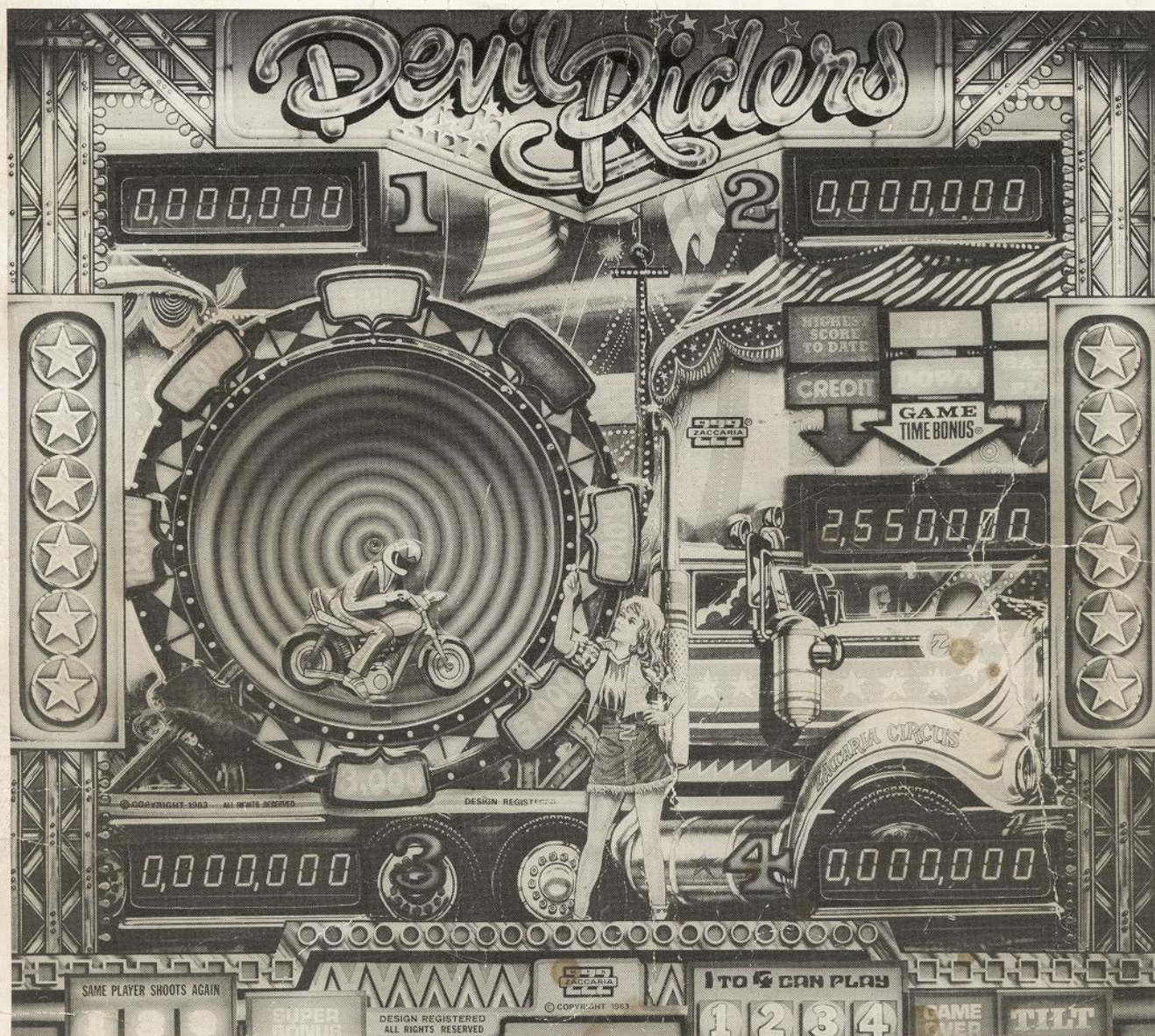




ZACCARIA®



MANUALE D'ISTRUZIONI

I D GB F

IIª EDIZIONE

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**catalogo
ricambi**

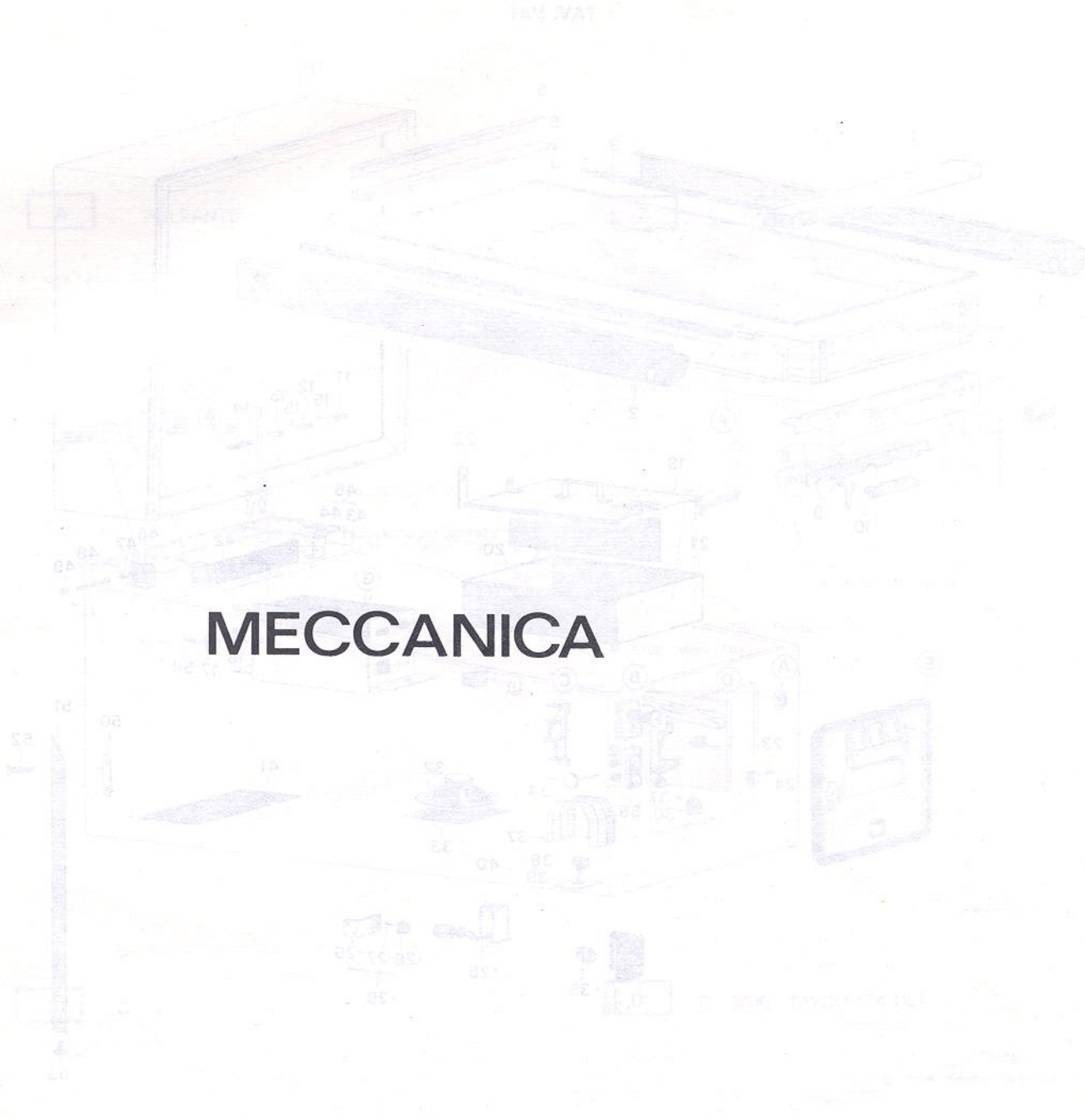
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ELETTRONICA

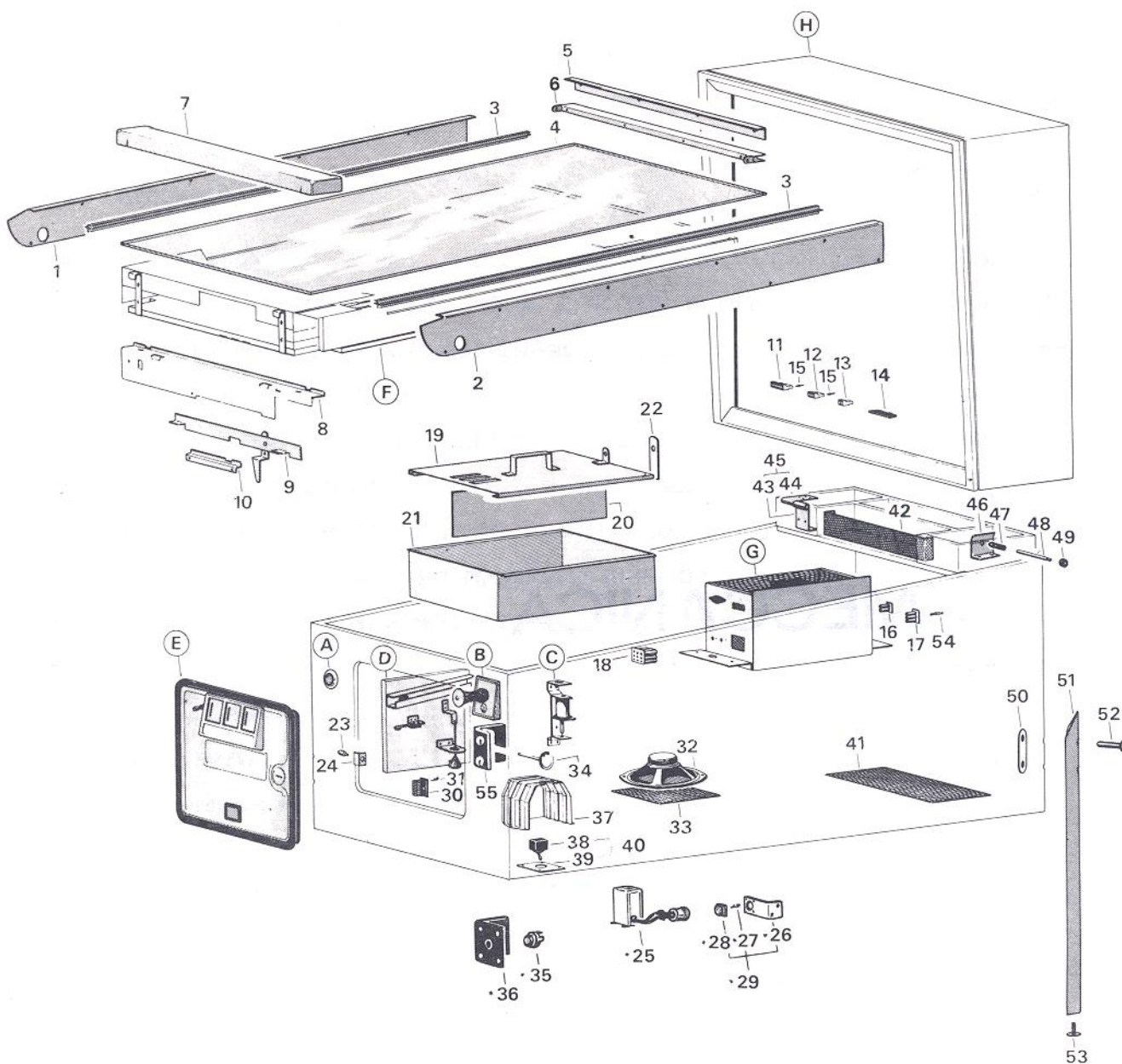
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MECCANICA

