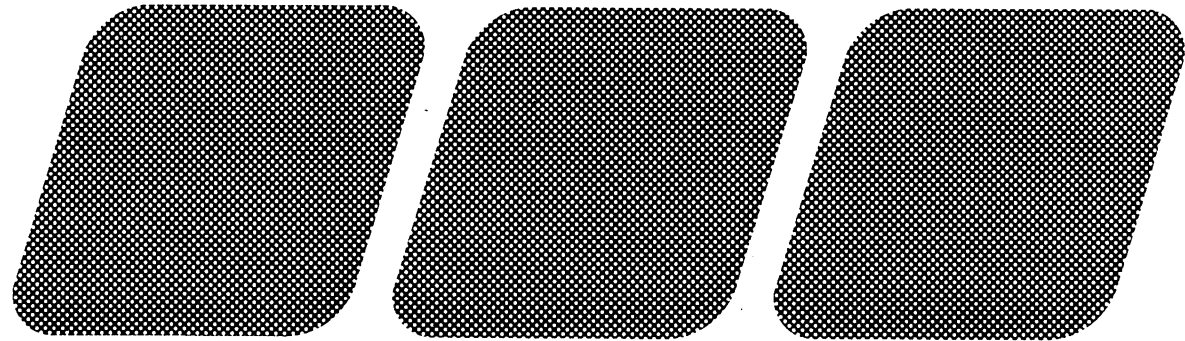


**SCHEMATIC
DIAGRAM**

CRUMAR[®]

Musical Instruments



**mod.
Spirit**

**SCHEMATIC
DIAGRAM**

mod.
Spirit



FEMALE CONNECTOR SYMBOL (es. J 2/1)



PLUG IN CONNECTOR SYMBOL



WIRE SOLDERING POINT



TEST POINT (T P...)



CONNECTING POINT (ON p.c.b.)



