

**SCHEMATIC
DIAGRAM**

CRUMAR[®]

Musical Instruments

*mod.
t1-c*

| | |
|-----------------------|------------------------------------|
| ¹ →○ K 2.1 | FEMALE CONNECTOR SYMBOL (es. K2.1) |
| ○← | PLUG IN CONNECTOR SYMBOL |
| ○→ | OUTPUT SIGNAL (TO DWG...) |
| ○← | INPUT SIGNAL (FROM DWG...) |
| ○ | TEST POINT (TP...) |
| ● | CONNECTING POINT (ON p.c.b.) |

ALL resistors 1/4 unless otherwise indicated

ALL tabswitches shown in OFF position

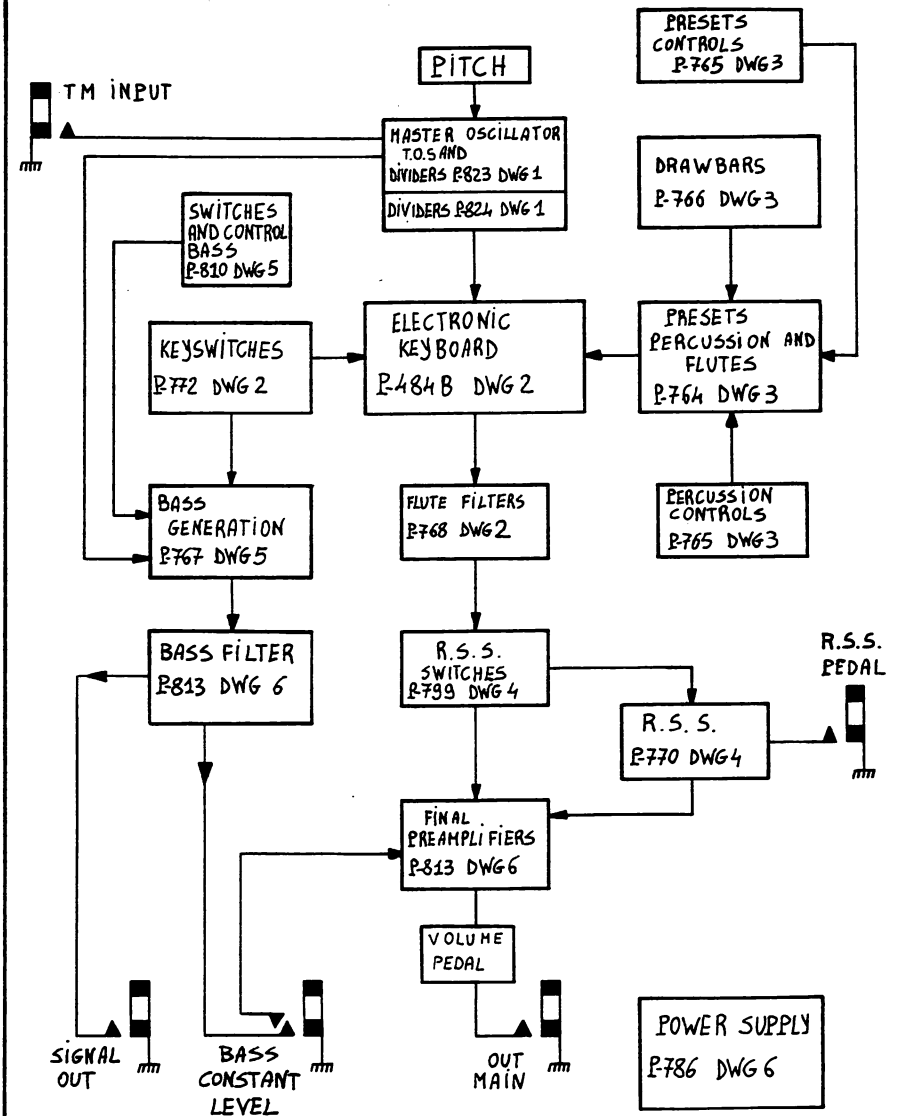
ALL keyswitches shown in OFF position

See part list for component part numbers

INDEX

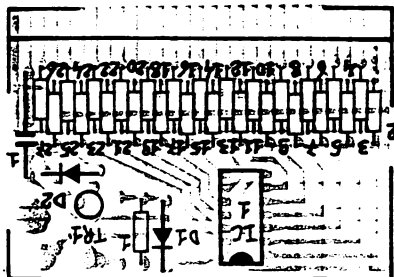
| | |
|----------------|---|
| DWG 1 (P-480B) | = MODULES |
| DWG 1 (P-481B) | = MODULES |
| DWG 1 (P-482B) | = MODULES |
| DWG 1 (P-483B) | = MODULES |
| DWG 1 (P-823) | = MASTER OSCILLATOR T.O.S. AND DIVIDERS |
| DWG 1 (P-824) | = DIVIDERS |
| DWG 2 (P-484B) | = ELECTRONIC KEYBOARD |
| DWG 2 (P-772) | = KEYSWITCHES |
| DWG 2 (P-768) | = FLUTE FILTERS |
| DWG 3 (P-764) | = PRESETS PERCUSSION AND FLUTES |
| DWG 3 (P-765) | = PRESETS AND PERCUSSION CONTROLS |
| DWG 3 (P-766) | = DRAWBARS |
| DWG 4 (P-770) | = R.S.S. |
| DWG 4 (P-799) | = R.S.S. SWITCHES |
| DWG 5 (P-767) | = BASS GENERATION |
| DWG 5 (P-810) | = SWITCHES AND CONTROL BASS |
| DWG 6 (P-786) | = POWER SUPPLY |
| DWG 6 (P-813) | = FINAL PREAMPLIFIERS |

BLOCK DIAGRAM

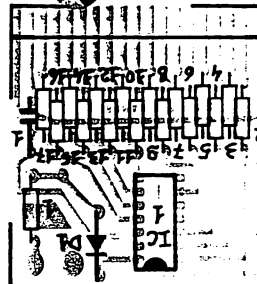


QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPiato RIPRODOTTO MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA.

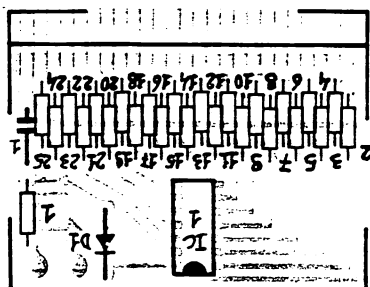
| | | | |
|-----------------------------------|------------|------------|----------|
| C R U M A R Cristoforo Colombo | | MODEL: TIC | |
| DRAWN BY | Bordani G. | REVISION | |
| DESIGNED BY | R. Bria | DATE | 30/10/80 |