catalogo
ricambi

TAV. I



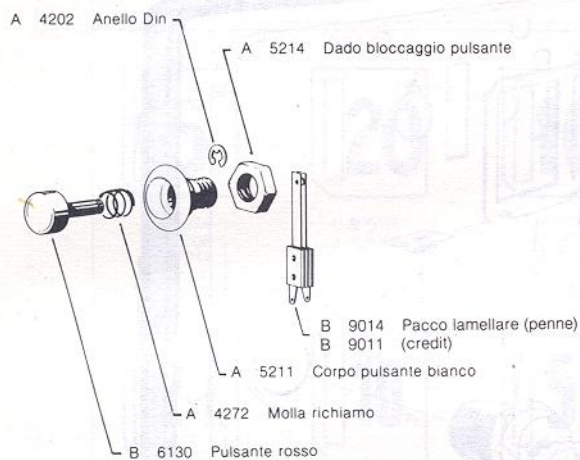
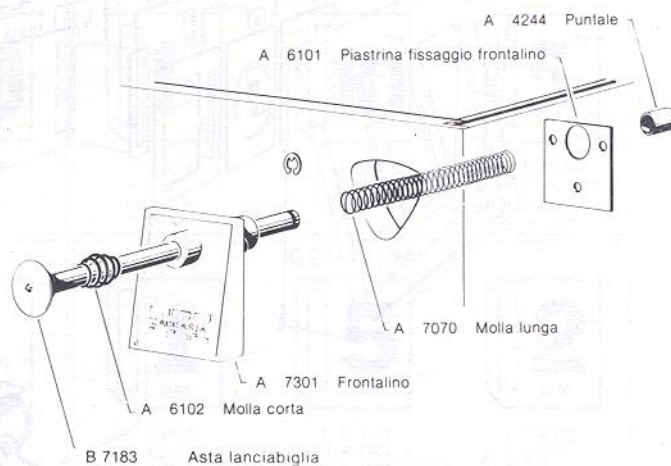
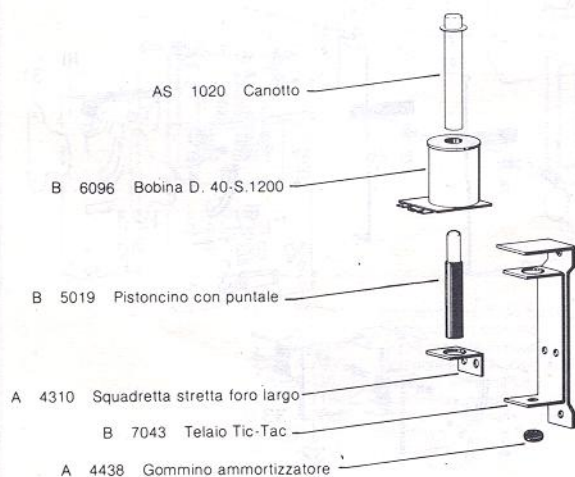
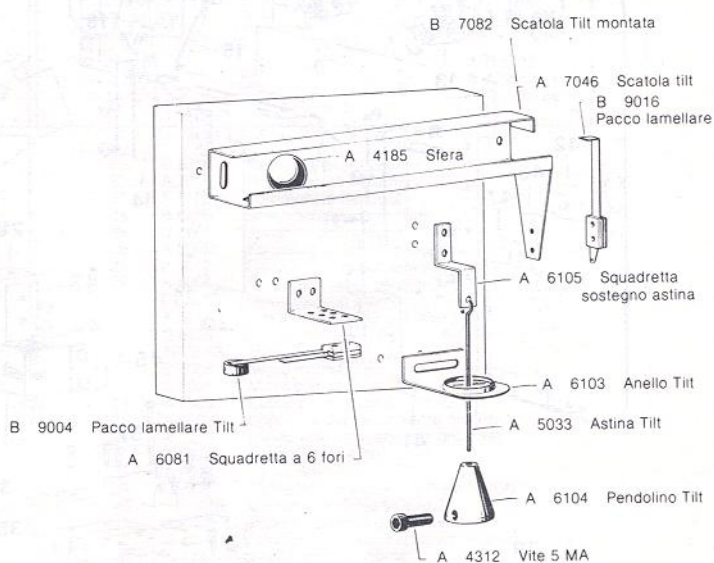
- | | | |
|-----|---------|--|
| 1 | A 7219 | Sponda sinistra |
| 2 | A 7218 | Sponda destra |
| 3 | A 7039 | Guida vetro |
| 4 | MV 015 | Vetro del piano di gioco |
| 5 | A 7073 | Angolare vetro |
| 6 | A 7074 | Colletto cassone |
| 7 | B 7090 | Poggiamano |
| 8 | B 7085 | Aggancio poggiamano |
| 9 | B 7044 | Leva aggancio poggiamano |
| 10 | A 7099 | Squadretta fissaggio leva |
| 11 | CE 1986 | Connettore 7 vie arancio (femmina) |
| 12 | CE 1989 | Connettore 3 vie giallo (femmina) |
| 13 | CE 1988 | Connettore 2 vie giallo (femmina) |
| 14 | CE 1984 | Connettore 20 vie nero (femmina) |
| 15 | CE 1993 | Chiave di polarizzazione 640630-1 |
| 16 | CE 1808 | Connettore 2 vie AMP volante |
| 17 | CE 1764 | Connettore 3 vie AMP volante |
| 18 | CE 1765 | Connettore 9 vie AMP volante |
| 19 | B 7217 | Coperchio cassetta monete |
| 20 | A 7272 | Divisorio cassetta monete |
| 21 | B 7216 | Cassetta monete |
| 22 | A 6018 | Squadretta fissaggio cassetta monete |
| 23 | CE 3002 | Pulsante a saldare 9633 - 9433 |
| 24 | A 5317 | Squadretta a «L» porta pulsante credit |
| *25 | CEB 145 | Contatore «Valore» delle monete |
| *26 | A 7174 | Squadretta porta connettore |
| *27 | CE 1325 | Contatto femmina |
| *28 | CE 1326 | Connettore per stampante UTG porta femmina |
| *29 | B 7173 | Connettore per stampante montato e cablato |
| 30 | CE 1339 | Connettore femmina 2 x 8 MODU 2 |
| 31 | CE 1340 | Contatto femmina MODU 2 |
| 32 | CE 2018 | Altoparlante 7W 4 Ω |

- | | | |
|----|---------|---|
| 33 | A 7150 | Rete protezione altoparlante |
| 34 | CE 1753 | Potenziometro 100 |
| 35 | CE 3082 | Jack cuffia |
| 36 | A 7406 | Staffa supporto potenziometro e Jack |
| 37 | A 7217 | Protezione interruttore |
| 38 | A 4451 | Interruttore |
| 39 | A 5112 | Piastrina porta interruttore |
| 40 | B 7172 | Interruttore montato |
| 41 | A 7398 | Lamiera forata 320 x 160 |
| 42 | A 7176 | Rete protezione colletto cassone |
| 43 | B 7140 | Cerniera maschio con perno |
| 44 | A 7155 | Cerniera corta |
| 45 | B 7171 | Completo cerniera |
| 46 | A 6256 | Squadretta guida asta aggancio automatico |
| 47 | A 6258 | Molla aggancio automatico |
| 48 | A 6257 | Asta aggancio automatico |
| 49 | A 6220 | Manopola zigrinata 5 MA |
| 50 | A 6106 | Piastrina fissaggio bulloni |
| 51 | E 003 | Gamba flipper |
| 52 | A 7047 | Bullone |
| 53 | B 7045 | Piedino |
| 54 | CE 1966 | Contatto AMP maschio |
| 55 | A 6308 | Squadretta porta pulsanti programmazione |

*OPTIONAL

- | | | | |
|---|-------|----------|----------|
| A | Vedi: | TAV. II | pag. 5 |
| B | Vedi: | TAV. II | pag. 5 |
| C | Vedi: | TAV. II | pag. 5 |
| D | Vedi: | TAV. II | pag. 5 |
| E | Vedi: | TAV. III | pag. 6-7 |
| F | Vedi: | TAV. IV | pag. 8-9 |
| G | Vedi: | TAV. XIV | pag. 19 |
| H | Vedi: | TAV. XV | pag. 20 |

