Trigger Fanout Board

User Manual

Introduction

The TFB (Trigger Fanout Board) is a hardware kit . It is composed of 2 cards : 1 PCI and 1 VME. No software is necessary, setting jumpers is sufficient.
This kit was made to be able to control both APV and FED through TTCVXs and TTCRX present on FEC and 9U FED.

Description of the kit

The PCI TFB and the TSC are plugged in the same PCI backplane. 2 flat cables are connected directly (J1->J1, J2->J2) between both cards.

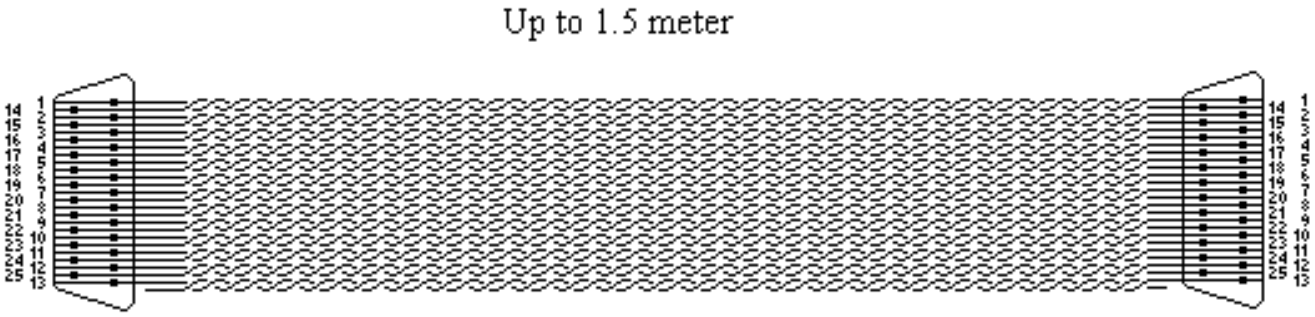
The PCI TFB and the VME TFB are connected together through a direct 25 pins cable (see below).

The PCI TFB exists particularly for the link between VME TFB and TSC, nevertheless, it can recuperate up to 6 FAST WARN lines from FED PMCs and ouput a TTL signal which is an OR function of the 6 inputs.

The VME TFB is able to :

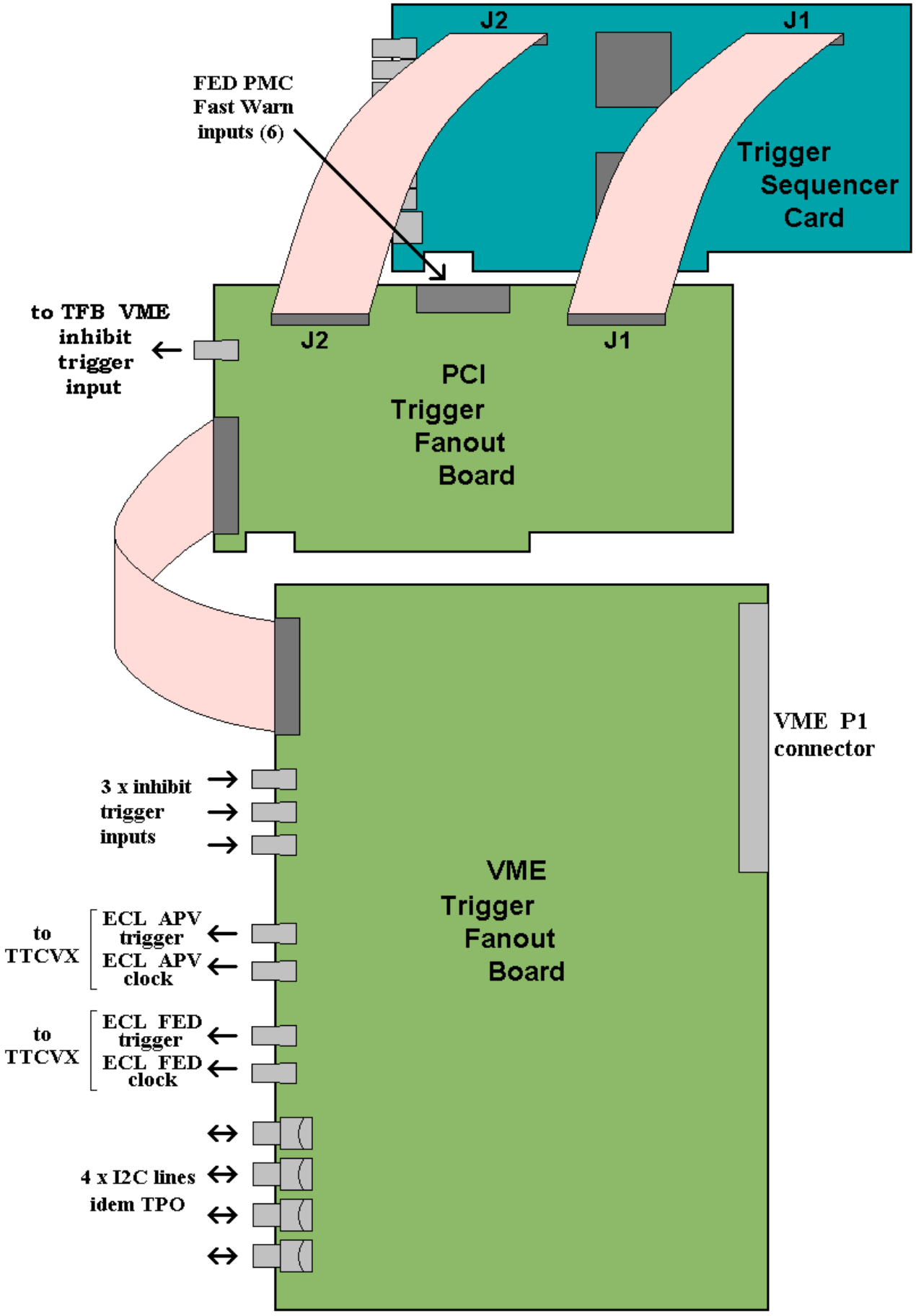
- interface 4 I2C lines (same features as TPO),
- deliver ECL trigger and clock signals for APVs through TTCVX
- deliver ECL trigger and clock signals for 9U FED through TTCVX
- input 3 any polarity TTL inhibit signals.