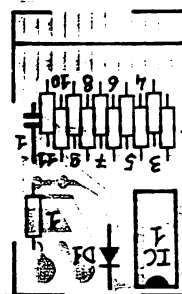
P483B



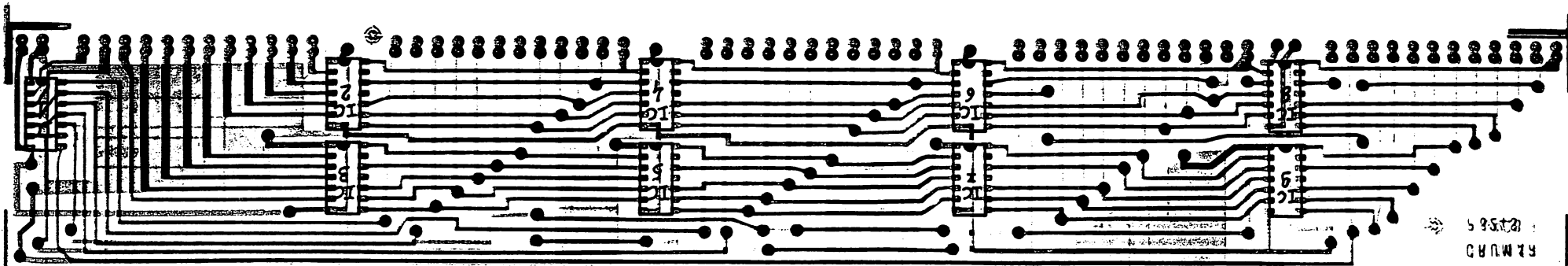
P481B



P482B

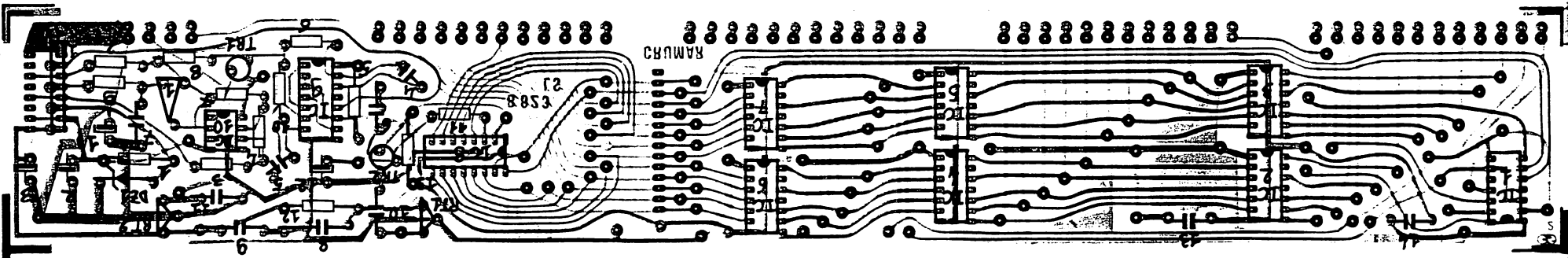


P480B



RAMUAD

P-824

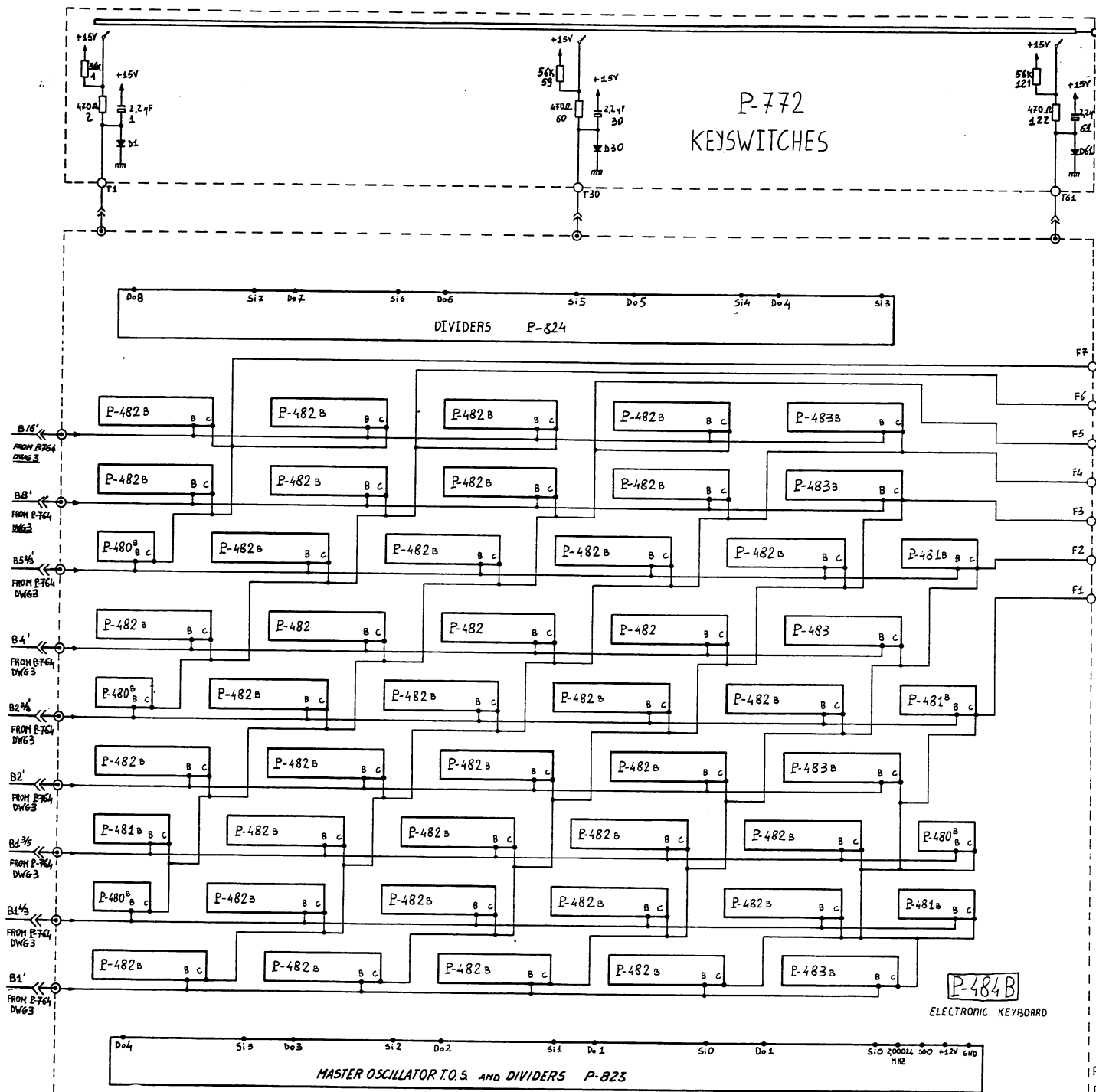


P-823

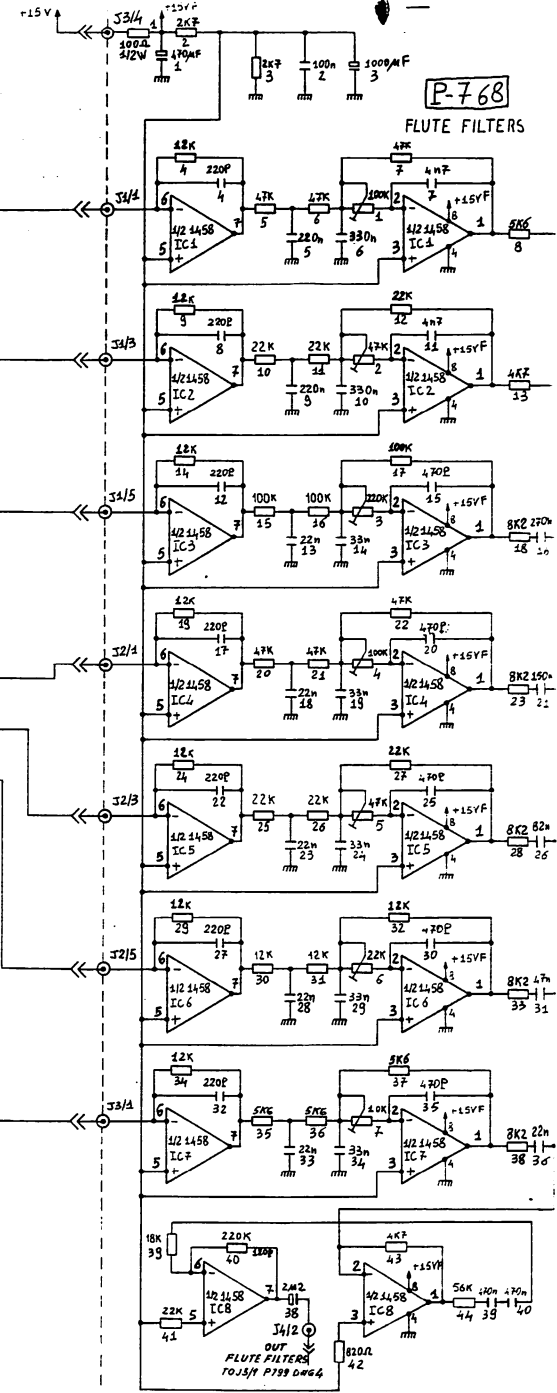
| | | | |
|------------|---------|------------|-------------|
| DATE | REVIZIA | PROIECTANT | VERIFICATOR |
| | | R. B. S. | |
| MODEL: TIC | CRUMAR | | |

DMS-17 REVISOR
 CRUMAR
 MODEL: TIC
 VERIFICATOR
 R. B. S.
 DATE
