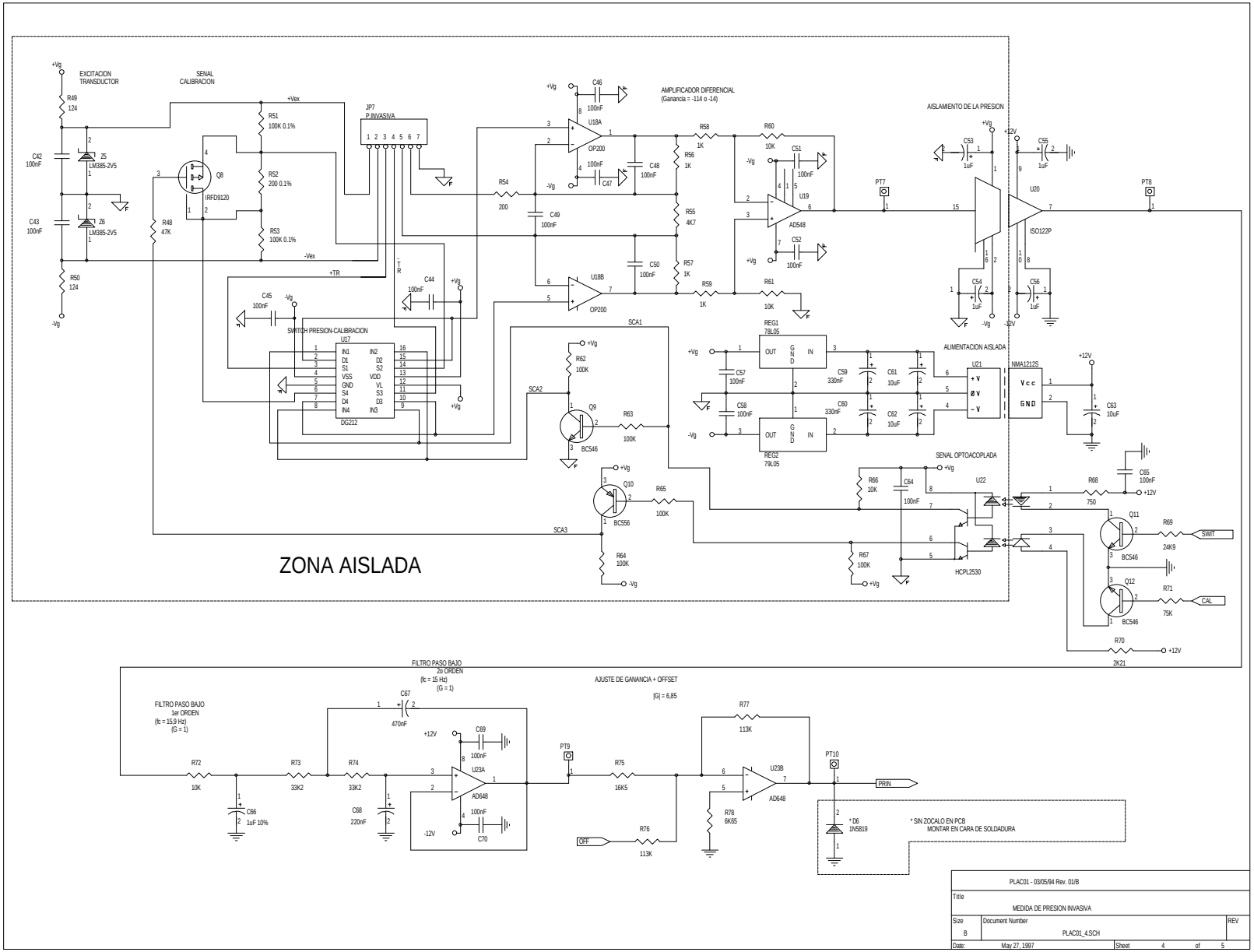
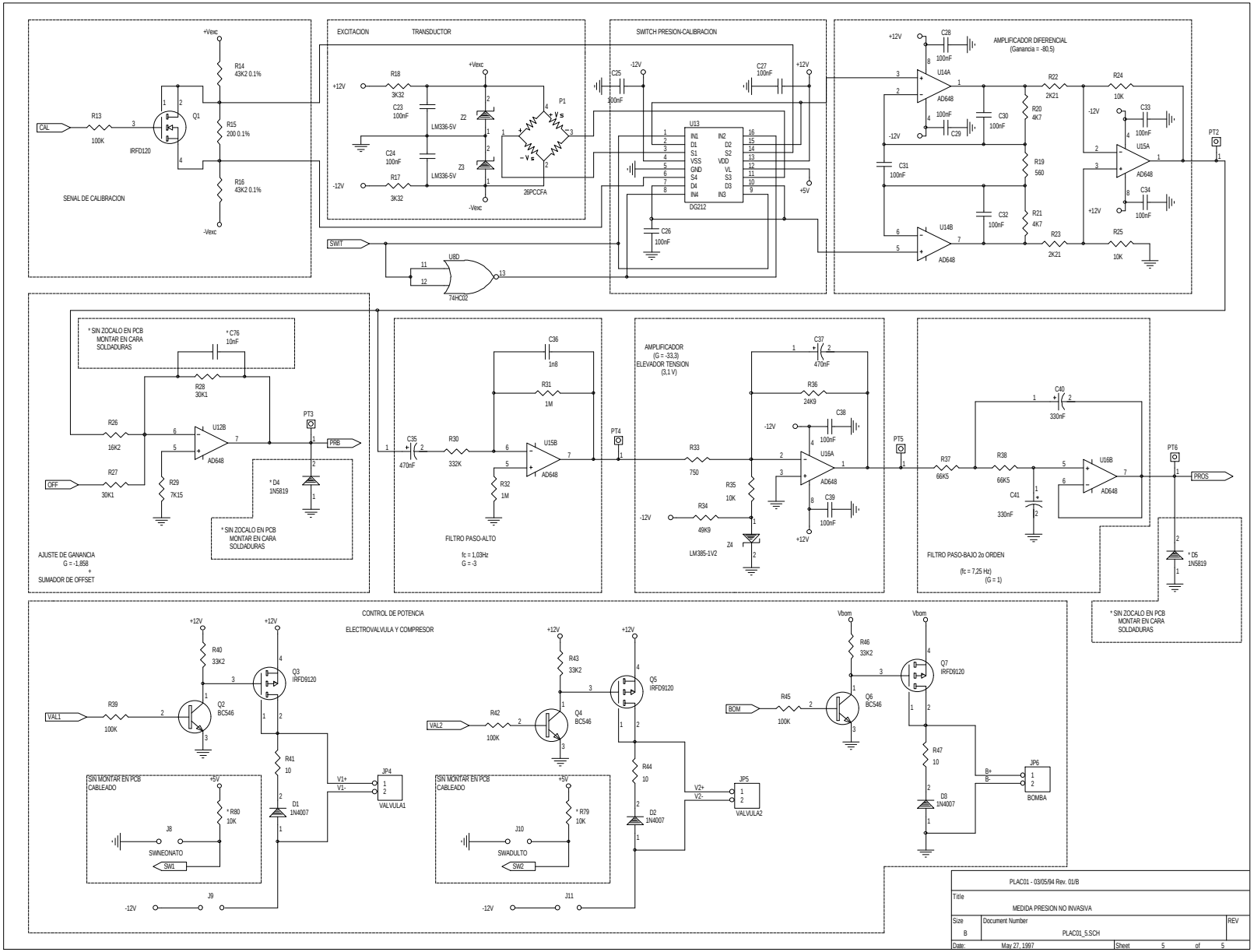

U1
MC34064P
VSS
VDD
OUT
RESET
R1A 10K
C5 47nF
C6 15pF
C7 15pF
X1 12MHz
R3 10M
RELOJ
R2 1K
C8 1uF
J6
J7
R1B 10K
R1C 10K
R1D 10K
R1E 10K
R1F 10K
+5V
U2
68HC11
XTAL
EXTAL
RESET
XIRQ
IRQ
R/W
AS
MODA
MODB
GND
VRH
VRL
VDD
U3
SN75176
RO
RE
DE
DI
VCC
DORI
GND
R4 * 100
JP2
JP3
RXD
TXD
U4
74HC373
U5
SRAM 32Kx8
U6
EPROM 64Kx8
ADRESS BUS
DATA BUS
U7A
U7B
U7C
U7D
74HC00
U8A
U8B
U8C
74HC02
C9 100nF
C10 100nF
C11 100nF
C12 1uF
C13 100nF
C14 100nF
C15 100nF
C16 100nF
C71 100nF
C72 100nF
C73 100nF
C74 100nF
WE\
OE\
CSRAM
CSROM
MISO
MOSI
SCK
SS
* No Colocar R4
PLAC01 - 03/05/94 Rev. 01/B
MICROPROCESADOR
PLAC01_2.SCH
May 27, 1997
Sheet 2 of 5

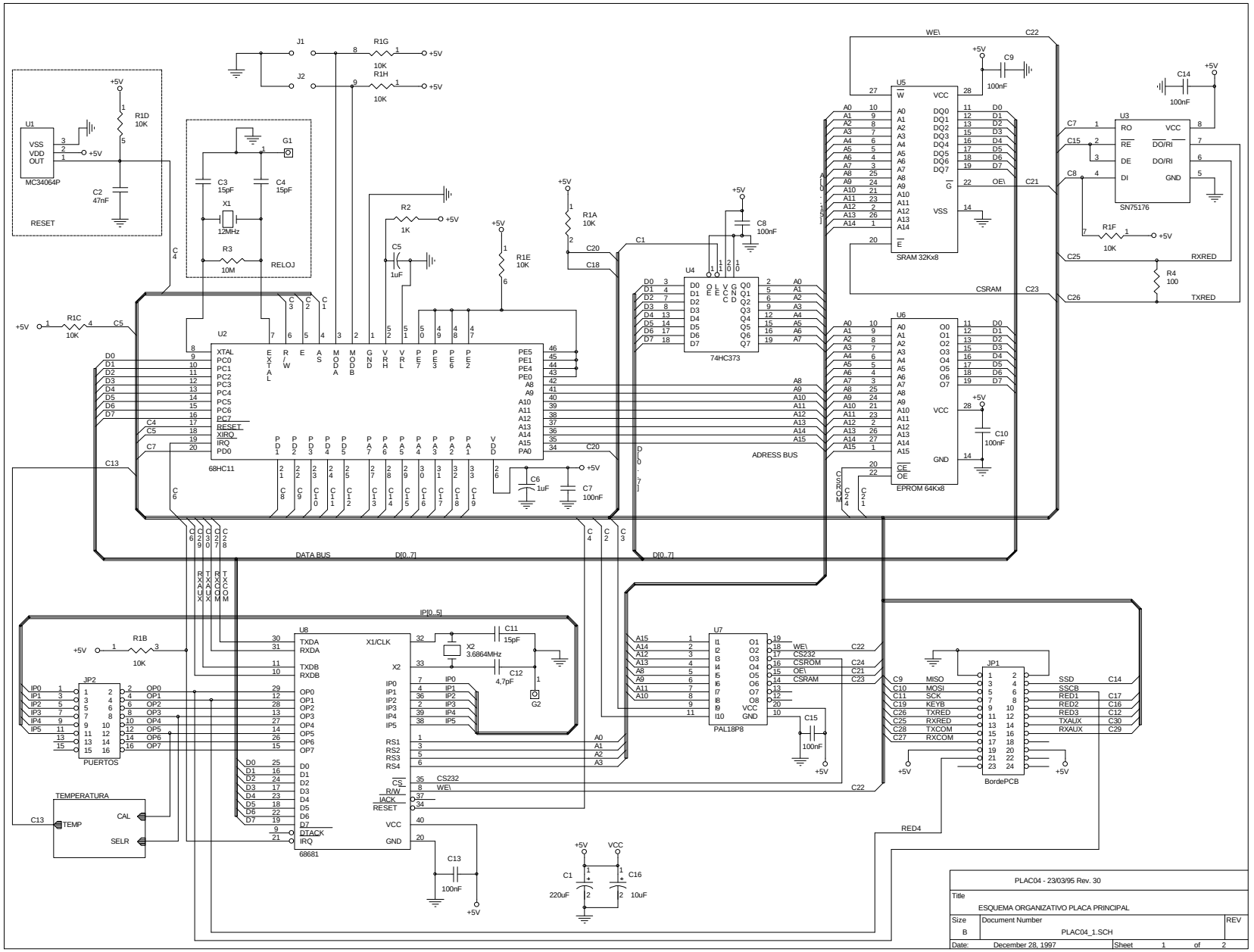


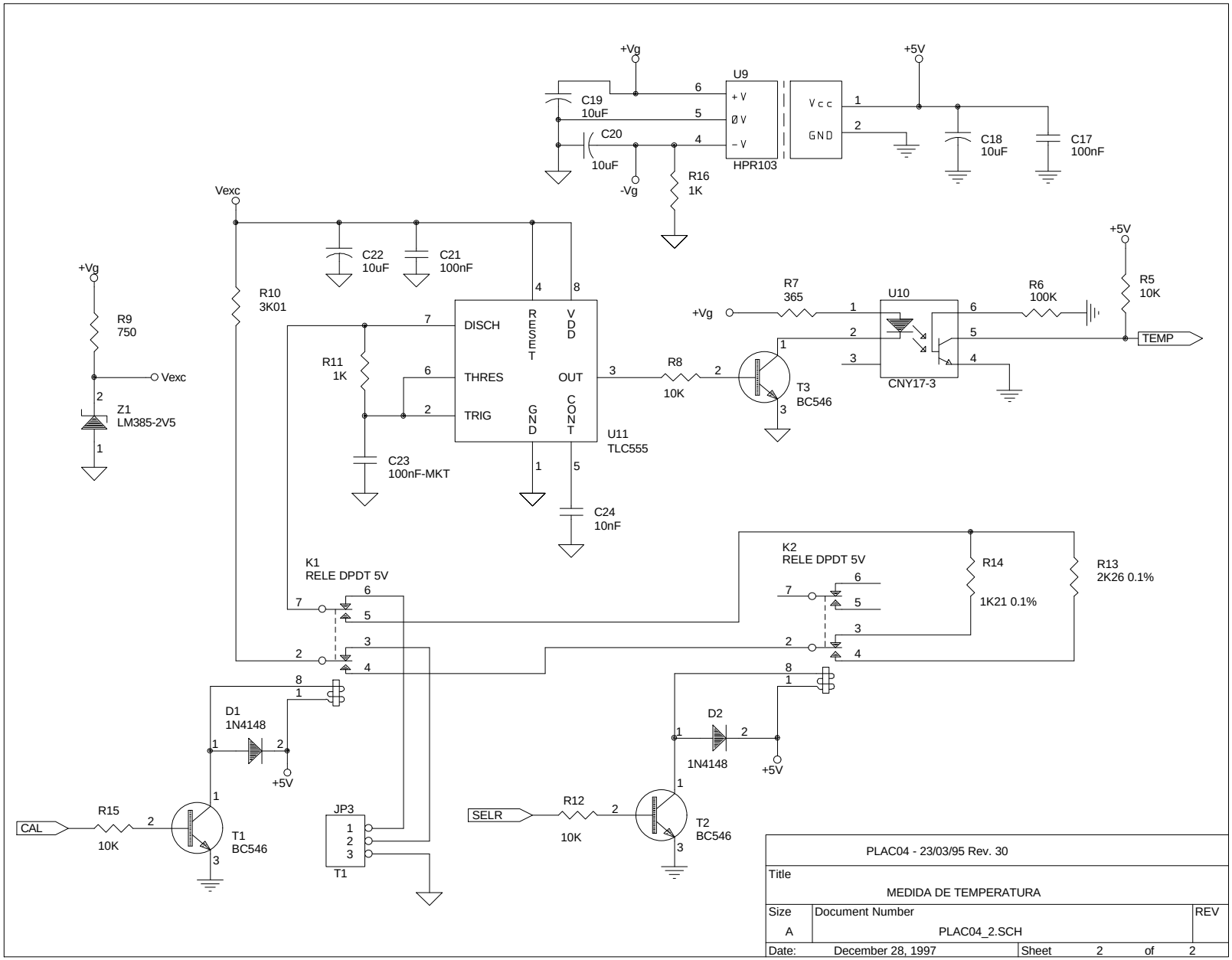
PLAC01 - 03/05/94 Rev. 01/B			
Title: OFFSET D/A + 8 PUERTOS			
Size: A	Document Number: PLAC01_3.SCH		REV
Date: May 27, 1997	Sheet 3 of 5		


