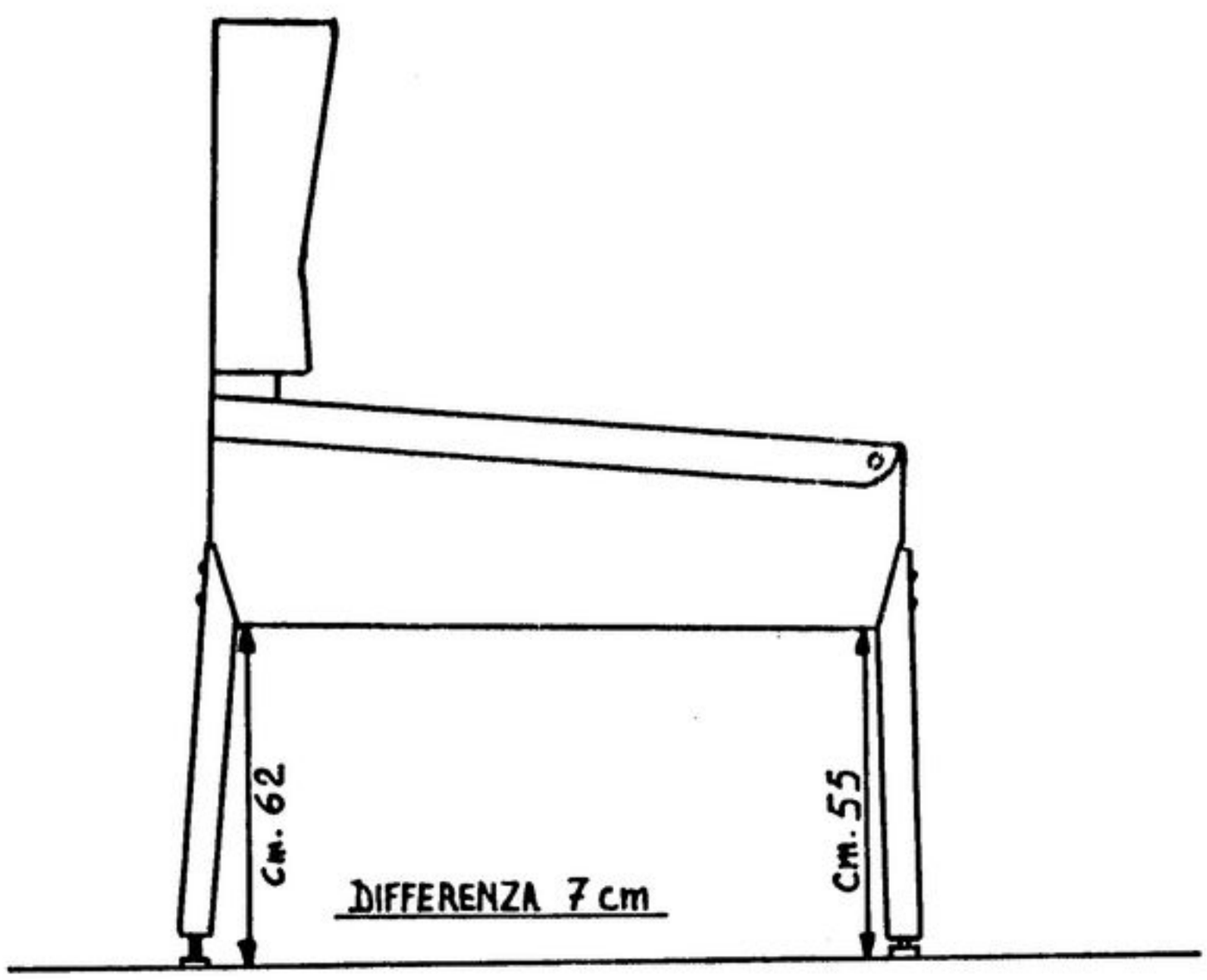
X FORCE

MANUALE DI ISTRUZIONI

INSTRUCTION MANUAL

ASSEMBLY

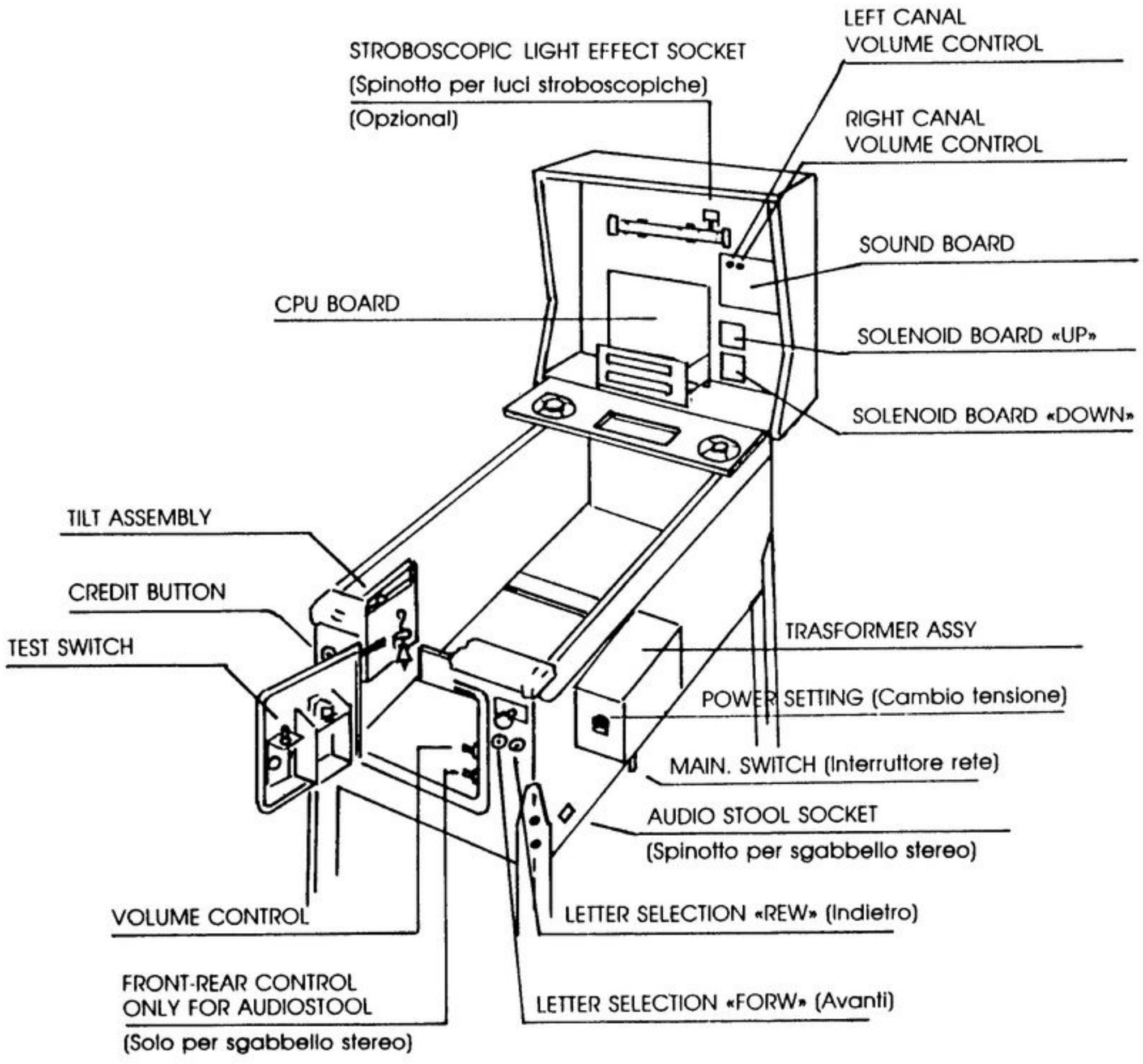
1) Fix legs to the cabinet by using proper bolts located inside cash box.
2) Pull out power cord with care and put it inside its proper housing. Make sure of knot against wrench.
3) Remove elastic belt from lights board and raise the board to the upright position, then fix it by proper sliding bracket to the right hand. Remove backglass and fix light board by proper bolts.
4) Adjust pinball inclination as shown by the drawing here below. If legs of different size are utilized, height doesn't correspond but the difference between front and back legs must be 7 cm.
When high back stool with stereo speakers is mounted, front legs must be 72 cm. maximum, otherwise the two feet of front legs do not fit inside stool housing.



Per un buon funzionamento dell'apparecchio si raccomanda di rispettare le quote indicate nel disegno. Le quote indicano la distanza in verticale dal pavimento al fondo del mobile. Quando si applica l'audiosgabello le quote diventeranno cm. 64 e CM. 57.

For good game operation, observe height as indicated above, 62 and 55 cm. from the floor to the bottom of the cabinet.
When audio stool is installed, height will be 64 and 57 cm.

DISEGNO DI INSIEME E POSIZIONE CONTROLLI
ASSEMBLY DRAWING AND CONTROL LOCATIONS



GENERAL OPERATION

CHECK FOLLOWING POINTS BEFORE SWITCHING THE MACHINE ON:

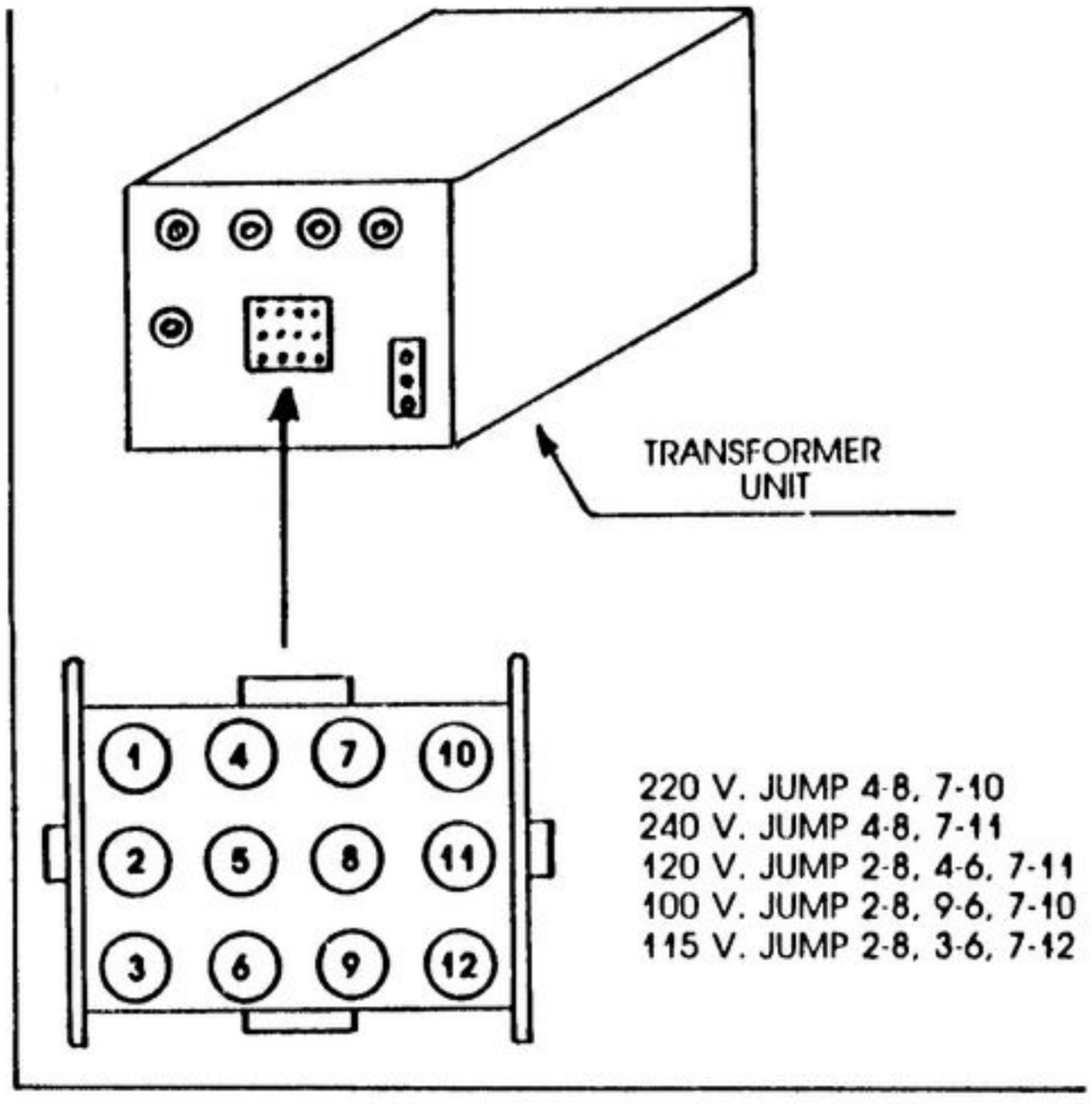
1) Make sure correct voltage is selected (Voltage selection is located on transformer box visible from coin door)

2) Make sure all the connectors are firmly connected (they may get unthreaded during transportation)

3) Check tilt contacts sensivity (all in open position)

NOTICE
Ground wire (yellow/green) of power cord must be connected.
The Manufacturer is not responsible for any damage due to wrong installation.

4) Plug the pinball in and switch it on.



— Displays lit show: INSERT COIN, 1 TO 6 PLAYERS CAN PLAY, entered advertising message and 5 highest scores in sequence from 1st to 5th.

— Playfield lamps start flashing in track mode.

— 10 sec. of background music indicate correct operation of sounds.

— When credits are inserted CREDIT ... - 3 BALLS PER GAME - PRESS START BUTTON - are displayed alternatively.

— When 1/2 credit is inserted ONE MORE COIN PLEASE is displayed.

— Put the 4 balls inside hole, one by one are released automatically.

— Insert some credits and press CREDIT button, 1st ball is released and game starts.

— When in game over, match is displayed in two numbers (if match setting is YES MATCH). When the numbers correspond to play score one credit is given.
When more than one player is playing the credit is given to the first player having correspondent number.

— When one of the 5 highest scores is overcome after match, INSERT YOUR INITIALS is displayed. Select letters by pressing LETTER SELECTION button to the right hand and enter them by CREDIT button. Each letter can be selected in 8 sec. maximum.
After this function GAME OVER is displayed with end of play music.
YOU CAN CONTINUE THE GAME IF YOU INSERT COIN IN 10 SECONDS appears immediatly after. Balls captured on the bridge during the play are held and squad can be completed by the next play.
Up to 6 players can play. Scoreof player on play is displayed on 1st line, score of the other players appears one by one on 2nd display line.