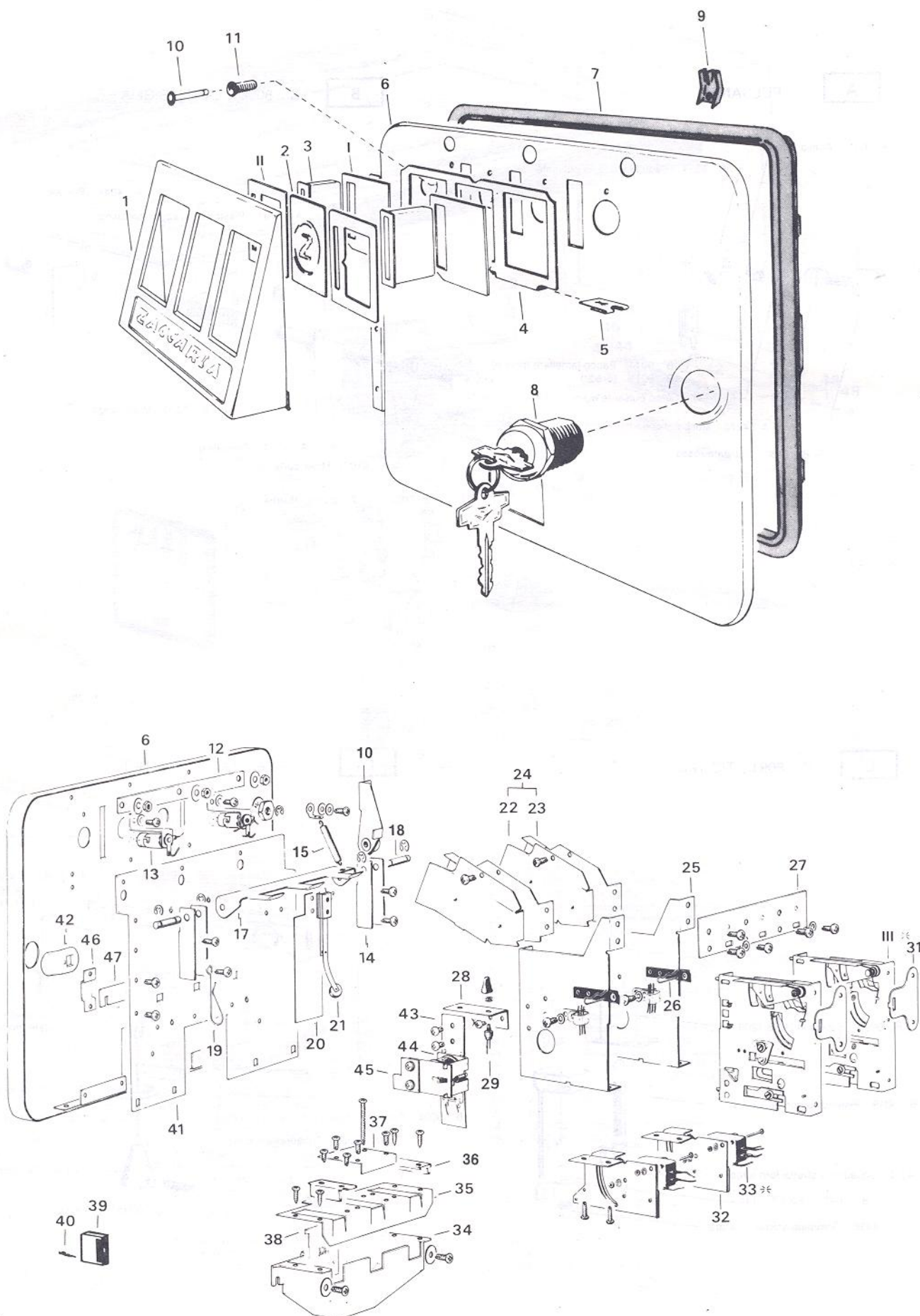
TAV. II

A**PULSANTE****B****C 8004 LANCIABIGLIA****C****C 8091 TIC-TAC****D****C 8006 TAVOLETTA TILT**

TAV. III

E

C 8140 SPORTELLO PORTA GETTONIERE



AUSTRALIA



I B 5056
II A 5007
III B 7258

AUSTRIA



I B 5045
II A 5008



I B 5047
II A 5007

BELGIO



I B 5074
II A 5008
III B 7244



I B 5076
II A 5007



I B 5075
II A 5007
III B 7148

DANIMARCA , SVEZIA



I B 4074
II A 5007
III B 7337
* B 7327



I B 5066
II A 5007



I B 5065
II A 4401m.
III B 7336
* B 7328

FRANCIA



I B 6166
II A 5008
III B 7239



I B 5034
II A 4401
III B 7097



I B 5060
II A 4401
III B 7096

GERMANIA



I B 4059
II A 5008
III B 7112



I B 4041
II A 4401
III B 7114



I B 4060
II A 5007
III B 7113

INGHILTERRA



I B 4062
II A 5007
III B 7099



I B 4091
II A 4401
III B 7147

ITALIA



I B 5001
II A 5007
III B 7084



I B 6136
II A 5242
III B 7175

SVIZZERA



I B 5024
II A 5008



I B 5060
II A 4401



I B 5025
II A 5007

UNGHERIA



I B 6174
II A 5007
III B 7084



I B 6173
II A 5242
III B 7175 m

U.S.A. , CANADA



I B 5046
II A 5008
III B 7092



I B 5061
II A 5007
III B 7084m.

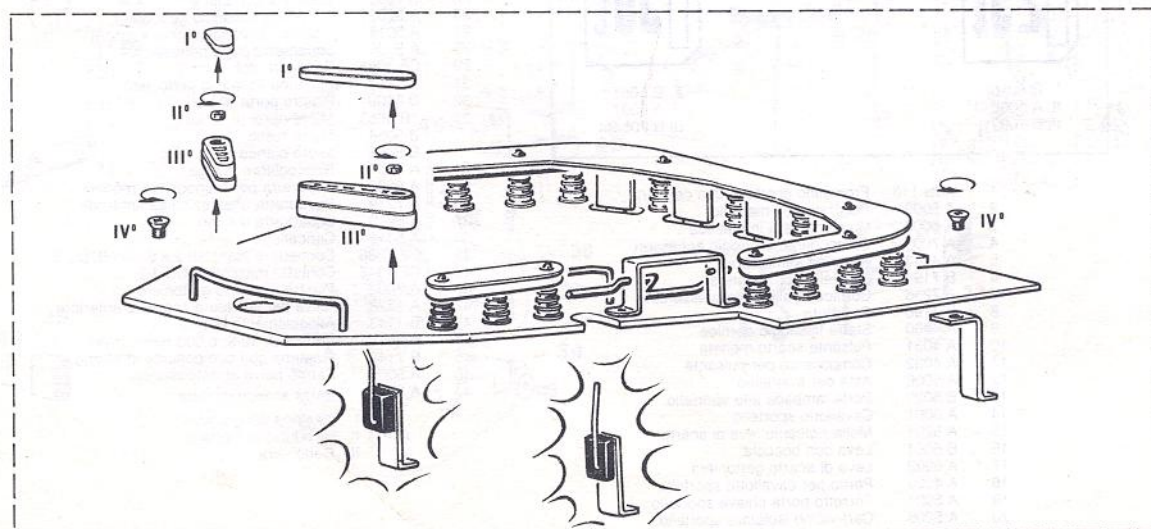
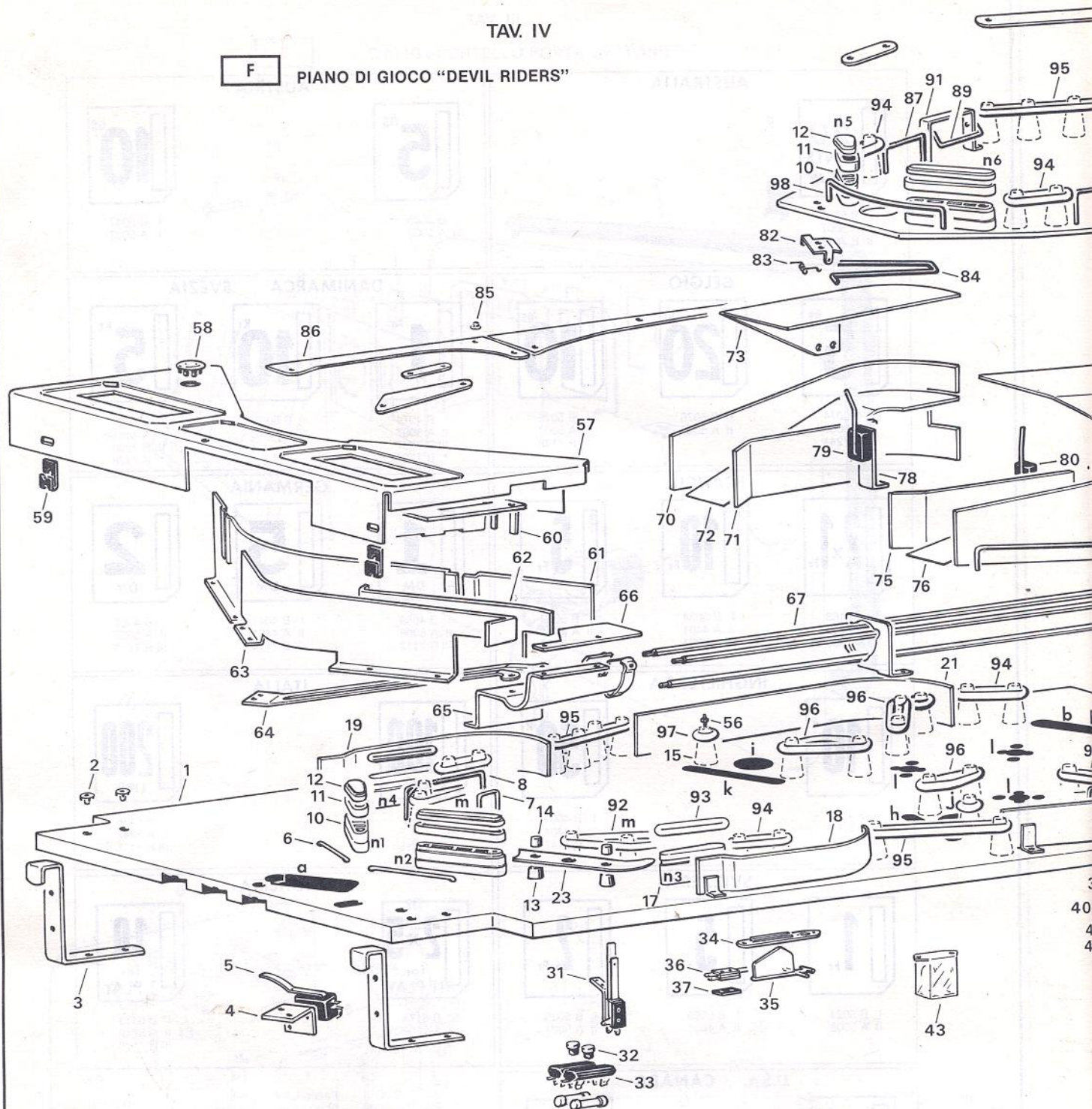
- 1 ASB 116 Frontalino sportello con cerniera
- 2 A 5009 Piastrina con marchio
- 3 A 6008 Guida moneta in plastica
- 4 A 7005 Componente fissaggio accessori
- 5 A 4383 Piastrina semidoppia
- 6 B 7194 Sportello con cerniera
- 7 A 7236 Cornice in alluminio pressofuso
- 8 B 7196 Serratura
- 9 A 4460 Staffa fissaggio cornice
- 10 A 4031 Pulsante scarto moneta
- 11 A 4032 Componente per pulsante
- 12 A 5006 Asta per frontalino
- 13 B 5029 Porta lampada alto sportello
- 14 A 6001 Cavallotto sportello
- 15 A 5201 Molla richiamo leva di scarto
- 16 B 6001 Leva con boccia
- 17 A 6002 Leva di scarto gettoniera
- 18 A 4005 Perno per cavallotto sportello
- 19 A 5021 Ferretto porta chiave sportello
- 20 A 5205 Cartoncino isolatore sportello