 REVIZIA
 PROIECTANT
 VERIFICATOR

P-772 KEYSWITCHES



P-484B
ELECTRONIC KEYBOARD



P-768

FLUTE FILTERS

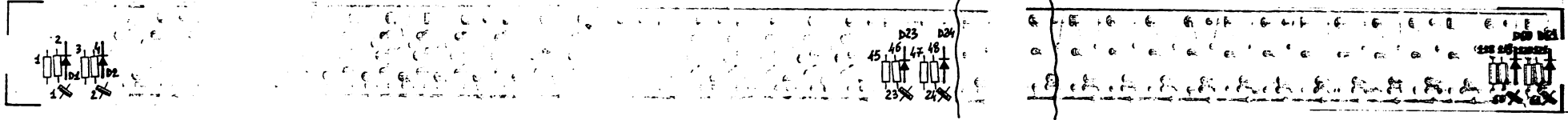
MASTER OSCILLATOR T.O.S AND DIVIDERS P-823

P484 = ELECTRONIC - KEYB.
P772 = KEYSWITCHES
P768-FL FILTERS

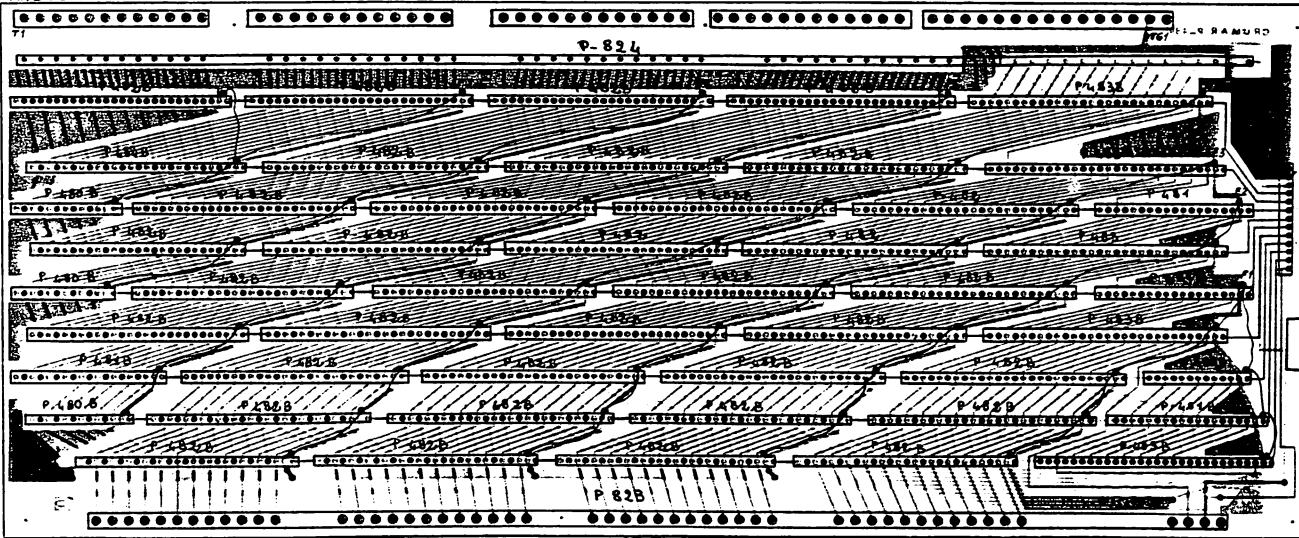
J4/1-3 = GND
P-768

| C R U M A R | | MODEL T 1 C | |
|-------------|-----------|-------------|---------|
| DRAWN BY | De SLe... | REVISION | |
| DESIGNED BY | R B... | DATE | 3/20/68 |