METALLIC FILM RESISTOR 1%

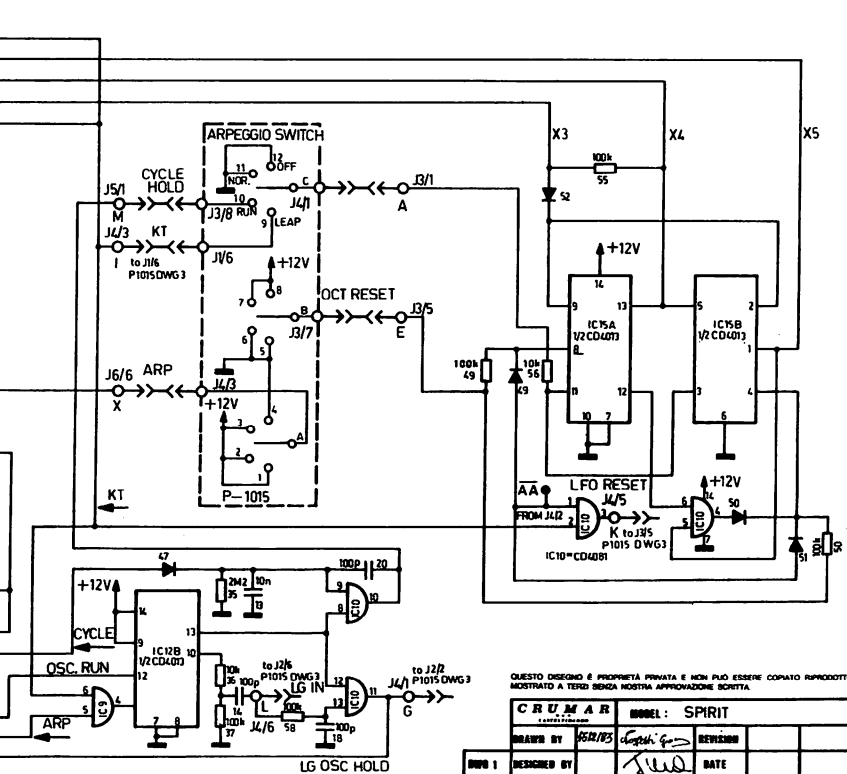
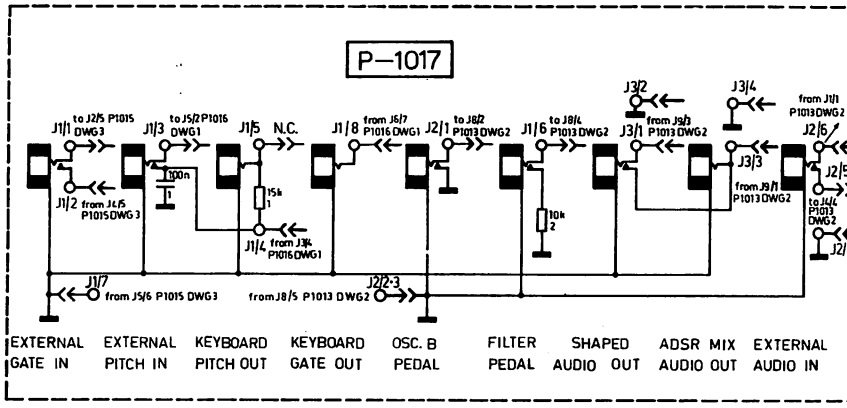