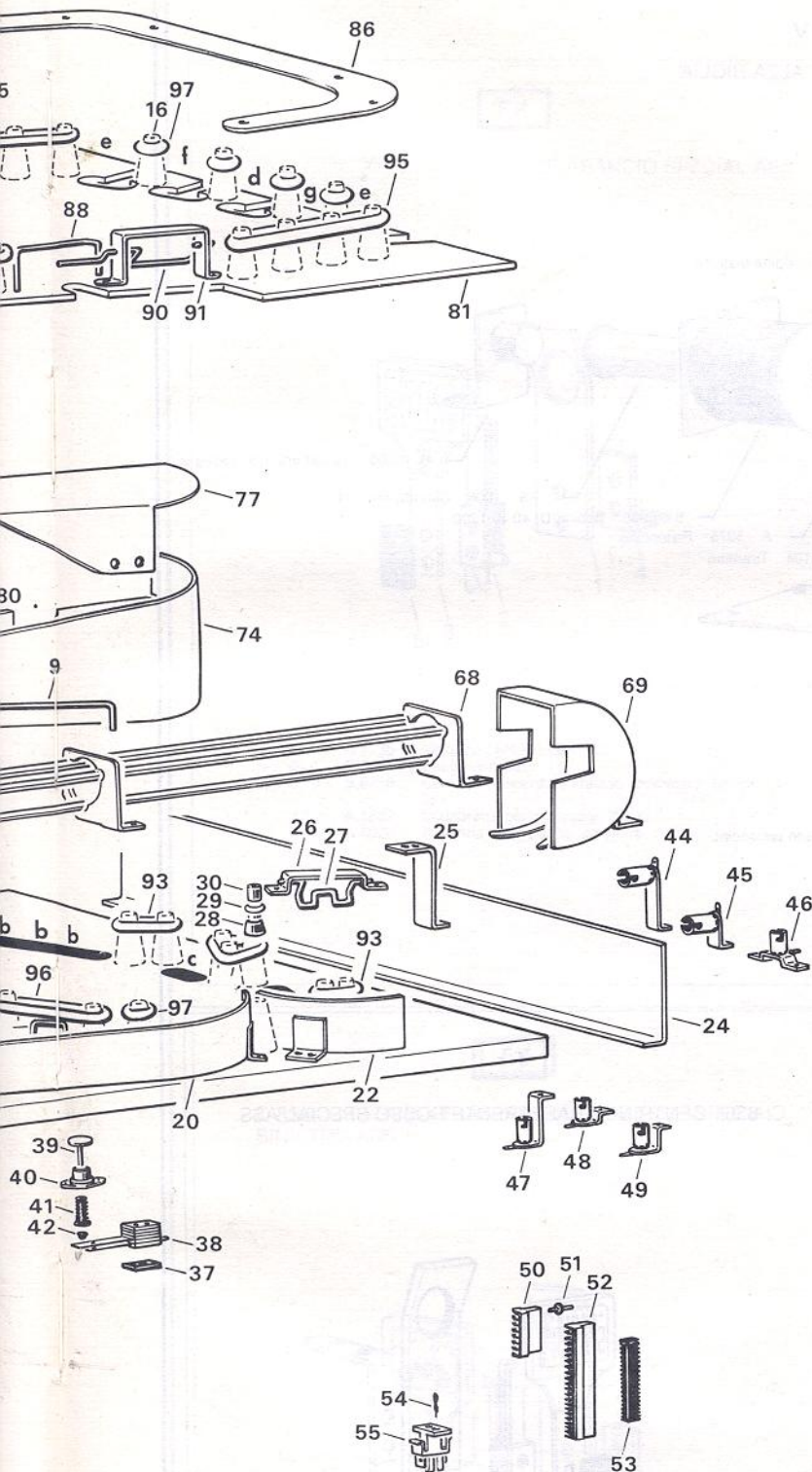
- 21 B 9015 Pacco lamellare tilt
 - 22 A 7009 Scorrimento maschio
 - 23 A 7008 Scorrimento femmina
 - 24 B 6076 Scorrimento assemblato
 - 25 B 7006 Supporto gettoniera
 - 26 A 5252 Forcellina fissaggio gettoniera
 - 27 A 5014 Piastrina accoppiamento supporti
 - 28 A 5206 Squadretta porta pulsanti
 - 29 CE 3085 Deviatore con ritorno
 - 31 A 5114 Piastrina fissaggio gettoniera
 - 32 B 6109 Piastra porta micro
 - 33 *B 5053 Micro nero
 - B 5054 Micro rosso
 - B 5055 Micro bianco
 - 34 A 7300 Raccoglitore in lega
 - 35 A 6009 Copertura per raccoglitore monete
 - 36 A 7279 Squadretta unidirezionale antifrode
 - 37 A 5010 Squadretta a 4 fori
 - 38 A 5011 Cancellotto
 - 39 CE 1338 Connettore maschio 2x8 vie MODU 2
 - 40 CE 1348 Contatto maschio MODU 2
 - 41 A 7002 Piastra supporto gettoniere
 - 42 A 4328 Leva per serratura sportello anteriore
 - 43 B 7143 Alloggiamento bobina
 - 44 B 6101 Bobina D. 12-S. 6.000 con nucleo
 - 45 B 7144 Piastrina con componente in ottone
 - 46 A 5002 Fermo barra arresto moneta
 - 47 A 5001 Barra arresto moneta
- I Piastrina serigrafata
II Introduzione moneta
III Gettoniera

TAV. IV

F

PIANO DI GIOCO "DEVIL RIDERS"