ZONA AISLADA
EXCITACION TRANSDUCTOR
SENAL CALIBRACION
AMPLIFICADOR DIFERENCIAL
(Ganancia = -114 o -14)
AISLAMIENTO DE LA PRESION
SWITCH PRESION-CALIBRACION
ALIMENTACION AISLADA
SENAL OPTOACOPLADA
FILTRO PASO BAJO
1er ORDEN
(fc = 15,9 Hz)
(G = 1)
FILTRO PASO BAJO
2o ORDEN
(fc = 15 Hz)
(G = 1)
AJUSTE DE GANANCIA + OFFSET
|G| = 6,85
* SIN ZOCALO EN PCB
MONTAR EN CARA DE SOLDADURA
PLAC01 - 03/05/94 Rev. 01/B
MEDIDA DE PRESION INVASIVA
PLAC01_4.SCH
May 27, 1997

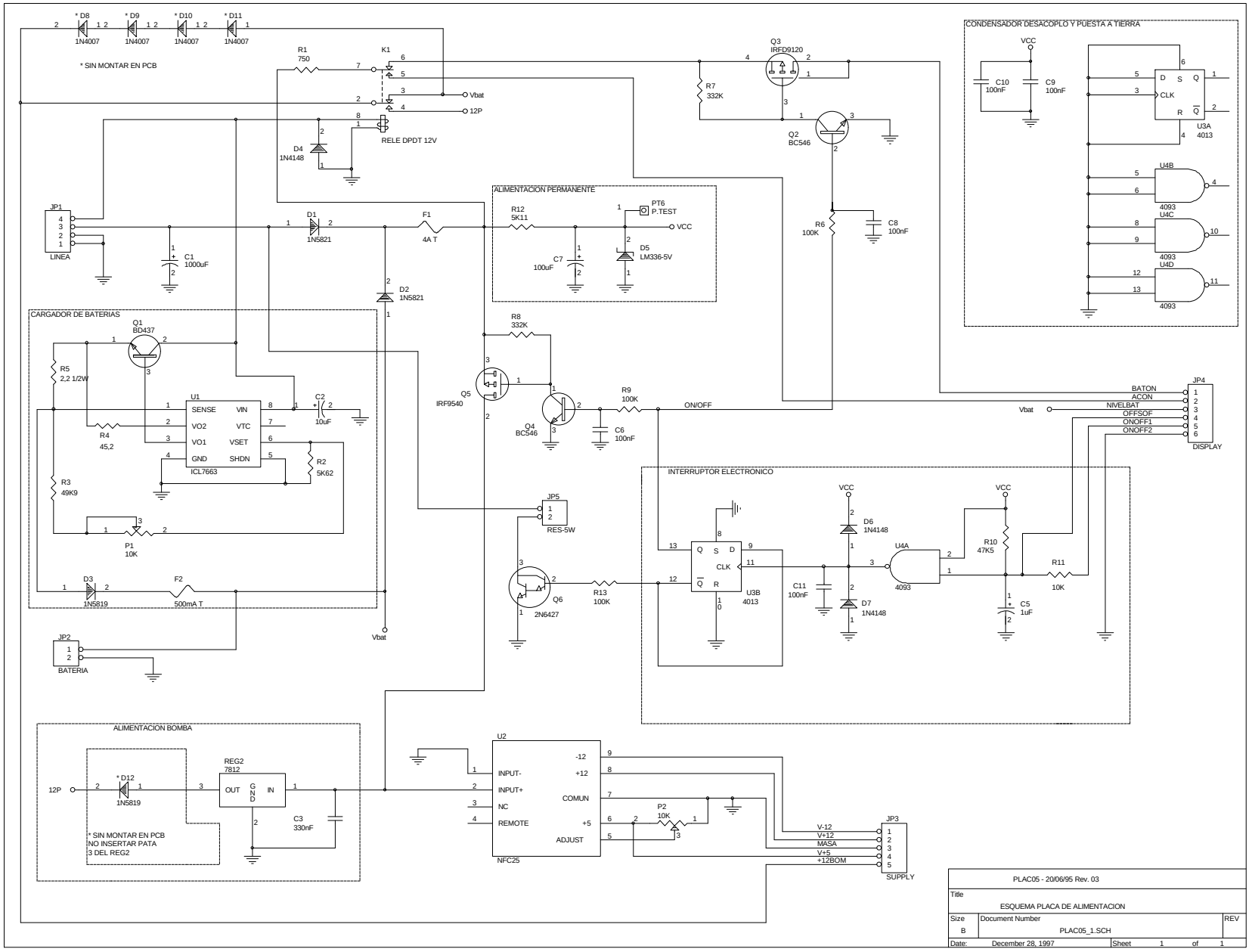

SENAL DE CALIBRACION
EXCITACION
TRANSDUCTOR
SWITCH PRESION-CALIBRACION
AMPLIFICADOR DIFERENCIAL
(Ganancia = -80,5)
AJUSTE DE GANANCIA
G = -1,858
+
SUMADOR DE OFFSET
FILTRO PASO-ALTO
fc = 1,03Hz
G = -3
AMPLIFICADOR
(G = -33,3)
ELEVADOR TENSION
(3,1 V)
FILTRO PASO-BAJO 2o ORDEN
(fc = 7,25 Hz)
(G = 1)
CONTROL DE POTENCIA
ELECTROVALVULA Y COMPRESOR
PLAC01 - 03/05/94 Rev. 01/B
MEDIDA PRESION NO INVASIVA
PLAC01_5.SCH
May 27, 1997

5.3.2. P000PLAC04 Schematics.

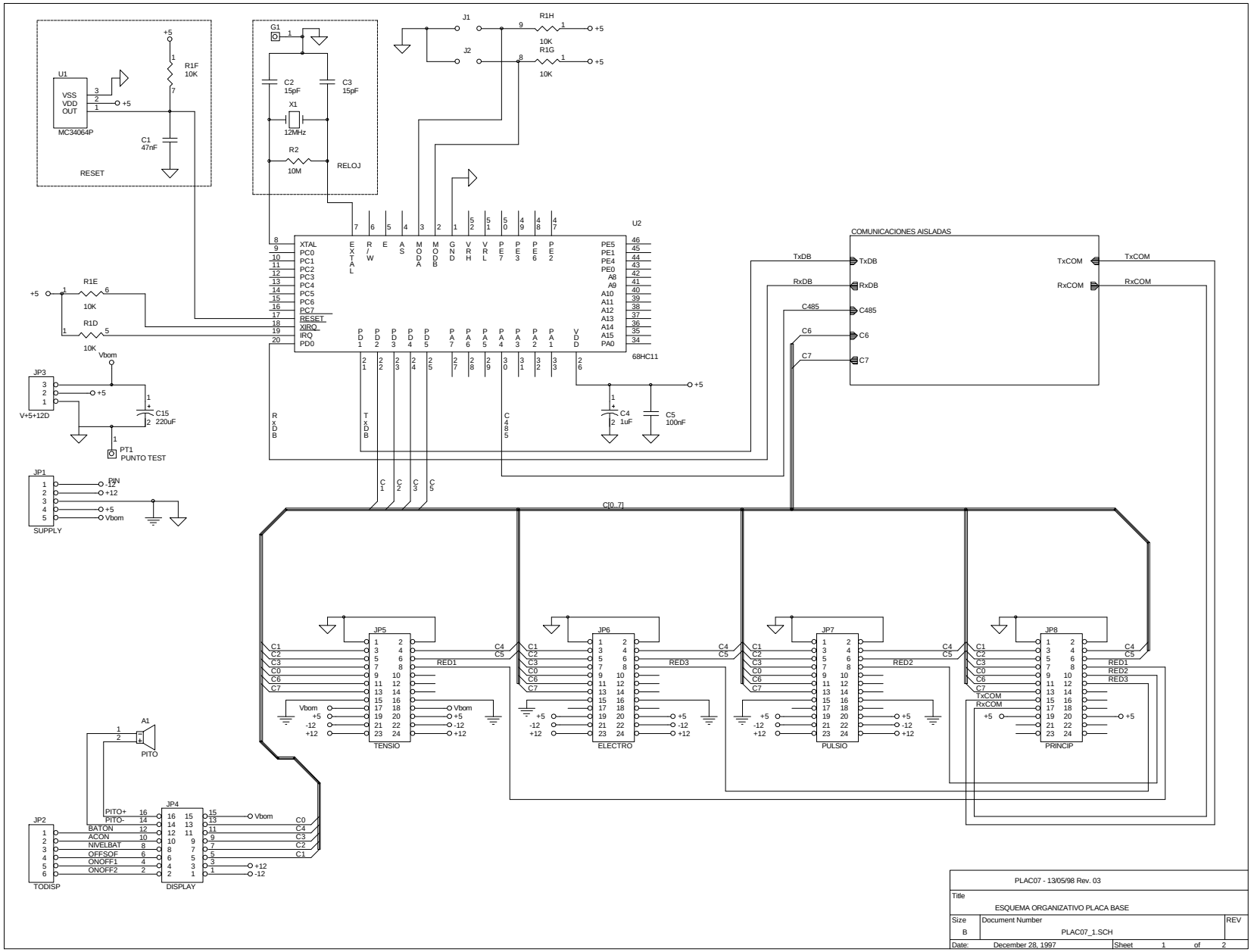

MC34064P
RESET
12MHz
RELOJ
68HC11
74HC373
SRAM 32Kx8
EPROM 64Kx8
SN75176
ADRESS BUS
DATA BUS
PUERTOS
TEMPERATURA
PAL18P8
BordePCB
PLAC04 - 23/03/95 Rev. 30
ESQUEMA ORGANIZATIVO PLACA PRINCIPAL
PLAC04_1.SCH
December 28, 1997

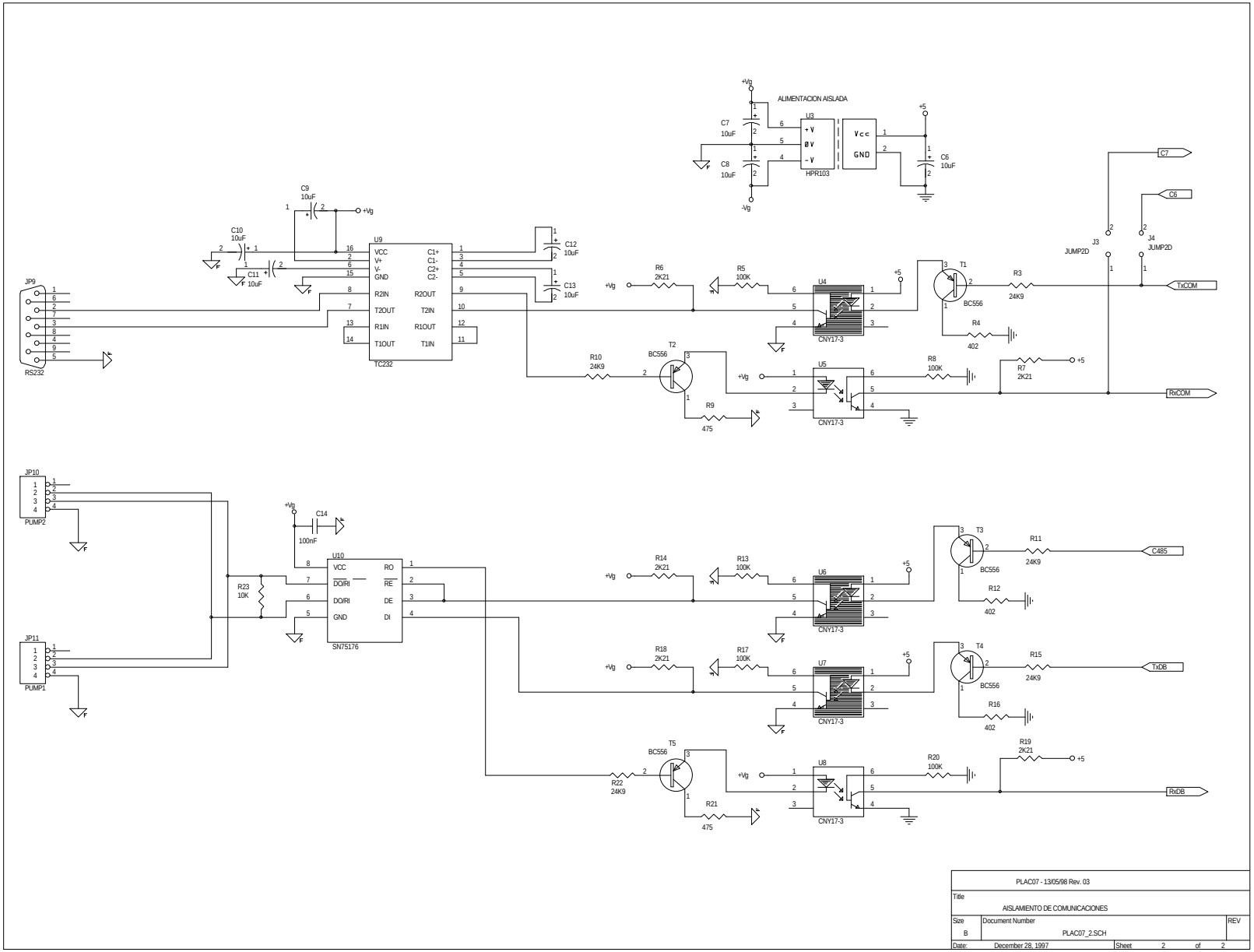

+Vg
+5V
U9
C19
10uF
C20
10uF
HPR103
Vcc
GND
C18
10uF
C17
100nF
R16
1K
-Vg
Vexc
C22
10uF
C21
100nF
R10
3K01
R9
750
Z1
LM385-2V5
R11
1K
C23
100nF-MKT
DISCH
THRES
TRIG
RESET
VDD
OUT
GND
CONT
U11
TLC555
R8
10K
R7
365
U10
CNY17-3
R6
100K
R5
10K
TEMP
T3
BC546
C24
10nF
K1
RELE DPDT 5V
K2
RELE DPDT 5V
R14
1K21 0.1%
R13
2K26 0.1%
D1
1N4148
D2
1N4148
CAL
R15
10K
T1
BC546
JP3
SELR
R12
10K
T2
BC546
PLAC04 - 23/03/95 Rev. 30
Title
MEDIDA DE TEMPERATURA
Size
A
Document Number
PLAC04_2.SCH
REV
Date: December 28, 1997
Sheet 2 of 2