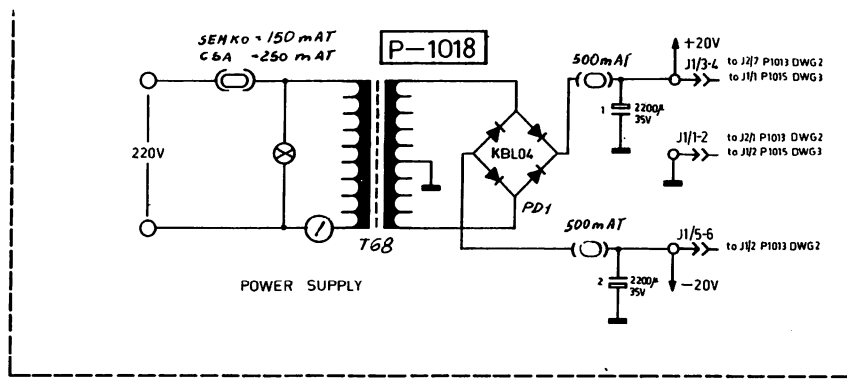
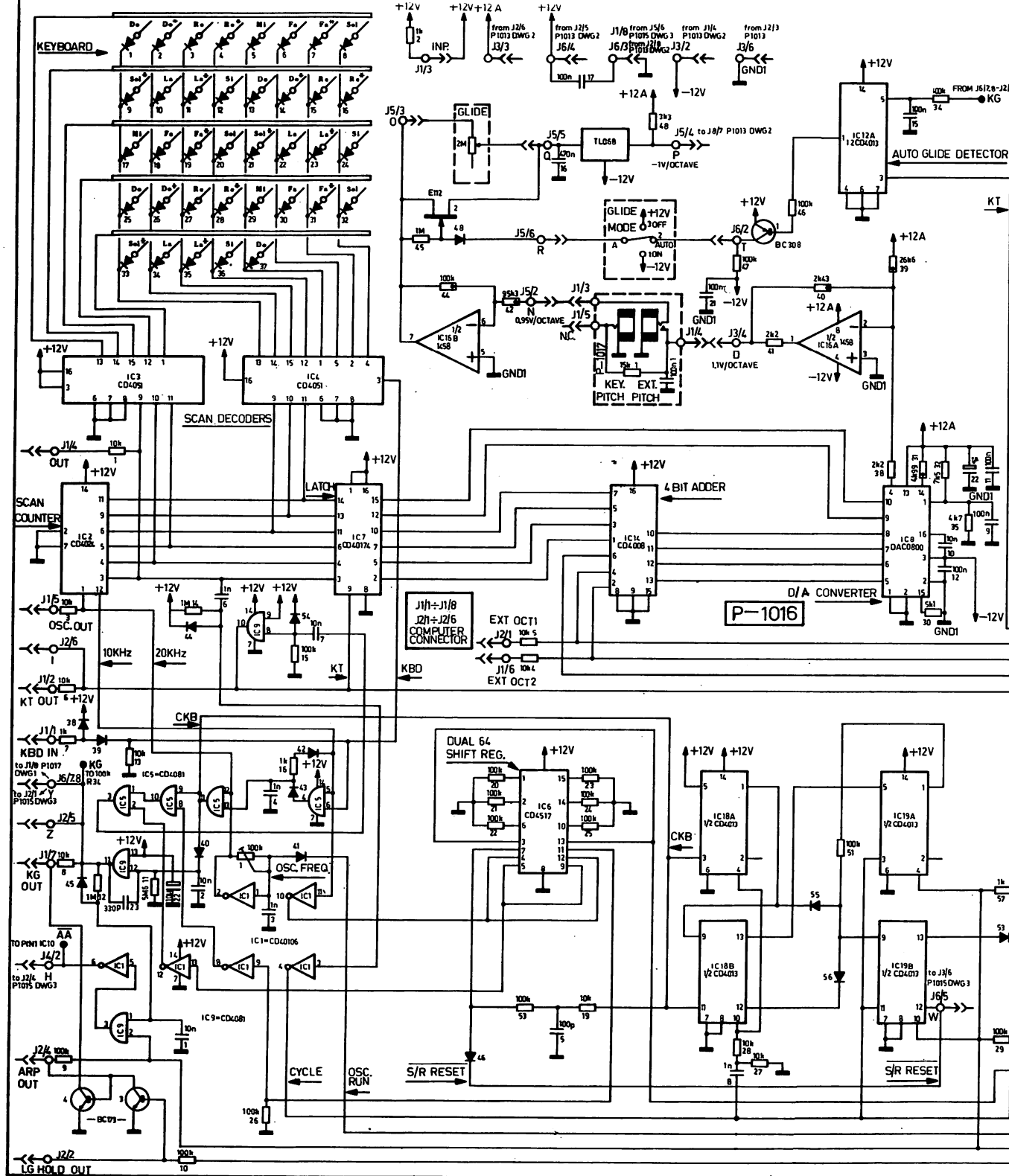
ALL resistors 1/4w unless otherwise indicated