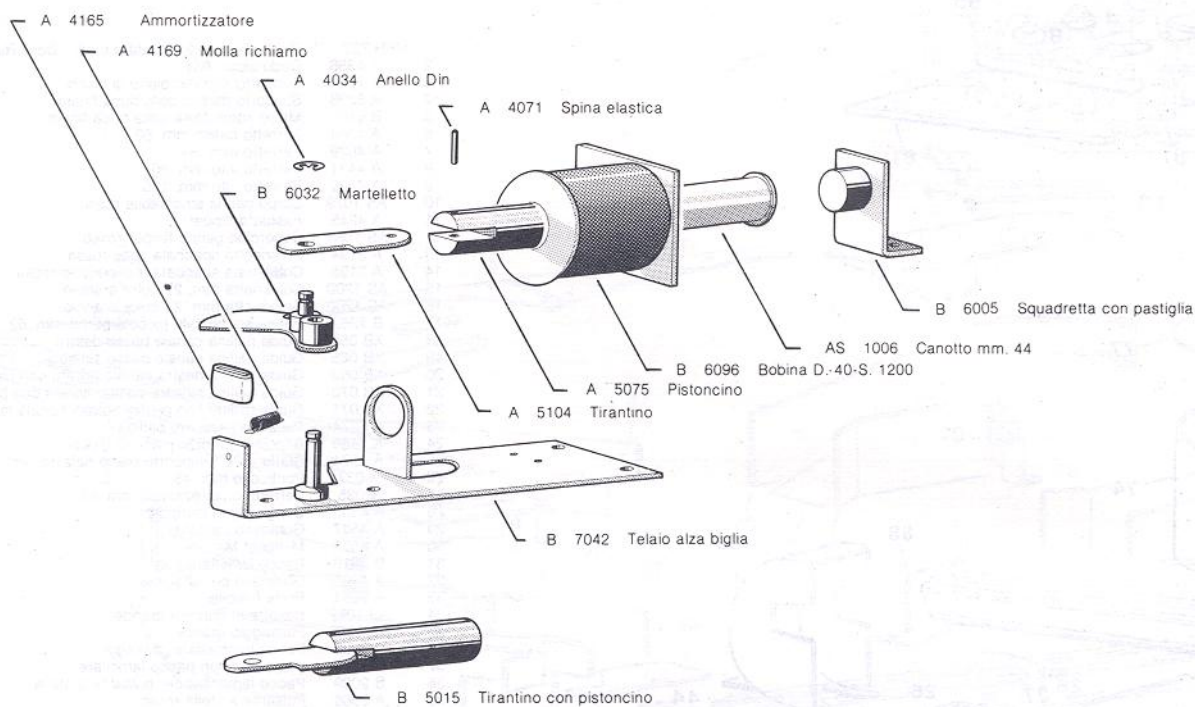




- | | | |
|----|---------|--|
| 1 | MRB 722 | Piano di gioco serigrafato mod. "Devil Riders" |
| 2 | A 4386 | Dado sicurt /M4 |
| 3 | A 7364 | Supporto alto per piano di gioco |
| 4 | A 5298 | Supporto micro della buca finale |
| 5 | B 6164 | Micro interruttore della buca finale |
| 6 | A 4368 | Ferretto basso mm. 80 |
| 7 | A 4629 | Ferretto mm. 30 |
| 8 | A 4431 | Ferretto alto mm. 80 |
| 9 | A 4395 | Ferretto alto mm. 185 |
| 10 | AS 1079 | Corpo penna smontabile rosso |
| 11 | A 4245 | Fascetta flipper |
| 12 | AS 1080 | Coperchio penna flipper rosso |
| 13 | A 5194 | Colonna spaccata base rossa |
| 14 | A 5195 | Colonna spaccata a coperchio rosso |
| 15 | AS 1200 | Colonna mm. 27 color arancio |
| 16 | AS 1200 | Colonna mm. 27 color arancio |
| 17 | B 7362 | Penna smontabile piccola perno mm. 62 |
| 18 | XB 066 | Guida pallina canale basso destro |
| 19 | XB 065 | Guida pallina canale basso sinistro |
| 20 | XB 069 | Guida pallina destra canale fioretti con piedini saldati |
| 21 | XB 070 | Guida pallina sinistra canale fioretti con piedini saldati |
| 22 | XB 071 | Guida pallina con piedini saldati canale lancio |
| 23 | A 6274 | Piastrina recupero pallina |
| 24 | A 7480 | Angolare rinforzo piano di gioco |
| 25 | A 4574 | Staffa a "Z" supporto piano rialzato |
| 26 | X 037 | Ponticello mm. 48 |
| 27 | X 035 | Ferretto unidirezionale mm. 48 |
| 28 | A 4533 | Componente minipost |
| 29 | A 4537 | Gommino minipost |
| 30 | A 4535 | Minipost M4 |
| 31 | B 9019 | Pacco lamellare flap |
| 32 | A 4068 | Gommino per minipost |
| 33 | B 7054 | Porta fusibile |
| 34 | AS 1042 | Basetta in plastica grande |
| 35 | AS 1035 | Passaggio grande |
| 36 | B 9008 | Pacco lamellare passaggi |
| 37 | A 6020 | Piastrina copri pacco lamellare |
| 38 | B 9009 | Pacco lamellare per pulsante a stella |
| 39 | A 5066 | Pulsante a stella rosso |
| 40 | A 5199 | Basetta per pulsante |
| 41 | A 5233 | Inserito di regolazione in ottone |
| 42 | A 4260 | Quiclok |
| 43 | Cec 005 | Relay PR 41B 0048 |
| 44 | B 6045 | Porta lampada alto |
| 45 | B 6222 | Porta lampada piatto alto mm. 15 |
| 46 | B 6177 | Porta lampada piano bingò |
| 47 | B 6045 | Porta lampada alto |
| 48 | B 6043 | Porta lampada basso |
| 49 | B 6044 | Porta lampada medio |
| 50 | CE 1986 | Connettore 7 vie AVG femmina, arancio |
| 51 | CE 1993 | Chiavetta di polarizzazione |
| 52 | CE 3154 | Connettore 14 vie AVG femmina, giallo |
| 53 | CE 1984 | Connettore 20 vie AVG femmina, nero |
| 54 | CE 1966 | Contatto AMP maschio |
| 55 | CE 1808 | Connettore 2 vie AMP volante |
| 56 | A 7055 | Vite portaisole legno (A 7063 vite portaisole /M4) |
| 57 | MRB 709 | Carter serigrafato Devil Riders |
| 58 | A 4362 | Spia rossa |
| 59 | A 4343 | Piastrina semidoppia fissaggio carter |
| 60 | MRB 710 | Graduatore serigrafato Devil Riders |
| 61 | A 7361 | Angolare rialzo carter |
| 62 | A 7360 | Guida pallina corta alta |
| 63 | A 7359 | Guida pallina lunga alta |
| 64 | A 7363 | Binario pallina alto |
| 65 | B 7293 | Staffa raccoglitore pallina P.C. |
| 66 | A 6319 | Copertura lancia biglia |
| 67 | A 7575 | Trafila per canale lancio pallina 790 mm. |
| 68 | A 6269 | Supporto trafilatura A 90° |
| 69 | B 7288 | Canale risalita pallina assemblato |
| 70 | B 7373 | Sponda lunga rampa mobile sinistra con piedini saldati |
| 71 | B 7375 | Sponda corta rampa mobile sinistra con piedini saldati |
| 72 | B 7381 | Supporto rampa mobile sinistra con molla |
| 73 | A 7573 | Copertura rampa mobile sinistra |
| 74 | B 7372 | Sponda lunga rampa mobile destra con piedini saldati |
| 75 | B 7374 | Sponda corta rampa mobile destra con piedini saldati |
| 76 | B 7378 | Supporto rampa mobile destra con molla |
| 77 | A 7574 | Copertura rampa mobile destra |
| 78 | A 5347 | Squadretta supporto microinterruttore ponticello |
| 79 | B 6185 | Microinterruttore E 51-60-B-R |
| 80 | B 6254 | Microinterruttore E 51-60-E |
| 81 | MRB 707 | Piano rialzato in plexiglas serigrafato Devil Riders |
| 82 | A 4723 | Supporto ferretto discesa pallina piegato 90° |
| 83 | A 4564 | Molla a torsione richiamo ferretto discesa pallina |
| 84 | A 4562 | Ferretto discesa pallina |
| 85 | A 4279 | Coperchiottolo isole |
| 86 | MRB 711 | Isole piane Devil Riders |
| 87 | x113 | Ferretto filettato M3 piegato L = 73 mm. sinistro |
| 88 | x112 | Ferretto filettato M3 piegato L = 73 mm. destro |
| 89 | x105 | Ferretto sinistro comando micro |
| 90 | x111 | Ferretto destro comando micro |
| 91 | A 4619 | Ponticello supporto ferretto |
| 92 | A 4254 | Gommino N. 6 |
| 93 | A 4248 | Gommino N. 1 |
| 94 | A 4250 | Gommino N. 2 |
| 95 | A 4253 | Gommino N. 5 |
| 96 | A 4252 | Gommino N. 4 |
| 97 | A 4246 | Gommino N.0 |
| 98 | x108 | Ferretto filettato 3MA mm. 134 |

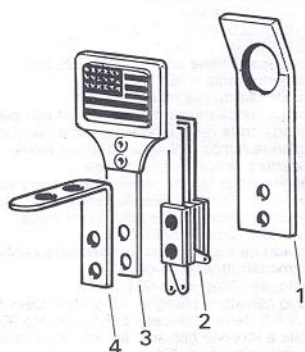
TAV. V

Fa C 8050 ALZA BIGLIA



Fb

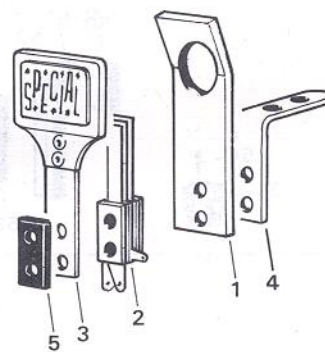
C 8381 CENTRINO STELLE E STRISCIE ASSEMBLATO



- | | | |
|---|--------|--------------------------------|
| 1 | A 6335 | Rinforzo centrino con foro |
| 2 | B 9007 | Pacco lamellare |
| 3 | B 6255 | Centrino trasparente |
| 4 | A 6318 | Squadretta porta centrino n.t. |

Fc

C. 8361 CENTRINO TRASPARENTE ROSSO SPECIAL ASS.

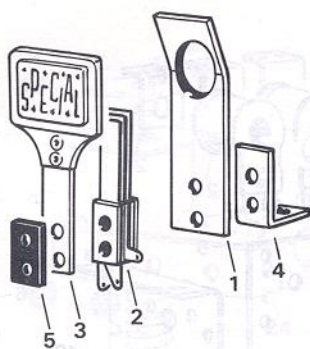


- | | | |
|---|--------|--|
| 1 | A 6335 | Rinforzo centrino con foro |
| 2 | B 9007 | Pacco lamellare |
| 3 | B 6247 | Centrino trasparente rosso special con lamella |
| 4 | A 6318 | Squadretta porta centrini n.f. |
| 5 | A 6020 | Piastrina copri pacco lamellare |

TAV. VI

F d

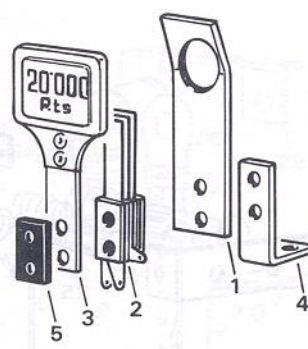
C 8382 CENTRINO TRASPARENTE ARANCIO SPECIAL ASS.



- | | | |
|---|--------|--|
| 1 | A 6335 | Rinforzo centrino con foro |
| 2 | B 9007 | Pacco lamellare |
| 3 | B 6256 | Centrino trasparente arancio special con lamella |
| 4 | A 4682 | Squadretta porta bersagli 20x30 |
| 5 | A 6020 | Piastrina copri pacco lamellare |

F e

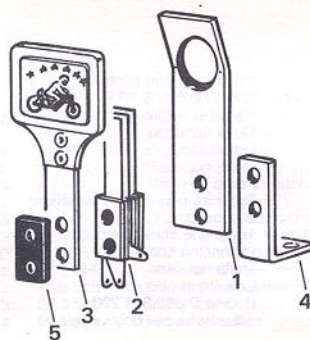
C. 8383 CENTRINO TRASPARENTE 20.000 PTS ASS.



- | | | |
|---|--------|---|
| 1 | A 6335 | Rinforzo centrino con foro |
| 2 | B 9007 | Pacco lamellare |
| 3 | B 6257 | Centrino trasparente 20.000 PTS con lamella |
| 4 | A 4682 | Squadretta porta bersagli 20 x 30 |
| 5 | A 6020 | Piastrina copri pacco lamellare |

F f

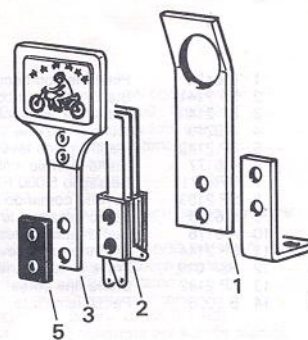
C 8384 CENTRINO TRASPARENTE ADVANCE SPECIAL SINISTRO ASS.