ACCOUNTING CONTROL

Any time program is reviewed, answer following questions first:
What is present program?
What is winning average?
Is the play too long?
Is the play too short?
Is maximum score to be reset?
Pinball accounting must be checked in the interest of the operator. Income is good when player is excited to play. Best operation is win average between 25 and 30% in locations with customary clients, 10% with play win on match and 1 ball or score win on Specials in seasonal locations.
Maximum score is increased any time a player overcomes it, up to unattainable score.
Score reset to the minimum (8.000.000 points) after few weeks is recommended.

ROUTINE MAINTENANCE

Some pieces of advise are given here below in order to maintain the machine in good order and avoid unnecessary service calls. It is still more important to maintain the machine in optimal conditions for the players. It is well known that players lose interest in the game if the machine does not work well, if flippers and bumpers do not react well, if playfield is dirty, lights are burnt out, etc.
The following operations should be carried out any time the machine is adjusted, even when it is working all right.

1) Check and tighten, if necessary, screws of ring holding posts.
2) Check rings and replace them when necessary. Adjust contacts any time rings are replaced.
3) Clean playfield with care. Do not use corrosive products.
4) Check flipper units (tie rods, pads, contacts and coils). Replace coils when efficiency is poor.
5) Check bumpers (tie rods and pads).

ACCOUNTING - ADJUSTMENT - SELFDIAGNOSIS

45 tests as follows:

ACCOUNTING from test 1 to test 15

ADJUSTMENT from test 17 to test 40

SELFDIAGNOSIS from test 41 to test 45

Act on lever switch inside coin mech. door to enter the tests. Press UP button to go forwards, press DOWN button to go backwards.

TEST TABLE

ACCOUNTING

TEST	FUNCTION	DATA	DATA	BASIC PROGRAM
1	Coins inserted in left hand coin mech. 1 (left/contact 04)			—
2	Coins inserted in right hand coin mech. 2 (contact 05)			—
3	Coins inserted in middle coin mech. 3 (middle/contact 06)			—
4	Total plays (total games)			—
5	Total plays won(games won)			—
6	Total balls won (balls won)			—
7	Total Superbonus won (superbonus won)			—
8	Highest score (maximum score) HI-score won			—
9	Winning score (score won)			—
10	Orange Special hit			—
11	Red Special hit			—
12	Tilts (play tilts)			—
13	Switching time (by minutes) (total time)			—
14	Operating time (by minutes) (game time)			—
15	Average play time (by minutes and seconds) (average)			—

All accounting tests (from 1 to 15) are set to zero one by one by acting as follows When on test to be set zero, press both LETTER SELECTION buttons located to the right hand of coin mech. door, and CREDIT button at the same time.

16	Basic program reset (setting - program default) see end table instructions

GAME ADJUSTMENT

TEST	FUCTION	DATA	DATA	BASIC PROGRAM
17	Highest Score selection (normal or random)			normal
18	Highest Score minimum			8.000.000
19	Coins for 1 credit in coin mech. 1 (left/contact 04)			2
20	Credits per coin in mech. 1 (left/contact 04)			1
21	Coins for 1 credit in coin mech. 2 (right/contact 05)			1
22	Credits per coin in coin mech. 2 (right/contact 05)			1
23	Coins for 1 credit in coin mech. 3 (middle/contact 06)			1
24	Credits per coin in coin mech. 3 (middle/contact 06)			2
25	Balls per play (from 1 to 7)			3
26	Match setting (yes match - no match)			yes match
27	1st winning score			3.000.000
28	2nd winning score			6.000.000
29	3rd winning score			8.000.000
30	Highest Score win (record) (1 replay, 2 replays, superb.no win)			2 replays
31	1st score win (replay, extra ball, superb., no win)			extra ball
32	2nd score win (replay, extra ball, superb., no win)			replay
33	3rd score win (replay, extra ball, superb., no win)			replay
34	Orange Special win (replay, extraball, superb., 1.000.000) no win			extra ball
35	Red Special win (replay, extra ball, superb., 1.500.000) no win			replay
36	Play automatic adjustment (self-adjust, no-adjust) ..... (see end table instructions)			self-adjust
37	Orange Special time (5 sec., 10 sec., 15 sec., 20 sec.)			15 sec.
38	Red Special time (5 sec., 10 sec., 15 sec., 20 sec.)			15 sec.
39	Enemies to be captured for the Special (from 1 to 5) Enemy			3
40	Advertising messages (spot) see end table instructions			

All game setting tests can be modified as follows:
when on test to be modified press FORW button of LETTER SELECTION and CREDIT button at the same time.

SELFDIAGNOSIS

45	RAM TEST	Press CREDIT button when on test 45. OK is displayed if RAM is good, FAULT if it is not.
44	DISPLAY TEST	Press CREDIT button when on test 44. Alphabet letters and numbers from 0 to 9 are displayed.
43	CONTACT TEST	Press CREDIT button when on test 43. Contact number and OFF/ON condition are displayed. Press CREDIT button again to check next contact.
42	LAMP TEST	Press CREDIT button when on test 42. Number of the lamp to be switched on is displayed. Press the button continuously for fast advance.
41	SOLENOID TEST	Press CREDIT button when on test 41. The number of solenold to be temporary excited is displayed. Whne pressing FORW and CREDIT buttons at the same time excitement of same solenold is repeated.

BASIC PROGRAM RESET (test 16)

Function of this test is to clear the whole RAM and reset the game automatically to basic program. Check last right hand column of test table to know how reset was made. Control above is required when RAM contains unusual data which do not correspond to test functions. It may occur when the machine is not operated for several weeks (8 at least) or battery recharge circuit is out of use.
Act as follows to operate on test 16: press both LETTER SELECTION buttons and CREDIT button at the same time, when on test 16. Then check game setting tests from 17 to 40 for possible changes of basic program.

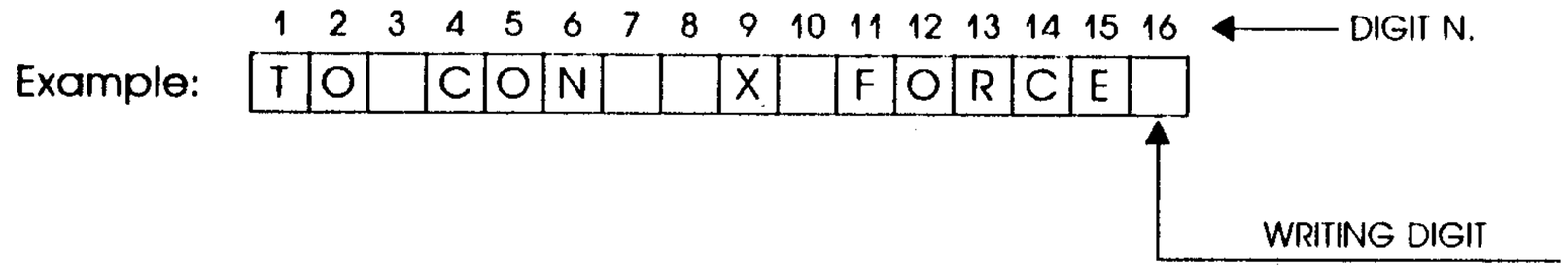
AUTOMATIC GAME ADJUSTMENT (test 36)

Function of this test is to make the game easy or difficult depending on average time of each play. Test 36 acts on Orange and Red Special time, on right hand lateral canal closure time and ball rescue on left hand lateral canal.
Average time is 2 minutes per 3 balls play and 3,20 minutes per 5 balls play.
When for any reason longer or shorter average time is desired, set test 36 on NO ADJUST (automatic adjustment excluded).
Average time is to be calculated after 50 plays minirnum. Automatic adjustment acts as above however average time different from time stated by automatic adjustment can appear on accounting after several games played due to game setting.
Average time per play can't be higher or lower than 50% of time set (2 minutes for 3 balls and 3,20 for 5 balls).

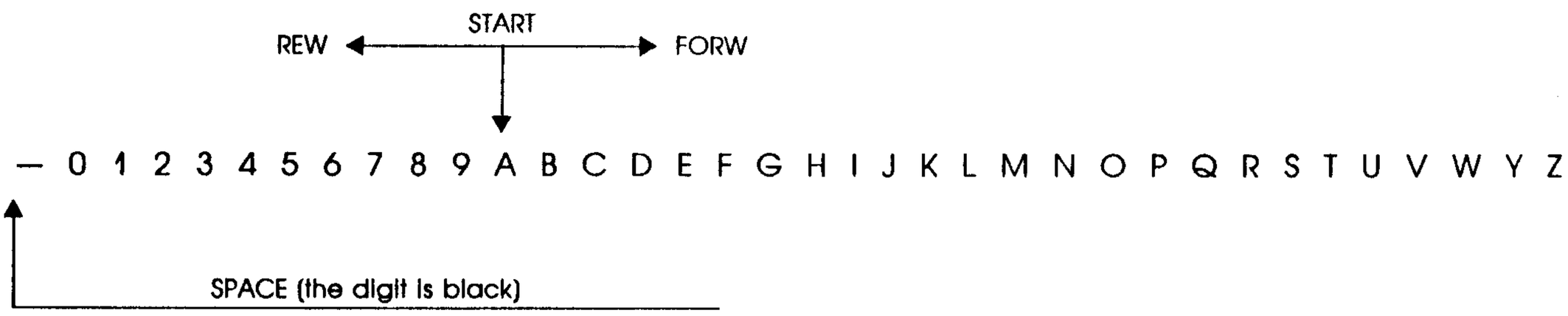
ADVERTISING MESSAGE (test 40)

Advertising message can be entered on 16 digits displays of X FORCE and models to come designed by Tecnoplay.
Operators can use theseadvertisements as desired by entering messages relating to their company, to the location on choise of its owner, and also contracts for advertising vending products can be made.
The message is displayed on the machine when in game over at 15 sec. intervals.
Act as follows to enter the message:
1) Press CREDIT button when on test 40. DISPLAY MESSAGE appears on first line, second line is clear. Othewise if INSERT LETTER or other wordings appear, move to test 39 or 41, then return on test 40. Now DISPLAY MESSAGE is displayed.
If no message was entered before, INSERT LETTER is displayed directly without passing through DISPLAY MESSAGE.
Press REWARD button of LETTER SELECTION 5 times minimum and last message entered appears from left hand to right hand any time REWARD button is pressed.
By presing FORW button the message moves back towards left hand. If a new message is not entered, move message towards left hand as originally.

2) Now enter a message further to the existing one. Press REWARD button untill letter of end message occupies the penultimate right hand digit (15) so that digit (16) is the next one.



Now press CREDIT button. INSERT LETTER appears on first line and letter A on digit 16 starts flashing, which means that letters desired can be selected and entered by pressing CREDIT button.
Letters and numbers available:

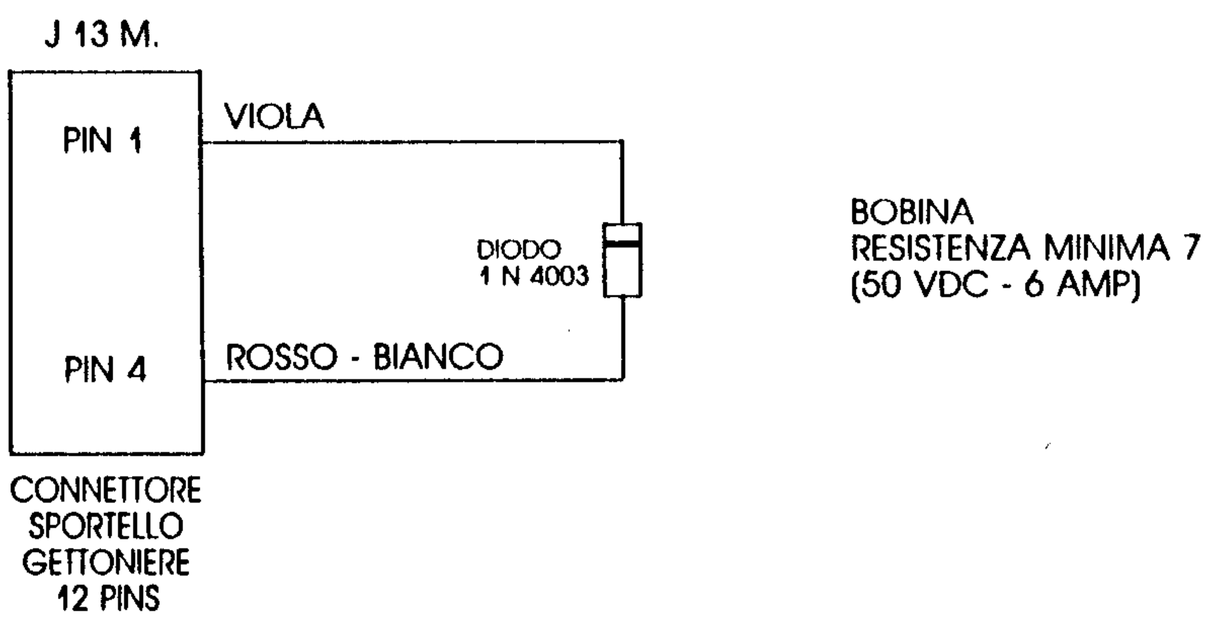


Insert 4 spaces before entering the message to separate it from previous one.
150 digits are available for one or more messages, spaces included.
Repeat operations 1 and 2 and bring first letter of first message on digit 16 then press REW button and CREDIT button at the same time to clear the old message and enter new one. When INSERT LETTER appearsprevious message is cleared and new one can be entered. If this is first message to be entered, press CREDIT button when on test 40 and INSERT LETTER appears. Select letters desired as above.
To review possible mistakes, when on DISPLAY MESSAGE bring wrong letter on digit 16, go in INSERT LETTER, select correct letter and enter it by pressing CREDIT button.

VINCITE DEL SUPERBONUS

La vincita di 1 superbonus corrisponde ad un premio speciale che può essere concesso mediante l'espulsione di 1 gettone. Applicando un distributore di gettoni a tubo con bobina (TOKEN DISPENSER) e collegandolo come da schema si avrà l'espulsione del gettone e la relativa registrazione in contabilità.