5.3.3. P000PLAC05 Schematics.

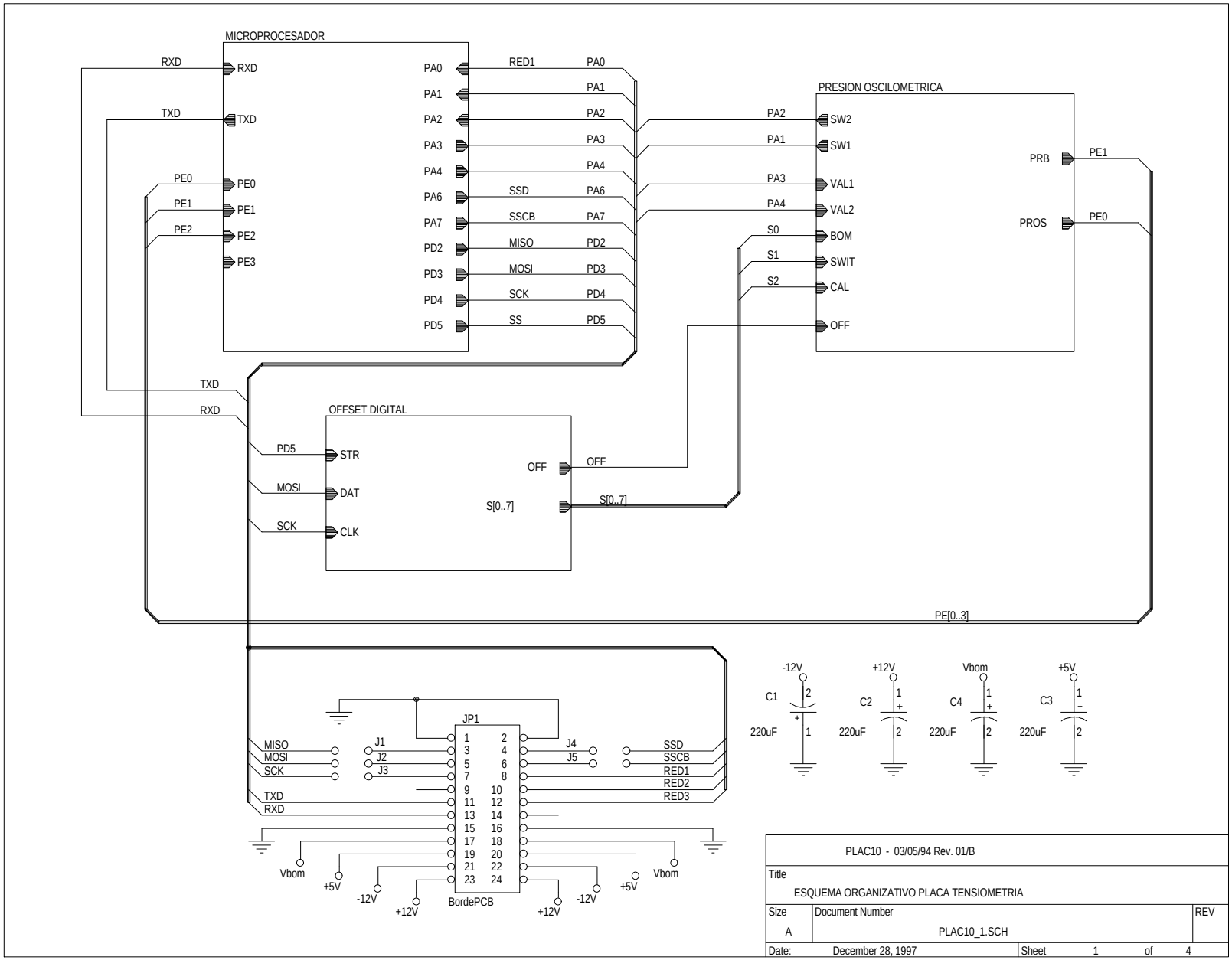

* D8 1N4007
* D9 1N4007
* D10 1N4007
* D11 1N4007
* SIN MONTAR EN PCB
R1 750
K1
RELE DPDT 12V
Vbat
12P
D4 1N4148
Q3 IRFD9120
R7 332K
Q2 BC546
CONDENSADOR DESACOPLO Y PUESTA A TIERRA
VCC
C10 100nF
C9 100nF
U3A 4013
U4B
U4C
U4D
4093
JP1
LINEA
C1 1000uF
D1 1N5821
F1 4A T
ALIMENTACION PERMANENTE
R12 5K11
PT6 P.TEST
C7 100uF
D5 LM336-5V
R6 100K
C8 100nF
D2 1N5821
CARGADOR DE BATERIAS
Q1 BD437
R5 2,2 1/2W
U1
SENSE
VIN
VO2
VTC
VO1
VSET
GND
SHDN
ICL7663
C2 10uF
R4 45,2
R2 5K62
R3 49K9
P1 10K
D3 1N5819
F2 500mA T
JP2
BATERIA
R8 332K
Q5 IRF9540
Q4 BC546
R9 100K
C6 100nF
ON/OFF
JP4
BATON
ACON
NIVELBAT
OFFSOF
ONOFF1
ONOFF2
DISPLAY
JP5
RES-5W
INTERRUPTOR ELECTRONICO
D6 1N4148
D7 1N4148
U3B 4013
U4A
R10 47K5
R11 10K
C11 100nF
C5 1uF
Q6 2N6427
R13 100K
ALIMENTACION BOMBA
REG2 7812
* D12 1N5819
C3 330nF
* SIN MONTAR EN PCB
NO INSERTAR PATA
3 DEL REG2
U2
INPUT-
INPUT+
NC
REMOTE
-12
+12
COMUN
+5
ADJUST
NFC25
P2 10K
JP3
V-12
V+12
MASA
V+5
+12BOM
SUPPLY
PLAC05 - 20/06/95 Rev. 03
Title
ESQUEMA PLACA DE ALIMENTACION
Size B
Document Number PLAC05_1.SCH
REV
Date: December 28, 1997
Sheet 1 of 1

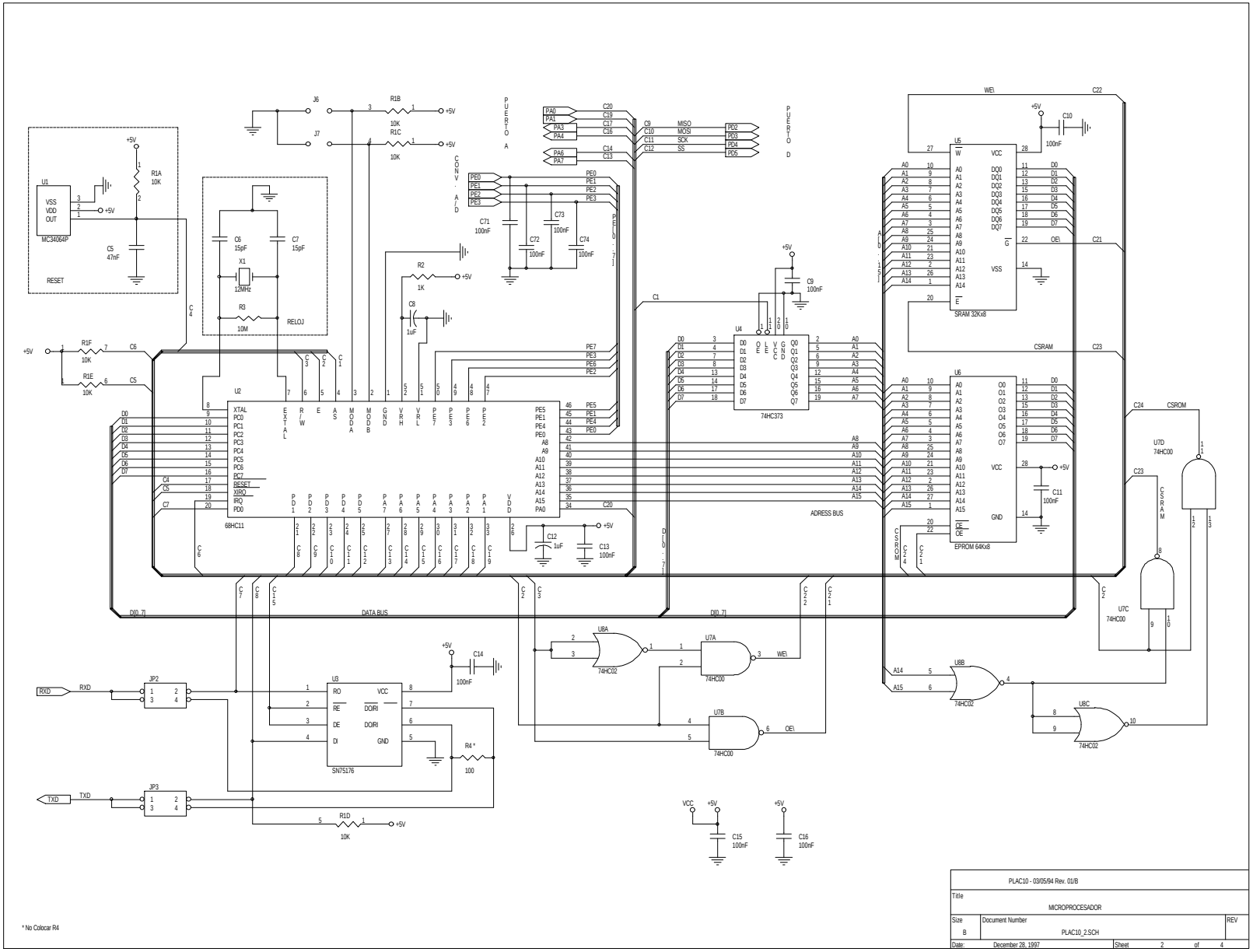
5.3.4. P000PLAC07 Schematics.

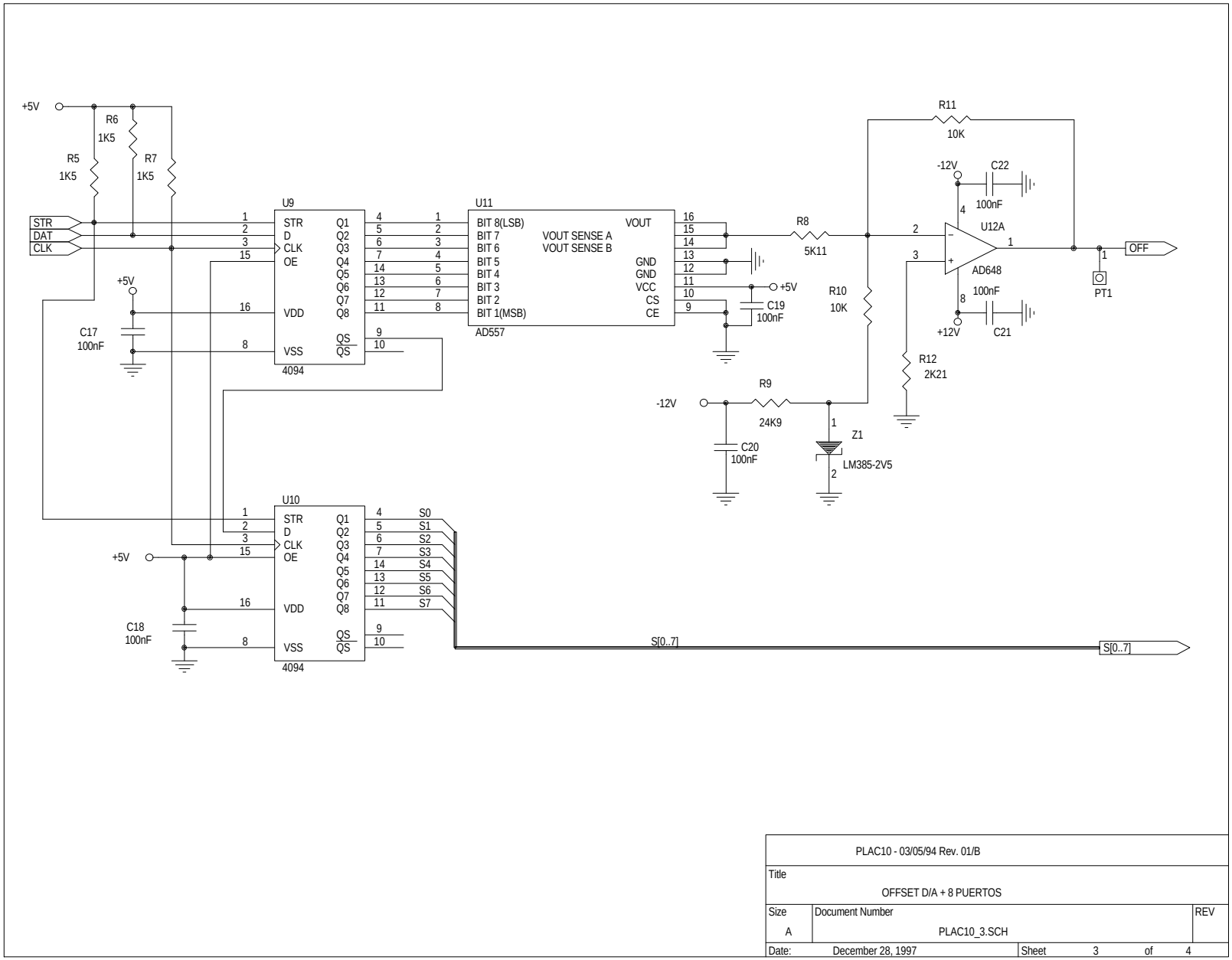

RESET
MC34064P
RELOJ
12MHz
68HC11
COMUNICACIONES AISLADAS
TxDB
RxDB
C485
C6
C7
TxCOM
RxCOM
SUPPLY
PUNTO TEST
C[0..7]
TENSIO
ELECTRO
PULSIO
PRINCIP
PITO
TODISP
DISPLAY
RED1
RED2
RED3
PLAC07 - 13/05/98 Rev. 03
ESQUEMA ORGANIZATIVO PLACA BASE
PLAC07_1.SCH
December 28, 1997