25 pins CABLE



The most suitable is a 26 wires flat twisted pair cable (the 26th is left unwired).

Description of the kit


J2
J1
FED PMC
Fast Warn
inputs (6)
Trigger
Sequencer
Card
to TFB VME
inhibit
trigger
input
J2
J1
PCI
Trigger
Fanout
Board
VME P1
connector
3 x inhibit
trigger
inputs
VME
Trigger
Fanout
Board
to
TTCVX
ECL APV
trigger
ECL APV
clock
to
TTCVX
ECL FED
trigger
ECL FED
clock
4 x I2C lines
idem TPO

SUPPLY

PCI : Power comes from the PCI connector
VME : Power comes from the P1 connector. Setting jumper J52, the card can be supplied from external +5V and –5.2V.

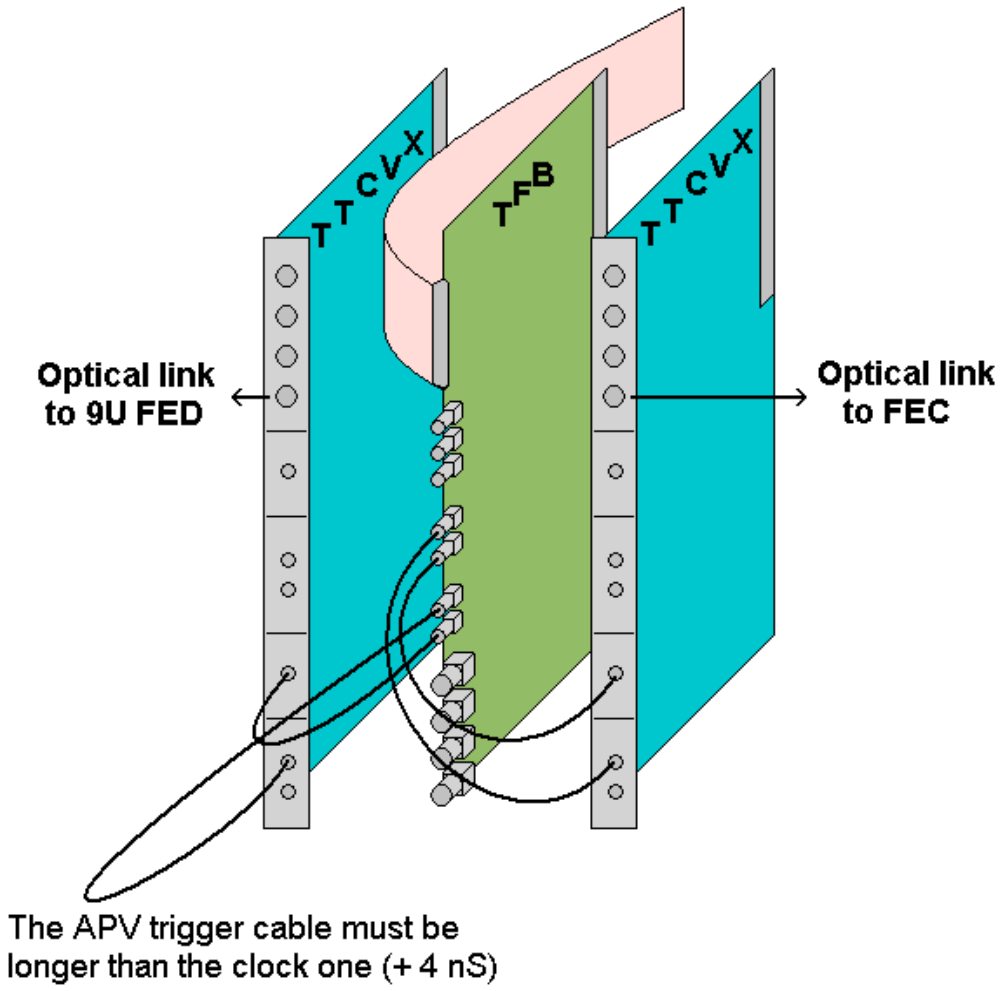
CONNECTING TO FED PMC Fast Warn

The PCI card can accept up to 6 FED PMC Fast Warn outputs.

Input #	1	3	5	7	9	11	13 NC
GND	2	4	6	8	10	12	14

PMC FED inputs cabling

CONNECTING TO TTCVX



JUMPERS

INHIBIT CIRCUIT

See ***Schematics VME Supply and throttle parts*** and ***Jumpers on top VME layer***

There are 3 TTL inhibit inputs. Inputs and output can be adapted setting jumpers, therefore any logic combination can be made. The inputs polarization can also be set. They are not by default.

input#	Input polarization		Input polarity			Output polarity		
	+ 5v	gnd		Active low	Active high		direct	inverted
3	J5	J9	J12	1-2 (PMC FED)	2-3 * (9U FED)	J6	1-2 *	2-3
2	J3	J7	J10					
1	J4	J8	J11					

* default position

A green LED is lighted when the INHIBIT signal (directly connected to TSC input) is at low level (0v).

APV and FED CIRCUITS

See Figures ***Schematics VME ECL adaptation and I2C parts*** , ***Jumpers on top VME layer*** and ***Jumpers on bottom VME layer***

The APV circuit comes directly ECL from TSC. The polarity is adjustable. The ECL polarization is already made inside TSC.

	APV	
	Clock	Trigger
positive	J19 *	J23 *
negative	J17	J22

Jumpers for APV circuit

The FED circuit is LVDS. Clock and trigger are translated to ECL. The polarity is adjustable. The ECL polarization can be connected or not. In addition, one more LVDS circuit was connected.

	FED				APV			
	clock		trigger		clock		trigger	
	Polarity	ECL Pol**	Polarity	ECL Pol**	polarity	ECL Pol**	polarity	ECL Pol**
positive	J15 *	J26 *	J13 *	J16 *	J19 *	J29 *	J23 *	J25 *
negative	J20	J28 *	J14	J24 *	J17	J27 *	J22	J21 *