SCHEMA DI COLLEGAMENTO DEL DISTRIBUTORE DI GETTONI (TOKEN DISPENSER)



LISTA SOLENOIDI - SOLENOID TABLE

SOL. N°	DRIVER TRANS.	CONNECT. N°	PIN	FUNZIONE - FUNCTION	BOBINA - COIL	N° FUSE	VALORE/VALUE(2) OMEGA 6,3x32 T		VALORE/VALUE(2) OMEGA 6x30 T	
1	36 UP	CN 13	7	TIC-TOC	D-40 / S-1200	—	—	—	—	—
2	37 UP	CN 13	6	TOKEN DISPENCER	—	—	—	—	—	—
3	•38 UP	CN 11	7	LEFT CANAL KICKER	D-63 / S-1100	12	2,5 A	2 sec.	2,5 A	3 sec.
4	39 UP	CN 11	5	LEFT KICKER	D-40 / S-1200	5	2 A.	—	2 A.	—
5	40 UP	CN 11	4	RIGHT KICKER DOWN	D-40 / S-1200	5	2 A.	—	2 A.	—
6	41 UP	CN 13	1	LIGHT EFFECT FOR HEAD	STROBOSCOPIC LAMP (1)	—	—	—	—	—
7	42 UP	CN 11	9	BARRIER RIGHT MOVING TARGET	D-45/S-1000/D-14/S-5000	11	2 A.	3 sec.	1,6 A.	3 sec.
8	43 UP	CN 11	6	BARRIER CENTER MOVING TARGET	D-45/S-1000/D-14/S-5000	13	2 A.	3 sec.	1,6 A.	3 sec.
9	45 UP	CN 11	2	BARRIER LEFT MOVING TARGET	D-45/S-1000/D-14/S-5000	14	2 A.	3 sec.	1,6 A.	3 sec.
10	44 UP	CN 12	9	LEFT BALL DRIVER	D-355 / S-1800	5	2 A.	—	2 A.	—
11	47 UP	CN 12	8	SPECIALS MOVING TARGET	D-45/S-1000/D-14/S-5000	10	2 A.	3 sec.	1,6 A.	3 sec.
12	46 UP	CN 12	6	BOTTOM BUMPER	D-45 / S-1000	6	1,6 A.	3 sec.	1,25 A.	3 sec.
13	49 UP	CN 12	5	BRIDGE EJECT	D-50 / S-1500	2	1,25 A.	2 sec.	1,25 A.	3 sec.
14	48 UP	CN 12	4	LEFT BUMPER	D-45 / S-1000	7	1,6 A.	3 sec.	1,25 A.	3 sec.
15	51 UP	CN 12	3	TOP BUMPER	D-45 / S-1000	4	1,6 A.	3 sec.	1,25 A.	3 sec.
16	•50 UP	CN 12	2	CHOPPER EJECT	D-63 / S-1100	3	2,5 A.	2 sec.	2,5 A.	3 sec.
17	36 DW	CN 16	7	HORIZONTAL KICKER - TOP LEFT	D-40 / S-1200	5	2 A.	—	2 A.	—
18	37 DW	CN 16	6	HORIZONTAL KICKER - TOP RIGHT	D-40 / S-1200	5	2 A.	—	2 A.	—
19	38 DW	CN 14	7	MOVING MINI POST - RIGHT CANAL	D-45/S-1000/D-14/S-5000	1	2 A.	3 sec.	1,6 A.	3 sec.
20	39 DW	CN 14	5	FLIPPER RELAY	RELAY 2 SC 10 A. 48 DC	—	—	—	—	—
21	43 DW	CN 14	6	PLAYFIELD EFFECT LAMP (3 LAMP SERIAL)	LAMP BA 15 - 12 V. 10 W.	—	—	—	—	—
22	42 DW	CN 14	9	RIGHT KICKER UP	D-40 / S-1200	5	2 A.	—	2 A.	—
23	41 DW	CN 14	3	OUT HOLE KICKER	D-40 / S-1200	5	2 A.	—	2 A.	—
24	40 DW	CN 14	4	HOLE EJECT	D-355 / S-1800	5	2 A.	—	2 A.	—
25	45 DW	CN 14	2	LAMP - LEFT KICKER DOWN	LAMP BA 15 - 12 V. 25 W.	—	—	—	—	—
26	44 DW	CN 15	9	LAMP - RIGHT KICKER	LAMP BA 15 - 12 V. 25 W.	—	—	—	—	—
27	47 DW	CN 15	8	LAMP - LEFT ROLLOWER	LAMP BA 15 - 12 V. 25 W.	—	—	—	—	—
28	46 DW	CN 15	6	LAMP - RIGHT KICKER TOP	LAMP BA 15 - 12 V. 25 W.	—	—	—	—	—
29	•49 DW	CN 15	5	LAMPS - EFFECT PLAYFIELD/HEAD (3 lamps parall.)	LAMP BA 15 - 12 V. 10 W.	—	—	—	—	—
30	48 DW	CN 15	4	LAMP - BOTTOM BUMPER	LAMP BA 15 - 12 V. 25 W.	—	—	—	—	—
31	51 DW	CN 15	3	LAMP. TOP BUMPER	LAMP BA 15 - 12 V. 25 W.	—	—	—	—	—
32	50 DW	CN 15	2	LAMP - LEFT BUMPER	LAMP BA 15 - 12 V. 25 W.	—	—	—	—	—

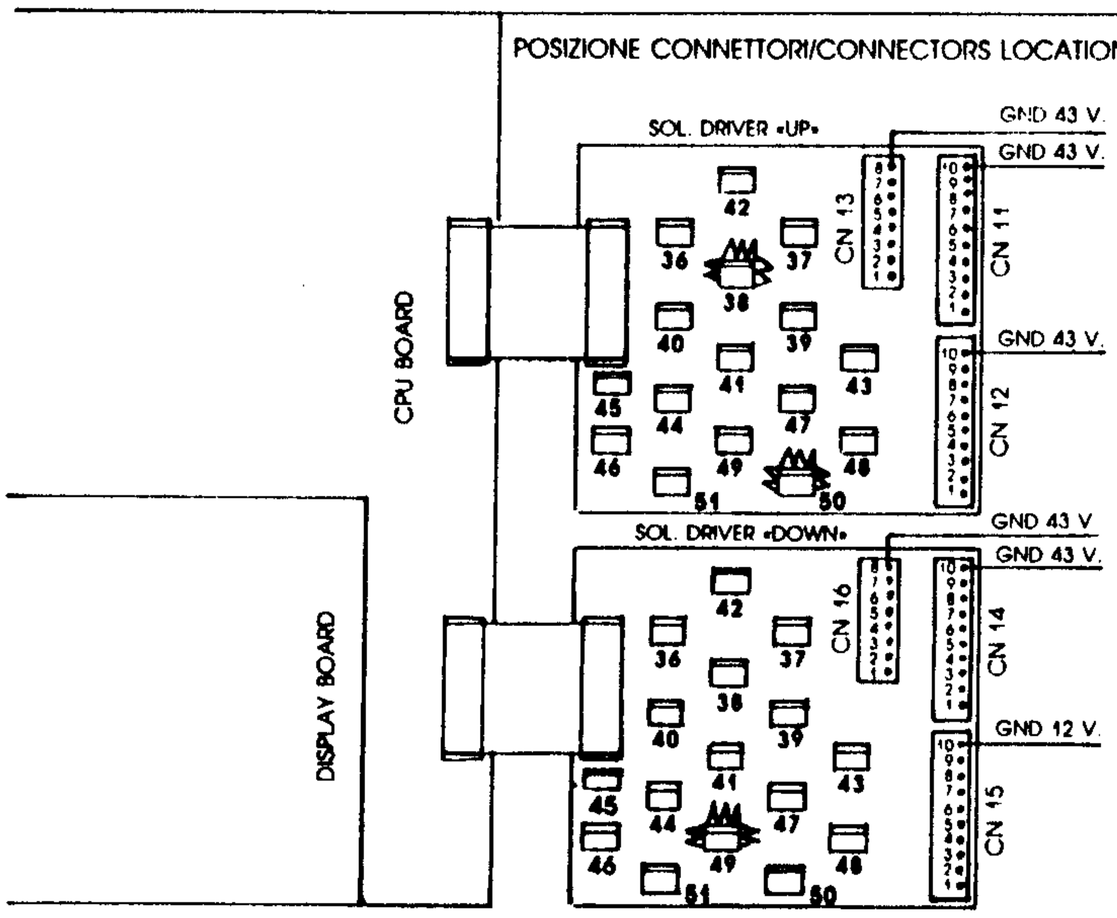
— TUTTI I TRANSISTORS (DARLINGTON) SONO BDX 33 B SOSTITUIBILI CON BDX 33 C or BD 649
ALL TRANSISTOR ARE BDX 33 B INTERCAMBIABLE WITH BDX33C or BD 649

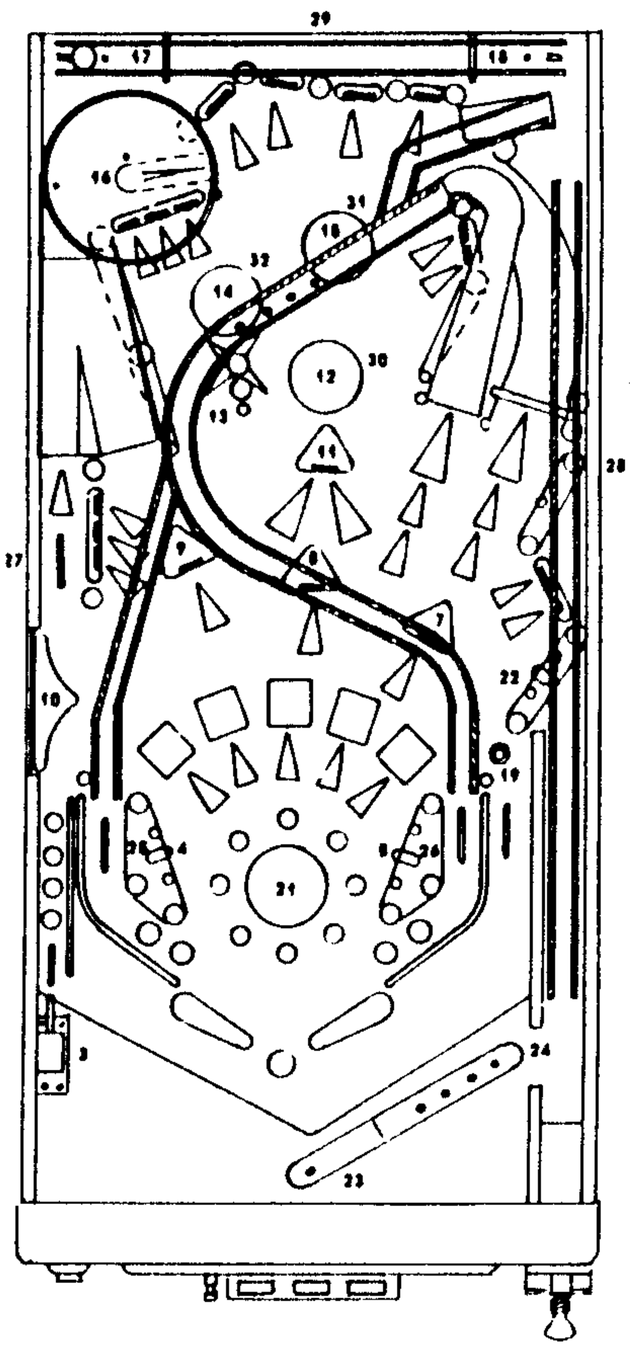
— • = DEVE ESSERE MONTATO CON DISSIPATORE DI CALORE - MUST BE WITH HEAT SINK

— (1) OPTIONAL

— (2) I VALORI DEI FUSIBILI ED I TEMPI DI FUSIONE SONO PER FUSIBILI TIPO «OMEGA-T»
THE VALUES AND THE INTERRUCTION TIME ARE FOR FUSES «OMEGA -T»

POSIZIONE CONNETTORI/CONNECTORS LOCATION

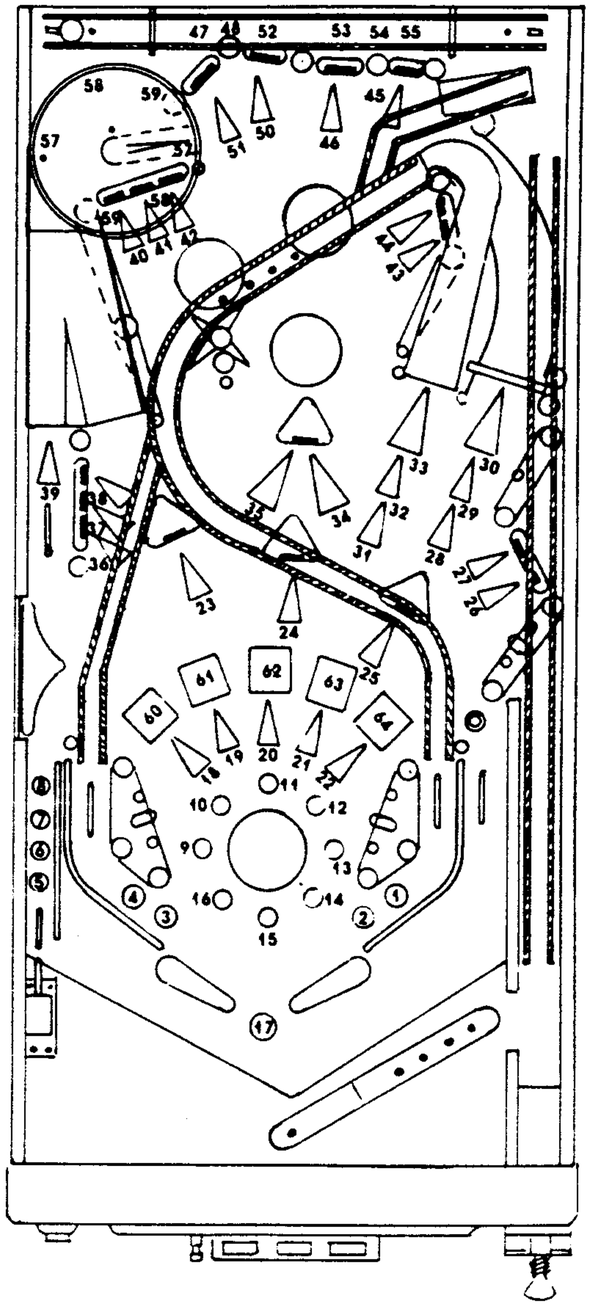




MATRICE LAMPADE - LAMPS MATRIX «X FORCE»