ALIMENTACION AISLADA
HPR103
TC232
SN75176
CNY17-3
BC556
RS232
PUMP2
PUMP1
JUMP2D
TxCOM
RxCOM
C485
TxDB
RxDB
PLAC07 - 13/05/98 Rev. 03
AISLAMIENTO DE COMUNICACIONES
PLAC07_2.SCH
December 28, 1997

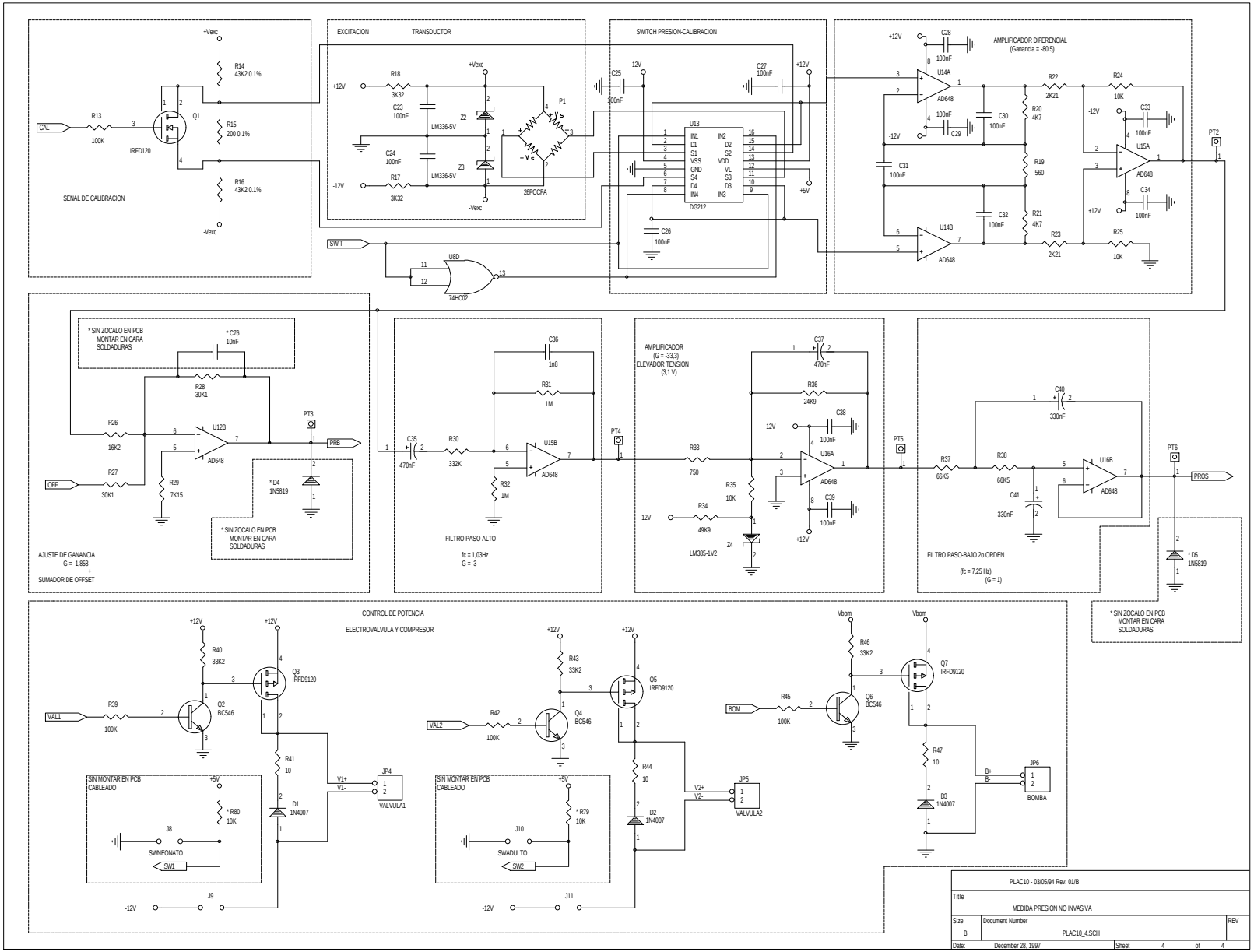
5.3.5. P000PLAC10 Schematics.


MICROPROCESADOR
RXD
TXD
PE0
PE1
PE2
PE3
PA0
PA1
PA2
PA3
PA4
PA6
PA7
PD2
PD3
PD4
PD5
RED1
SSD
SSCB
MISO
MOSI
SCK
SS
PRESION OSCILOMETRICA
SW2
SW1
VAL1
VAL2
BOM
SWIT
CAL
OFF
PRB
PROS
S0
S1
S2
OFFSET DIGITAL
STR
DAT
CLK
S[0..7]
PE[0..3]
JP1
J1
J2
J3
J4
J5
SSD
SSCB
RED1
RED2
RED3
BordePCB
Vbom
+5V
-12V
+12V
C1
C2
C3
C4
220uF
PLAC10 - 03/05/94 Rev. 01/B
ESQUEMA ORGANIZATIVO PLACA TENSIOMETRIA
PLAC10_1.SCH
December 28, 1997
Sheet 1 of 4

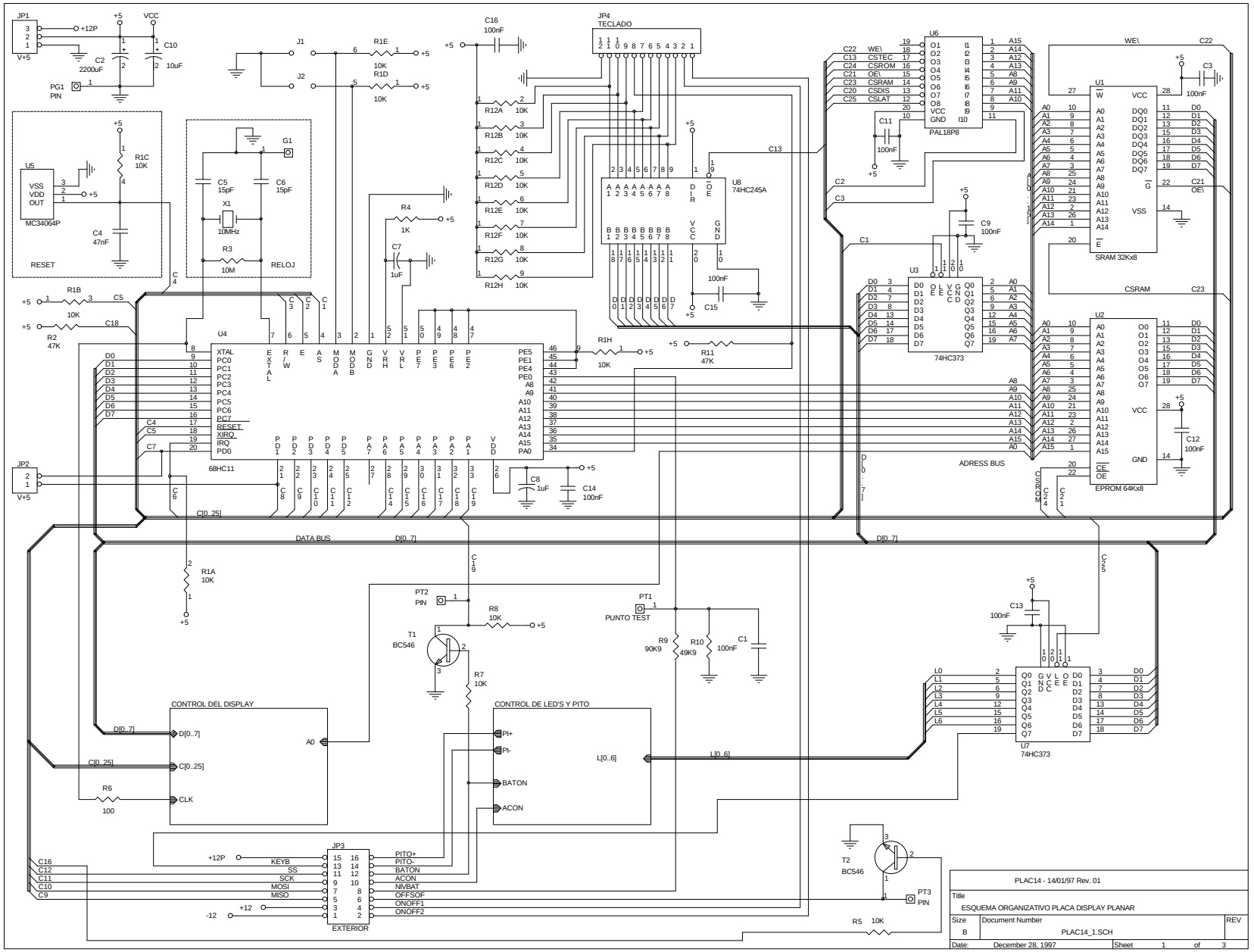

U1
MC34064P
VSS
VDD
OUT
RESET
R1A 10K
C5 47nF
X1
12MHz
C6 15pF
C7 15pF
RELOJ
R3 10M
R2 1K
C8 1uF
R1F 10K
R1E 10K
J6
J7
R1B 10K
R1C 10K
U2
68HC11
XTAL
EXTAL
RESET
XIRQ
IRQ
PD0
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
R/W
E
AS
MODA
MODB
GND
VRH
VRL
VDD
PE7
PE6
PE5
PE4
PE3
PE2
PE1
PE0
PA7
PA6
PA5
PA4
PA3
PA2
PA1
PA0
C12 1uF
C13 100nF
C14 100nF
C71 100nF
C72 100nF
C73 100nF
C74 100nF
C9 100nF
C10 100nF
C11 100nF
C15 100nF
C16 100nF
U4
74HC373
U5
SRAM 32Kx8
U6
EPROM 64Kx8
ADRESS BUS
DATA BUS
U3
SN75176
RO
RE
DE
DI
VCC
DORI
DORI
GND
R4 * 100
R1D 10K
JP2
JP3
RXD
TXD
U8A
74HC02
U7A
74HC00
U7B
74HC00
U8B
74HC02
U8C
74HC02
U7D
74HC00
U7C
74HC00
WE\
OE\
CSRAM
CSROM
MISO
MOSI
SCK
SS
* No Colocar R4
PLAC10 - 03/05/94 Rev. 01/B
Title
MICROPROCESADOR
Size B
Document Number PLAC10_2.SCH
REV
Date: December 28, 1997
Sheet 2 of 4

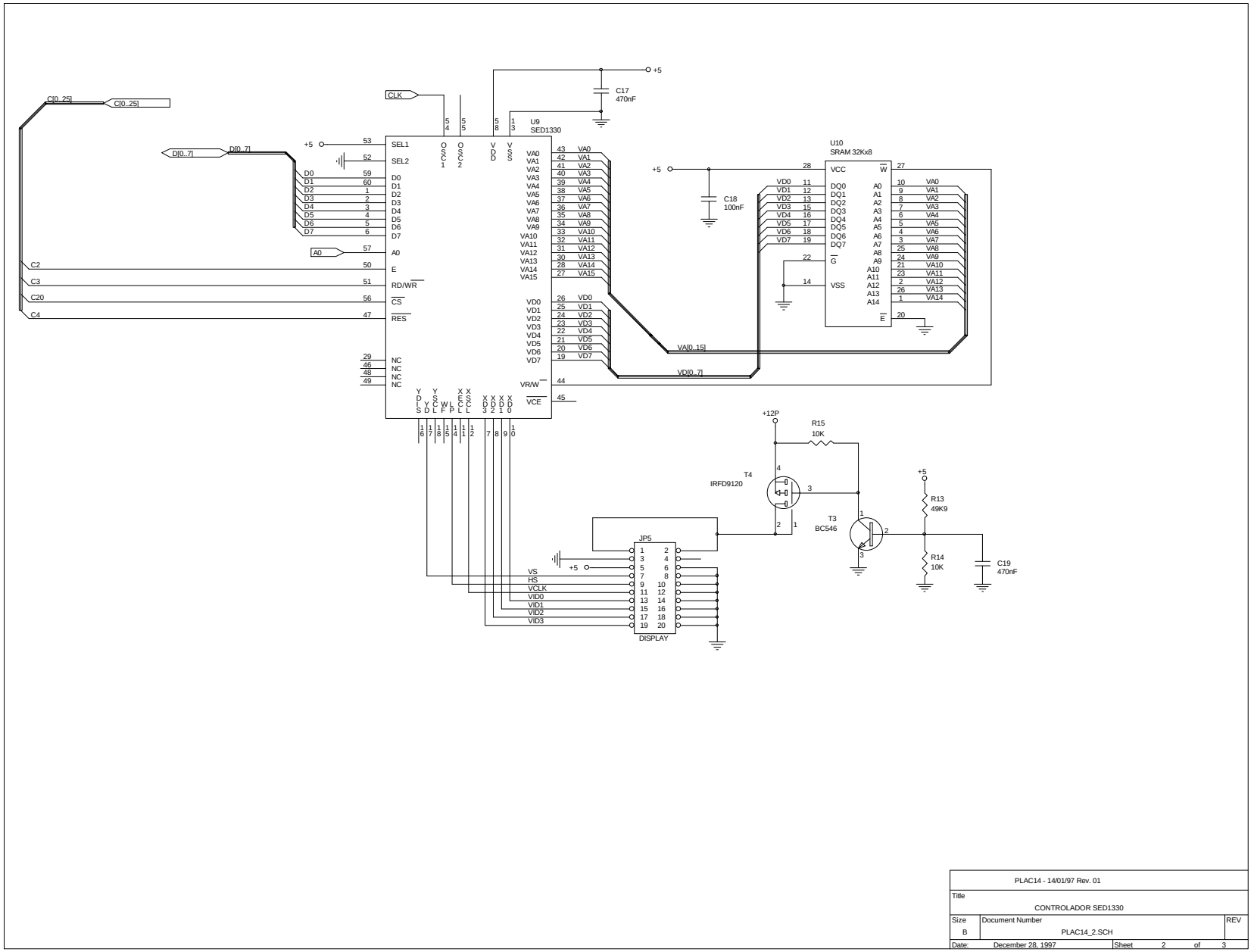


PLAC10 - 03/05/94 Rev. 01/B		
Title: OFFSET D/A + 8 PUERTOS		
Size: A	Document Number: PLAC10_3.SCH	REV:
Date: December 28, 1997	Sheet 3 of 4	