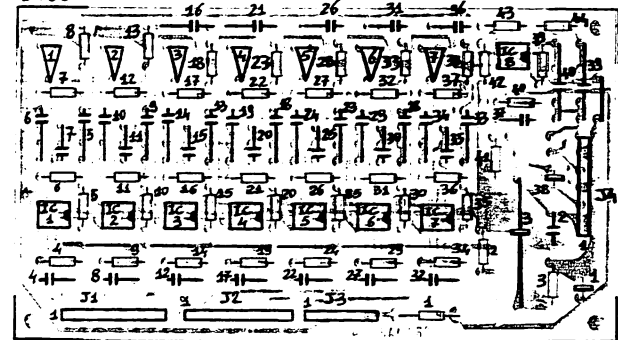
P-772



P-624

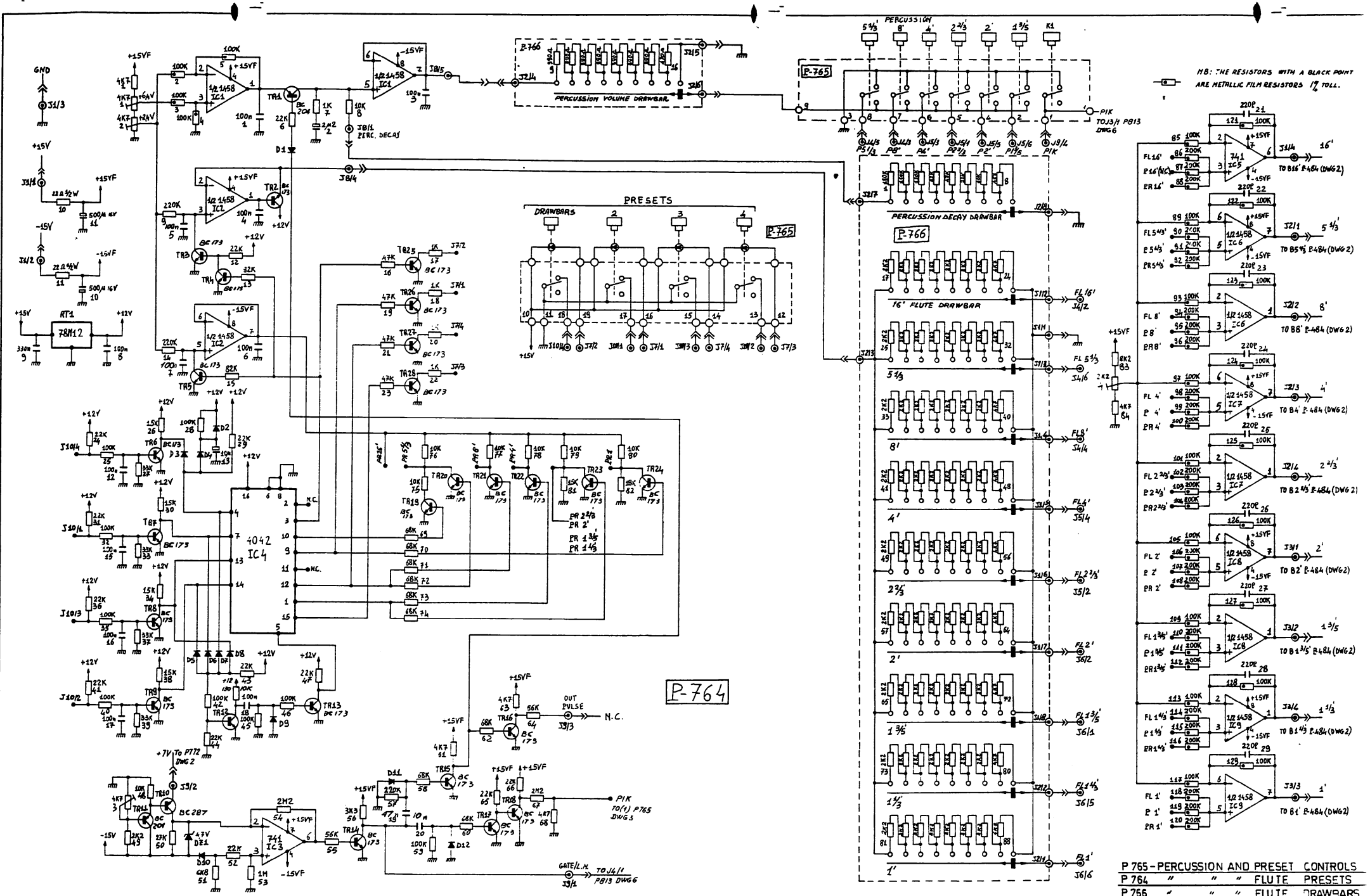


P-768



QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO, RIPRODOTTO, MODIFICATO A TERZO SENZA NOSTRA APPROVAZIONE SCRITTA.

| | |
|--------------------|----------------|
| CRUMAR | MODEL: TIC |
| DRAWN BY: R. Baran | REVISION: 6 |
| DWG. 2A | DATE: 20/04/82 |

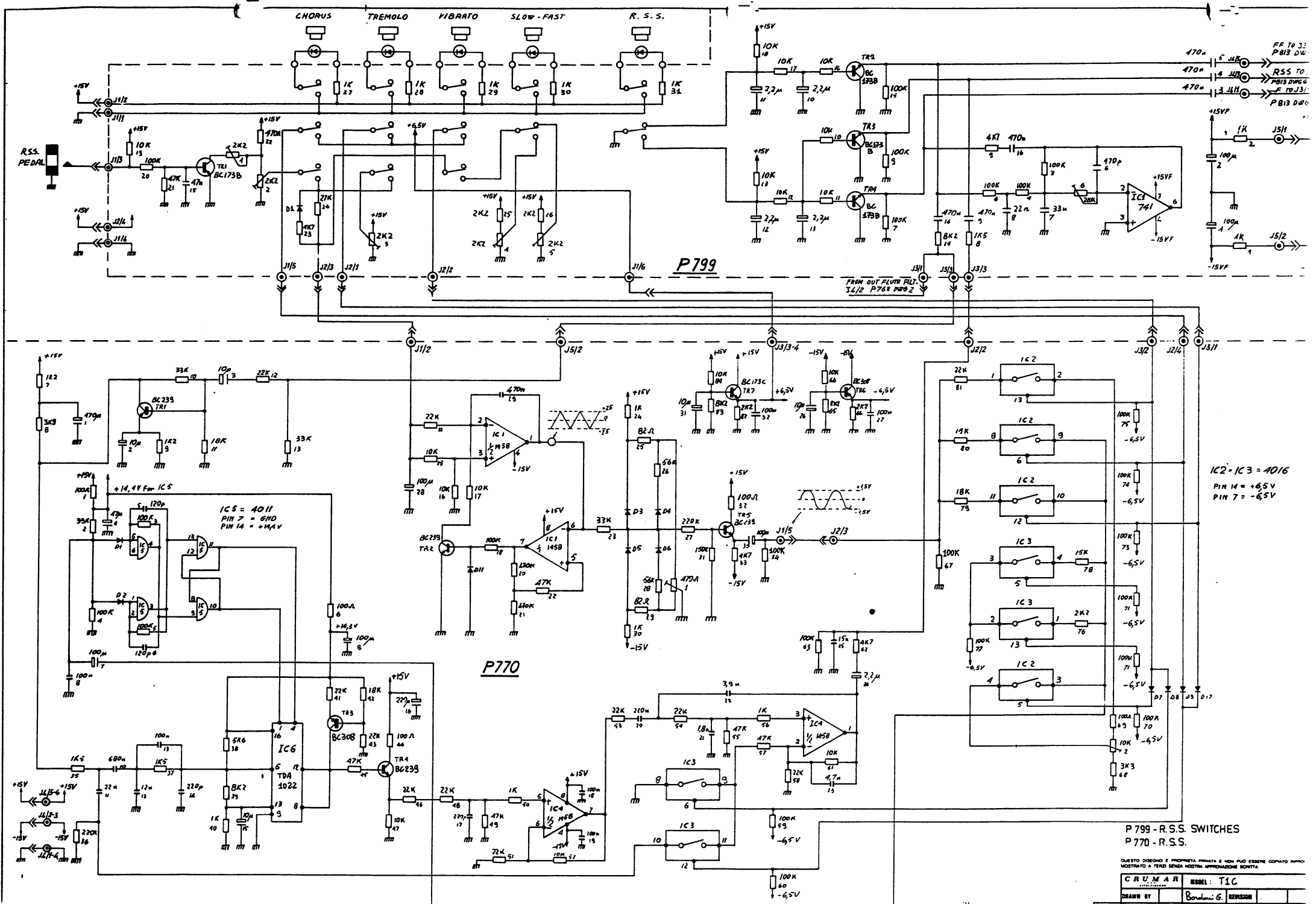


NOTE: THE RESISTORS WITH A BLACK POINT ARE METALLIC FILM RESISTORS 1% TOLL.