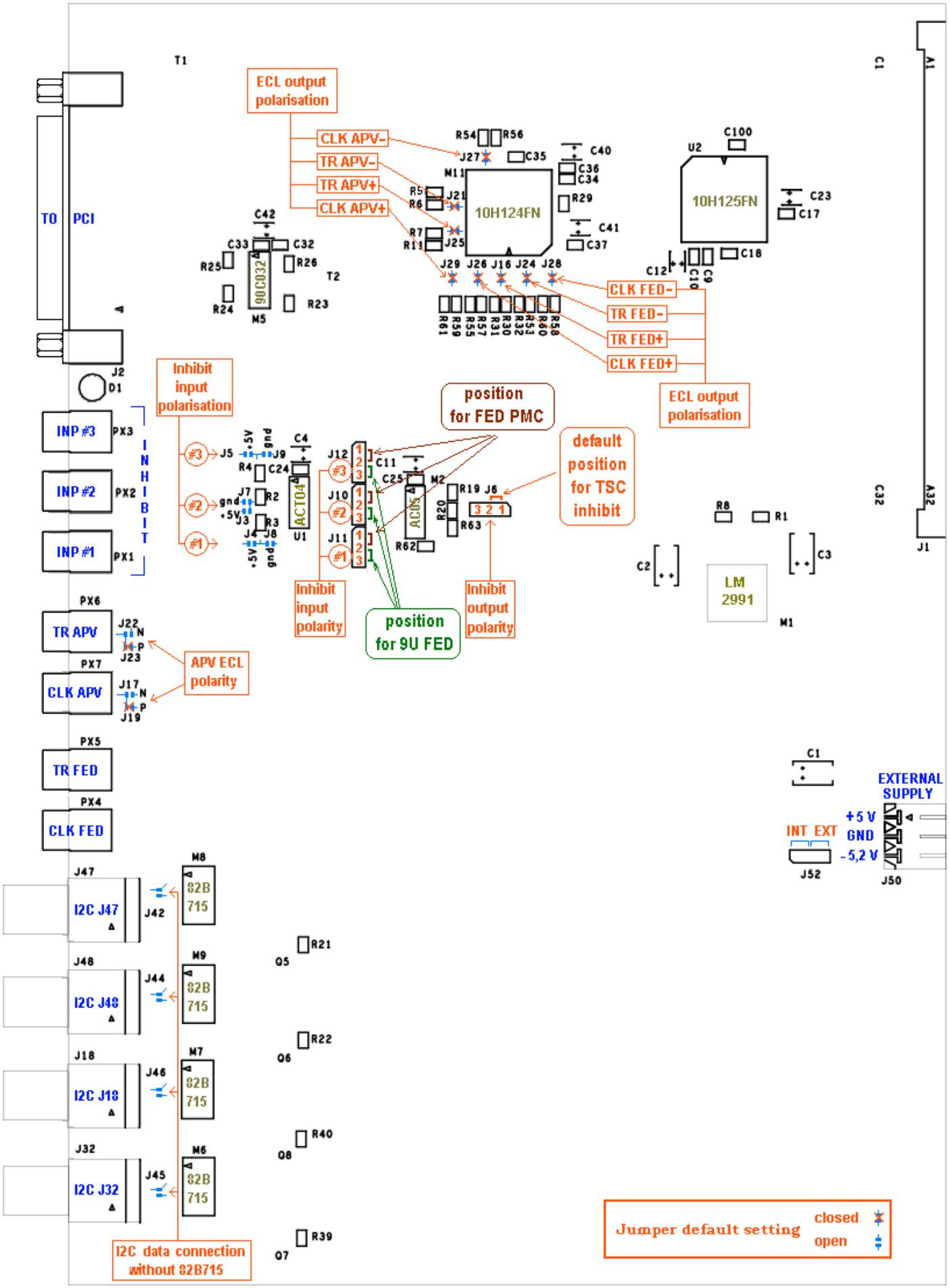
Jumpers for FED circuit

** ECL Polarization

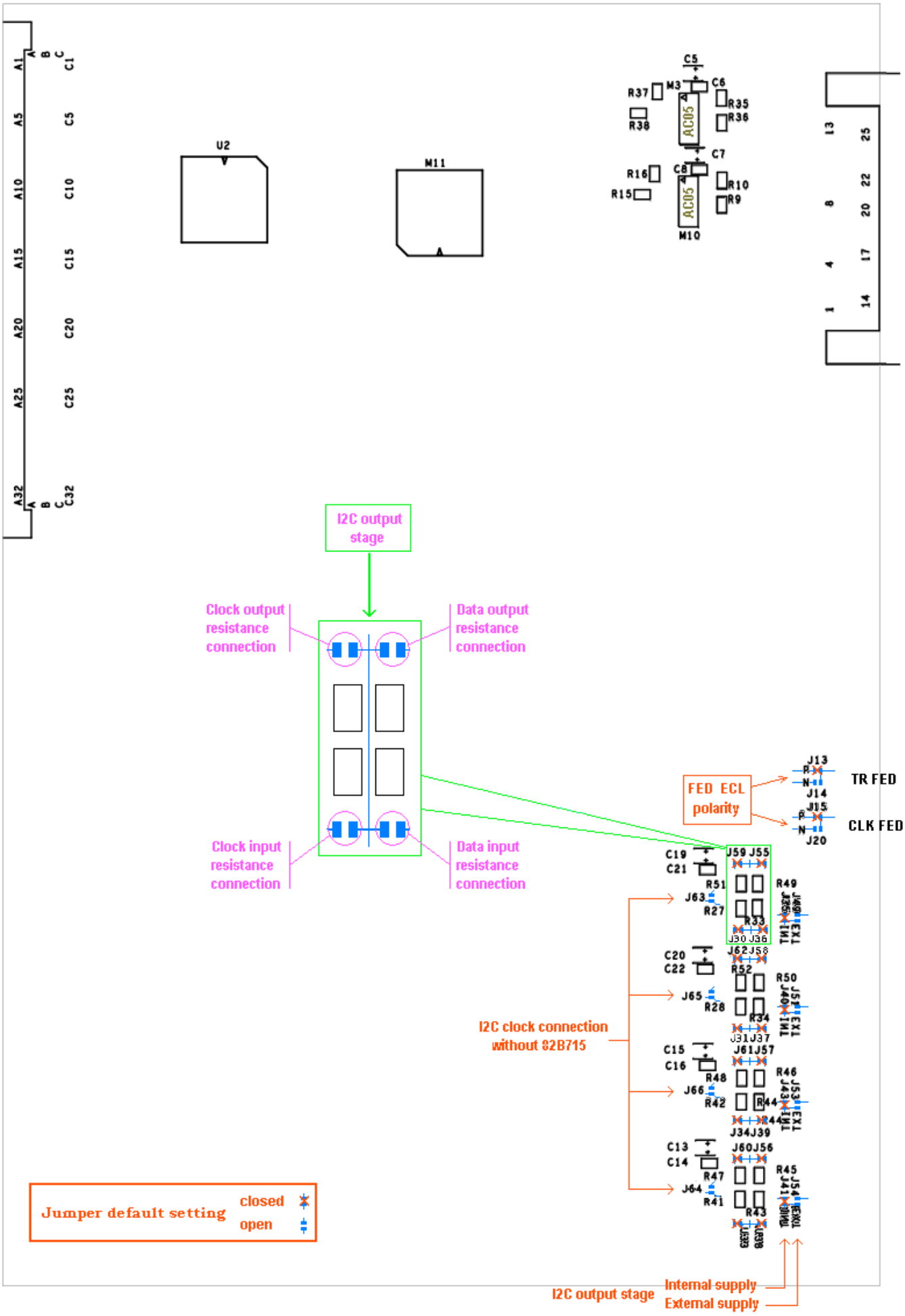