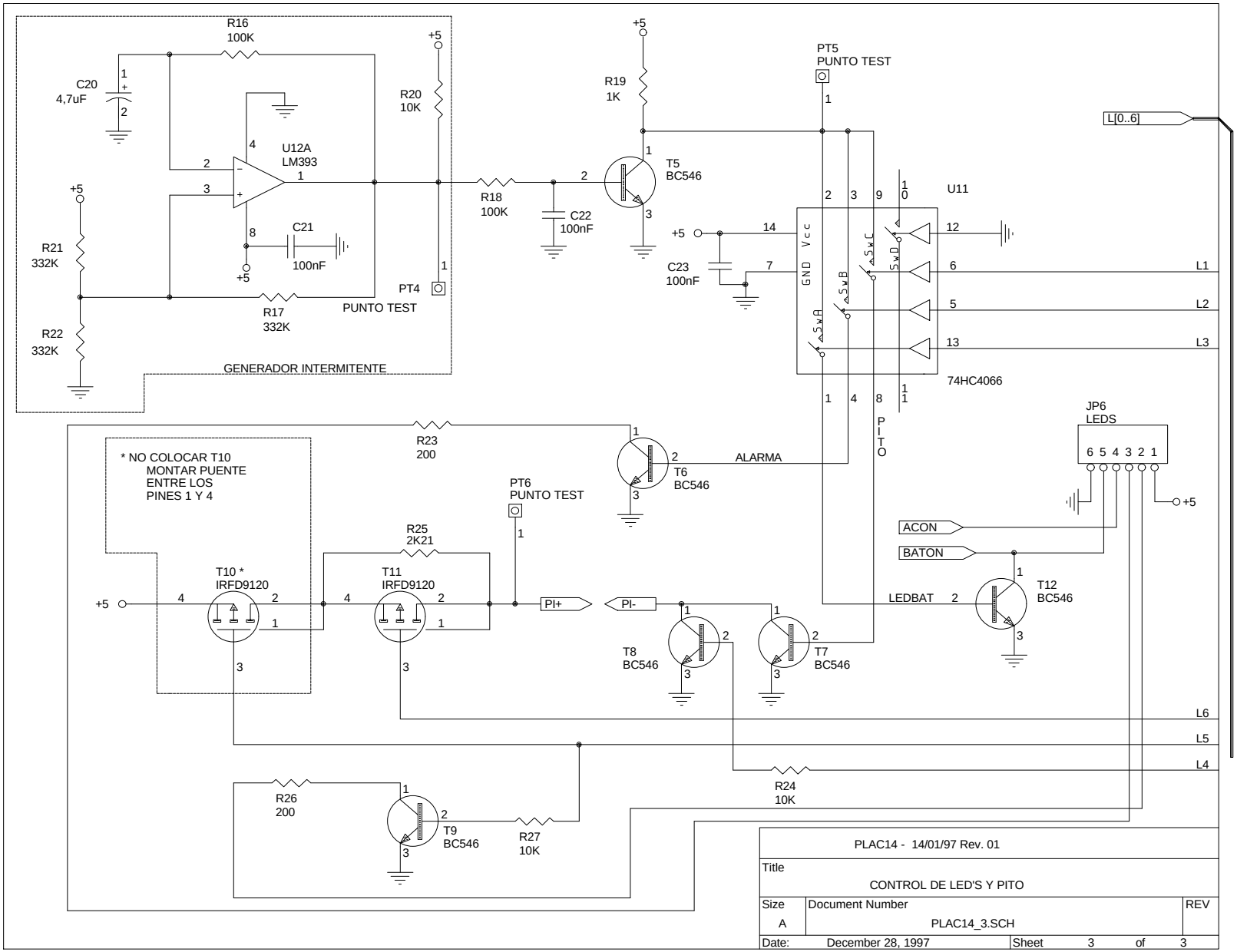

EXCITACION
TRANSDUCTOR
SWITCH PRESION-CALIBRACION
AMPLIFICADOR DIFERENCIAL
(Ganancia = -80,5)
SENAL DE CALIBRACION
AJUSTE DE GANANCIA
G = -1,858
+
SUMADOR DE OFFSET
FILTRO PASO-ALTO
fc = 1,03Hz
G = -3
AMPLIFICADOR
(G = -33,3)
ELEVADOR TENSION
(3,1 V)
FILTRO PASO-BAJO 2o ORDEN
(fc = 7,25 Hz)
(G = 1)
CONTROL DE POTENCIA
ELECTROVALVULA Y COMPRESOR
VALVULA1
VALVULA2
BOMBA
PLAC10 - 03/05/94 Rev. 01/B
MEDIDA PRESION NO INVASIVA
PLAC10_4.SCH
December 28, 1997
Sheet 4 of 4

5.3.6. P000PLAC14 Schematics.

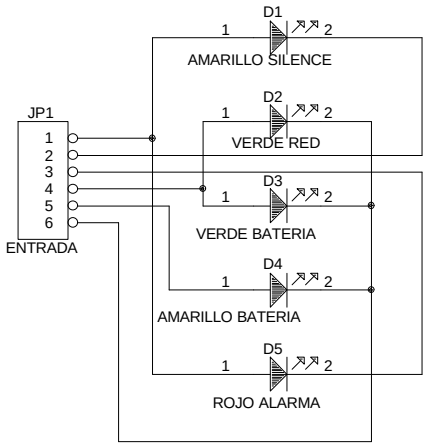

JP1
V+5
+12P
VCC
C2
2200uF
C10
10uF
PG1
PIN
J1
J2
R1E
R1D
10K
C16
100nF
JP4
TECLADO
R12A
R12B
R12C
R12D
R12E
R12F
R12G
R12H
U6
PAL18P8
C22
WE\
C13
CSTEC
CSROM
OE\
CSRAM
CSDIS
CSLAT
C11
100nF
U1
SRAM 32Kx8
CSRAM
C23
U2
EPROM 64Kx8
ADRESS BUS
U8
74HC245A
U3
74HC373
C9
C12
C21
U5
MC34064P
VSS
VDD
OUT
R1C
C4
47nF
RESET
G1
C5
15pF
C6
15pF
X1
10MHz
R3
10M
RELOJ
R4
1K
C7
1uF
R1B
R2
47K
C18
U4
68HC11
XTAL
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
RESET
XIRQ
IRQ
PD0
R1H
R11
C8
1uF
C14
100nF
JP2
C[0..25]
DATA BUS
D[0..7]
R1A
PT2
PIN
R8
T1
BC546
R7
PT1
PUNTO TEST
R9
90K9
R10
49K9
C1
100nF
U7
74HC373
CONTROL DEL DISPLAY
CONTROL DE LED'S Y PITO
A0
CLK
R6
100
PI+
PI-
BATON
ACON
L[0..6]
JP3
EXTERIOR
KEYB
SS
SCK
MOSI
MISO
+12
-12
PITO+
PITO-
BATON
ACON
NIVBAT
OFFSOF
ONOFF1
ONOFF2
T2
BC546
PT3
PIN
R5
10K
PLAC14 - 14/01/97 Rev. 01
Title
ESQUEMA ORGANIZATIVO PLACA DISPLAY PLANAR
Size
B
Document Number
PLAC14_1.SCH
REV
Date:
December 28, 1997
Sheet
1
of
3



PLAC14 - 14/01/97 Rev. 01		
Title: CONTROLADOR SED1330		
Size: B	Document Number: PLAC14_2.SCH	REV
Date: December 28, 1997	Sheet 2 of 3	

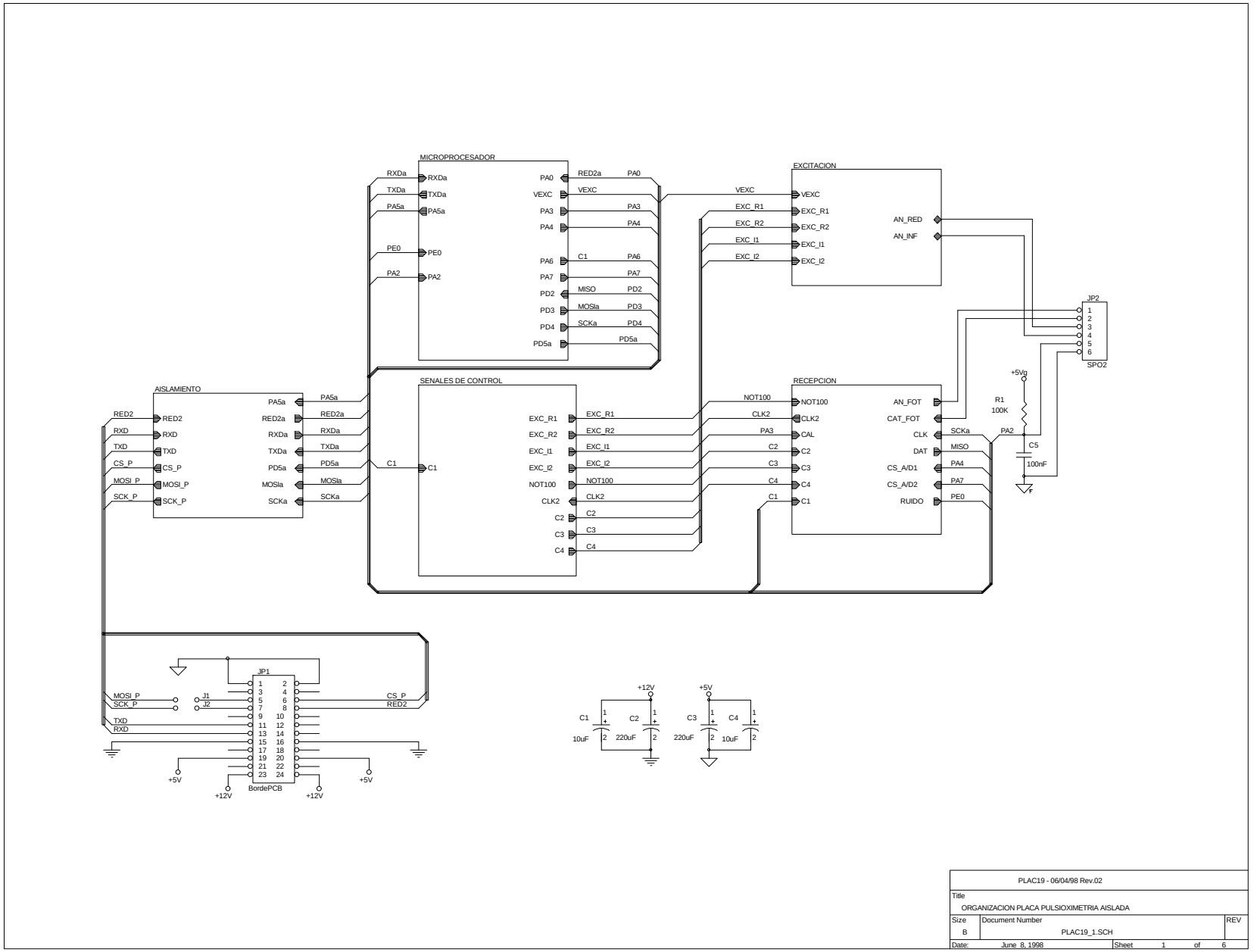

R16
100K
C20
4,7uF
U12A
LM393
C21
100nF
R21
332K
R22
332K
R17
332K
PUNTO TEST
PT4
GENERADOR INTERMITENTE
R20
10K
R19
1K
R18
100K
C22
100nF
T5
BC546
PT5
PUNTO TEST
L[0..6]
U11
C23
100nF
74HC4066
L1
L2
L3
JP6
LEDS
ACON
BATON
LEDBAT
T12
BC546
PITO
ALARMA
R23
200
T6
BC546
PT6
PUNTO TEST
* NO COLOCAR T10
MONTAR PUENTE
ENTRE LOS
PINES 1 Y 4
T10 *
IRFD9120
R25
2K21
T11
IRFD9120
PI+
PI-
T8
BC546
T7
BC546
L6
L5
L4
R24
10K
R26
200
T9
BC546
R27
10K
PLAC14 - 14/01/97 Rev. 01
Title
CONTROL DE LED'S Y PITO
Size
A
Document Number
PLAC14_3.SCH
REV
Date: December 28, 1997
Sheet 3 of 3