P 765 - PERCUSSION AND PRESET CONTROLS
 P 764 " " " FLUTE PRESETS
 P 766 " " " FLUTE DRAWBARS

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

| | |
|--------------------|-------------|
| C R U M A R | MODEL: T1C |
| DRAWN BY: B. G. L. | REVISION: 1 |



P799

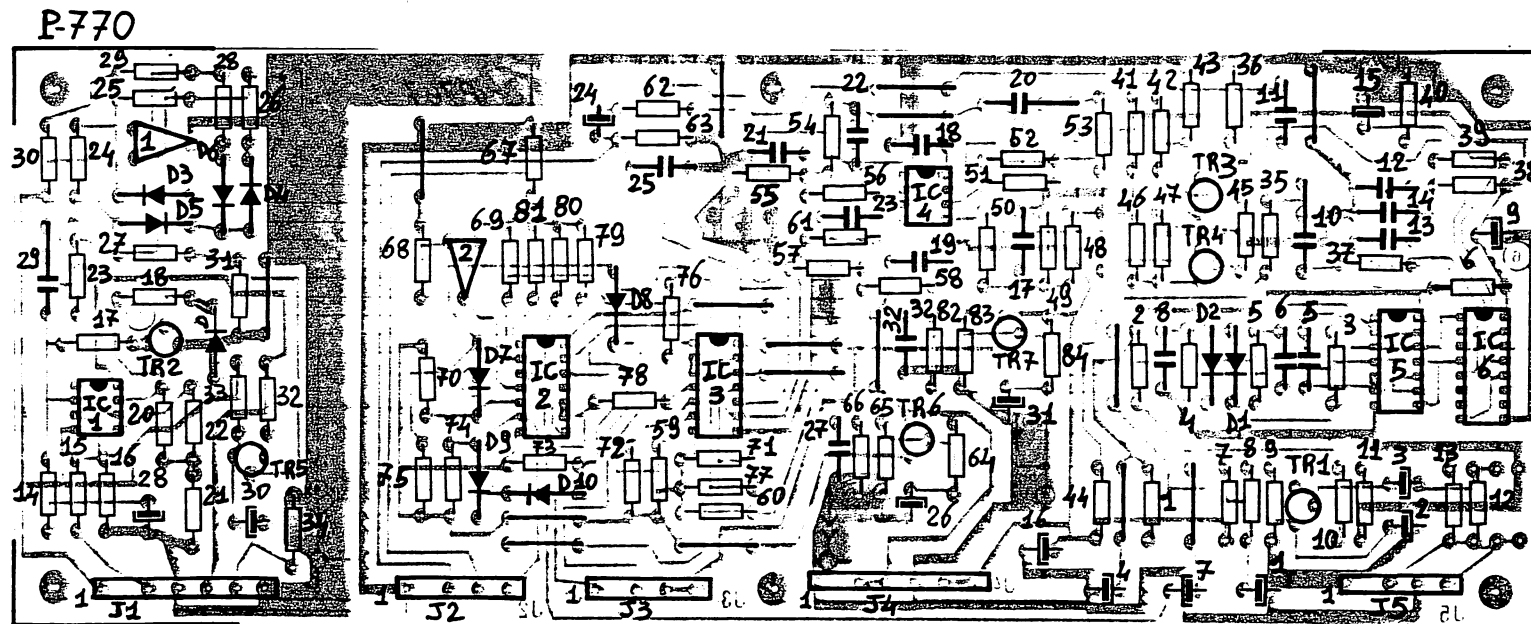
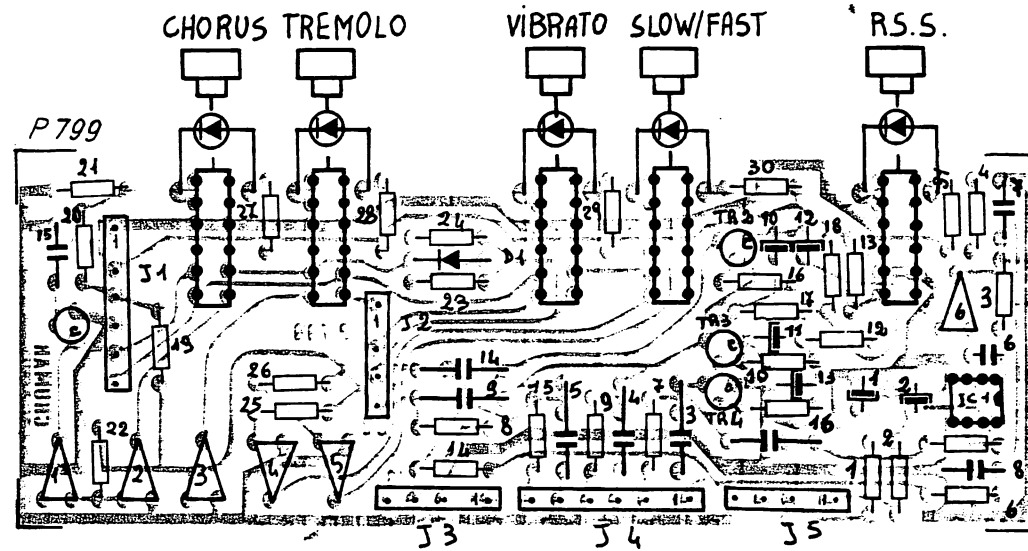
P770

P799 - R.S.S. SWITCHES
P770 - R.S.S.

IC2 - IC3 = 4016
PIN 14 = +6.5V
PIN 7 = -6.5V

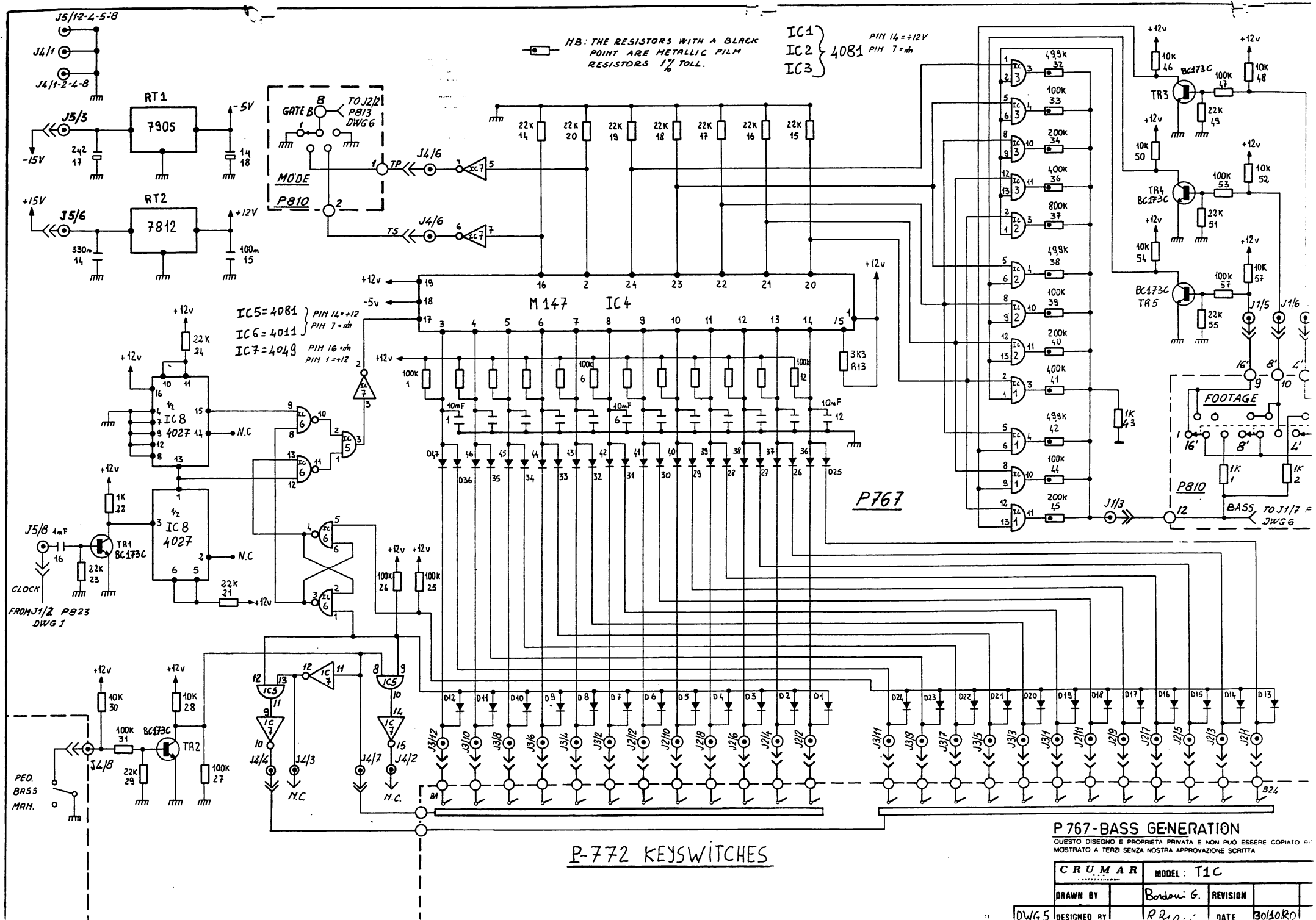
QUESTO SCHEMA È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO SENZA ABBONDO A TENDI SENZA NOSTRA APPROVAZIONE SCRITTA.