- | | | |
|---|--------|---|
| 1 | A 6335 | Rinforzo centrino con foro |
| 2 | B 9007 | Pacco lamellare |
| 3 | B 6258 | Centrino trasparente advance special sinistro con lamella |
| 4 | A 4682 | Squadretta porta bersagli 20x30 |
| 5 | A 6020 | Piastrina copri pacco lamellare |

F g

C 8385 CENTRINO TRASPARENTE ADVANCE SPECIAL DESTRO ASS.

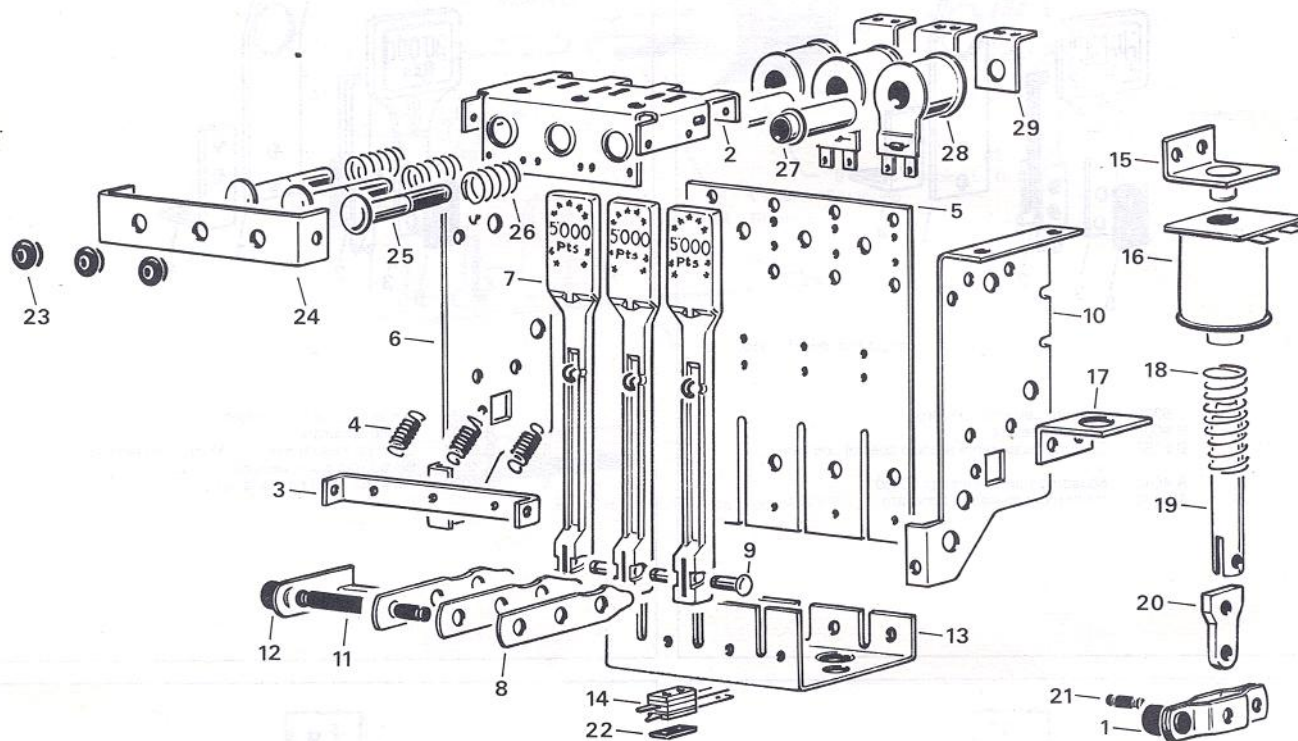


- | | | |
|---|--------|---|
| 1 | A 6335 | Rinforzo centrino con foro |
| 2 | B 9007 | Pacco lamellare |
| 3 | B 6259 | Centrino trasparente advance special destro con lamella |
| 4 | A 4682 | Squadretta porta bagagli 20 x 30 |
| 5 | A 6020 | Piastrina copri pacco lamellare |

TAV. VII

F h

C 8386 BANCO BERSAGLI A 3 POSIZIONI DESTRO



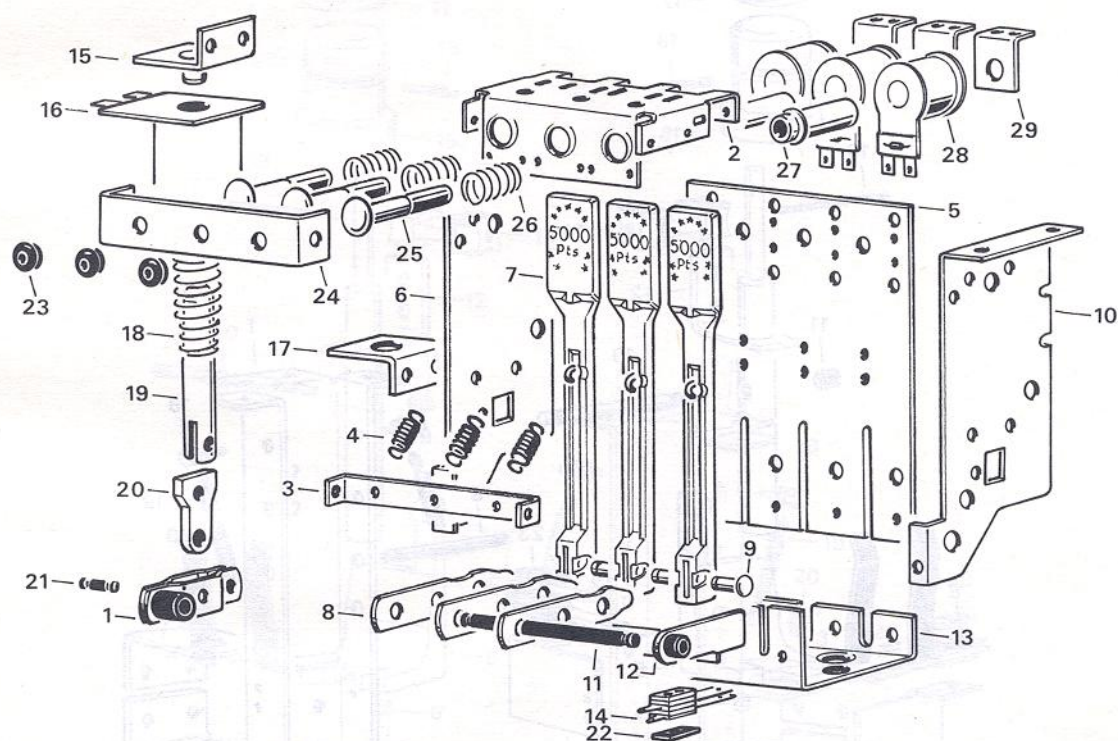
- | | |
|------------|---------------------------------|
| 1 B 6123 | Piastrine con boccia |
| 2 SP 2141 | Staffa fissaggio bobine piccole |
| 3 SP 2140 | Trave per aggancio molle |
| 4 A 6249 | Molla a trazione |
| 5 SP 2143 | Piastra guida leve |
| 6 A 6177 | Staffa laterale sinistra |
| 7 MRB 717 | Bersaglio 5.000 PTS |
| 8 SP 2153 | Levetta comando bersagli |
| 9 A 6185 | Perno fissaggio leva |
| 10 A 6178 | Staffa laterale destra |
| 11 SP 2144 | Alberino fulcro leve |
| 12 BSP 019 | Trave di collegamento destro |
| 13 SP 2142 | Staffa fine corsa |
| 14 B 9006 | Pacco lamellare |

- | | |
|------------|---------------------------------|
| 15 B 6121 | Squadretta con pastiglia |
| 16 B 6112 | Bobina D.50 - S.1600 |
| 17 A 6179 | Squadretta foro grande |
| 18 A 6110 | Molla richiamo |
| 19 A 6188 | Pistoncino |
| 20 A 6184 | Tirantino |
| 21 A 6187 | Perno |
| 22 A 6020 | Piastrina copri pacco lamellare |
| 23 A 4438 | Gommino |
| 24 SP 2139 | Trave fine corsa pistoncini |
| 25 B 6122 | Pistoncino con puntale |
| 26 A 4263 | Molla richiamo |
| 27 AS 1053 | Canotto in ottone |
| 28 B 6120 | Bobina D 355-S. 1.200 |
| 29 A 6181 | Squadretta per bobina piccola |