CONNETTORE CN 6	5	6	7	8	9	10	11	12

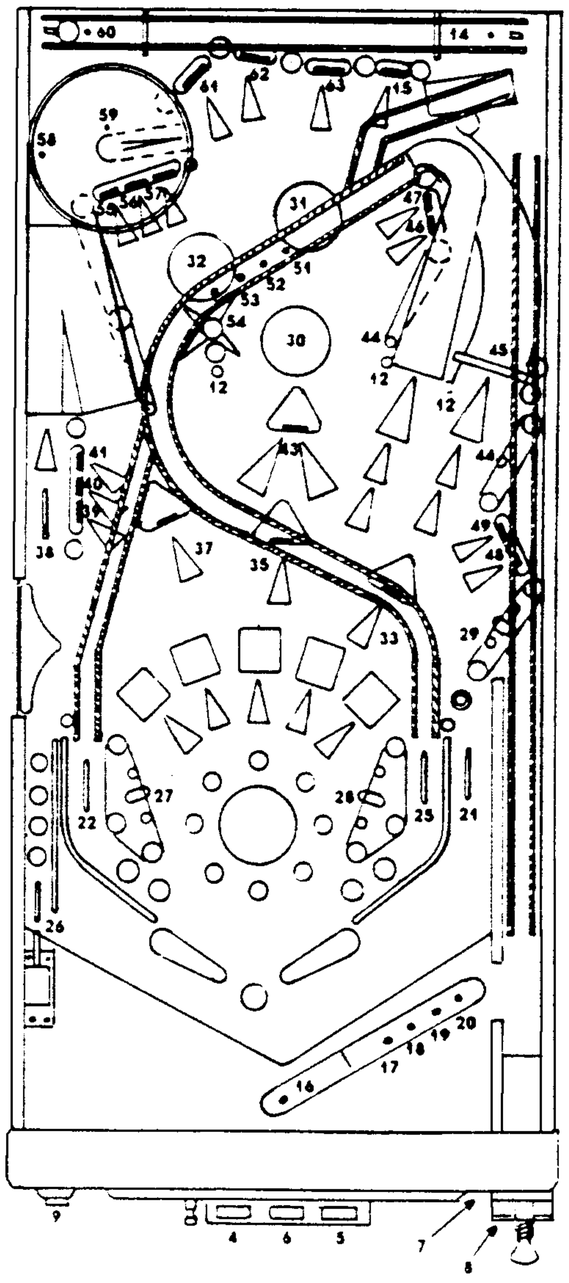
CONNECTOR CN5	N° COL. →	1	2	3	4	5	6	7	8
			NERO-B	MARR-B	ROSSO-B	ARAN-B	GIALLO-B	VERDE-B	BLU-B	VIOLA-B
	N° RIGA ↓	6,3V. 0,3A. 1N4003	BONUS MULTIP. x 40	BONUS MULTIP. x 20	BONUS MULTIP. x 10	BONUS MULTIP. x 5	EXIT LEFT CANAL 1	EXIT LEFT CANAL 2	EXIT LEFT CANAL 3	EXIT LEFT CANAL 4
4	1	NERO 1	2	3	4	5	6	7	8	
5	2	MARR 9	BONUS 7	BONUS 8	BONUS 1	BONUS 2	BONUS 3	BONUS 4	BONUS 5	BONUS 6
6	3	ROSSO 17	EXTRA BALL	ARROW ENEMY 1	ARROW ENEMY 2	ARROW ENEMY 3	ARROW ENNEMY 4	ARROW ENEMY 5	BARRIER 1st TARGET	BARRIER 2nd TARGET
7	4	ARANCIO 25	BARRIER 3rd TARGET	FIX TARGET RIGHT (Bottom)	FIX TARGET RIGHT (Top)	SPINNING TARGET (Bottom)	SPINNING TARGET (Middle)	SPINNING TARGET (Top)	BRIDGE RAMP (Bottom)	BRIDGE RAMP (Middle)
8	5	GIALLO 33	BRIDGE RAMP (Top)	RED SPECIAL	ORANGE SPECIAL	FIX TARGET LEFT (Bottom)	FIX TARGET LEFT (Middle)	FIX TARGET LEFT (Top)	LEFT ROLLOVER	FIX TARGET TOP (Left)
9	6	VERDE 41	FIX TARGET TOP (Middle)	FIX TARGET TOP (Right)	FIX TARGET RIGHT (Bottom)	FIX TARGET RIGHT (Top)	FIX TARGET TOP (Right)	FIX TARGET TOP (Middle-right)	5000 PTS HORIZONTAL RAIL	20000 PTS HORIZONTAL RAIL
10	7	BLU 49	NOT USED	FIX TARGET TOP (Middle-left)	FIX TARGET TOP (Left)	80000 PTS HORIZONTAL RAIL	80000 PTS HORIZONTAL RAIL	20000 PTS HORIZONTAL RAIL	5000PTS HORIZONTAL RAIL	NOT USED
11	8	VIOLA 57	CHOPPER EFFECT	CHOPPER EFFECT	CHOPPER EFFECT	ENNEMY 1	ENNEMY 2	ENNEMY 3	ENNEMY 4	ENNEMY 5



MATRICE CONTATTI - SWITCH MATRIX «X FORCE»

CONNETTORE CN 3	1	8	7	6	5	4	3	2

CONNECTOR CN3	N° COL. →	Ø	1	2	3	4	5	6	7
	N° RIGA ↓ / 1N4148		NERO.B	MARR.B	ROSSO.B	ARAN.B	GIALLO.B	VERDE.B	BLU.B	VIOLA.B
18	Ø NERO	TEST UP Ø	TEST DOWN 1	TILT 2 (vertical lead) 2	SERVICE 3	COIN SW 1 LEFT 4	COIN SW 2 RIGHT 5	COIN SW 3 MIDDLE 6	LETTER SELECTION FORW. 7	
17	1 MARR.	LETTER SELECTION REW. 8	CREDIT 9	TILT 1 (horizontality ball and pendulum) 10	NOT USED 11	MINI POST 12	NOT USED 13	HORIZONTAL RAIL RIGHT 14	FIX TOP TARGET (right) 15	
16	2 ROSSO	OUT HOLE 16	4th BALL 17	3rd BALL 18	2nd BALL 19	1st BALL 20	EXIT CANAL RIGHT 21	INNER CANAL LEFT 22	NOT USED 23	
15	3 ARANCIO	NOT USED 24	INNER CANAL RIGHT 25	EXIT CANAL LEFT 26	LEFT KICKER 27	RIGHT KICKER 28	TOP RIGHT KICKER 29	BOTTOM BUMPER 30	TOP BUMPER 31	
14	4 GIALLO	LEFT BUMPER 32	BARRIER 3 TARGET 33	NOT USED 34	BARRIER 2 TARGET 35	NOT USED 36	BARRIER 1 TARGET 37	LEFT ROLLOVER 38	FIX LEFT TARGET (bottom) 39	
13	5 VERDE	FIX LEFT TARGET (center) 40	FIX LEFT TARGET (top) 41	NOT USED 42	SPECIALS TARGET 43	FIXED CONTACT 44	SPINNING TARGET 45	FIX RIGHT TARGET (middle-top) 46	FIX RIGHT TARGET (top) 47	
12	6 BLU	FIX RIGHT TARGET (bottom) 48	FIX RIGHT TARGET (middle-bottom) 49	NOT USED 50	4th BALL BRIDGE 51	3rd BALL BRIDGE 52	2nd BALL BRIDGE 53	1st BALL BRIDGE 54	FIX TOP LEFT TARGET (left) 55	
11	7 VIOLA	FIX TOP LEFT TARGET (middle) 56	FIX TOP LEFT TARGET (right) 57	CHOPPER ENTRY 58	CHOPPER EXIT 59	HORIZONTAL RAIL LEFT 60	FIX TOP TARGET (left) 61	FIX TOP TARGET (middle-left) 62	FIX TOP TARGET (middle-right) 63	



SPEAKER RIGHT

SPEAKER LEFT

CN 19 — 4 + / 3 − / 2 + / 1 −

VOL. CH1

VOL. CH2

FROM POWER SUPPLY

22 VAC { 11 VAC, 11 VAC } — 34 VAC — 34 VAC — 10,5 VAC — 10,5 VAC

7,2 VAC { 3,6 VAC, 3,6 VAC }

CN1 — 1 … 12

FUSE1 0,315 A.

FUSE2 0,315 A.

FUSE3 0,5 A.

FUSE4 3,15 A.

CN 9 — 1 2 … 25 26

CN20 — 1 2 … 25 26

IC 1

SOUND BOARD

EXTENSION FOR CONTACTS SOLENOIDS LAMPS — CN4 — 1 2 … 19 20

IC 9

6 8 0 0 0

MPU

TO DISPLAY BOARD — CN10 — 2 1 … 34 33

TO DISPLAY BOARD

CN8 — 1 2 … 19 20

CN17 — 1 2 … 19 20

8 GND 43 — SOL. 1 — SOL. 2 — KEY — SOL. 6 — CN13

CN11 — 10 GND 43 — SOL. 7 — KEY — SOL. 3 — SOL. 8 — SOL. 4 — SOL. 5 — SOL. 9 — 1

CN12 — 10 GND 43 — SOL. 10 — SOL. 11 — KEY — SOL. 12 — SOL. 13 — SOL. 14 — SOL. 15 — SOL. 16 — 1

SOL. DRIVER BOARD UP

TO CABINET CONTACTS — COL.1 … COL.8 — ROW1 — ROW8 — 1 … 10

CN2

INPUTS CONTACS

CA 3081

ULN 2003

CPU BOARD

CN7 — 1 2 … 19 20

CN18 — 1 2 … 19 20

8 GND 43 — SOL. 17 — SOL. 18 — KEY — CN16

CN14 — 10 GND 43 — SOL. 22 — KEY — SOL. 19 — SOL. 21 — SOL. 20 — SOL. 24 — SOL. 23 — SOL. 25 — 1

CN15 — 10 GND 12 — SOL. 26 — SOL. 27 — KEY — SOL. 28 — SOL. 29 — SOL. 30 — SOL. 31 — SOL. 32 — 1

SOL. DRIVER BOARD DOWN

CN3 — 1 … 20 — COL.0 COL.7 COL.6 COL.5 COL.4 COL.3 COL.2 COL.1 NC ROW7 ROW6 ROW5 ROW4 ROW3 ROW2 ROW1 ROW0 NC NC

TO PLAYFIELD CONTACTS

CN5 — 1 … 12 — +16V +16V KEY ROW1 ROW2 ROW3 ROW4 ROW5 ROW6 ROW7 ROW8 GND

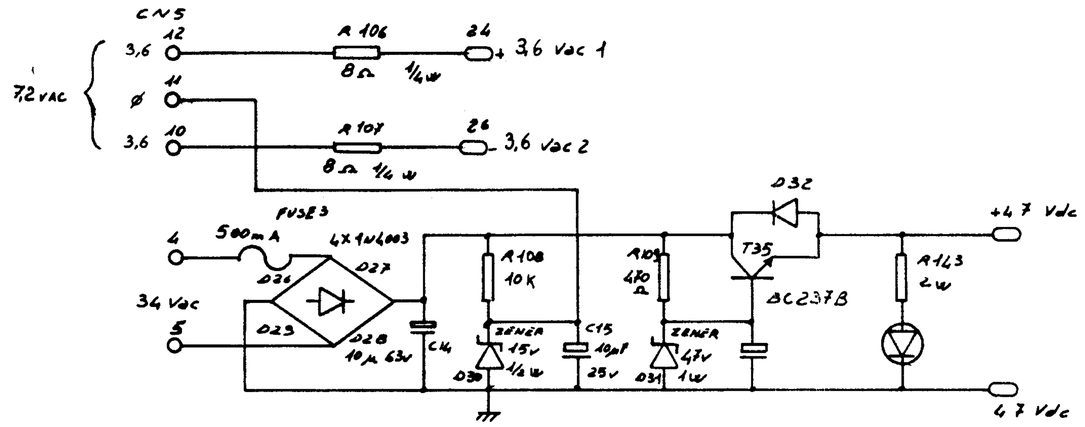
CN6 — 12 … 1 — NC KEY GND GND COL.1 COL.2 COL.3 COL.4 COL.5 COL.6 COL.7 COL.8

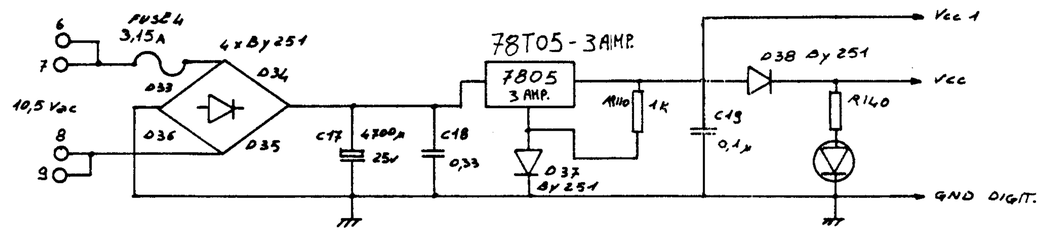
TO PLAYFIELD LAMPS

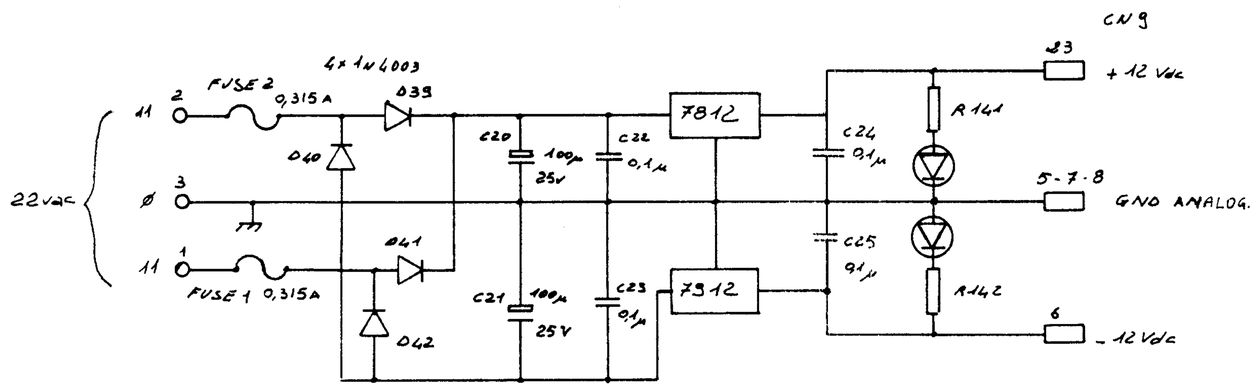
DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

tecnoplay
Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

PARTICOLARE	DESCRIZIONE				
/	P.C. BOARDS CONNECTIONS				
ASSEMBLATO	MATERIALE	TRATTAMENTO	PESO IN GR.	SCALA	
SHEET 1/1	/	/	/	/	
DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
A. Nanni	14/01/88							







tecnoplay Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino				DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE					
PARTICOLARE	DESCRIZIONE								
/	CPU BOARD - POWER SECTION								
ASSEMBLATO	MATERIALE		TRATTAMENTO		PESO IN GR.	SCALA			
SHEET 1/4	/		/		/	/			
DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO	
[illegible]	11/01/[illegible]								

IC2 N.C. N.C.