5.3.7. P000PLAC15 Schematics.

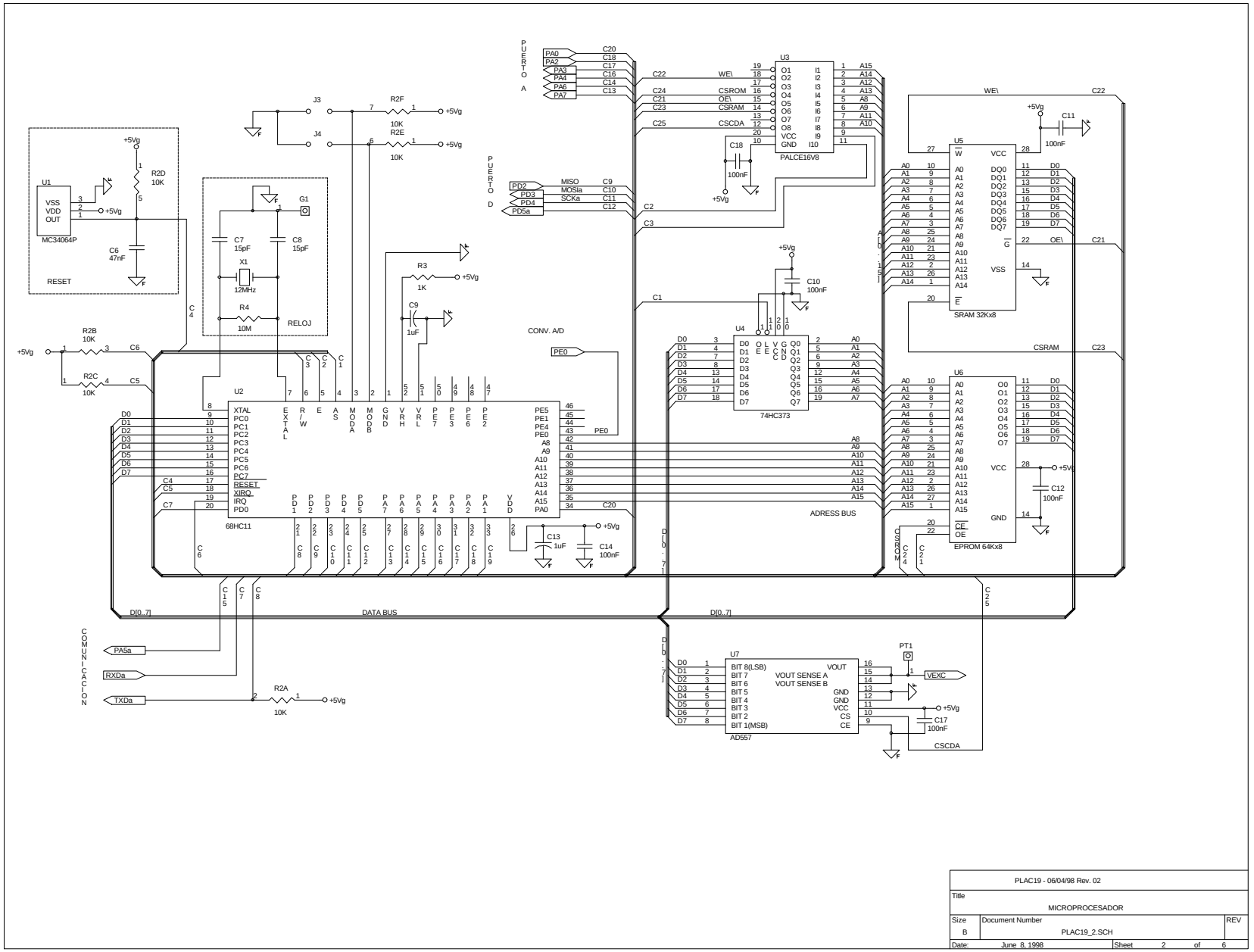


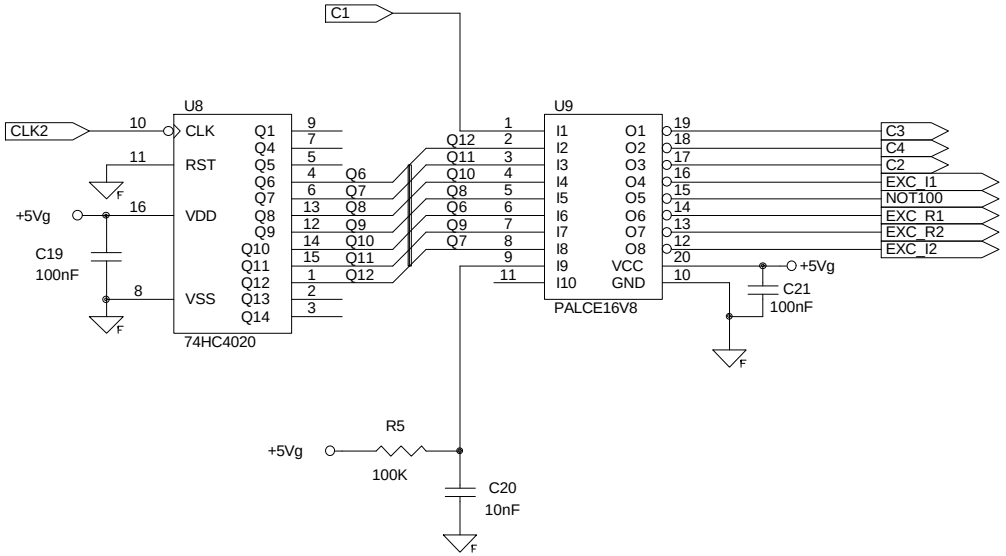
PLAC15 - 14/01/97 Rev. 01		
Title: ESQUEMA PLACA LEDFT		
Size: A	Document Number: PLAC15_1.SCH	REV:
Date: December 28, 1997	Sheet 1 of 1	

5.3.8. P000PLAC19 Schematics.

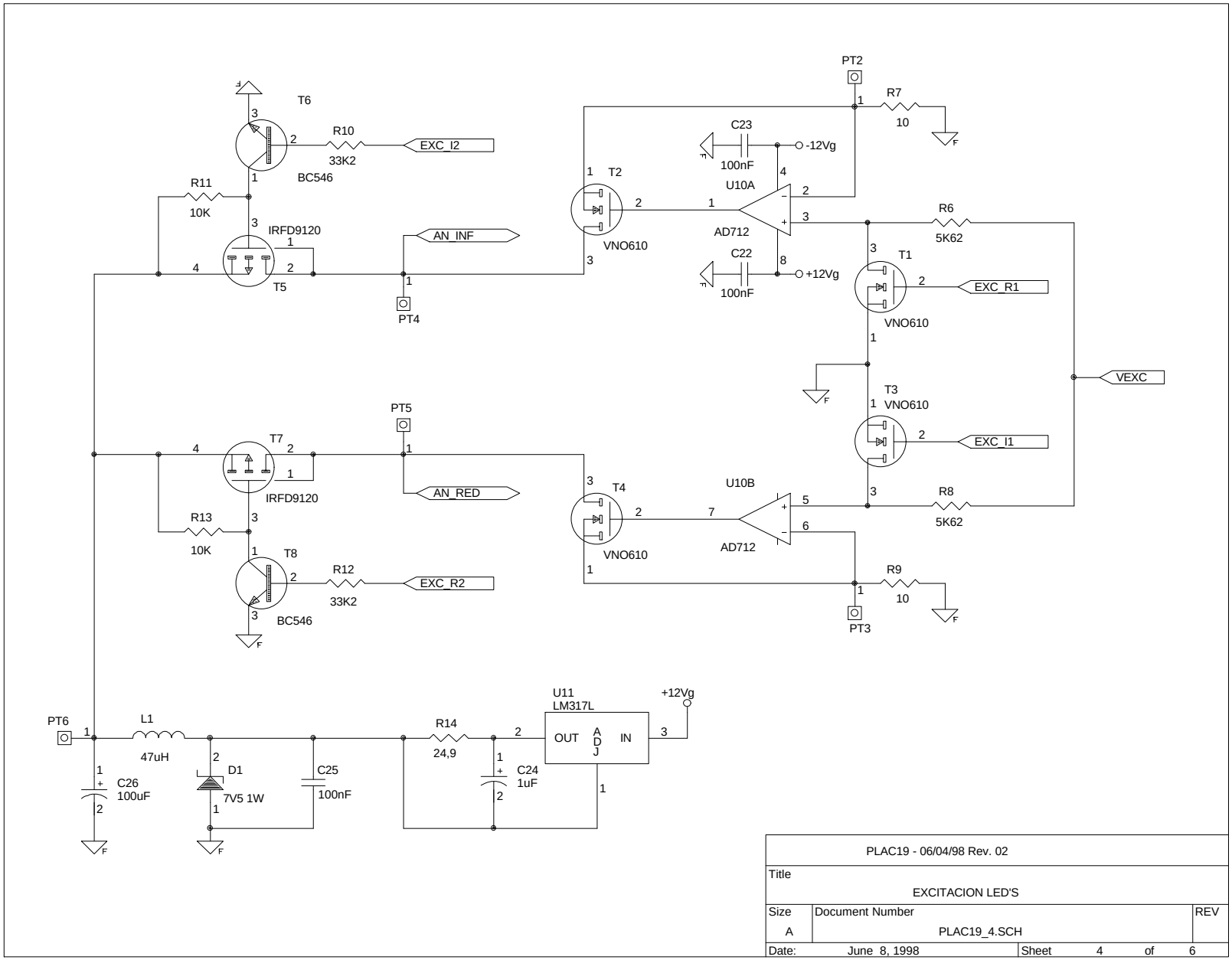


PLAC19 - 06/04/98 Rev.02		
Title: ORGANIZACION PLACA PULSIOXIMETRIA AISLADA		
Size: B	Document Number: PLAC19_1.SCH	REV
Date: June 8, 1998	Sheet 1 of 6	


PLAC19 - 06/04/98 Rev. 02
Title
MICROPROCESADOR
Size B
Document Number PLAC19_2.SCH
REV
Date: June 8, 1998
Sheet 2 of 6
68HC11
PALCE16V8
SRAM 32Kx8
EPROM 64Kx8
74HC373
AD557
MC34064P
DATA BUS
ADRESS BUS
CONV. A/D
RESET
RELOJ
COMUNICACION
PUERTO A
PUERTO D
+5Vg
WE\
OE\
CSRAM
CSROM
CSCDA
PA5a
RXDa
TXDa
VEXC



PLAC19 - 06/04/98 Rev. 02		
Title: SENALES DE CONTROL		
Size: A	Document Number: PLAC19_3.SCH	REV:
Date: June 8, 1998	Sheet 3 of 6	



PLAC19 - 06/04/98 Rev. 02		
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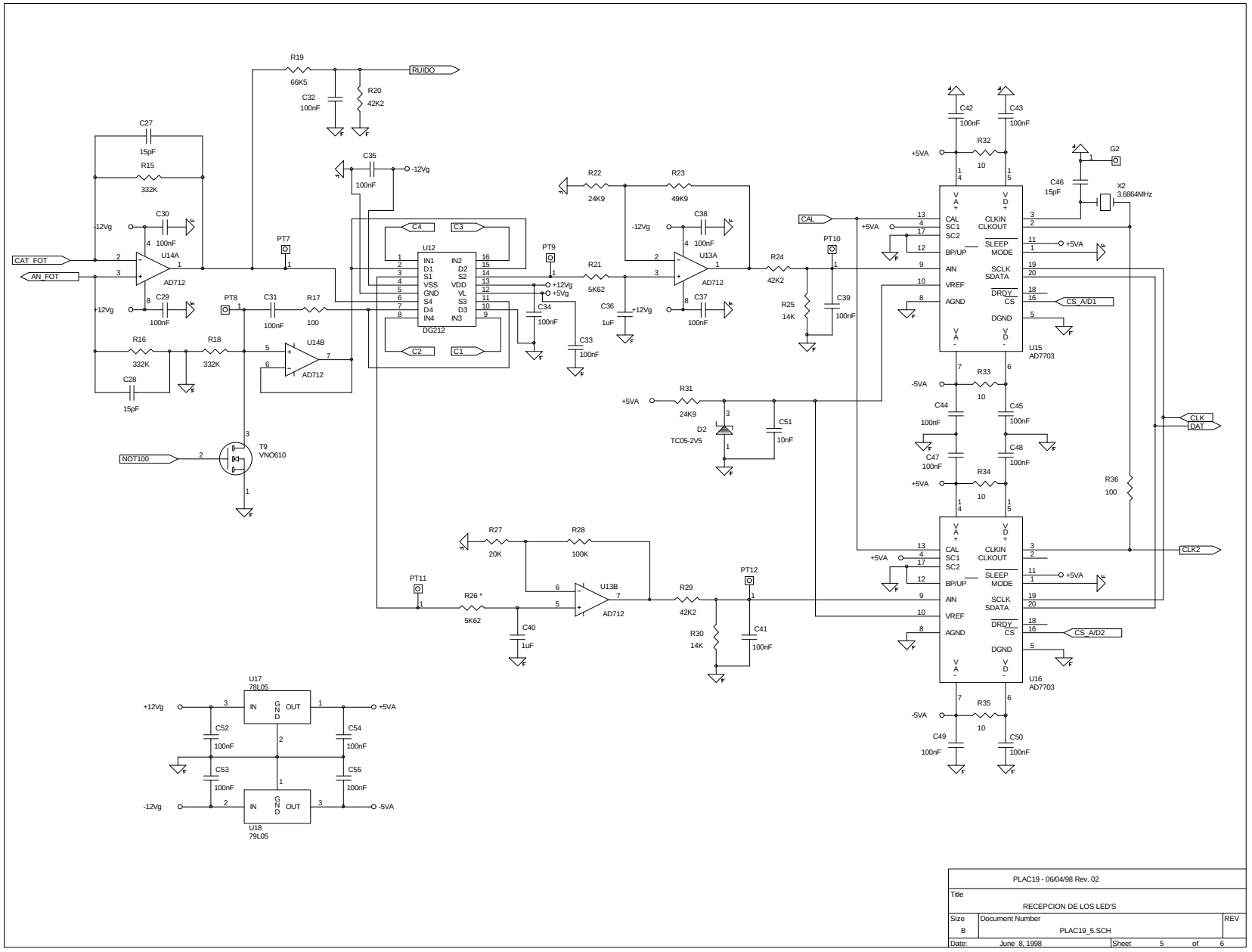
Size: A	Document Number: PLAC19_4.SCH	REV:
Date: June 8, 1998	Sheet 4 of 6	