ALL tab switches shown in OFF position

ALL key switches shown in OFF position

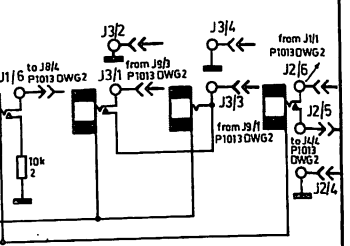
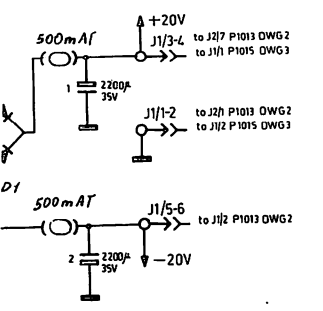
See part list for component part numbers

**CRUMAR RESERVES THE RIGHT TO CHANGE
SPECIFICATIONS AND DESIGNS, WITHOUT
NOTICE AND LIABILITY.**

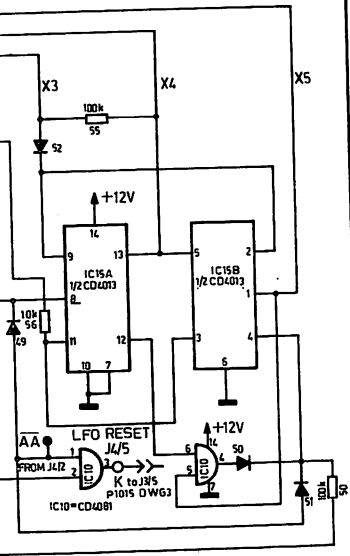


QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPiato RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR	MODEL: SPIRIT
DRAWN BY: 15/1/73	REVISION: 0
DESIGNED BY: [Signature]	DATE: [Blank]

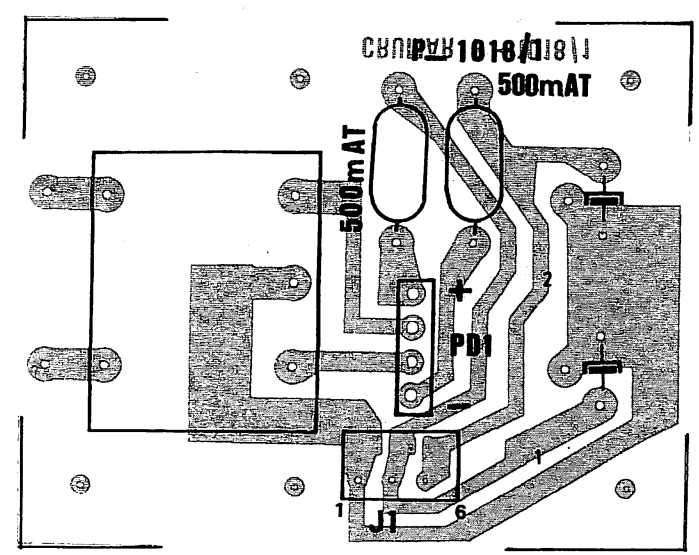
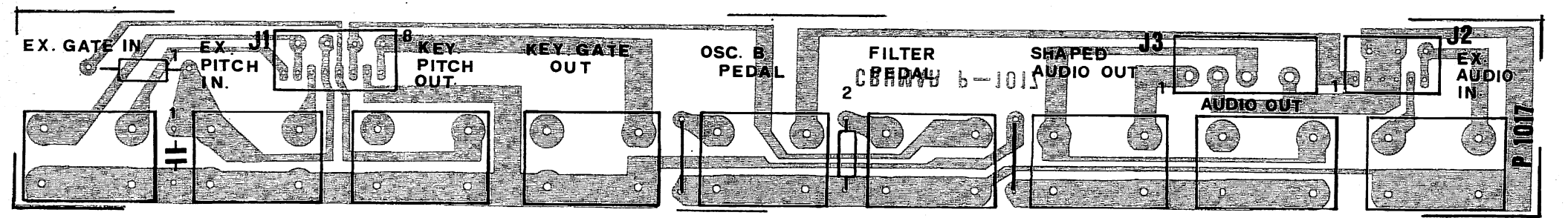
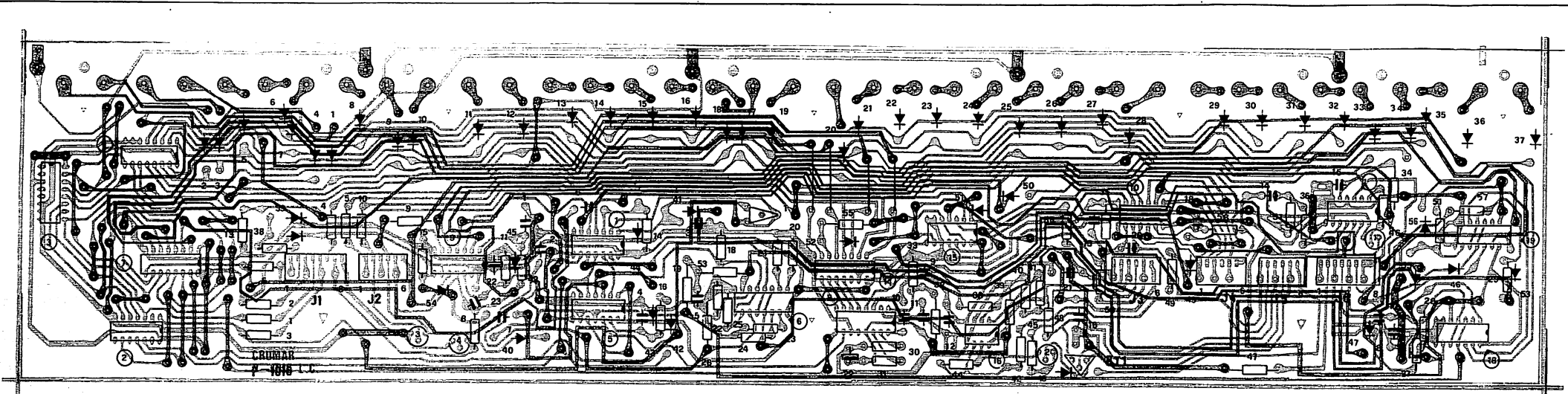