QZ 8,000MHz R1 820Ω R2 820Ω C1 470p IC1 7404 IC1 7404

GND C2 0,1µ Vcc SIP3 10K

R 142 2K2 R 111 2K2 R 113 2K2

IC2 74HC14 IC2 74HC14

½ IC4 74HC74

½ IC3 LS393

IC2 HC14 IC6 74HC10

IC7 HC02 RESET

SIP 3K2 ×4

IC5 4040

IC8 74HC244

RESET CKRTR

IC10 UDSorLDS

IC7 HC02 IC6 HC10

IC11 HC14 INTACK

IC7 N.C. IC7 N.C.

IC13 BLANKPIS 8 IC4

IC9 68000

111 : Interrupt ACK

HALT RESET DTACK DATACK

R4 1K R5 1K

IC12 7406 IC12 7406

INTACK IC13 HC32 IC13 HC32

IC14 HC32 WR LDS

IC14 HC32 WR UDS

74HC14 IC11 R/W

IC14 LDS IC14 UDS HC00 IC10

IC13 IC14 IC11 IC10 IC7 IC6

A5 LDS UDS R/W

RD LDS RD UDS UDSorLDS

CS CODE CS EPROM

HC138 IC19 CS I/O CS AUX CS EXP

LS157 IC38 R139 2K2 R138 2K2 CS CODE CS EPROM CS RAM

HC138 IC20 LAMP 1 LAMP 2 SOL 1 SOL 2 SOUND DISP1 DISP2 SET OUT

HC138 IC21 INPUT KEY INPUT SOUND RTRG

IC15 27C256/20 C30

IC17 27C256/20 C38

PF CS RAM

IC16 4364 C/6 10L

IC18 4364 C/6 10L

V BATT.

D0÷15

IC26 74HC244 IC27 3081 INPUT KEY SIP5 4K7 C34

BC548 T1

DISP1 DISP2 HC00 IC10 D1 R6 2K2 C3 100p IC11 74HC14

IC13 NC HC14 IC10 DAT ACK

COL1 COL2 COL3 COL4 COL5 COL6 COL7 COL0

R124 R123 R122 R121 R120 R119 R118 R117

D9 D5 D8 D4 D7 D3 D6 D2

R13 R12 R11 R10 R9 R8 R7 R14

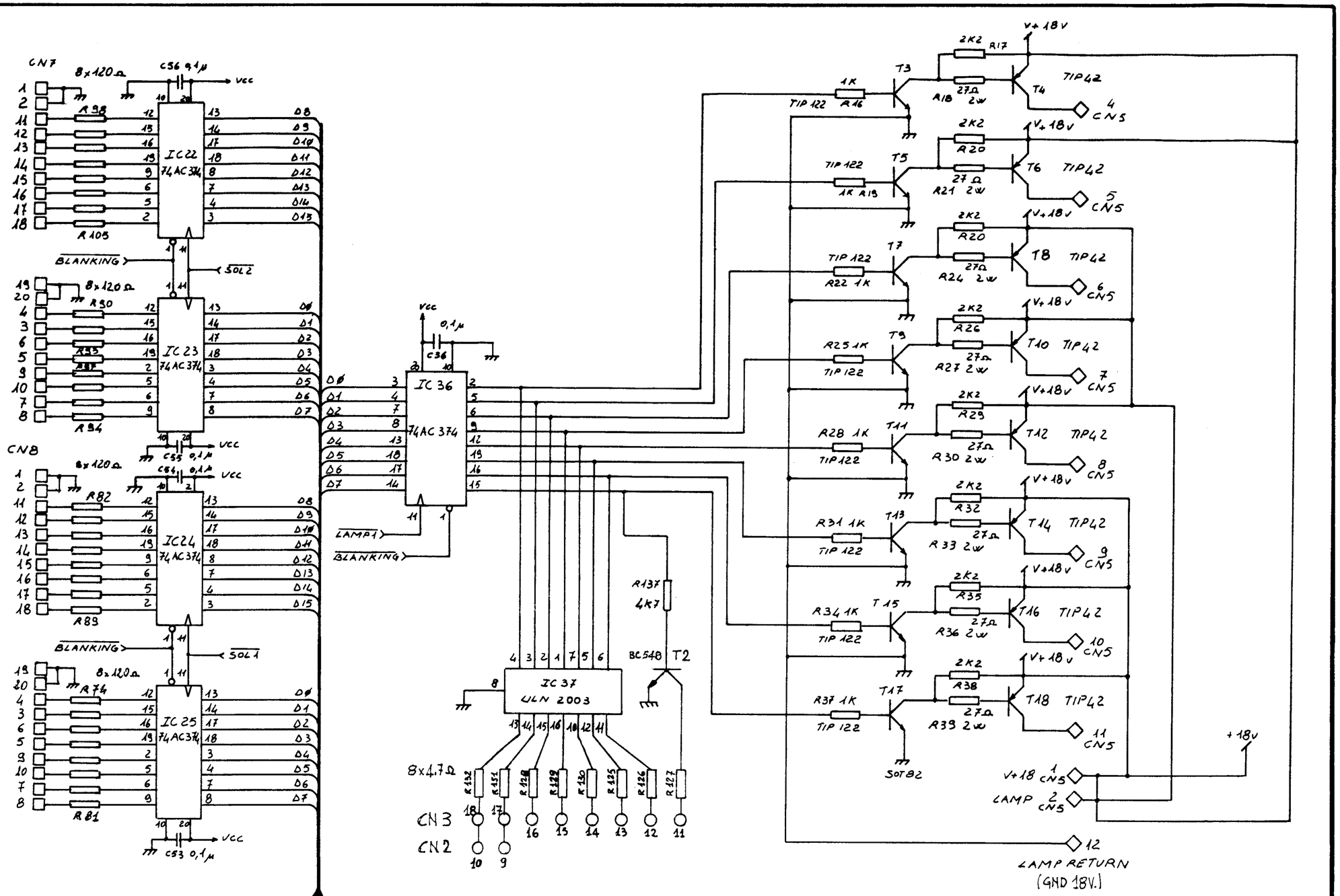
C64 C63 C62 C61 C60 C59 C58 C57

CN3 CN2

Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

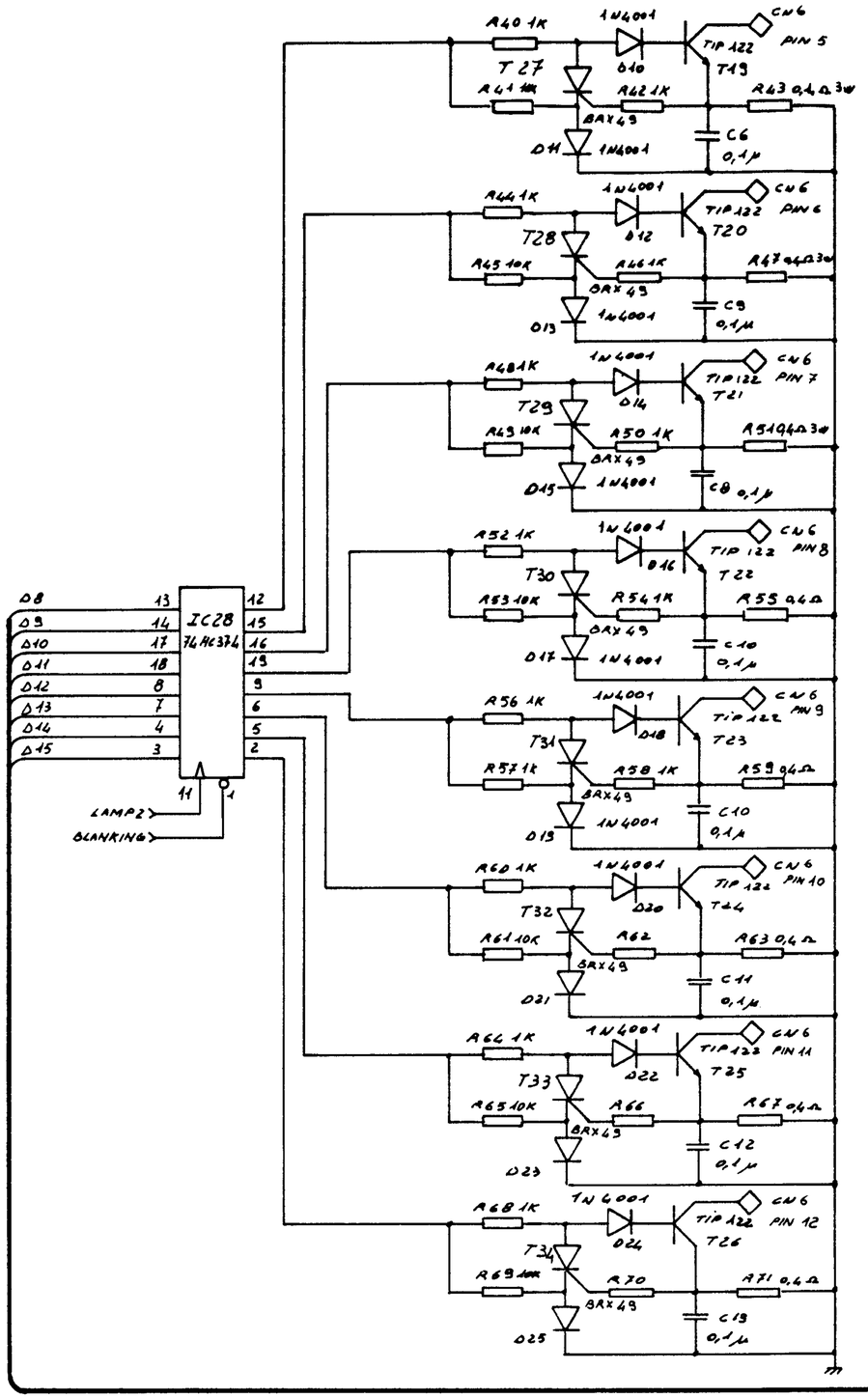
PARTICOLARE	DESCRIZIONE							
/	CPU BOARD							
ASSEMBLATO	MATERIALE	TRATTAMENTO	PESO IN GR.	SCALA				
SHEET 2/4	/	/	/	/				
DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
Frano	12/01/88							

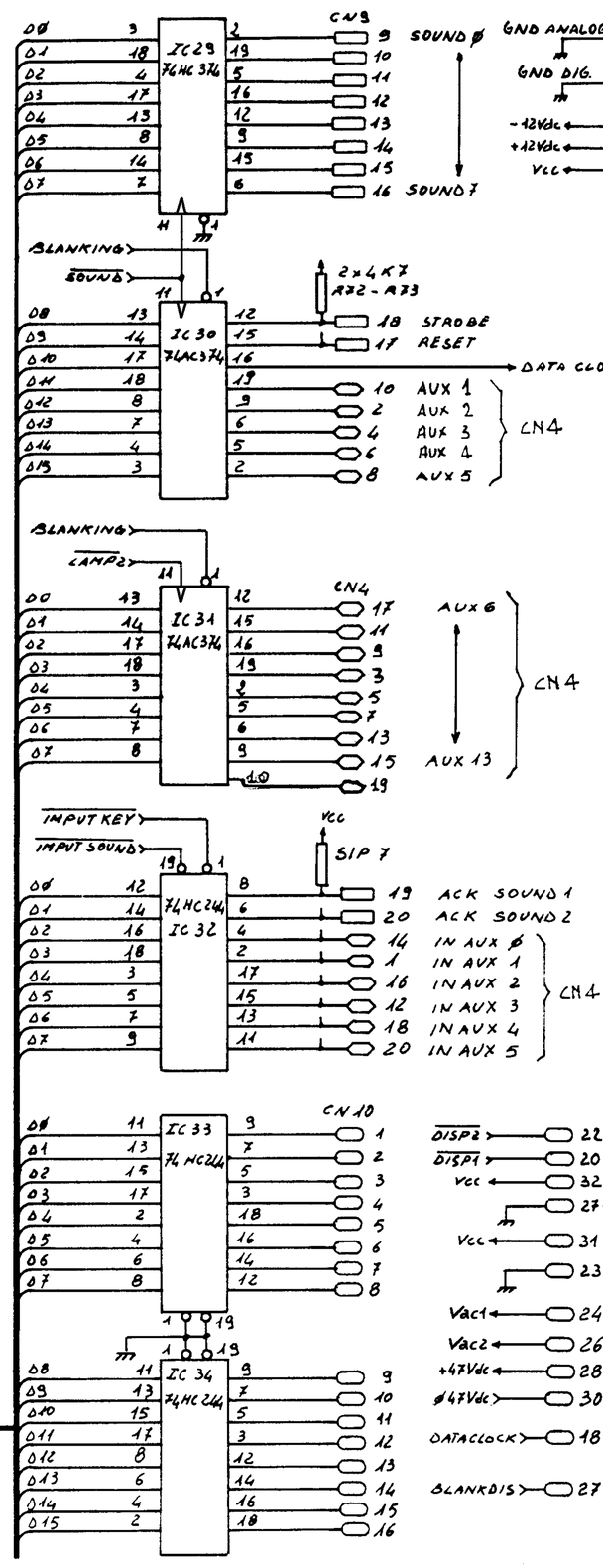


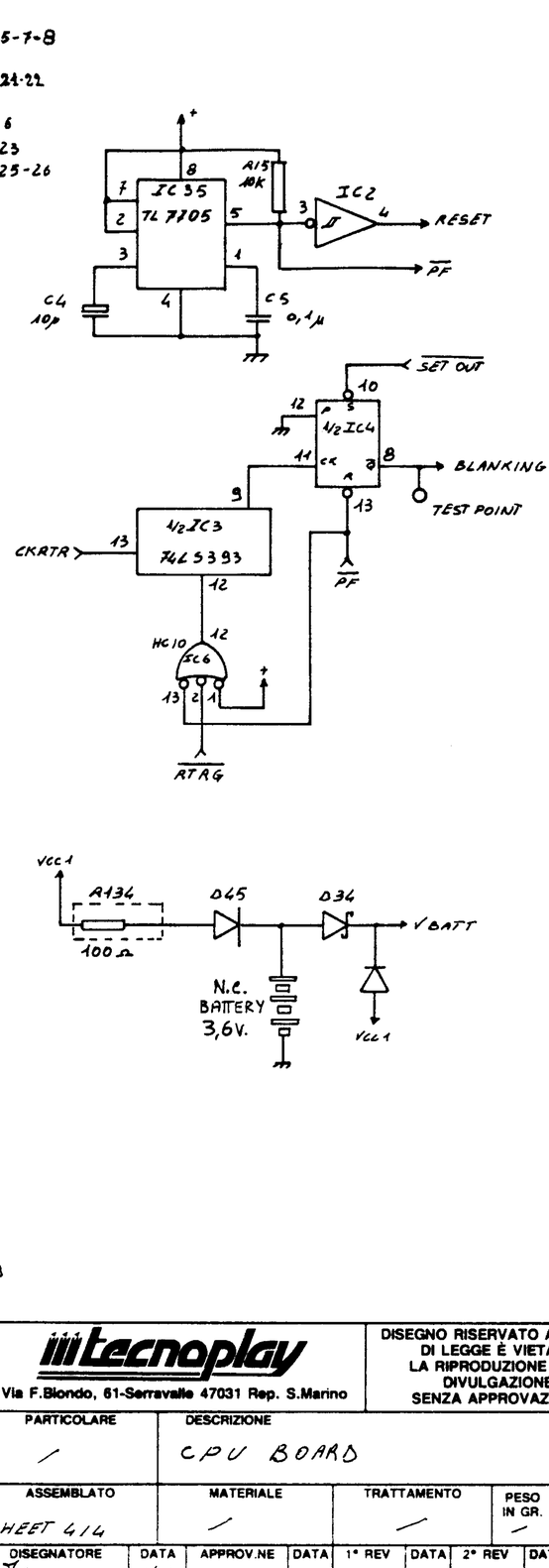
tecnoplay
Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