I2C CIRCUIT

See Figures ***Schematics VME ECL adaptation and I2C parts*** , ***Jumpers on top VME layer*** and ***Jumpers on bottom VME layer***

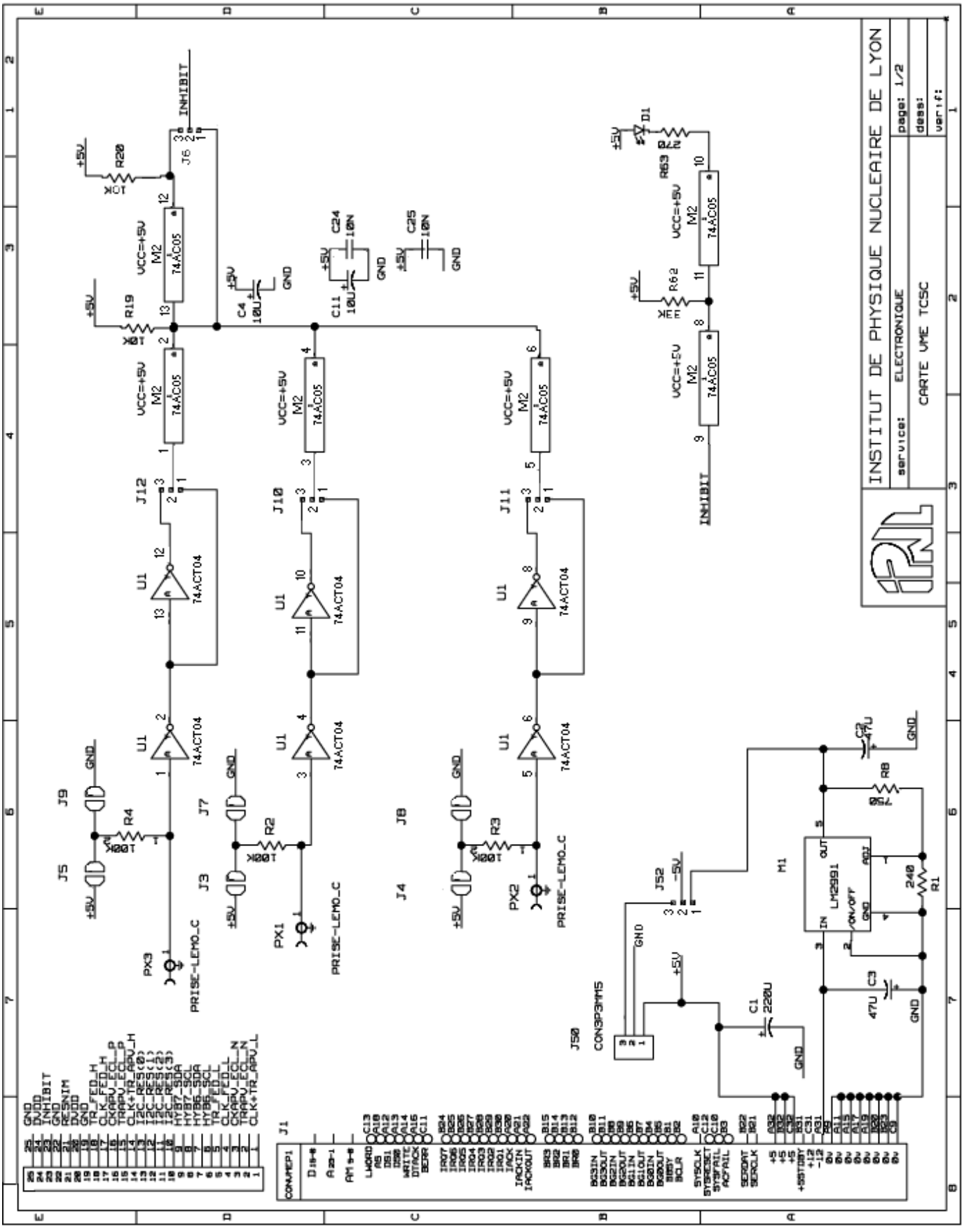
The circuit is exactly the same as TPO I2C part.