| | | | |
|-------------|-----------|------------|----------|
| C R U M A R | | MODEL: TIC | |
| DRAWN BY | Bonini G. | REVISION | |
| DESIGNED BY | D.P.O.L. | DATE | 30/10/83 |



QUESTO DISCHIO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO, RIPRODOTTO, MOSTRATO A TERZI, RIDIATO, NOSTRA APPROVAZIONE ESISTE.

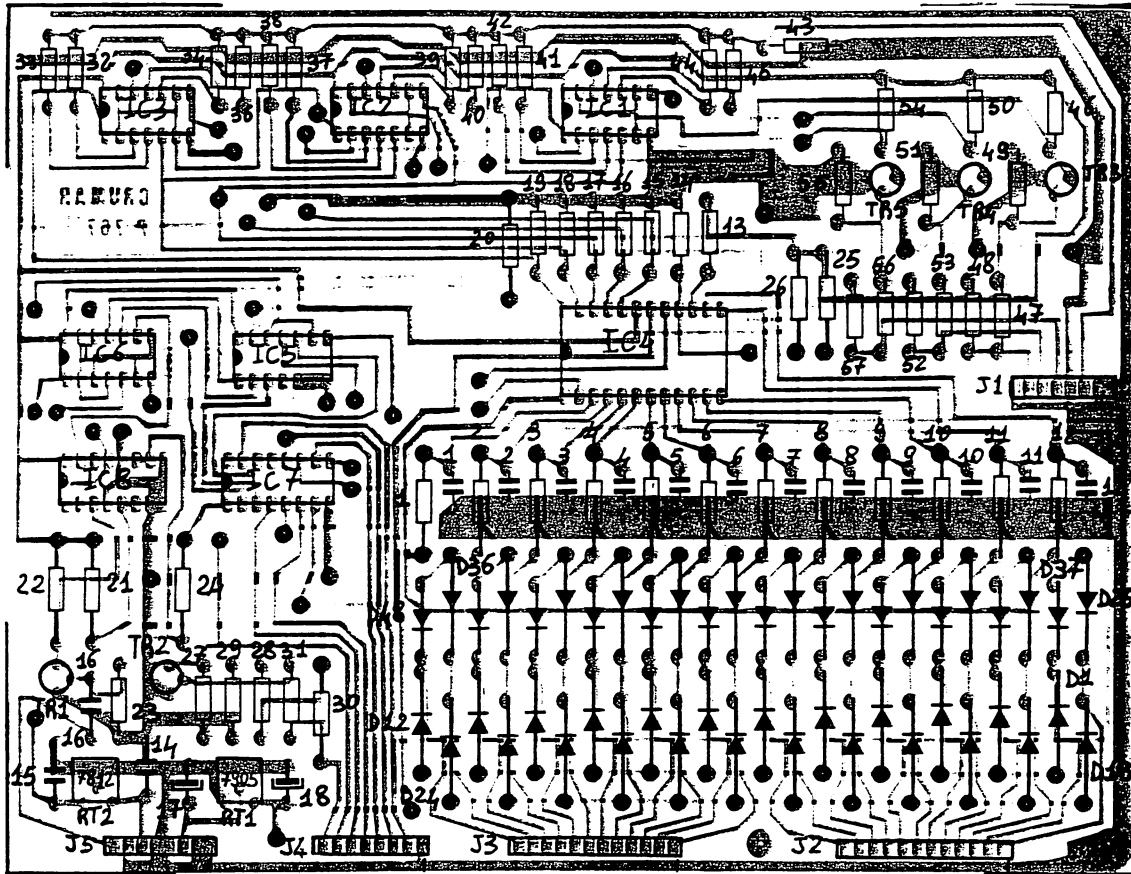
| | |
|---------------|---------------|
| GRUMAR | MODEL: TIC |
| BRAND: GIBSON | BRAND: GIBSON |
| DW64A | RETI: 100/100 |



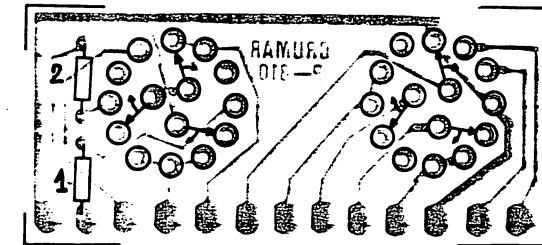
P 767 - BASS GENERATION
 QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPIATO O MOSTRATO A TERZI SENZA NOSTRA APPROVAZIONE SCRITTA

| | | | |
|----------|--------------------|------------|----------|
| CRUMAR | | MODEL: T1C | |
| DRAWN BY | Bondani G. | REVISION | |
| DWG 5 | DESIGNED BY R20... | DATE | 30/10/80 |