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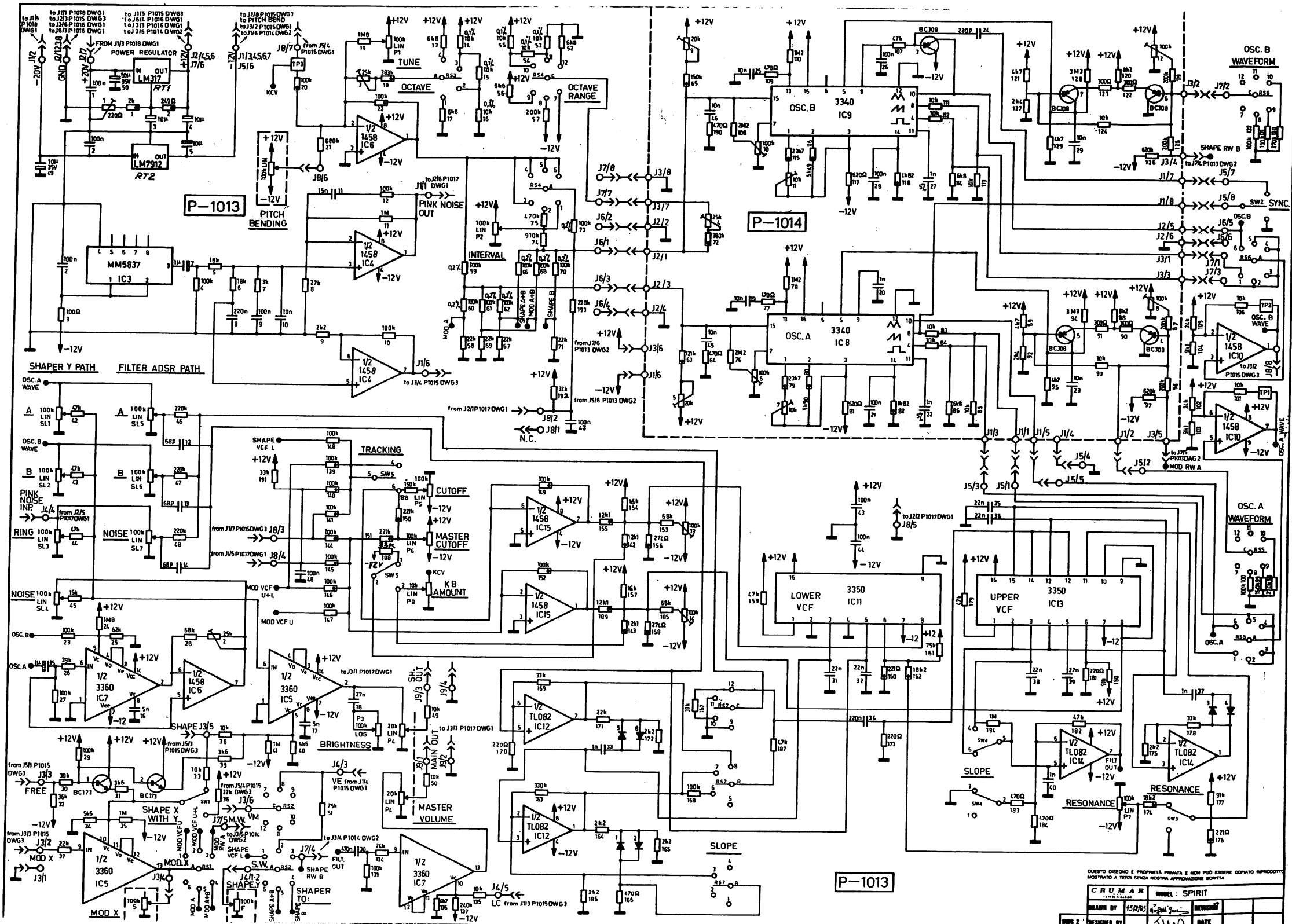
QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPiato RIPRODOTTO
MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR	MODEL: SPIRIT
DRAWN BY: 15/1/83	REVISION: 01
DESIGNED BY: XUD	DATE:



QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPiato RIPRODOTTO
MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR	MODEL: Spirit
DRAWN BY: 14-83	REVISION: 01
DESIGNED BY: 1A	DATE:



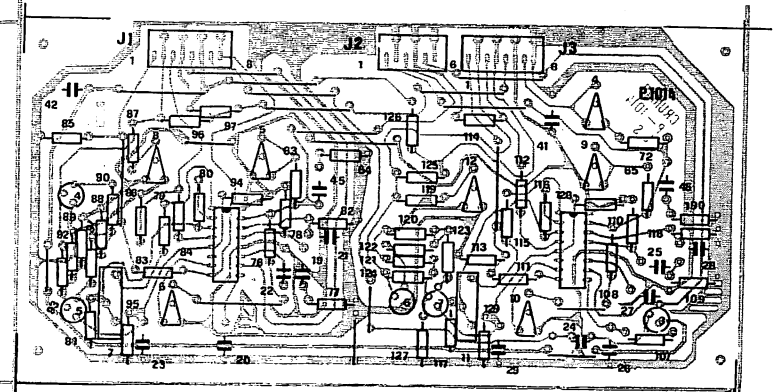
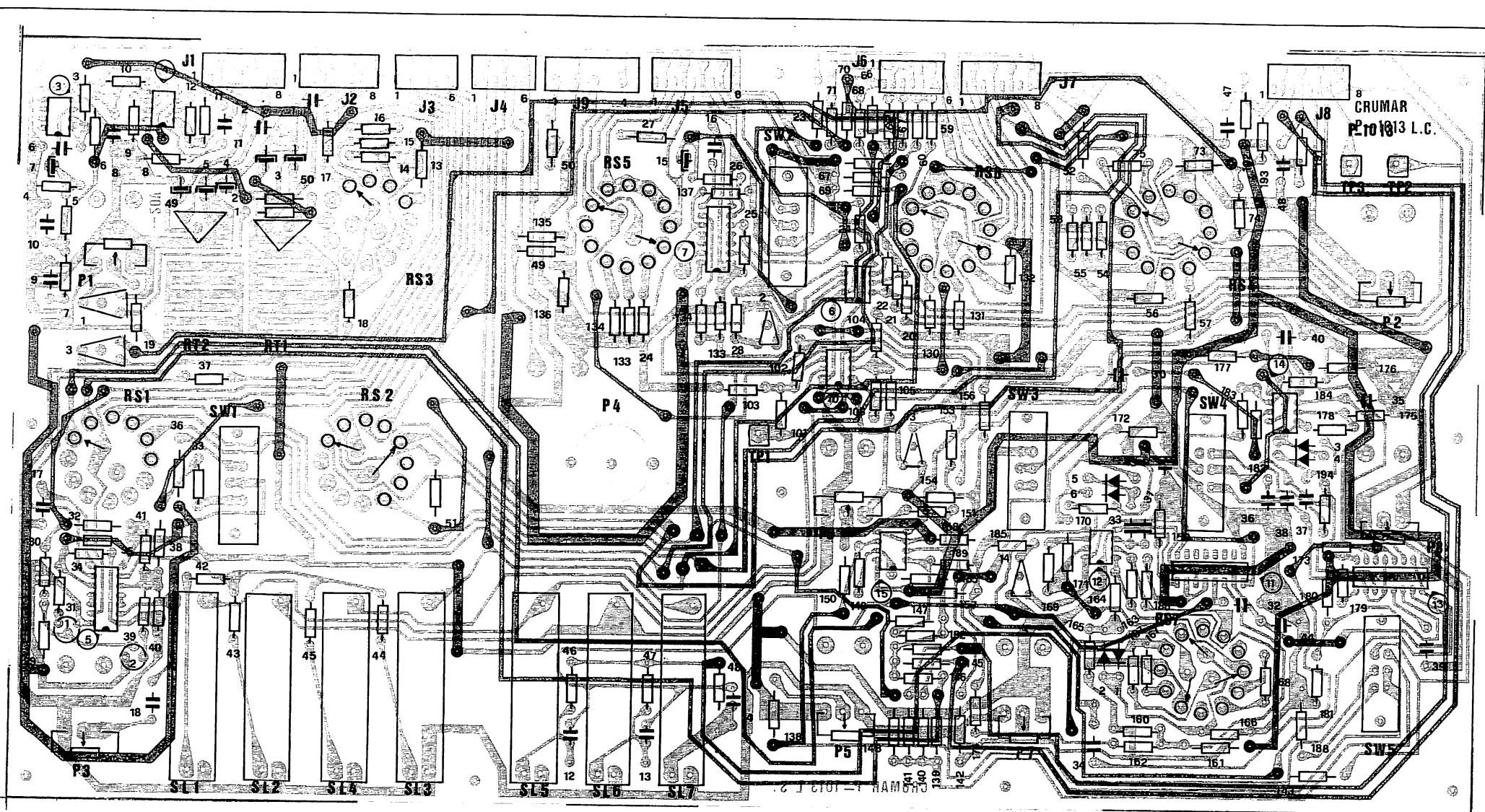
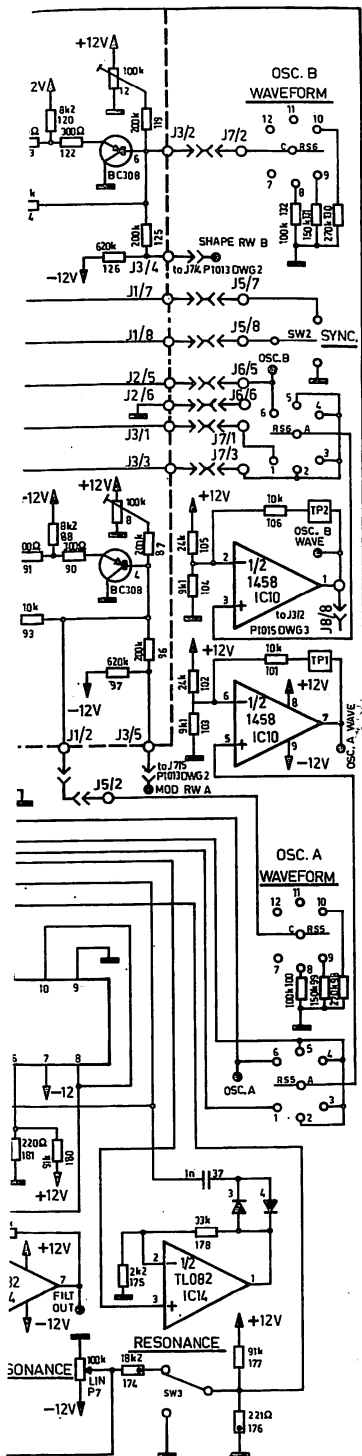
P-1013