TAV. VIII

F k

C 8387 BANCO BERSAGLI A 3 POSIZIONI SINISTRO



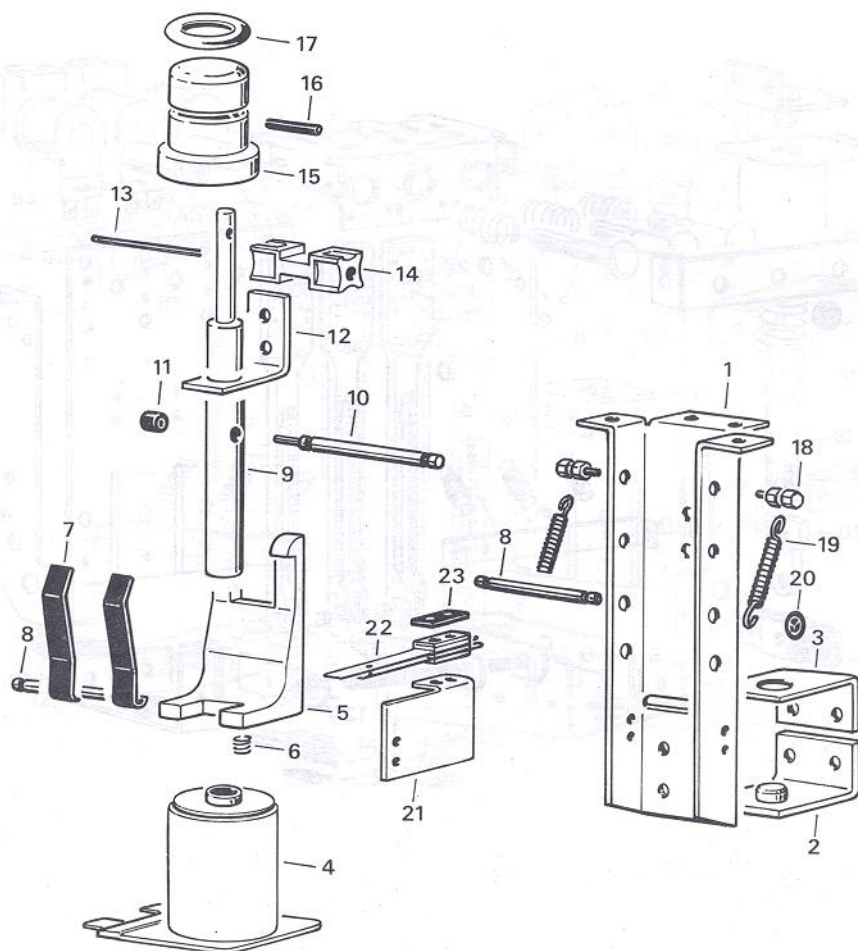
- | | | |
|----|---------|---------------------------------|
| 1 | B 6123 | Piastri con boccia |
| 2 | SP 2141 | Staffa fissaggio bobine piccole |
| 3 | SP 2140 | Trave per aggancio molle |
| 4 | A 6249 | Molla a trazione |
| 5 | SP 2143 | Piastra guida leva |
| 6 | A 6177 | Staffa laterale sinistra |
| 7 | MRB 717 | Bersaglio 5.000 PTS |
| 8 | SP 2153 | Levetta comando bersagli |
| 9 | A 6185 | Perno fissaggio leva |
| 10 | A 6178 | Staffa laterale destra |
| 11 | SP 2144 | Alberino fulcro leva |
| 12 | BSP 018 | Trave di collegamento sinistro |
| 13 | SP 2142 | Staffa fine corsa |
| 14 | B 9006 | Pacco lamellare |

- | | | |
|----|---------|---------------------------------|
| 15 | B 6121 | Squadretta con pastiglia |
| 16 | B 6112 | Bobina D.50 - S.1600 |
| 17 | A 6179 | Squadretta foro grande |
| 18 | A 6110 | Molla richiamo |
| 19 | A 6188 | Pistoncino |
| 20 | A 6184 | Tirantino |
| 21 | A 6187 | Perno |
| 22 | A 6020 | Piastrina copri pacco lamellare |
| 23 | A 4438 | Gommino |
| 24 | SP 2139 | Trave fine corsa pistoncini |
| 25 | B 6122 | Pistoncino con puntale |
| 26 | A 4263 | Molla richiamo |
| 27 | AS 1053 | Canotto in ottone |
| 28 | B 6120 | Bobina D 355-S 1.200 |
| 29 | A 6181 | Squadretta per bobina piccola |

TAV. IX

Fj

C 8378 GRUPPO POST MOBILE DESTRO

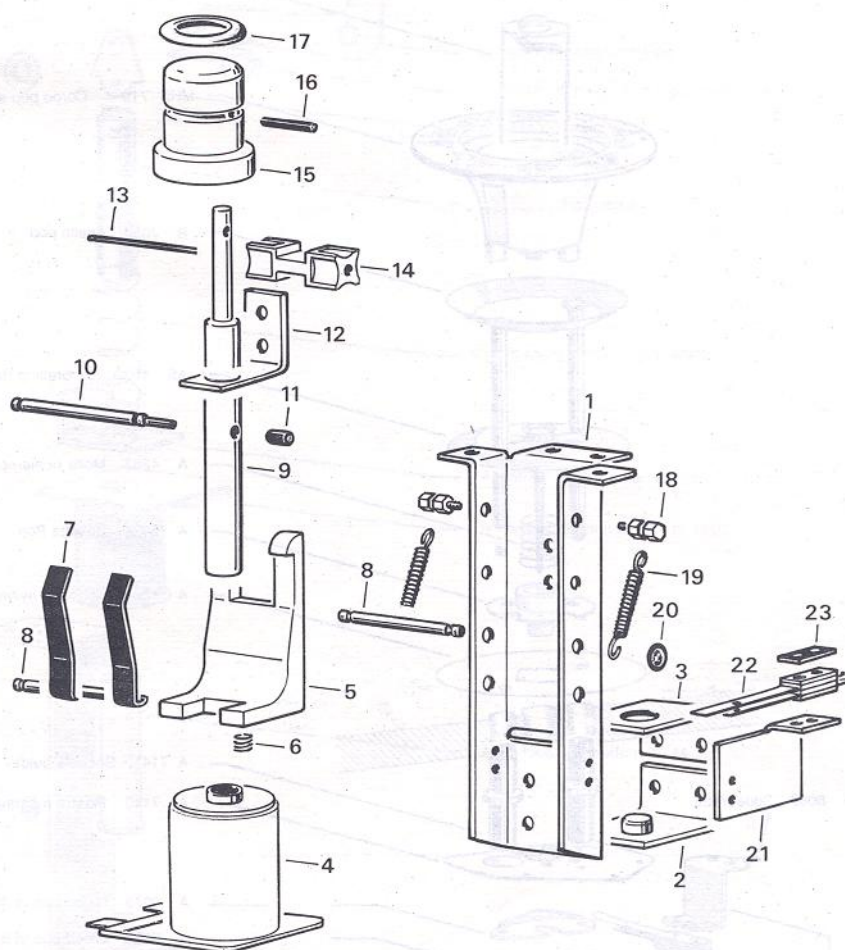


- | | | |
|----|---------|---|
| 1 | A 7572 | Staffa supporto post mobile |
| 2 | B 5082 | Squadretta con pastiglia mm. 25 x 46x3 |
| 3 | A 5386 | Squadretta supporto bobina mm. 25x46x3 |
| 4 | B 6192 | Bobina D 63-S.1100 |
| 5 | AS 1222 | Aggancio corsa post mobile |
| 6 | A 4764 | Molla a compressione |
| 7 | A 4762 | Molla piatta post mobile |
| 8 | A 4760 | Perno con 2 alloggiamenti Ø4 l=52 mm. |
| 9 | A 7571 | Perno supporto post mobile |
| 10 | A 5385 | Perno con 3 alloggiamenti Ø5 l=79,5 mm. |
| 11 | A 5090 | Tubino distanziale 4,8 x 9,5 x 3,3 |

- | | | |
|----|---------|---|
| 12 | A 4763 | Squadretta fine corsa |
| 13 | A 4759 | Filo armonico Ø3 mm. l=51 mm. |
| 14 | AS 1221 | Arresto pistone post mobile |
| 15 | AS 1224 | Supporto gommino post mobile |
| 16 | A 6260 | Spina elastica 3 x 16 |
| 17 | A 4248 | Gommino N. 1 |
| 18 | A 4761 | Barretta esagonale mm. 5 parzialmente filettata |
| 19 | A 6249 | Molla a trazione |
| 20 | A 4774 | Quiclok |
| 21 | A 5389 | Squadretta fissaggio pacco lamellare sinistra |
| 22 | B 9036 | Pacco lamellare post mobile |
| 23 | A 6020 | Piastrina copri pacco lamellare |