P-767

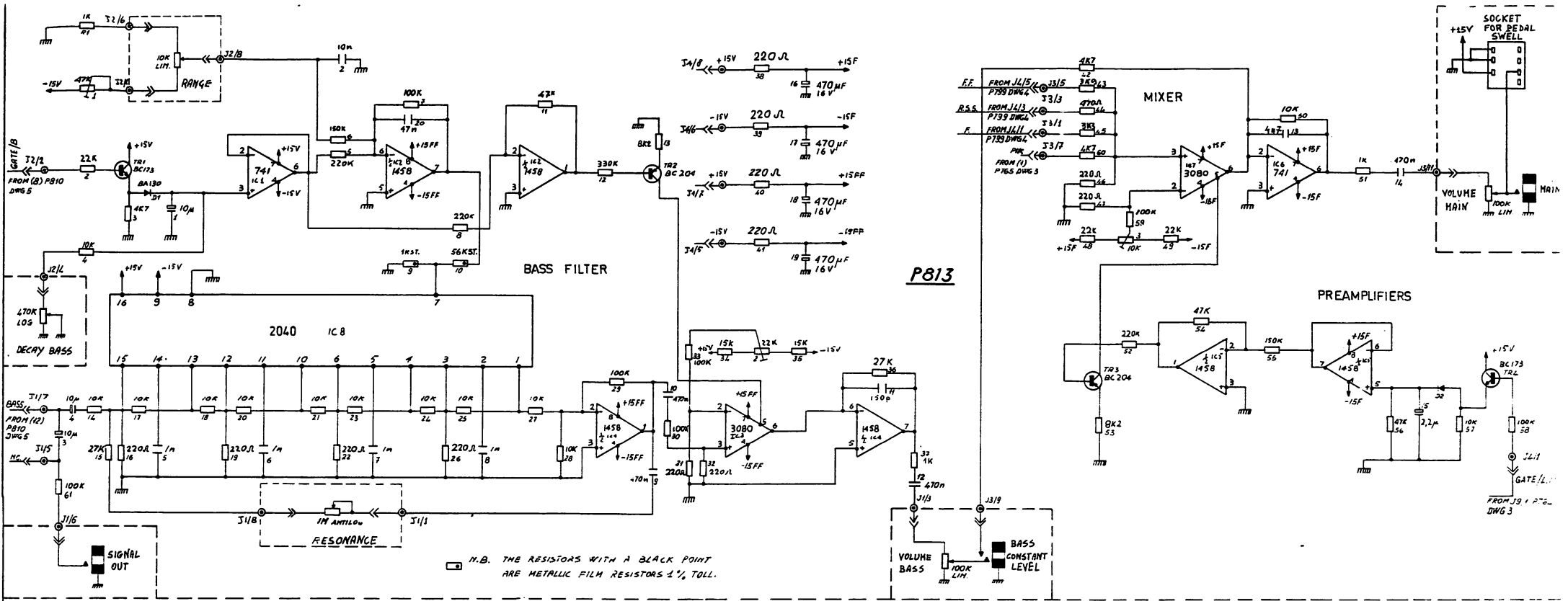


P. 810

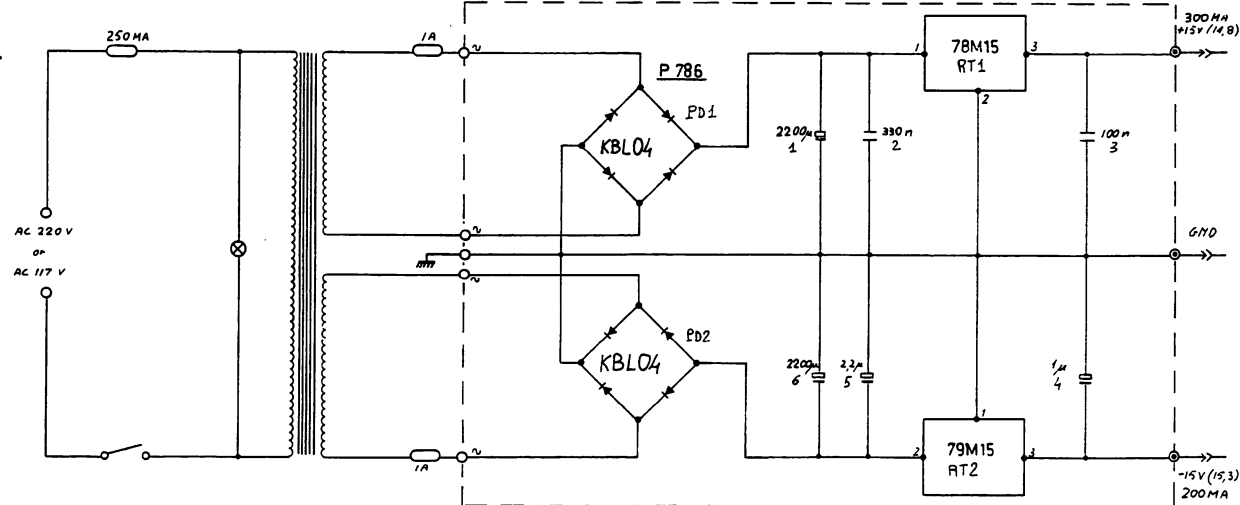


QUESTO DISEGNO È PROPRIETÀ PRIVATA E NON PUÒ ESSERE COPiato RIPRODOTTO, MODIFICATO A TERZO SENZA NOSTRA APPROVAZIONE SCRITTA

| | |
|----------------|-------------|
| CRUMAR | MODEL: TIC |
| DRAWN BY: Rhan | REVISION: 6 |
| DATE: 20/10/81 | |



POWER SUPPLY

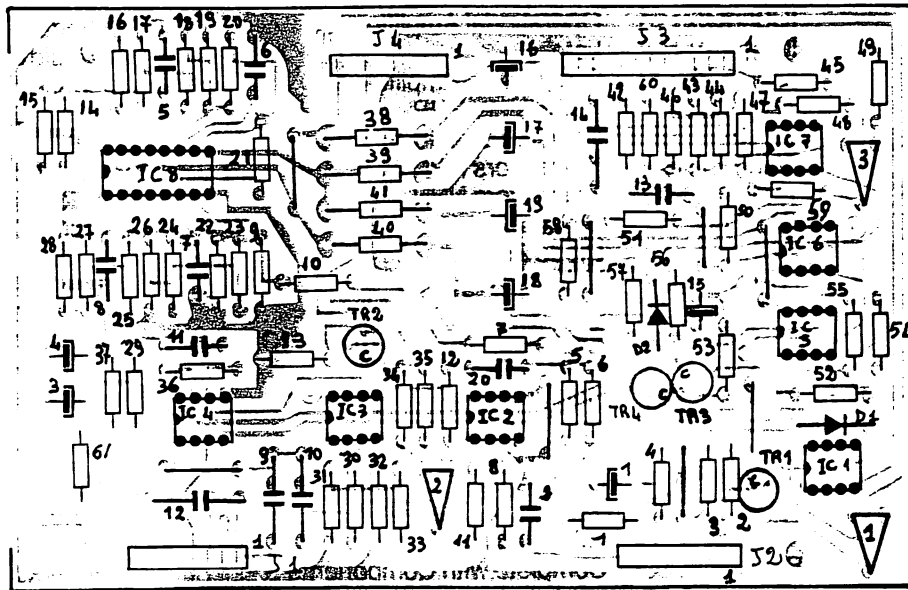


P 813 - BASS FILTER AND PREAMPLIF
P 786 - POWER SUPPLY

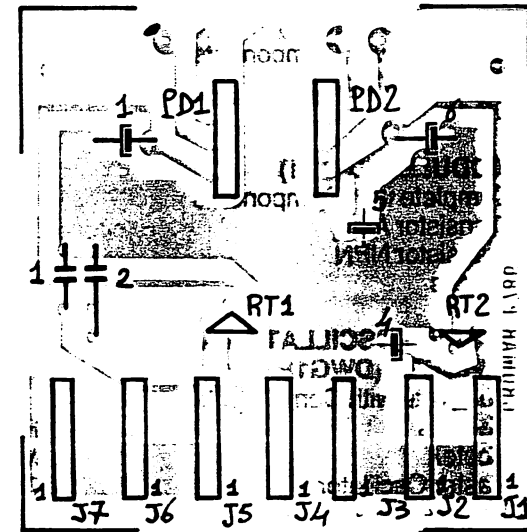
PRODOTTO E DISTRIBUITO IN ITALIA PER LA PENNISIOLA E NON PUO' ESSERE COMPRATO SEPARATAMENTE NESSUNO DEI COMPONENTI CHE SONO MOSTRATI NELLA PRESENTAZIONE SCHEMATICA

| CRUMAR | | MODEL T1C | |
|----------|-------------|-----------|----------|
| DRAWN BY | DESIGNED BY | REVISION | DATE |
| DWG66 | P. Bianchi | | 30-10-80 |