P-1014

P-1013

QUESTO DISSEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO RIPRODOTTO
 MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA

CRUMAR	MODEL: SPIRIT
DRAWN BY: 15/2/85	REVISION: 1
DESIGNED BY: <i>[Signature]</i>	DATE:



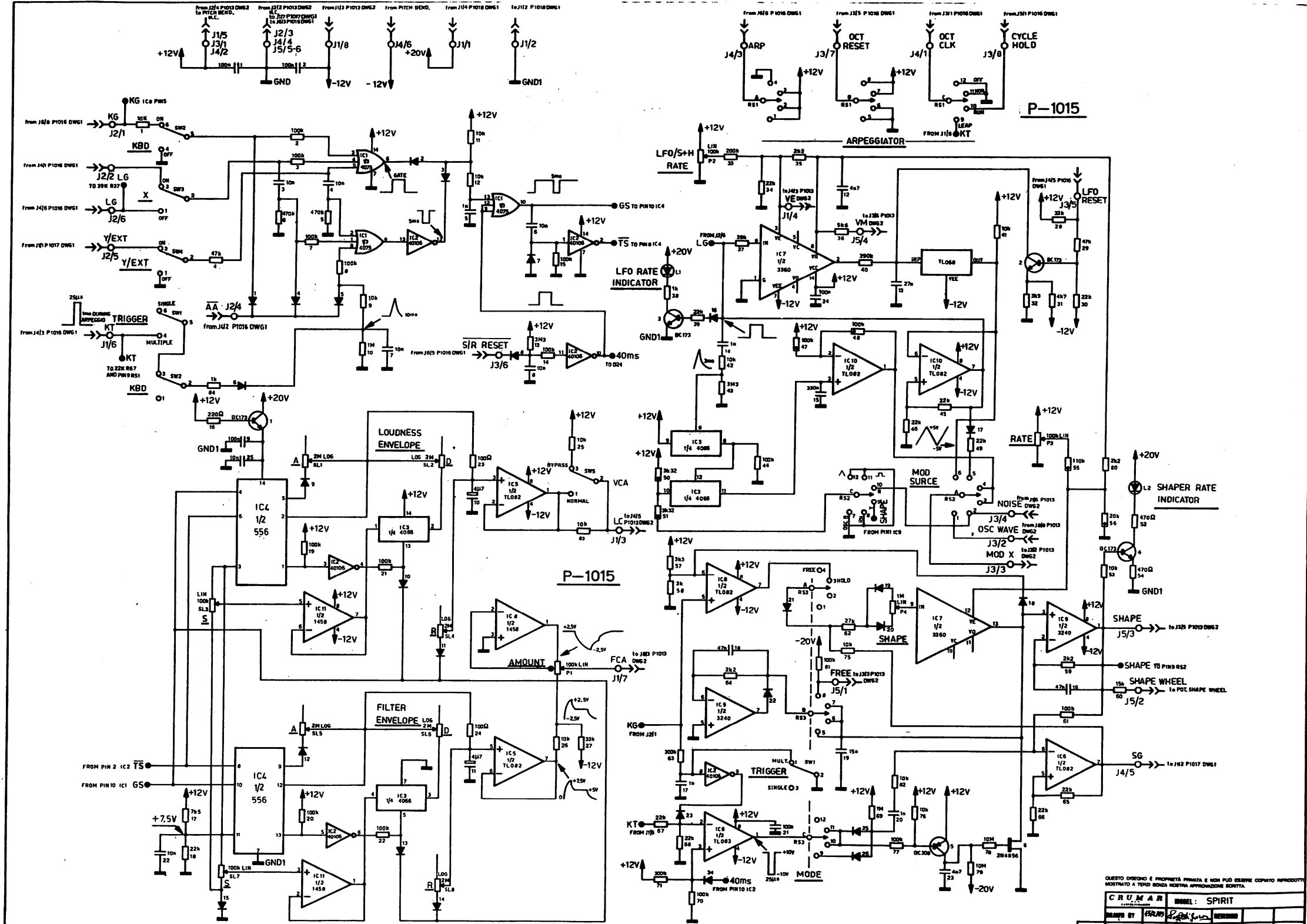
QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPiato RIPRODOTTO
MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR		MODEL: SPIRIT	
DRAWN BY	15/2/83	REVISION	
DESIGNED BY		DATE	

QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPiato RIPRODOTTO
MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR		MODEL: Spirit	
DRAWN BY	1/2-4/83	REVISION	
DESIGNED BY		DATE	

2A

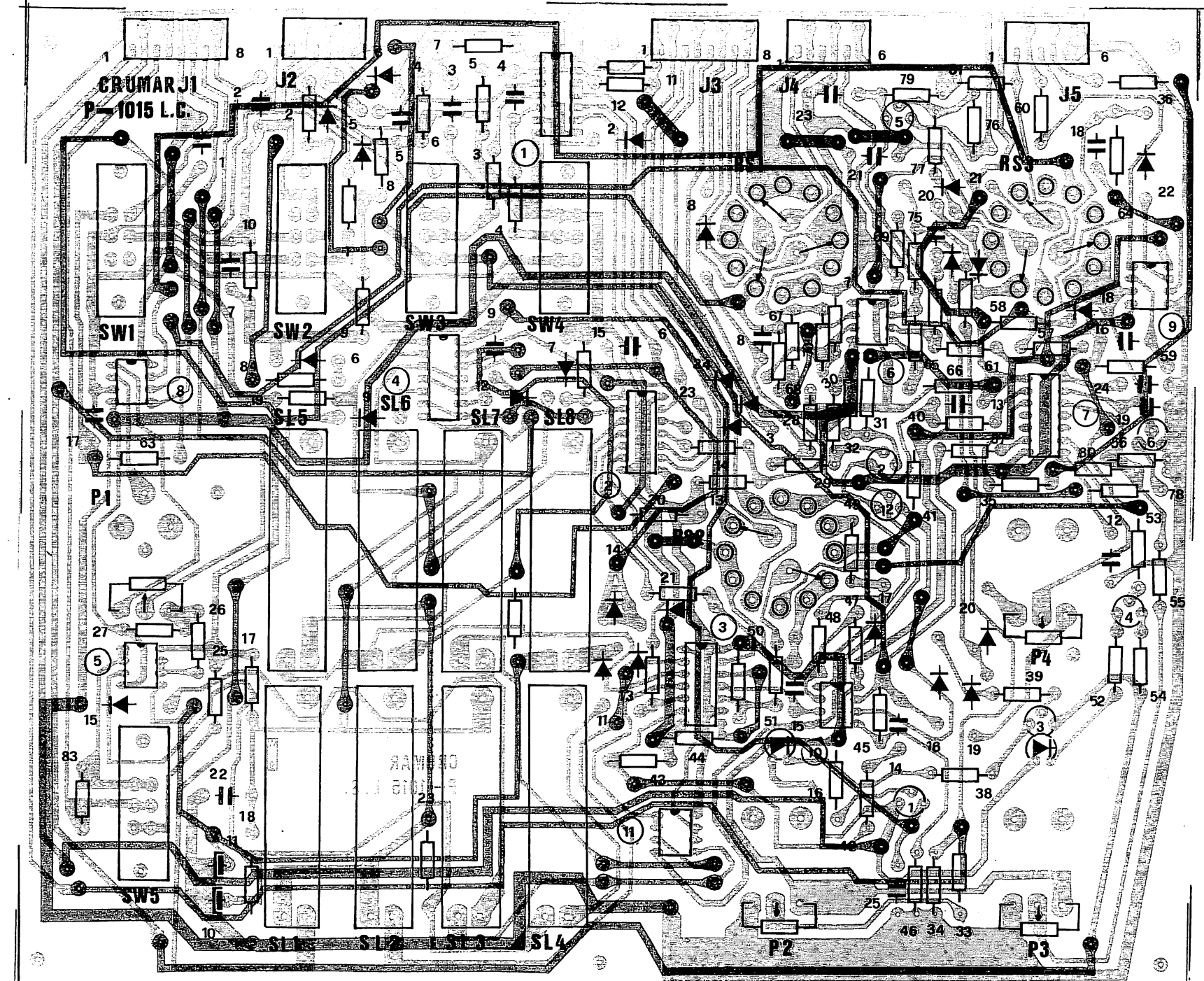


P-1015

P-1015

QUESTO DISSEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPiato APPRODOTTO MOSTRATO A TERZO SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR	MODEL: SPIRIT
DESIGNED BY: <i>ARM</i>	REVISION: <i>1</i>
DWG. N. <i>1015</i>	DATE: <i>1978</i>



QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPiato, RIPRODOTTO, MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

CRUMAR	MODEL:	Spirit
DRAWN BY	REVISED BY	DATE
12-4-83	Alan	
DESIGNED BY	DATE	

3A

MODEL SPIRIT

ELECTRONIC COMPONENT LIST

Schem. Ref.	Circuit	Type	Part Code
SEMKO VERSION-POWER SUPPLY (DWG 1)			
P1018/1	Complete with components		978002778
PD1	Rectifier bridge	KBL04	66000006
T68	Trasformer		18010111
CSA VERSION-POWER SUPPLY (DWG 1)			
P1018/1	Complete with components		978002779
PD1	Rectifier bridge	KBL04	66000006
T68	Trasformer		18010112
KEYSWITCHES (DWG 1)			
P1016	Complete with components		978002723
IC1	Hex schmitt trigger	40106	68010193
IC2	Stage binary counter	4024	68010122
IC3-4	Analog. multiplexers	4051	68010154
IC5-9-10	Quad 2 - input "AUD" gate	4081	68000019
IC6	Dual 64 bit static schift register	4517	68010198
IC7	Hex D Flip-Flop	40174	68000054
IC8	D/A converter	DACO800	68070197
IC12-15-18-19	Dual Type D Flip Flop	4013	68010136
IC14	4 bit Full adder	4008	68010196
IC16	Dual Op. Ampl.	1458	68000054
TR1	Transistors	BC308	62210001
TR2	Transistors	2N5437	62110041
TR3-4	Transistors	BC173	62120003
D1 ÷ 56	Diodes	BA130	65000001
OUT PUTS BOARDS (DWG 1)			
P1017	Complete with components		978002724
OSCILLATORS BOARD (DWG 2)			
P1014	Complete with components		978002721
IC8-9		3340	68030145
TR3/4/5/6/7	Transistors	BC308	62210001

MODEL SPIRIT

ELECTRONIC COMPONENT LIST

Schem. Ref.	Circuit	Type	Part Code
FILTER BOARD (DWG 2)			
P1013	Complete with components		978002720
RT1	Voltage regulator	LM317	62110034
RT2	Voltage regulator	7912	62110037
TR1-2	Transistors	BC173	62120003
IC3	Noise generator	MM5837	68010161
IC4-6-10-15	Dual Op. Ampl.	1458	68000054
IC5-7	Dual O.T.A.	3360	68030192
IC11-13	Dual V.C.F.	3350	68030191
IC 12-14	Dual Op. Ampl.	TL082	68030163
D1 ÷ D6	Diodes	BA130	65000001
MODULATION BOARD (DWG 3)			
P1015	Complete with components		978002722
IC1	Triple 3 input "AND" Gate	4075	68010195
IC2	Hex shmitt trigger	40106	68010193
IC3	Quad analog. switch	4066	68000094
IC4	Dual Timer	556A	68030194
IC5-6-8	Dual Op. Ampl.	TL082	68030163
IC7	Dual O.T.A.	3360	68030192
IC9	Dual Op. Ampl.	3240	68030199
IC10-11	Dual Op. Ampl.	1458	68000054

CT 5B 116

SPIRIT
ERRATA CORRIGE

DWG 1	P 1016:	R 56	=	2K2
DWG 2	P 1013:	R 45	=	6K8
		R 188	=	22K
DWG 2	P 1014:	TM 5	=	47K
DWG 3	P 1015:	D 22	=	1N 4149
		D 18	=	1N 4149
		R 79	=	1M
		IC 7	=	ADD. C 10 nF (pin 1. pin 7)
		IC 9	=	IT CAN BE TL 082