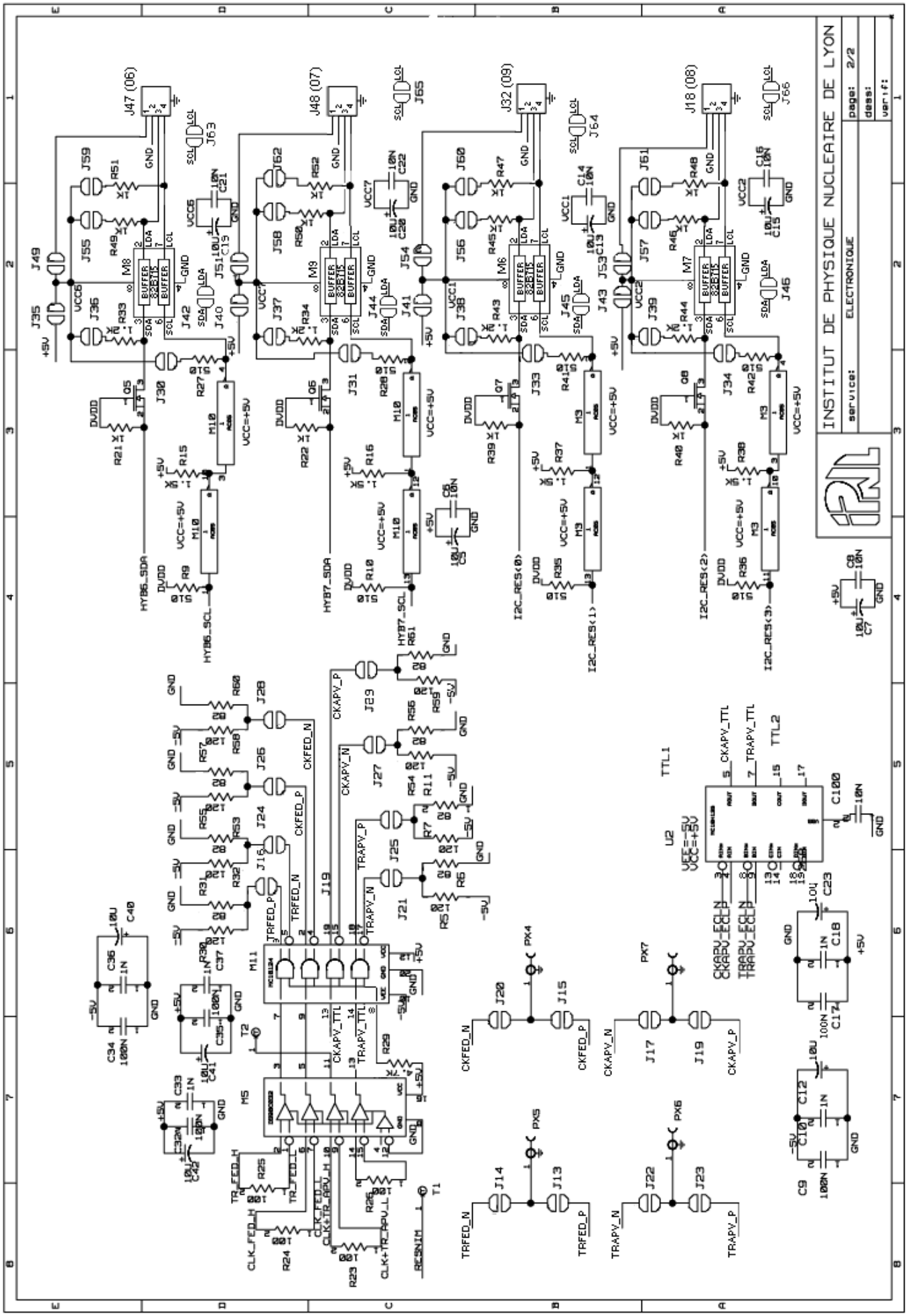
Jumpers on top VME layer



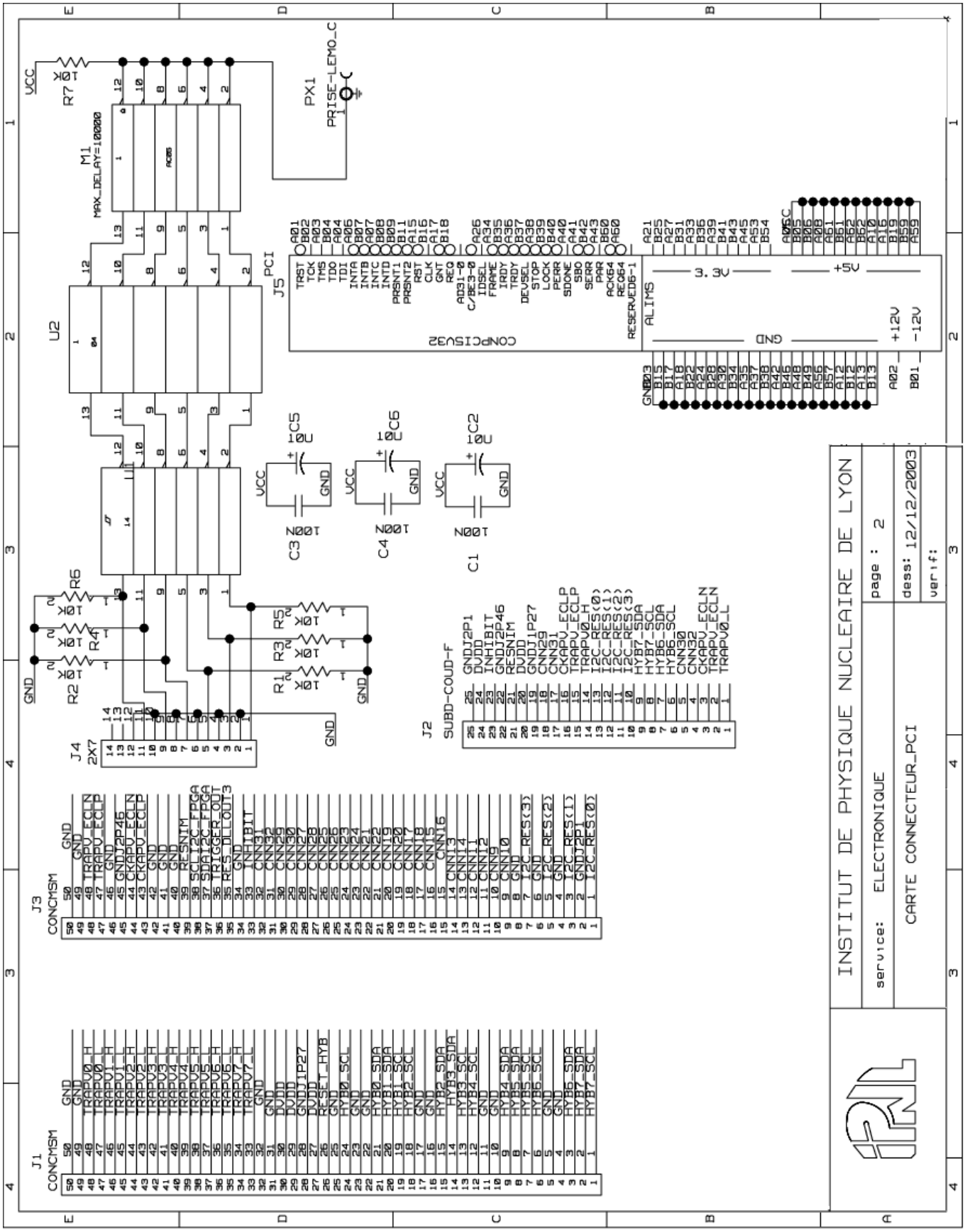
Jumpers on bottom VME layer



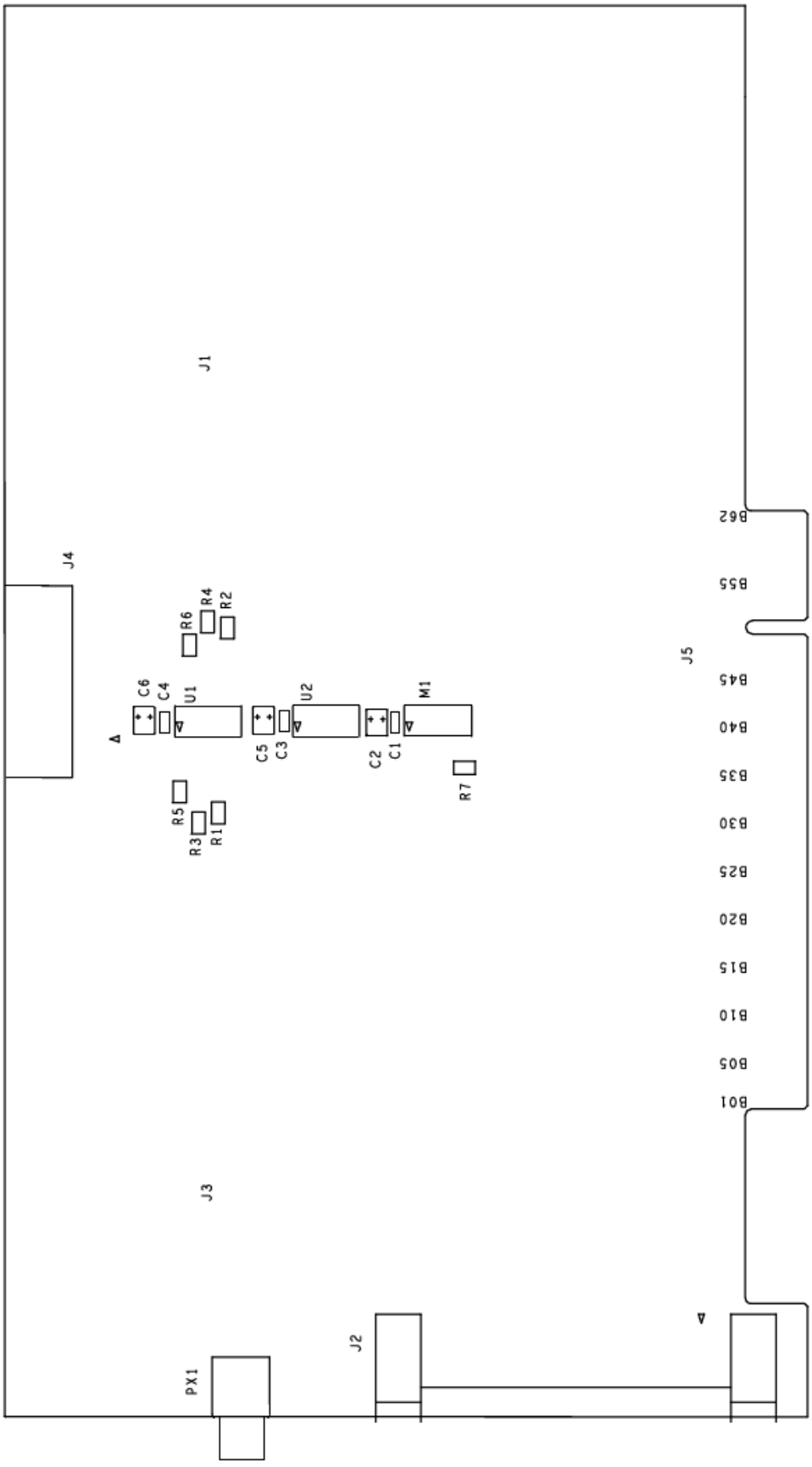
Schematics VME Supply and throttle parts



Schematics VME ECL adaptation and I2C parts



Schematics PCI



Implantation PCI

Component	Value	Label	Qty
VME CARD			
S70X45	100u	C1	1
S23X15_805	1n	C10,C18,C33,C36,C37	5
S23X15_805	10n	C6,C8,C14,C16,C21,C22,C24,C25,C100	9
S35X28POL	10u	C4,C5,C7,C11-C13,C15,C19,C20,C23,C40-C42	13