PLAC19 - 06/04/98 Rev. 02		
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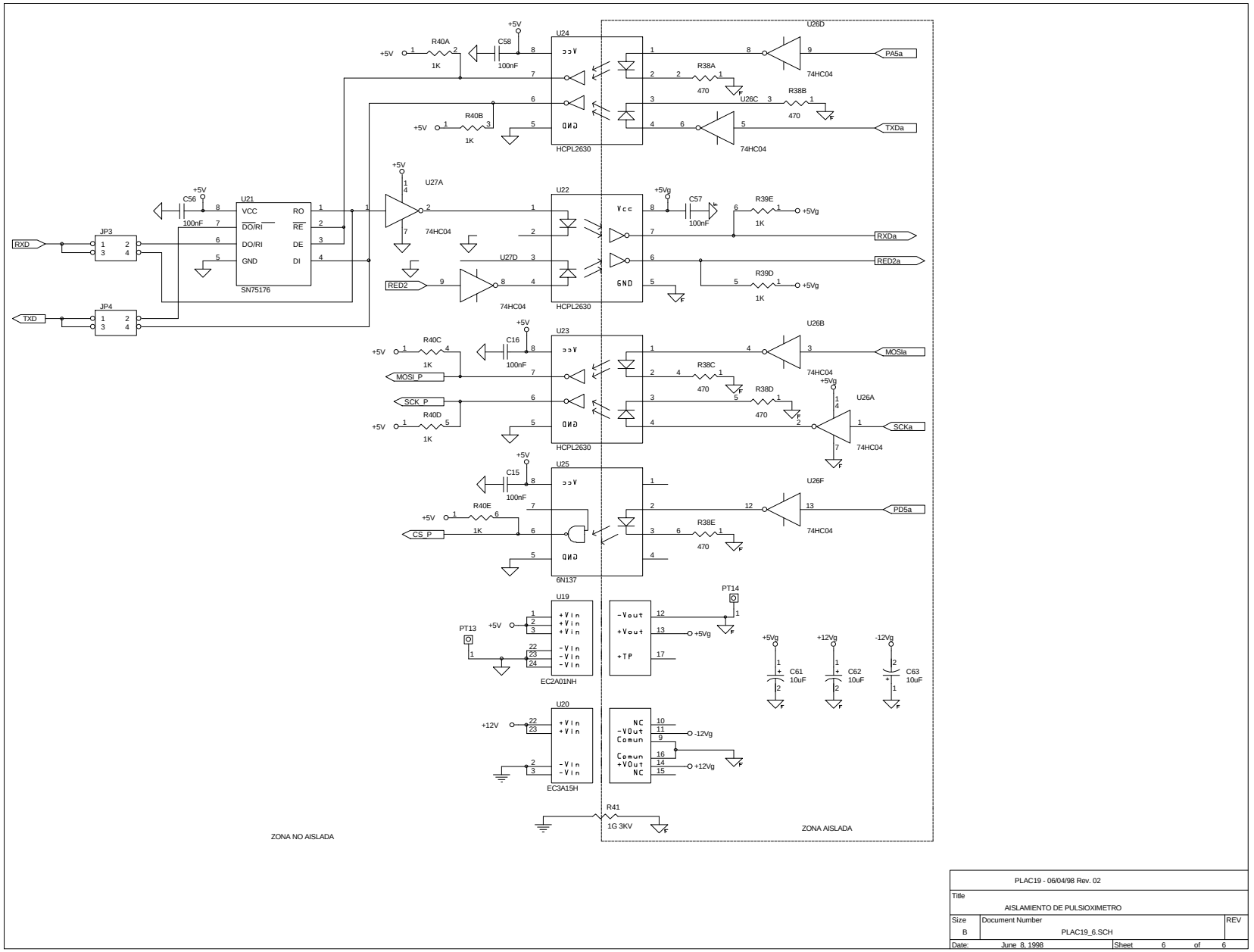
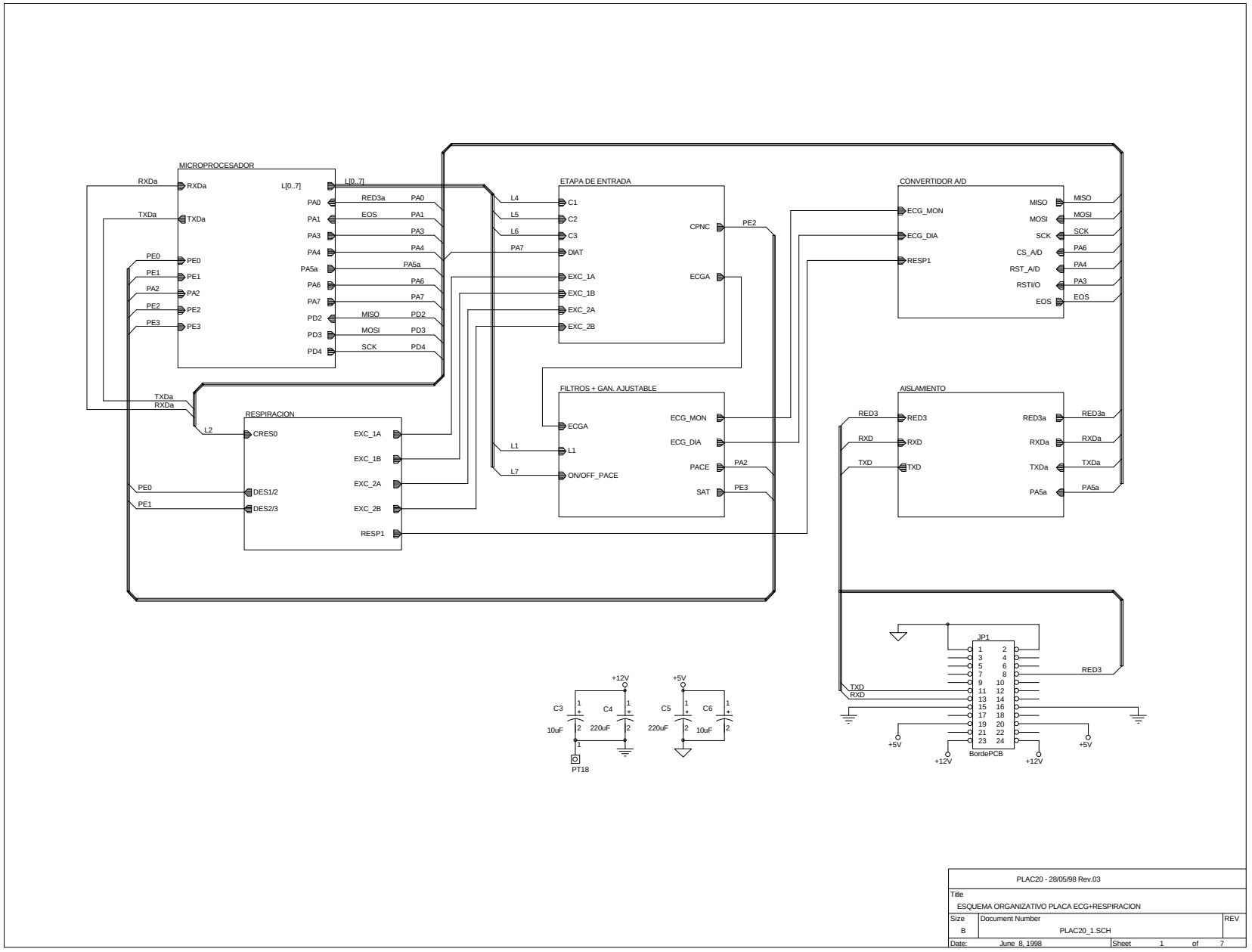
Size: B	Document Number: PLAC19_5.SCH	REV:
Date: June 8, 1998	Sheet 5 of 6	



PLAC19 - 06/04/98 Rev. 02			
Title: AISLAMIENTO DE PULSIOXIMETRO			
Size: B	Document Number: PLAC19_6.SCH		REV:
Date: June 8, 1998	Sheet 6 of 6		

5.3.9. P000PLAC20 Schematics.



PLAC20 - 28/05/98 Rev.03		
Title: ESQUEMA ORGANIZATIVO PLACA ECG+RESPIRACION		
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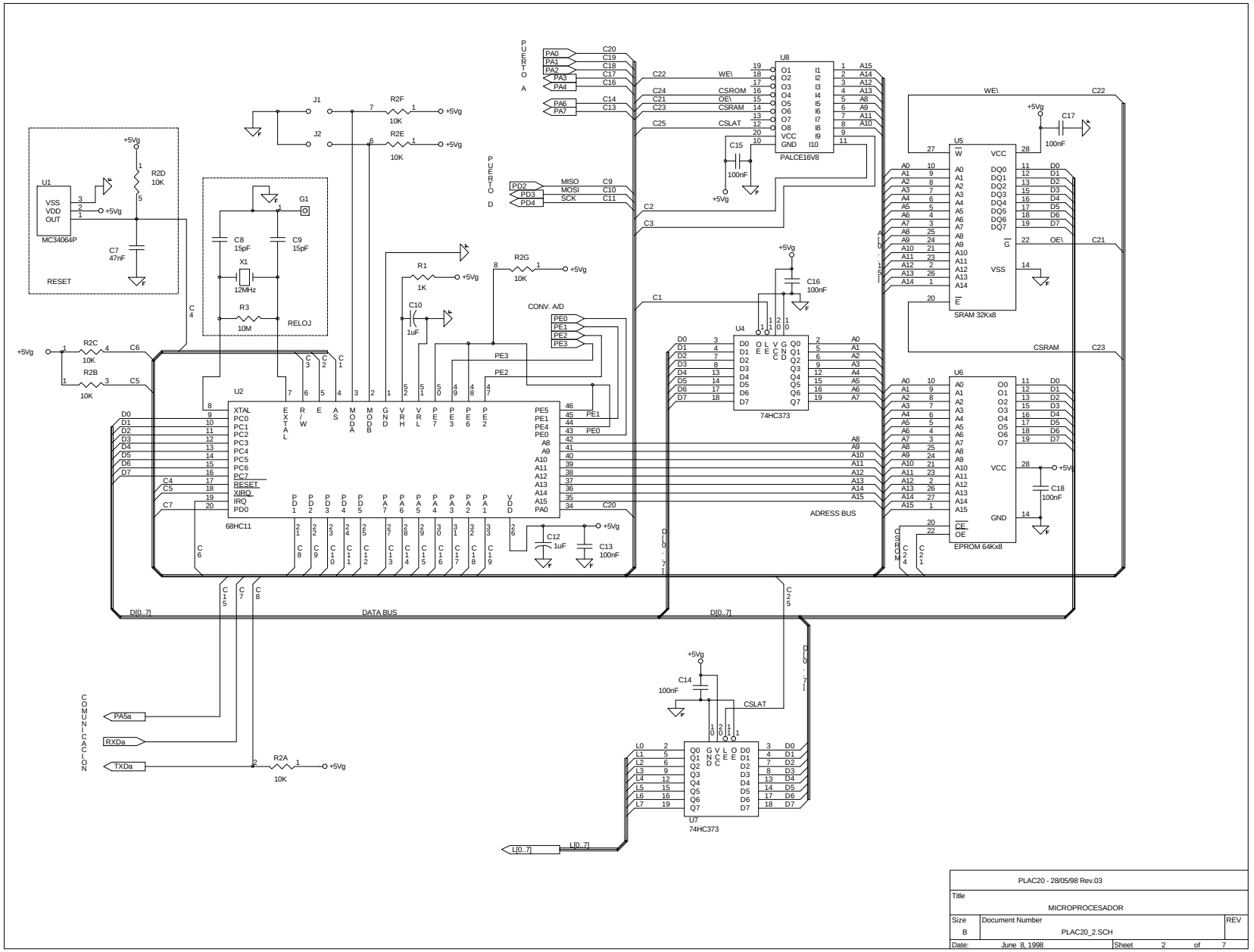
Date: June 8, 1998	Sheet 1 of 7	