P-813



P-786



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

| | |
|------------------------------|------------|
| CRUMAR | MODEL: TIC |
| DRAWN BY: Bondani G. REPSORI | |
| ETAT | |

MODEL T1C

ELECTRONIC COMPONENT LIST

| Schem. Ref. | Circuit | Type | Part Code |
|--|--------------------------|-----------|-----------|
| MODULES (DWG1) | | | |
| P-480B | Complete with Components | | 978002006 |
| IC1 | Transistor Array | TD-A0470D | 68000018 |
| D1 | Diode | BA130 | 65000001 |
| MODULES (DWG1) | | | |
| P-481B | Complete with Components | | 978002007 |
| IC1 | Transistor Array | TD-A0470D | 68000018 |
| D1 | Diode | BA130 | 65000001 |
| MODULES (DWG1) | | | |
| P-482B | Complete with Components | | 978002008 |
| IC1 | Transistor Array | TDA-0470D | 68000018 |
| D1 | Diode | BA130 | 65000001 |
| MODULES (DWG1) | | | |
| P-483B | Complete with Components | | 978002009 |
| IC1 | Transistor Array | TDA-0470D | 68000018 |
| TR1 | Transistor NPN | BC173B | 62120001 |
| D1 - D2 | Diodes | BA130 | 65000001 |
| MASTER OSCILLATOR AND DIVIDERS (DWG1) | | | |
| P-823 | Complete with Components | | 978002414 |
| IC1 ÷ IC7 | Dividers | HBF4727 | 68000041 |
| IC8 | Mostek | MK50240 | 68000009 |
| IC9 | Master Oscillator | 74LS221 | 68000058 |
| IC10 | Operational Amplifier | 1458 | 68000053 |
| TR1 ÷ TR2 | Transistor | BC173C | 62120003 |
| RT1 | Voltage Regulator | 7812 | 62110027 |
| RT2 | Voltage Regulator | 7805 | 62110023 |
| DZ1 | Diode Zener | ZPY5,6V | 67000017 |
| DIVIDERS (DWG1) | | | |
| P-824 | Complete with Components | | 978002415 |
| IC1 ÷ IC9 | Dividers | HBF4727 | 68000041 |
| ELECTRONIC KEYBOARD (DWG2) | | | |
| P-484B | Complete with Components | | 978002438 |
| KEYSWITCHES (DWG2) | | | |
| P-772 | Complete with Components | | 978002351 |
| D1 ÷ D61 | Diodes | BA130 | 65000001 |

MODEL T1C

ELECTRONIC COMPONENT LIST

| Schem. Ref. | Circuit | Type | Part Code |
|---|------------------------------|----------|-----------|
| FLUTE FILTERS (DW2) | | | |
| P-768 | Complete with Components | | 978002347 |
| IC1 ÷ IC8 | Low Noise Op. Amplifier 1458 | 68000053 | |
| PRESETS PERCUSSION AND FLUTES (DWG3) | | | |
| P-764 | Complete with Components | | 978002342 |
| IC1 - IC2 | Operational Amplifier | 1458 | 68000054 |
| IC3 - IC5 | Operational Amplifier | 741 | 68000059 |
| IC4 | Latch | 4042 | 68000049 |
| IC6 - IC9 | Operational Amplifier | 1458 | 68000054 |
| TR1 - TR11 | Transistors PNP | BC204 | 62210001 |
| TR10 | Power Transistor PNP | BC287 | 62110003 |
| TR2 ÷ TR9 | Transistors NPN | BC173B | 62120001 |
| TR12 ÷ TR28 | Transistors NPN | BC173B | 62120001 |
| D1 ÷ D12 | Diodes | BA130 | 65000001 |
| DZ1 | Diode Zener | ZPY4,7V | 67000020 |
| RT1 | Voltage Regulator | 78L12 | 62110027 |
| PRESETS AND PERCUSSION CONTROLS (DWG3) | | | |
| P-765 | Complete with Components | | 978002343 |
| DRAWBARS (DWG3) | | | |
| P-766 | Complete with Components | | 978002345 |
| R.S.S. (DWG4) | | | |
| P-770 | Complete with Components | | 978002349 |
| IC1 ÷ IC4 | Operational Amplifier | 1458 | 68000053 |
| IC2 - IC3 | Quad Analog Switches CMOS | 4016 | 68000072 |
| IC5 | Quad 2-Input NAND Gates CMOS | 4011 | 68000034 |
| IC6 | Analog Delay Line | TDA1022 | 68000084 |
| TR1 - TR7 | Transistors NPN | BC173B | 62120001 |
| TR3 - TR6 | Transistors PNP | BC308 | 62210001 |
| D1 ÷ D10 | Diodes | BA130 | 65000001 |
| R.S.S. SWITCHES (DWG4) | | | |
| P-799 | Complete with Components | | 978002378 |
| IC1 | Operational Amplifier | 741 | 68000059 |
| TR1 ÷ TR4 | Transistors NPN | BC173B | 62120001 |
| D1 | Diode | BA130 | 65000001 |

MODEL T1C

ELECTRONIC COMPONENT LIST

| Schem. Ref. | Circuit | Type | Part Code |
|---|------------------------------------|--------|-----------|
| BASS FILTERS GENERATION (DWG5) | | | |
| P-767 | Complete with Components | | 978002346 |
| IC1 ÷ IC3 | Quad 2-Input and Gates CMOS | 4081 | 68000019 |
| IC4 | MOS Bass Generation (Only SGS) | M147B | 68000087 |
| IC5 | Quad 2-Input AND Gates CMOS | 4081 | 68000019 |
| IC6 | Quad 2-Input NAND Gates CMOS | 4011 | 68000034 |
| IC7 | Hex Inverter-Buffer CMOS | 4049 | 68010131 |
| IC8 | Dual J-K Flip-Flop CMOS | 4027 | 68000089 |
| TR1 ÷ TR5 | Transistors NPN | BC173C | 62120003 |
| RT1 | Voltage Regulator | 79M05 | 62110029 |
| RT2 | Voltage Regulator | 78M12 | 62110027 |
| D1 ÷ D48 | Diodes | BA130 | 65000001 |
| SWITCHES AND CONTROL BASS (DWG5) | | | |
| P-810 | Complete with Components | | 978002390 |
| POWER SUPPLY (DWG6) | | | |
| P-786 | Complete with Components | | 978002365 |
| RT1 | Voltage Regulator | 78M15 | 62110020 |
| RT2 | Voltage Regulator | 79M15 | 62110022 |
| PD1 - PD2 | Rectifier Bridge | KBL04 | 66000006 |
| FINAL PREAMPLIFIERS (DWG6) | | | |
| P-813 | Complete with Components | | 978002394 |
| IC1 - IC6 | Operational Amplifier | 741 | 68000059 |
| IC2 - IC4 - IC5 | Operational Amplifier | 1458 | 68000053 |
| IC3 - IC7 | Operational Transconductance Ampl. | 3080 | 68000066 |
| IC8 | Voltage Controlled Filter | 2040 | 68070125 |
| TR1 - TR4 | Transistors NPN | BC173B | 62120001 |
| TR2 - TR3 | Transistors PNP | BC204 | 62210001 |
| D1 ÷ D2 | Diodes | BA130 | 65000001 |