PARTICOLARE	DESCRIZIONE				
/	CPU BOARD				
ASSEMBLATO	MATERIALE	TRATTAMENTO	PESO IN GR.	SCALA	
SHEET 3/4	/	/	/	/	
DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
Paolo	12/01/88							



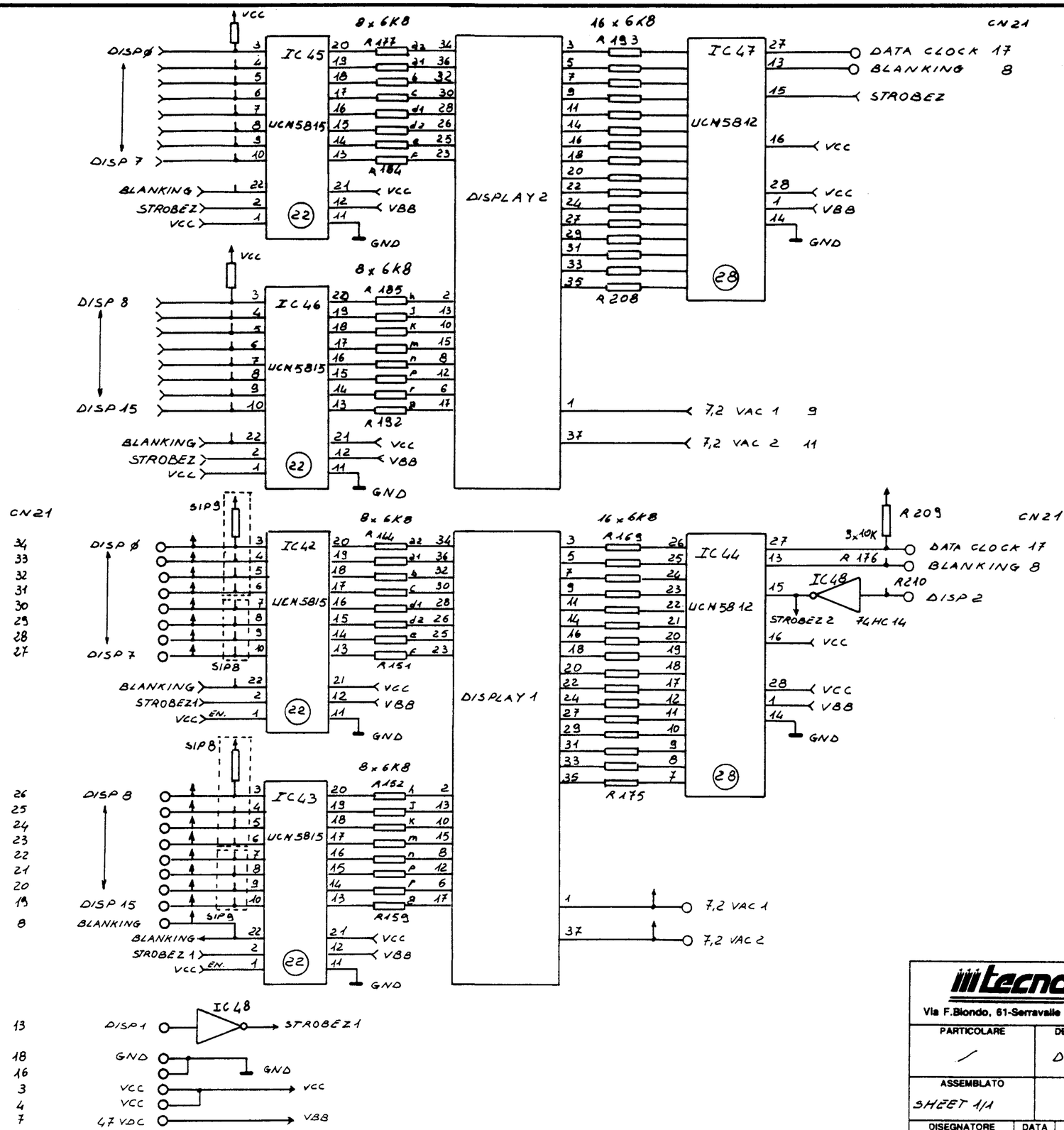




DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

tecnoplay
Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

PARTICOLARE	DESCRIZIONE					
/	CPU BOARD					
ASSEMBLATO	MATERIALE	TRATTAMENTO	PESO IN GR.	SCALA		
SHEET 4/4	/	/	/	/		
DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
Flavio	13/01/88							



tecnoplay Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino								DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE	
PARTICOLARE	DESCRIZIONE								
/	DISPLAY BOARD								
ASSEMBLATO	MATERIALE		TRATTAMENTO				PESO IN GR.	SCALA	
SHEET 1/1	/		/				/	/	
DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO	
	14/01/88								

MASTER CPU

CN20

IC1 TMS 7000

IC2 74LS138

IC3 74LS138

IC4 74LS373

IC5 74LS373

IC6 74HC14

IC7 74LS32

IC8

IC9

IC10

IC11 27256 4000÷8FFF

IC12 27256 C000÷FFFF

READ 8000÷BFFF

WRITE 4000÷7FFF

READ 4000÷7FFF

C000÷FFFF

SHEET2 IC

SHEET2 RD

SHEET2 WR

SHEET2 DB7

SHEET2 DB0

N.C.

ACK

ANALOG GND

DIGITAL GND

ACK MASTER CPU

DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

tecnoplay
Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

PARTICOLARE	DESCRIZIONE							
/	SOUND BOARD							
ASSEMBLATO	MATERIALE	TRATTAMENTO	PESO IN GR.	SCALA				
SHEET 1/2	/	/	/	/				
DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
Rossi	10/01/88							

R10 680 VR1 470 VR1 +5V 100K CER

74 HC14 3,58 MHz

220 pF C14

SHEET 1

RD WR AD DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0 IC

IC13 TMY 2016-A 5800 5801

SY SH MO IRQ N.C.

TO PIN 13 OF TMS7000 MPU

IC15 TMY 2016-B

IC17 TL082 C18 10µ R14 10K R15 10K R16 10K

C19 4K7 C20 4K7

R17 22K C21 470pF C79

IC18 5534 C80 -V

C22 10µF R18 10K

C23 R19 12K

IC21 1/2 TL082 C24 10µF

+V

IC 22 TDA 3810

C35 470K R29 33K R30 33K C37 4µ7 SIG LEFT

R31 10K C36 3K9 R32 10K C38 470K R33 10K C45 3K9 C46 4µ7 SIG RIGHT

C33 (25V) 100µF C34 100µF (25V)

R27 100K C32 10µF R28 33K

X2 C39 470K C40 10K C41 10K R38 15K R39 82K R34 15K R36 22K R35 10K R37 22K R40 22K R41 18K C42 22K C43 12K C44 10K

DB7 DB0

IC14 74LS377 6800 WR2

+5V 100K CER C73

IC16 DAC 0808

R11 2K2 C76 100K CER

C25 120pF R20 2K7 C26 10µ R21 15K

R22 56K C27 1K

R23 15K C28 2K2 C81 IC20 TL081 C82

R24 100K R25 100K C29 1K

R26 22K C30 1K C31 10µ IC21 1/2 TL082

R12 2K2 R13 4K7 C16 100K C17 100µF -12V

SHEET 1

SIG LEFT VR3 10K R42 2K7 C47 1µF TANT. IC19 1/2 TDA 2005 C48 100K R43 120K C49 10µF

SIG RIGHT VR2 10K R47 2K7 C54 1µF TANT.

C50 100µ C51 220µF 16V C52 100K C53 100K C58 220µF 16V C59 C60

R44 1,2K R46 4,7Ω 1,2W R49 1,2K R51 4,7Ω 1,2W R45 2,2Ω R50 2,2Ω

CN 19 4 3 2 1

POWER AMPLIFER

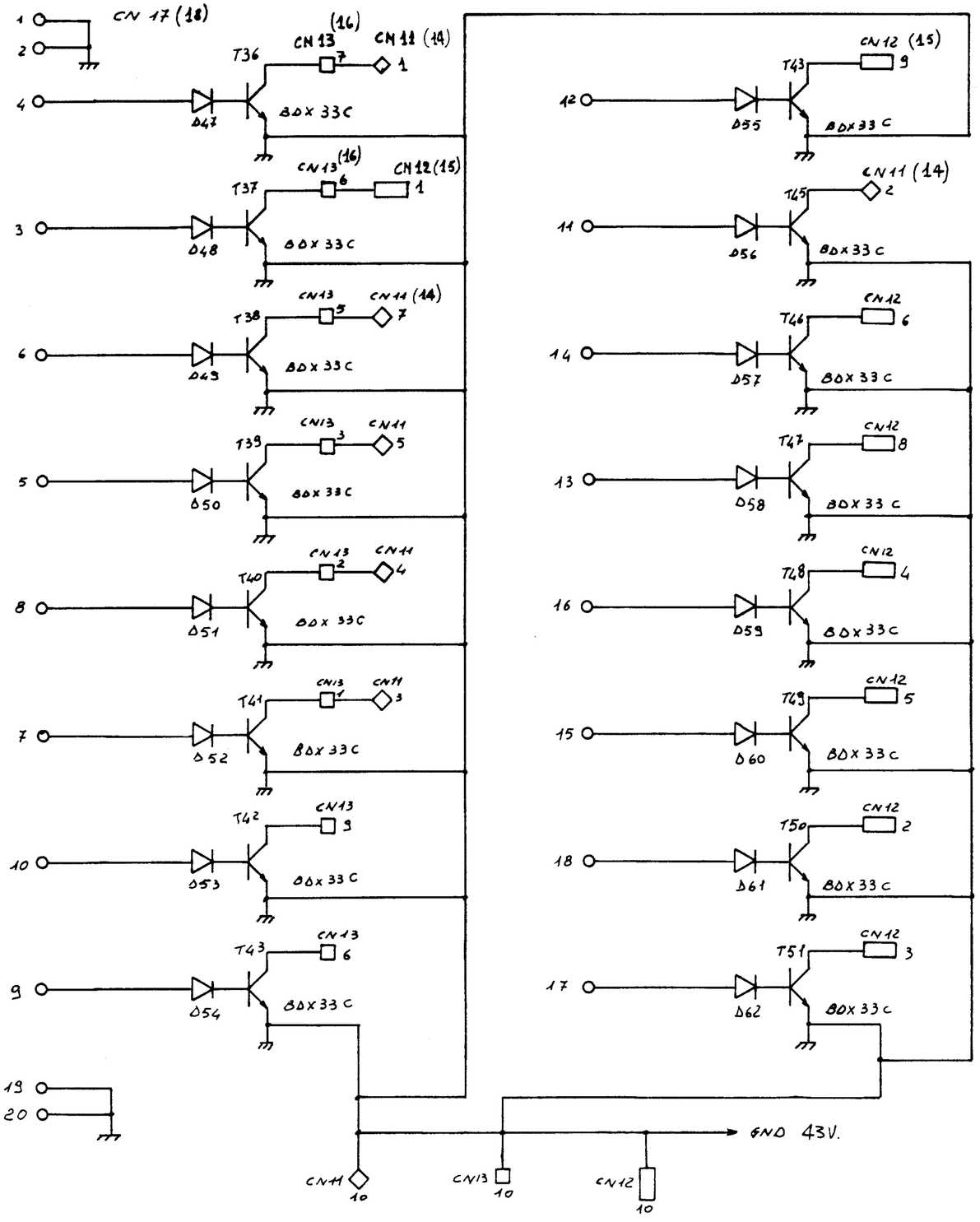
MASSA ANALOGICA PRESA DIRETTAMENTE SUL CONNETTORE D'INGRESSO (ANALOGIC GROUND)