PLAC20 - 28/05/98 Rev.03		
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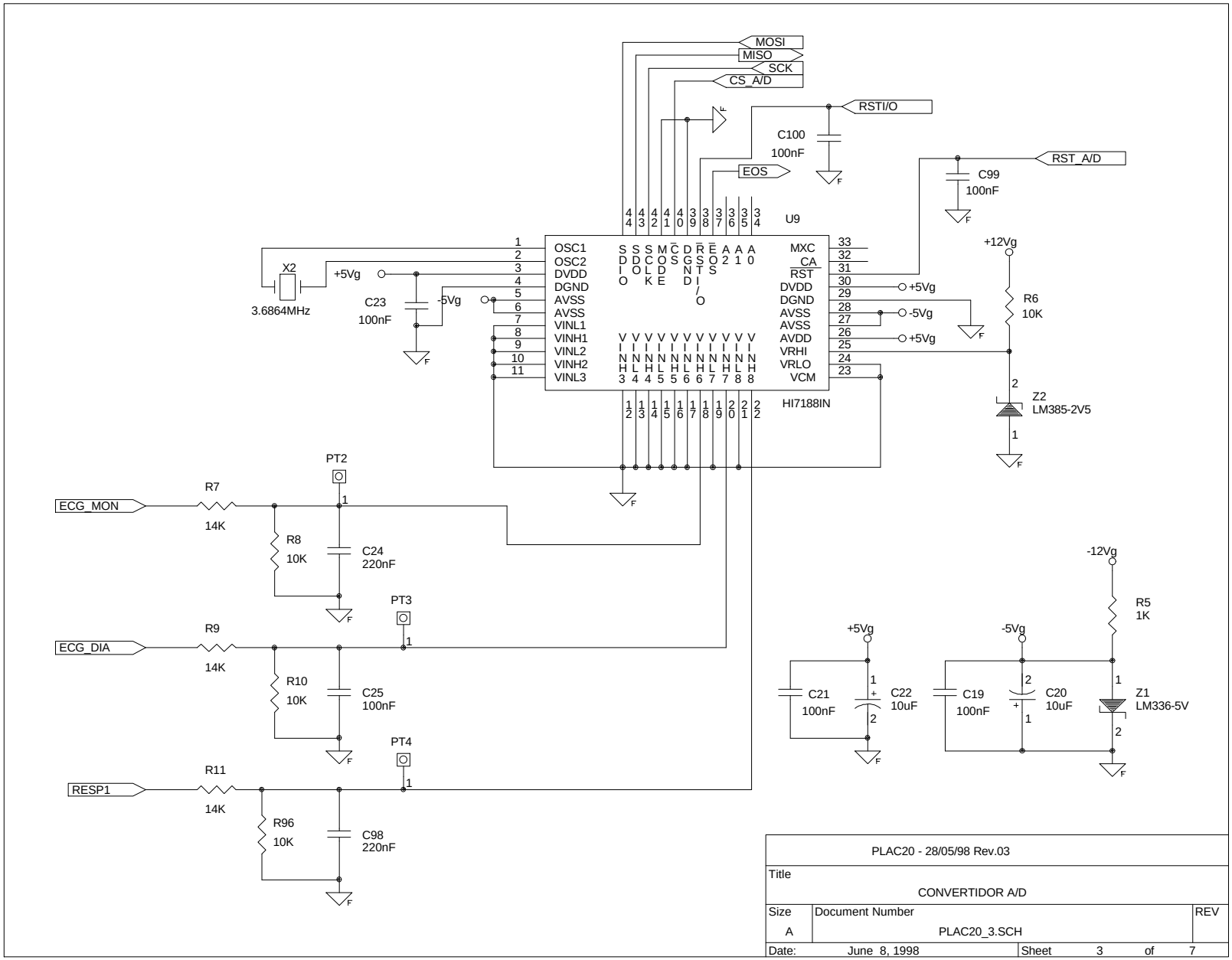
Date: June 8, 1998	Sheet 2 of 7	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DVDD
DGND
AVSS
AVSS
VINL1
VINH1
VINL2
VINH2
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DVDD
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AVSS
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PLAC20 - 28/05/98 Rev.03
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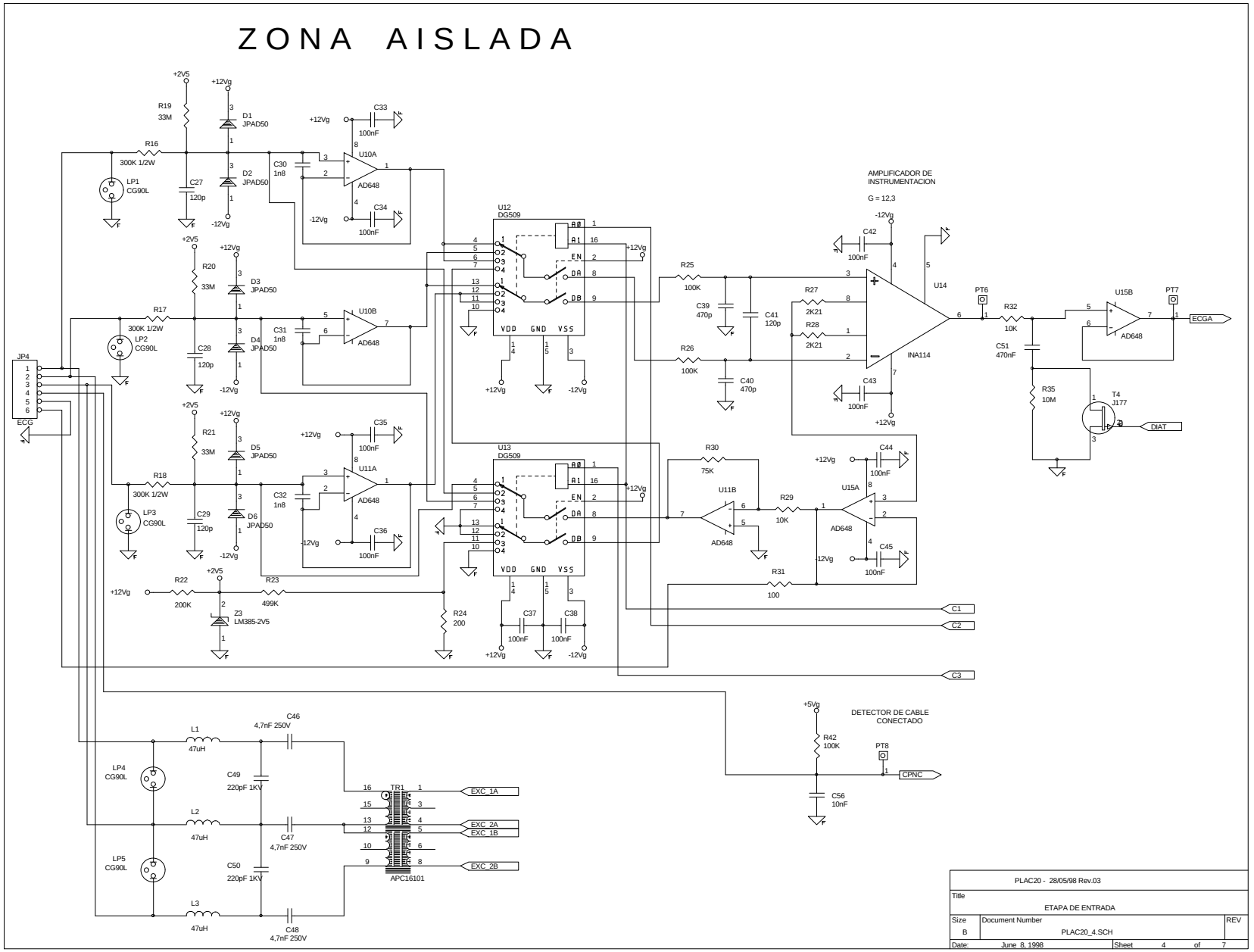
Date:
June 8, 1998
Sheet 3 of 7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DETECTOR DE CABLE CONECTADO
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EXC_2A
EXC_1B
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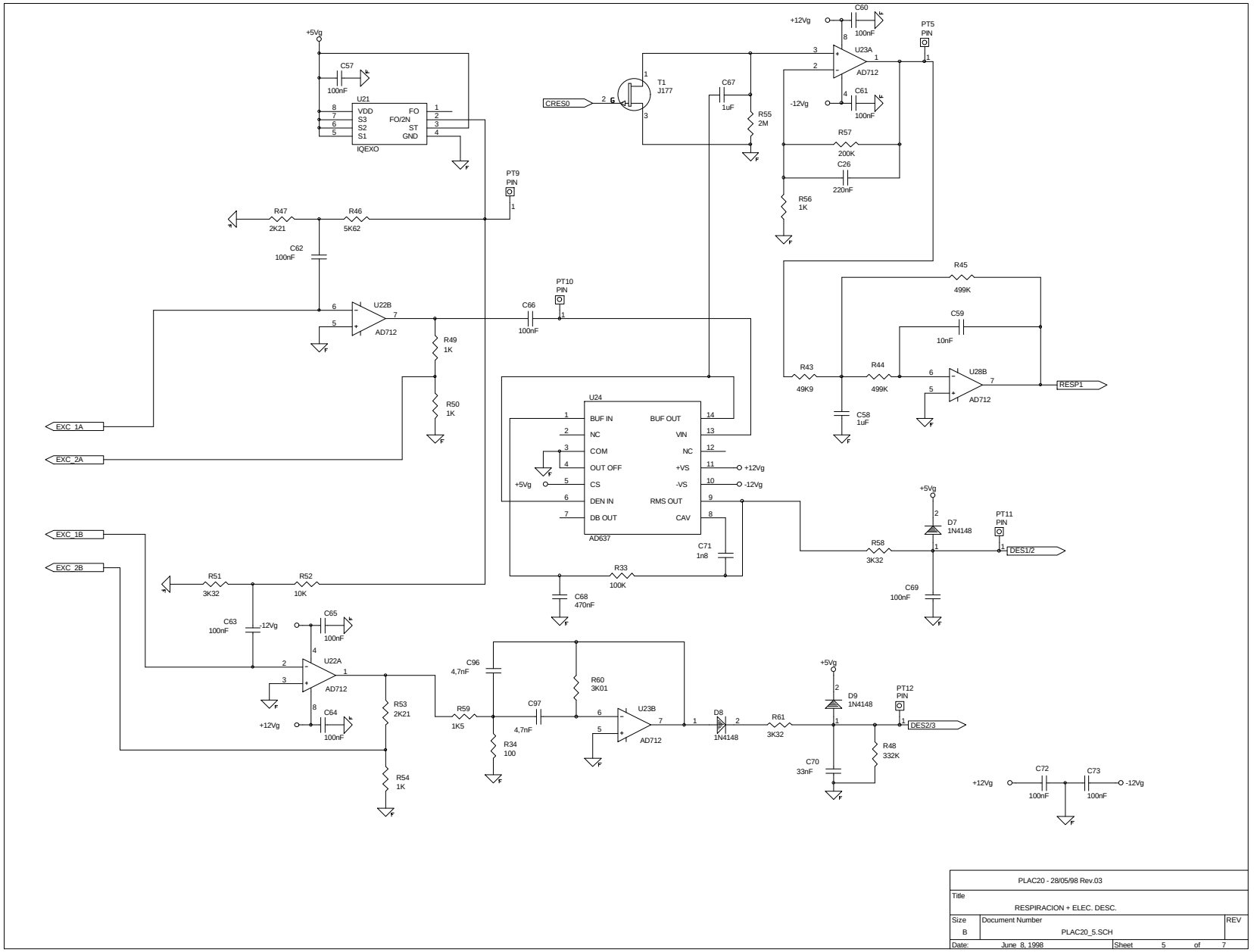
PLAC20 - 28/05/98 Rev.03
ETAPA DE ENTRADA
PLAC20_4.SCH
June 8, 1998
Sheet 4 of 7



PLAC20 - 28/05/98 Rev.03		
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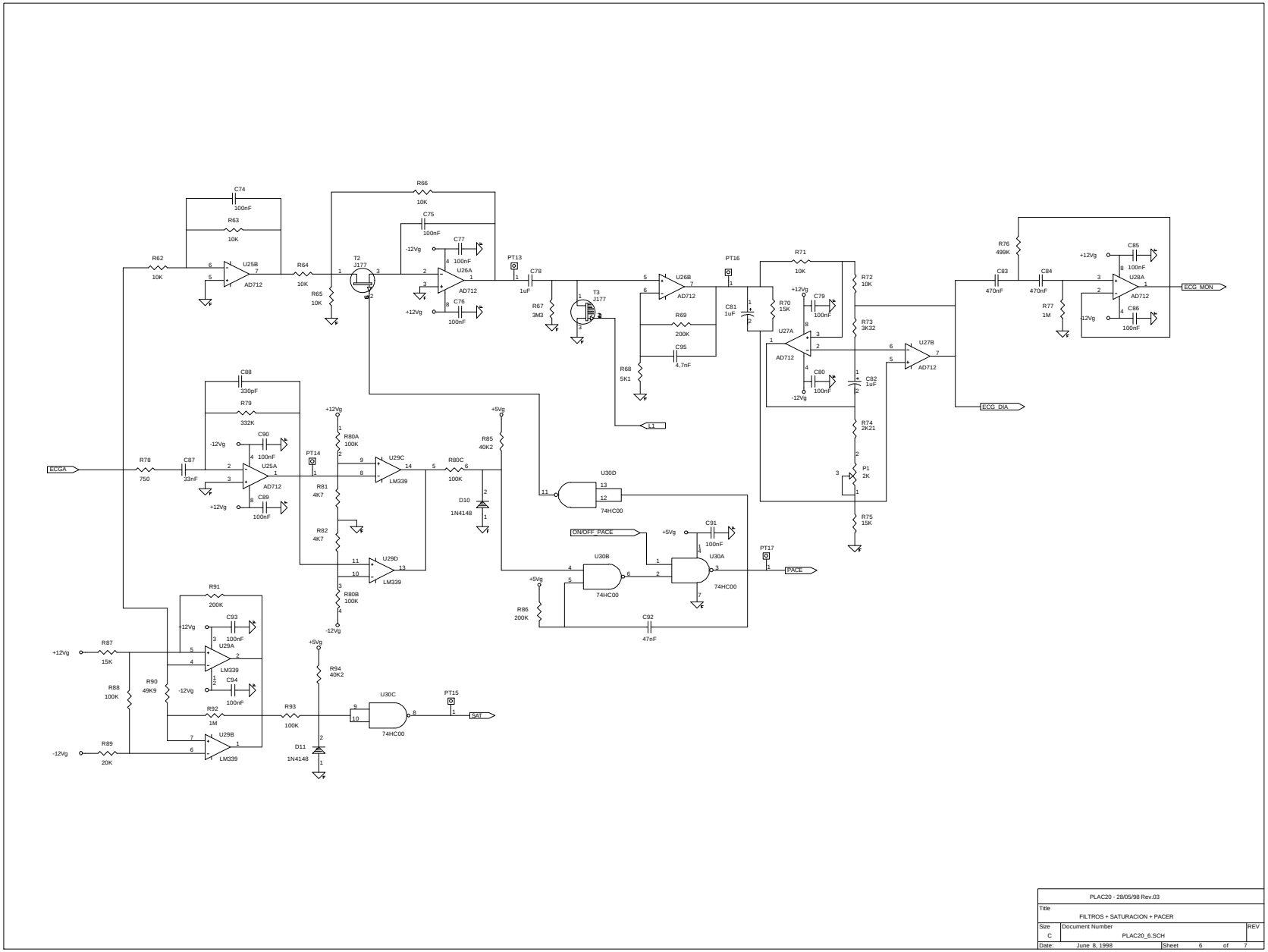
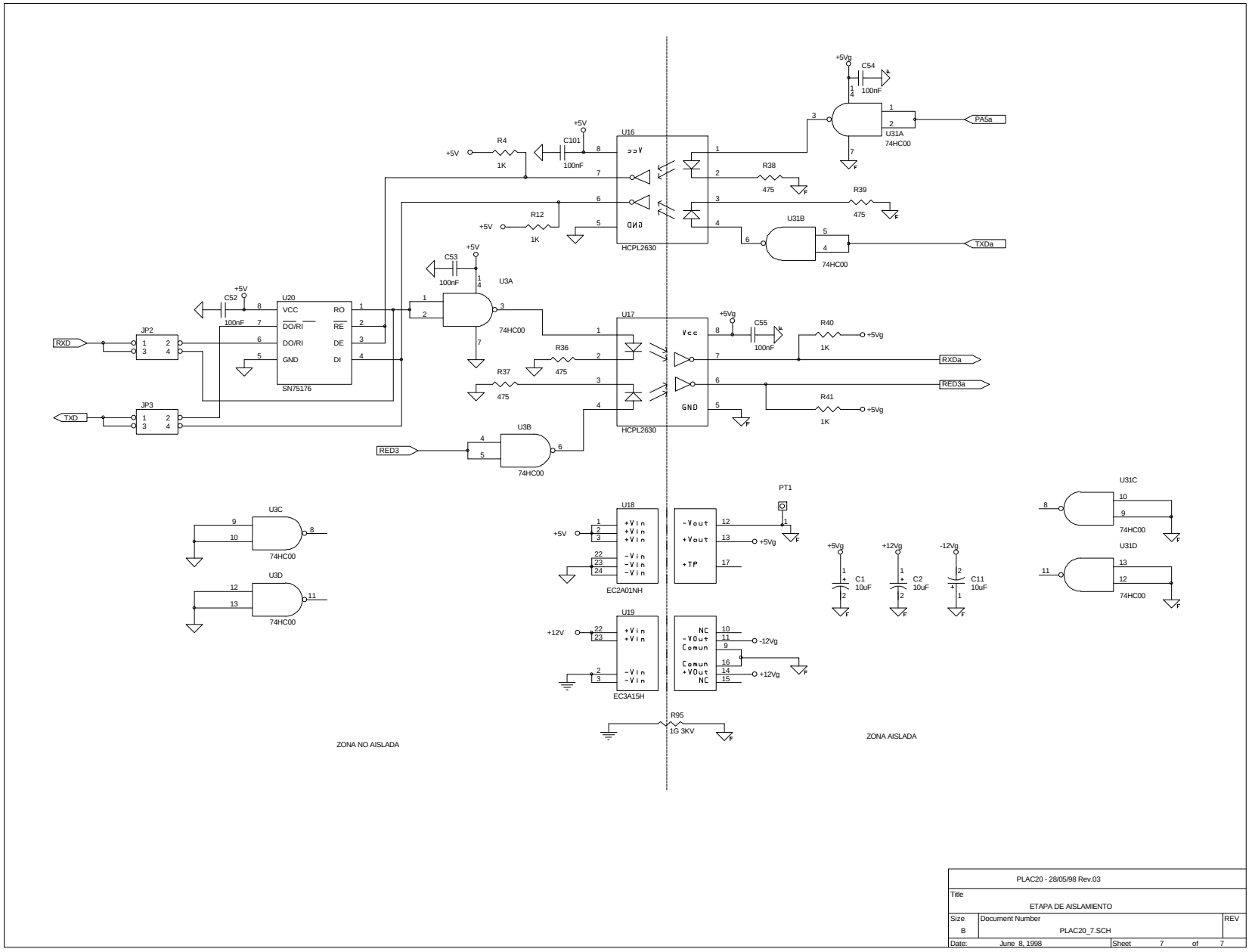
Size: B	Document Number: PLAC20_5.SCH	REV:
Date: June 8, 1998	Sheet 5 of 7	



PLAC20 - 28/05/98 Rev.03		
Title	FILTROS + SATURACION + PACER	
Size: C	Document Number: PLAC20_6.SCH	REV:
Date: June 8, 1998	Sheet 6 of 7	



PLAC20 - 28/05/98 Rev.03		
Title: ETAPA DE AISLAMIENTO		
Size: B	Document Number: PLAC20_7.SCH	REV:
Date: June 8, 1998	Sheet 7 of 7	