S23X15_805	100n	C9,C17,C32,C34,C35	5
S70X45	47u	C2,C3	2
S0805	240	R1	1
S0805	510	R9,R10,R27,R28,R35,R36,R41,R42	8
S0805	82	R6,R11,R31,R53,R56,R57,R60,R61	8
S0805	1.5k	R15,R16,R37,R38	4
S0805	10k	R19,R20	2
S0805	100k	R2-R4	3
S0805	1k	R21,R22,R39,R40,R45-R52	12
S0805	100	R23-R26	4
S0805	4.7k	R29	1
S0805	120	R5,R7,R30,R32,R54,R55,R58,R59	8
S0805	1.2k	R33,R34,R43,R44	4
S0805	33k	R62	1
S0805	270	R63	1
S0805	750	R8	1
74ACT04		U1	1
74AC05		M2,M3,M10	3
LM2991		M1	1
MC10H124FN		M11	1
MC10H125FN		U2	1
Support PLCC20			2
TN0200T		Q5-Q8	4
DS90C32		M5	1
82B715		M6-M9	4
CON_ALIM _3P		J50	1
CON_VME_3X32		J1	1
GREEN_LED		D1	1
LEMO 4 pins EPL0S.304.HLN		J18,J32,J47,J48	4
LEMO 1 pin EPL00.250.DTN		PX1-PX7	7
SUB_DB25 RIGHT ANGLE Fem		J2	1
PCI CARD			
S23X15_805	100n	C1,C3,C4	3
S35X28POL	10u	C2,C5,C6	3
S0805	10k	R1 -> R7	7
ERNI 50 pins SMD type 063210		J1,J3	2
SUB_DB25 RIGHT ANGLE Fem		J2	1
HE10 14 pins RIGHT ANGLE		J4	1
LEMO 1 pin EPL00.250.DTN		PX1	1
74AC05		M1	1
74ACT14		U1	1
74AC04		U2	1
CABLES			
SUBD 25 male			2
ERNI 50 pins type 103632			4

Component list