tecnoplay

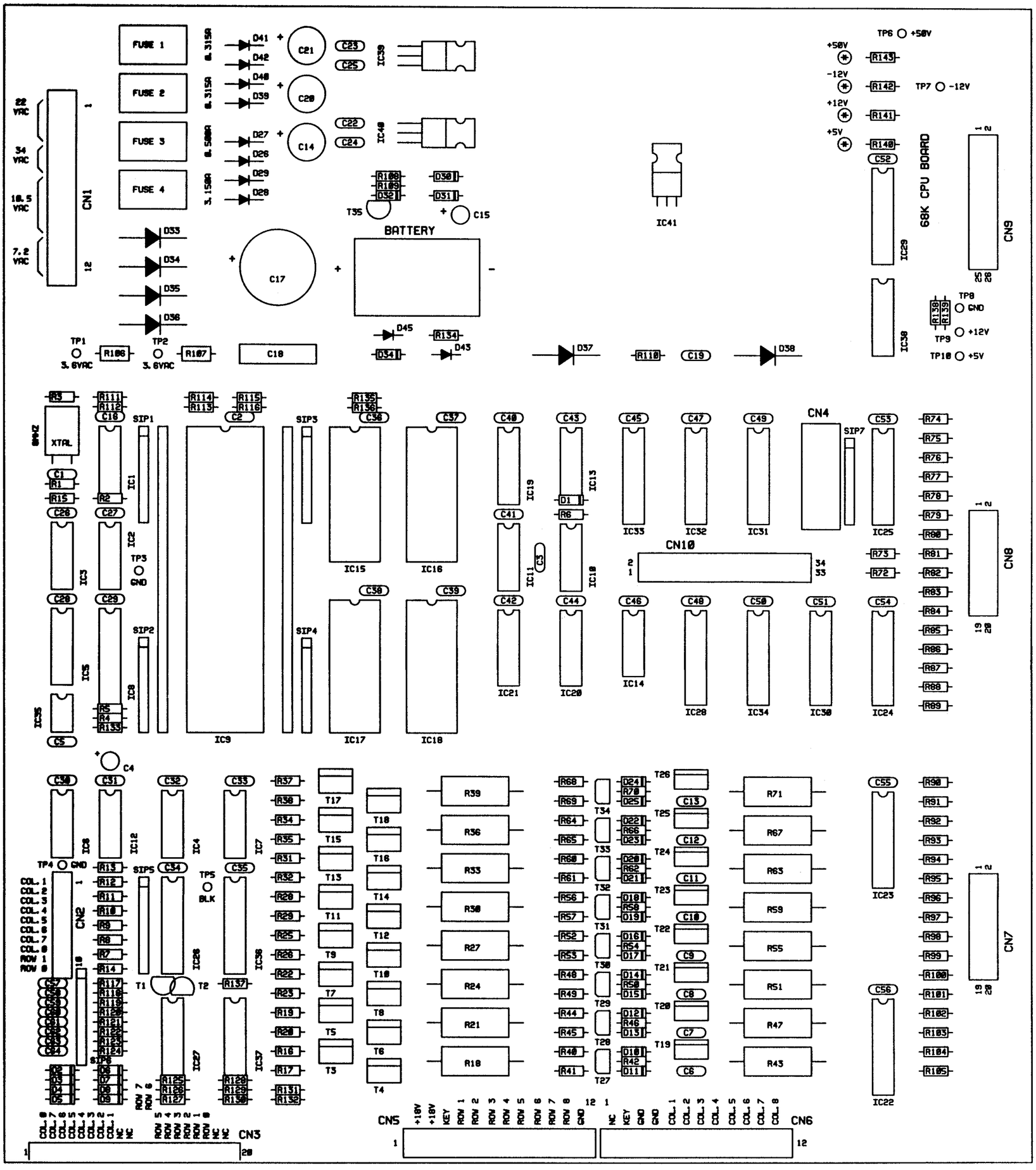
Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

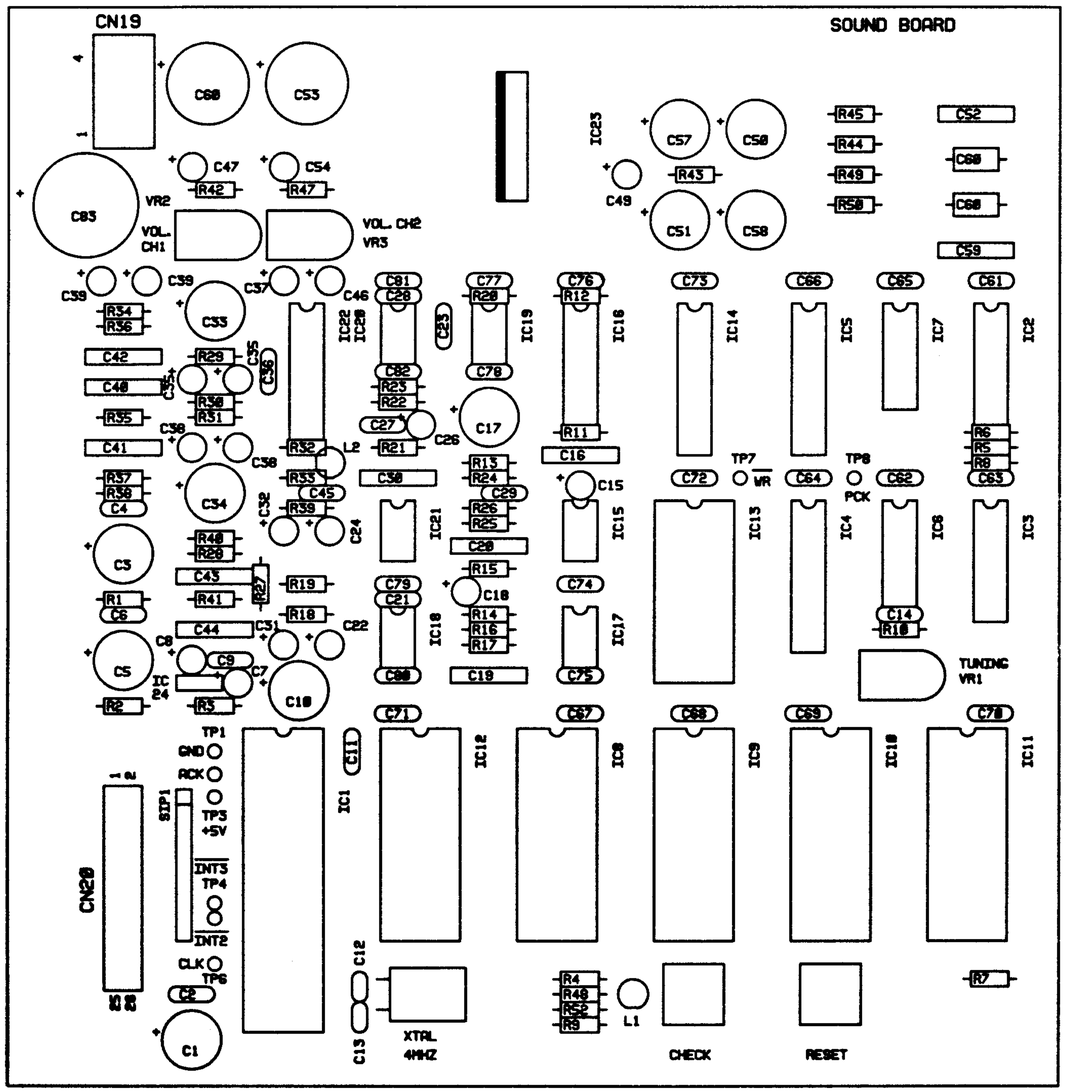
DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

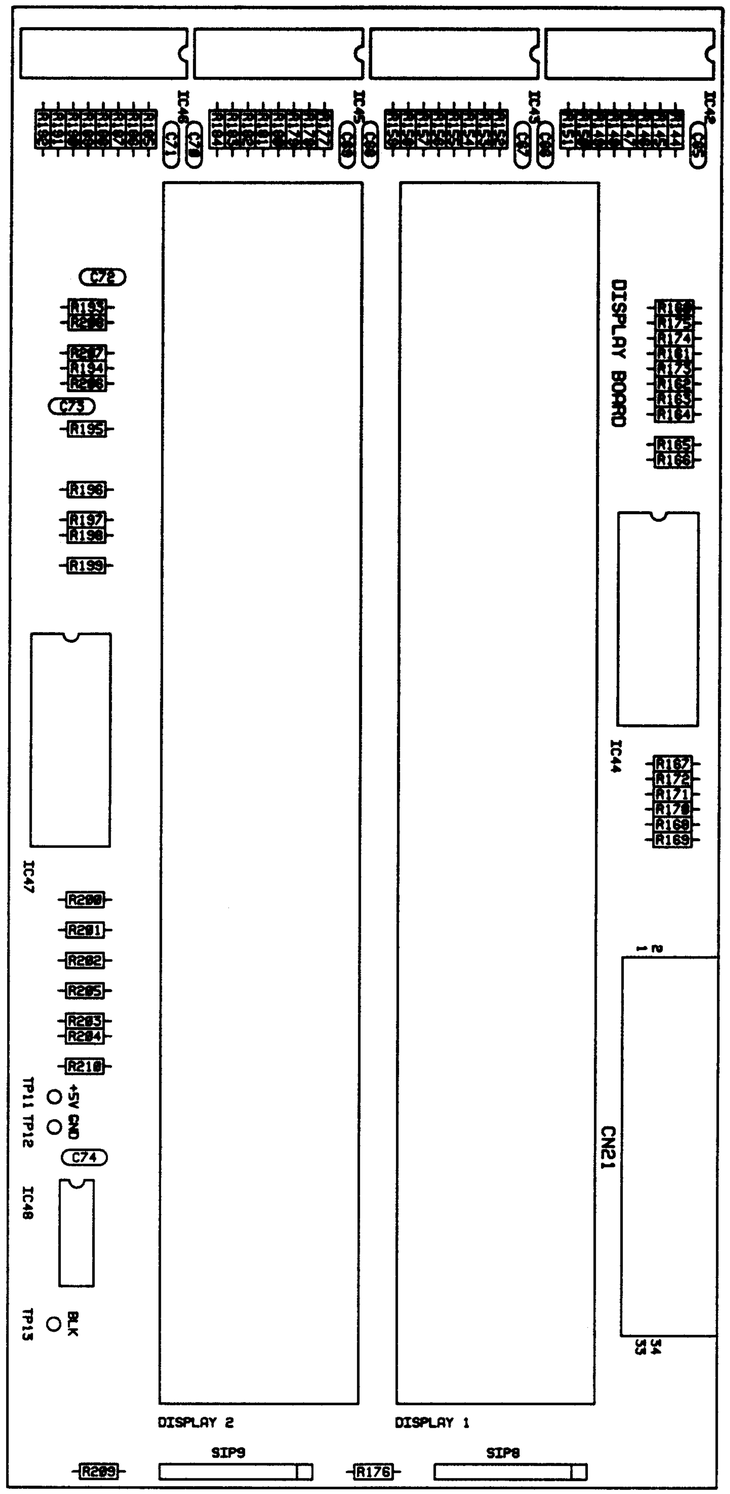
PARTICOLARE	DESCRIZIONE							
/	SOUND BOARD							
ASSEMBLATO	MATERIALE		TRATTAMENTO		PESO IN GR.	SCALA		
SHEET 2/2	/		/		/	/		
DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
[illegible]	10/04/88							

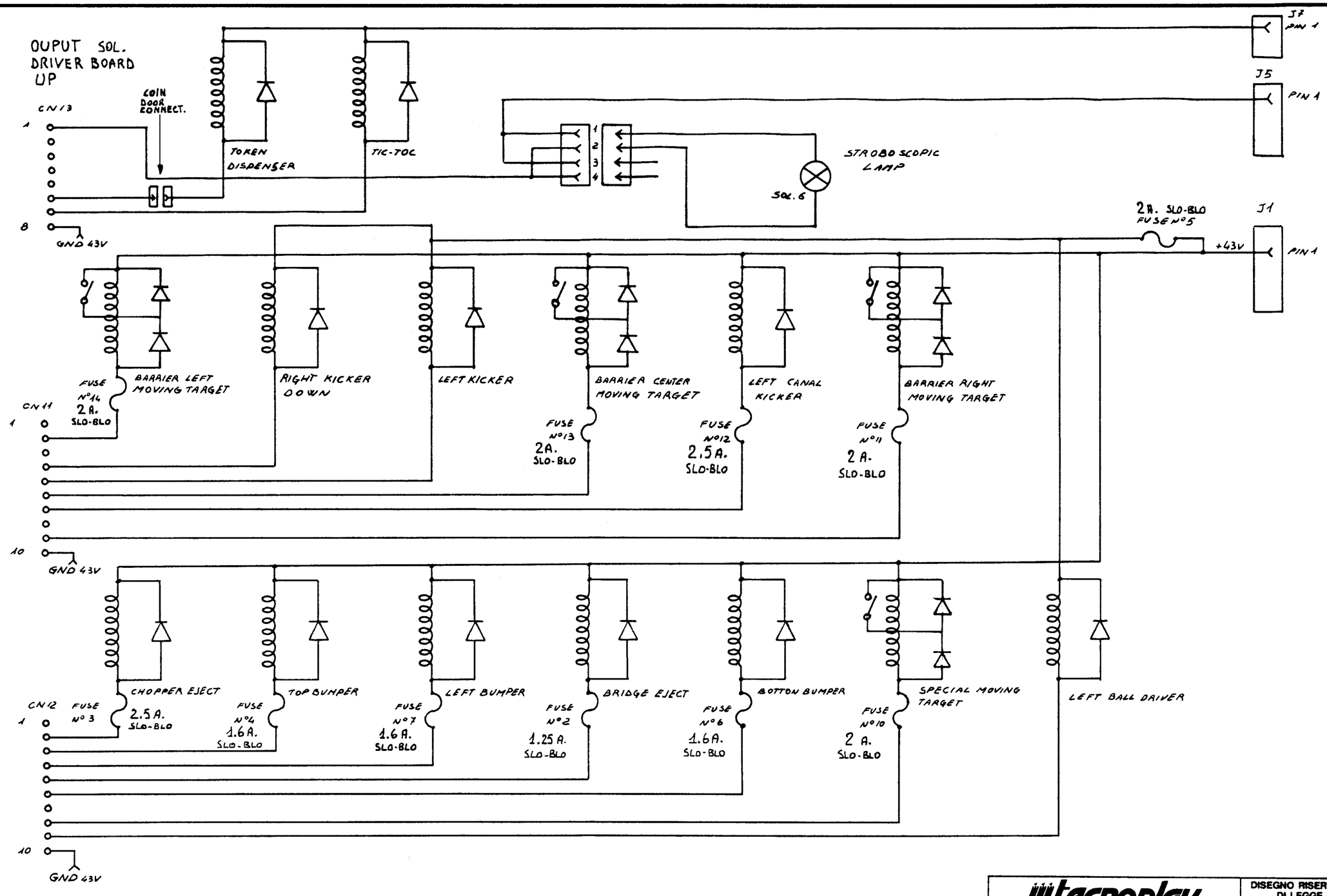


tecnoplay Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino								DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE	
PARTICOLARE /	DESCRIZIONE DRIVER BOARD								
ASSEMBLATO SHEET 1/1	MATERIALE /			TRATTAMENTO /			PESO IN GR. /	SCALA /	
DISEGNATORE Flavio	DATA 12/01/00	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO	


FUSE 1
FUSE 2
FUSE 3
FUSE 4
CN1
22 VAC
34 VAC
18.5 VAC
7.2 VAC
BATTERY
68K CPU BOARD
CN9
CN8
CN7
CN4
CN10
CN2
CN3
CN5
CN6
XTAL
TP1
TP2
TP3
TP4
TP5
TP6 +50V
TP7 -12V
TP8 GND
TP9 +12V
TP10 +5V
IC41
IC29
IC30
IC25
IC22
IC35
IC33
IC32
IC31
IC28
IC34
IC30
IC24
IC21
IC20
IC14
IC15
IC18
IC9
IC17
IC8
IC6
IC12
IC4
IC7
IC26
IC27
IC37
IC36
IC19
IC13
IC11
IC10
SIP1
SIP2
SIP3
SIP4
SIP5
SIP6
SIP7


SOUND BOARD
CN19
VR2
VOL. CH1
VOL. CH2 VR3
TUNING VR1
TP1 GND
TP2 RCK
TP3 +5V
INT3
TP4
INT2
TP5 CLK
TP6
SIP1
CN20
XTAL 4MHZ
CHECK
RESET
TP7 WR
TP8 PCK
L1
L2


DISPLAY BOARD
CN21
DISPLAY 2
DISPLAY 1
SIP9
SIP8
TP11 +5V
TP12 GND
TP13 BLK



tecnoplay
Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

PARTICOLARE	DESCRIZIONE			
/	SOLENOID WIRING			
ASSEMBLATO	MATERIALE	TRATTAMENTO	PESO IN GR.	SCALA
	/	/	/	/

DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
	14/01/88							

OUPUT SOL. DRIVER BOARD DOWN

CN16

1

8

GND 43V

HORIZONTAL KICKER TOP RIGHT

HORIZONTAL KICKER TOP LEFT

FUSE N°5 2 A. SLO BLO

+12V

LEFT KICKER DOWN

OUT HOLE KICKER

HOLE EJECT

10W

10W

10W

PLAYFIELD EFFECT LAMP

2 A. SLO-BLO FUSE N°1

MOVING MINI POST RIGHT CANAL

RIGHT KICKER UP

CN 14

1

10

GND 43V

J1

+43V — PIN 1

GND 43V — PIN 4

GND 12V — PIN 5

+12V — PIN 2

J7

GND 43V — PIN 2

CN15

1

10

GND 12V

LEFT BUMPER

TOP BUMPER

BOTTOM BUMPER

10W

CAPTIVE BALL FLASH

10W

10W

EFFECT PLAYFIELD HEAD

RIGHT KICKER TOP

LEFT ROLLOVER

RIGHT KICKER

RIGHT PUSH BUTTON

LEFT PUSH BUTTON

FUSE N°8 4 A. SLO-BLO

FUSE N°9 4 A. SLO-BLO

RIGHT FLIPPER COIL

LEFT FLIPPER COIL

SOL.20 FLIPPER RELAY

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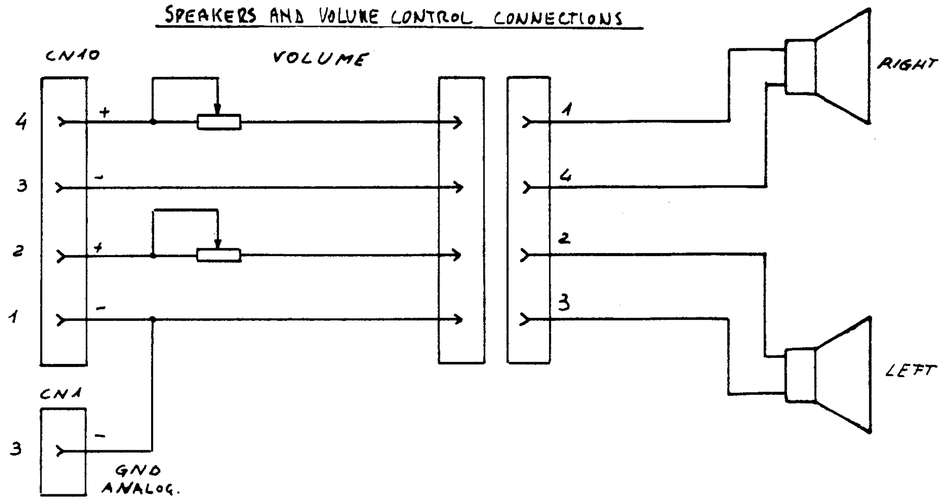
Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

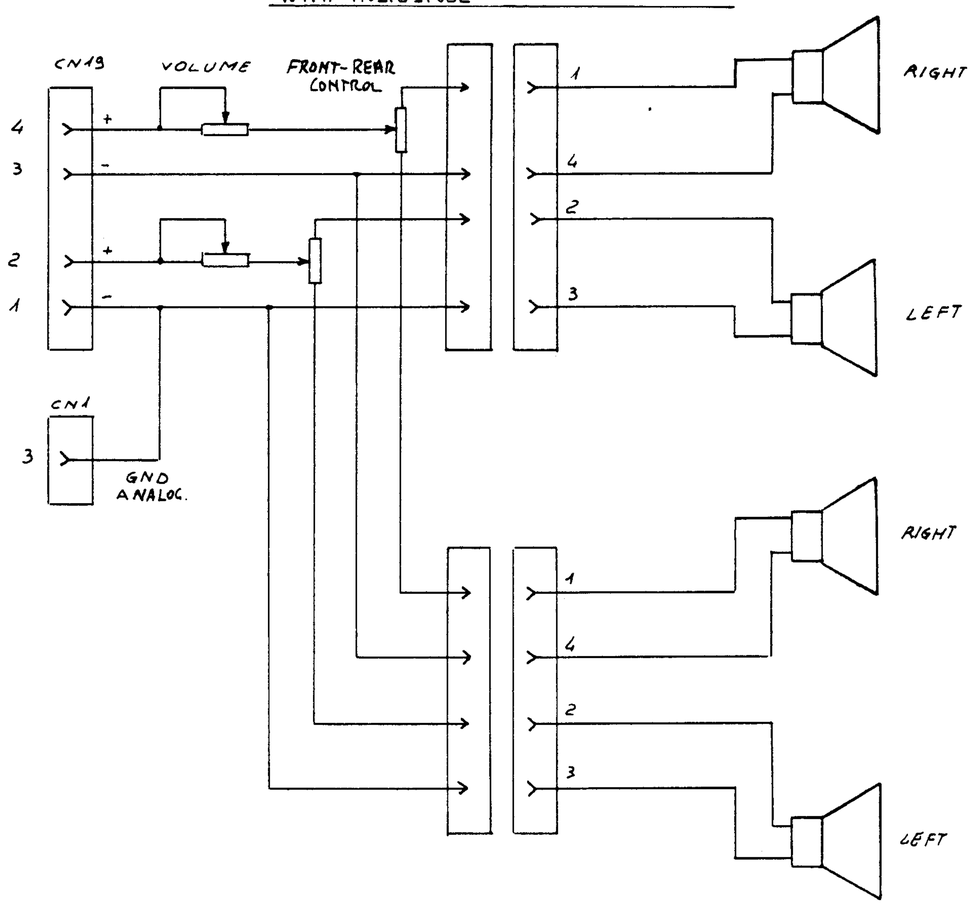
PARTICOLARE	DESCRIZIONE			
/	SOLENOID AND FLASH LAMP WIRING			
ASSEMBLATO	MATERIALE	TRATTAMENTO	PESO IN GR.	SCALA
	/	/	/	/

DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
	14/04/88							

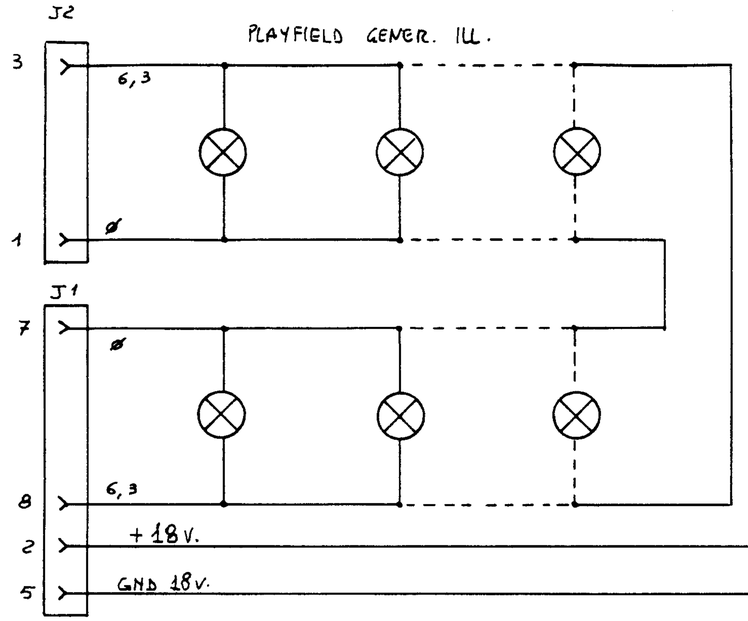
SPEAKERS AND VOLUME CONTROL CONNECTIONS



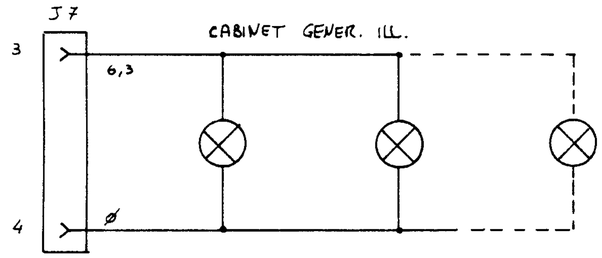
SPEAKERS AND VOLUME CONTROL CONNECTIONS WITH AUDIO STOOL



PLAYFIELD GENER. ILL.



CABINET GENER. ILL.



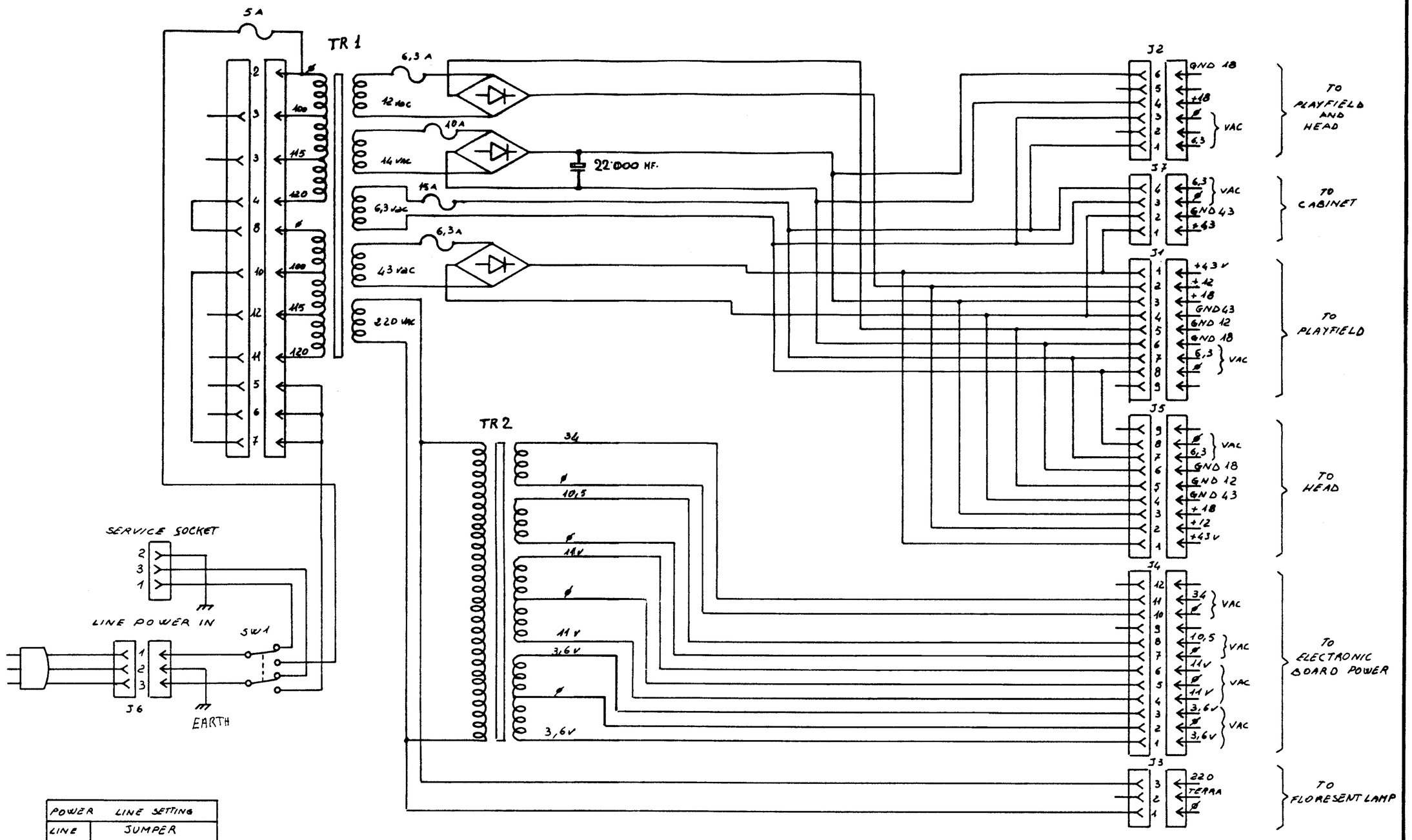
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Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

PARTICOLARE	DESCRIZIONE
/	SPEAKERS AND GEN. ILL. WIRING

ASSEMBLATO	MATERIALE	TRATTAMENTO	PESO IN GR.	SCALA
SHEET 1/1	/	/	/	/

DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
	14/9/88							



POWER LINE SETTING			
LINE	JUMPER		
220	4÷8	7÷10	–
240	4÷8	7÷11	–
120	2÷8	4÷6	7÷11
100	2÷8	9÷6	7÷10
115	2÷8	3÷6	7÷12
200	9÷8	7÷10	–

tecnoplay
Via F.Biondo, 61-Serravalle 47031 Rep. S.Marino

DISEGNO RISERVATO A NORMA DI LEGGE È VIETATA LA RIPRODUZIONE E LA DIVULGAZIONE SENZA APPROVAZIONE

PARTICOLARE	DESCRIZIONE							
/	POWER SUPPLY WIRING DIAGRAM							
ASSEMBLATO	MATERIALE	TRATTAMENTO	PESO IN GR.	SCALA				
SHEET 1/1	/	/	/	--				
DISEGNATORE	DATA	APPROV.NE	DATA	1° REV	DATA	2° REV	DATA	FOGLIO
Arduino	16/01/92							