Fi

C 8379 GRUPPO POST MOBILE SINISTRO

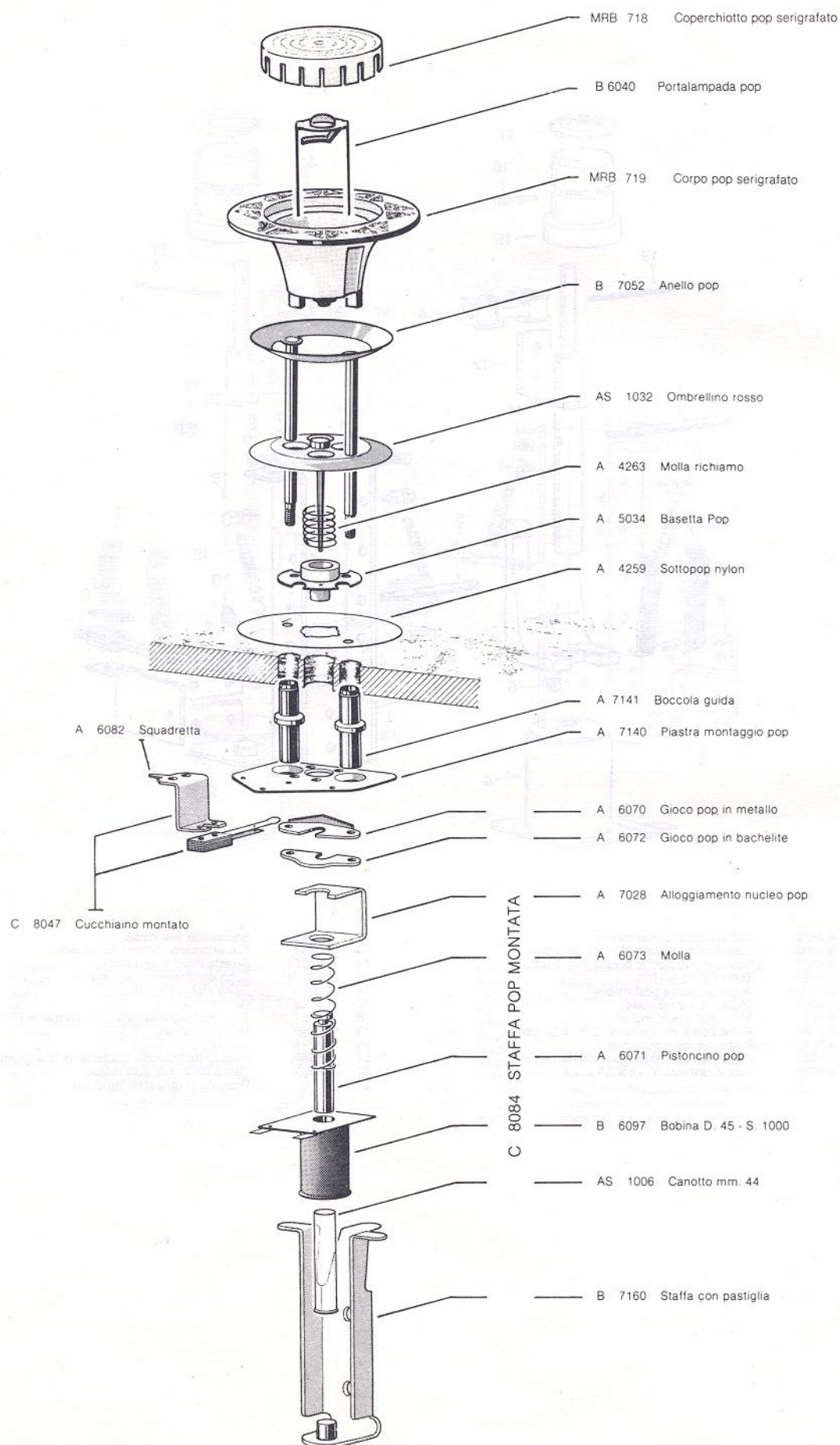


- | | | | | | |
|----|---------|---|----|---------|---|
| 1 | A 7572 | Staffa supporto post mobile | 12 | A 4763 | Squadretta fine corsa |
| 2 | B 5082 | Squadretta con pastiglia mm. 25 x 46x3 | 13 | A 4759 | Filo armonico Ø 3mm. l = 51 mm. |
| 3 | A 5386 | Squadretta supporto bobina mm. 25x46x3 | 14 | AS 1221 | Arresto pistone post mobile |
| 4 | B 6192 | Bobina D 63-S.1100 | 15 | AS 1224 | Supposto gommino post mobile |
| 5 | AS 1222 | Aggancio corsa post mobile | 16 | A 6260 | Spina elastica 3 x 16 |
| 6 | A 4764 | Molla a compressione | 17 | A 4248 | Gommino N. 1 |
| 7 | A 4762 | Molla piatta post mobile | 18 | A 4761 | Barretta esagonale mm. 5 parzialmente filettata |
| 8 | A 4760 | Perno con 2 alloggiamenti Ø4 l = 52 mm. | 19 | A 6249 | Molla a trazione |
| 9 | A 7571 | Perno supporto post mobile | 20 | A 4774 | Quicklok |
| 10 | A 5385 | Perno con 3 alloggiamenti Ø5 l = 79,5 mm. | 21 | A 5389 | Squadretta fissaggio pacco lamellare sinistra |
| 11 | A 5090 | Tubino distanziale 4,8 x 9,5 x 3,3 | 22 | B 9036 | Pacco lamellare post mobile |
| | | | 23 | A 6020 | Piastrina copri pacco lamellare |

TAV. XI

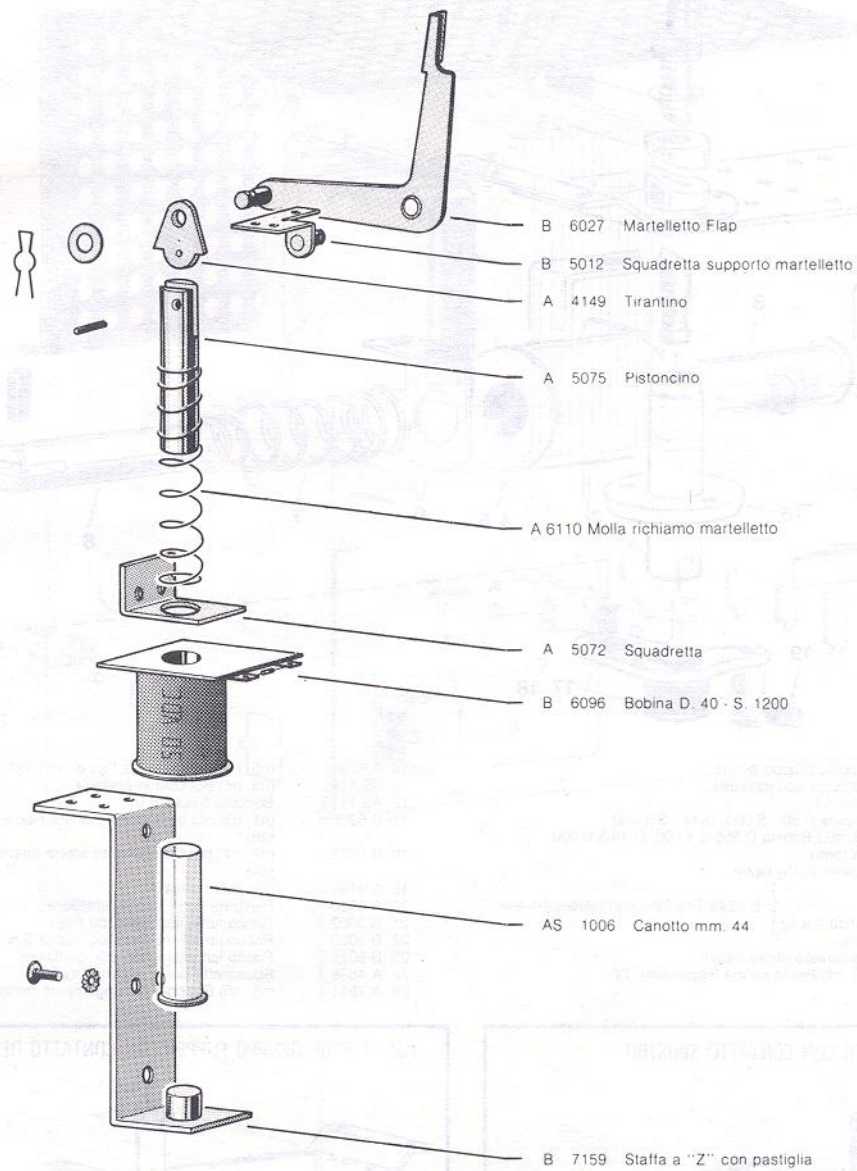
F |

POP

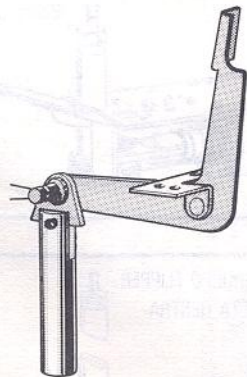


TAV. XII

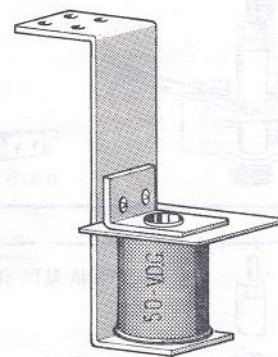
Fi FLAP



C 8040 Martelletto Flap montato

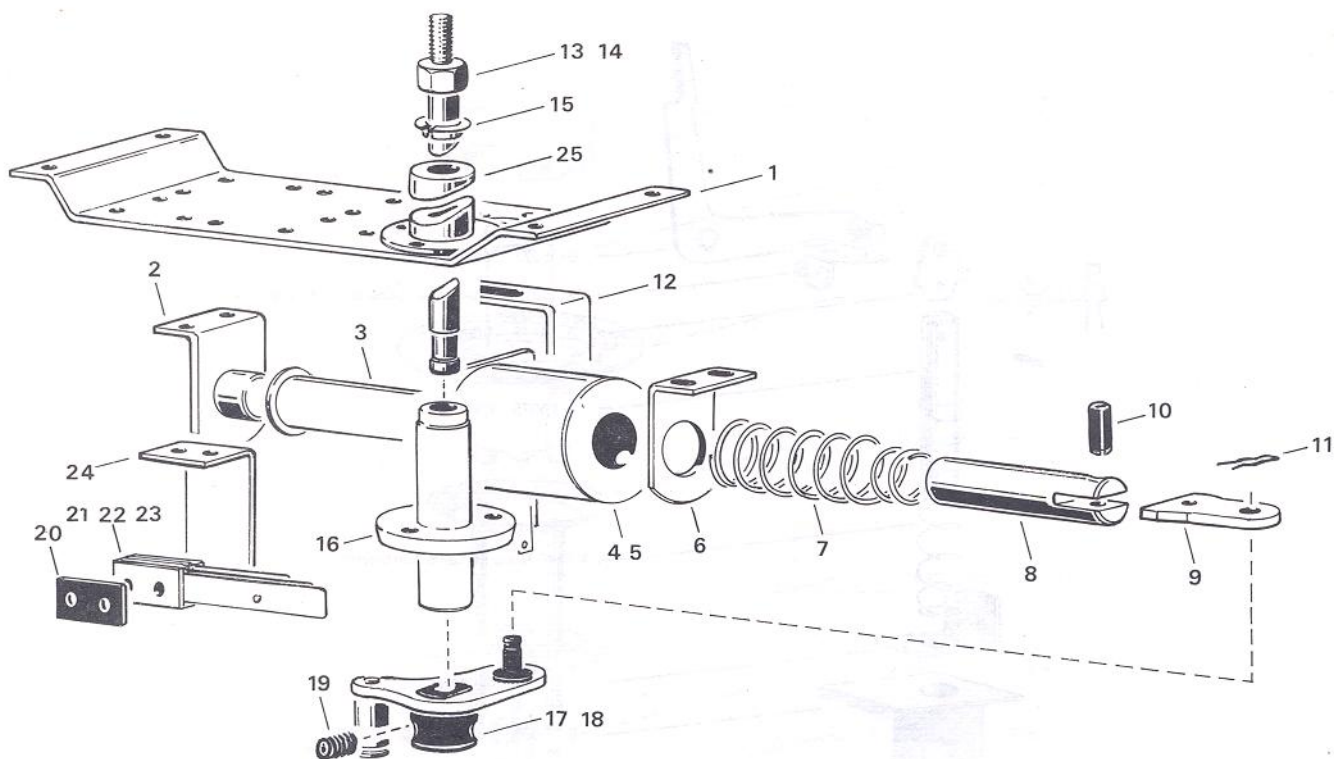


C 8082 Staffa a "Z" montata



TAV. XIII

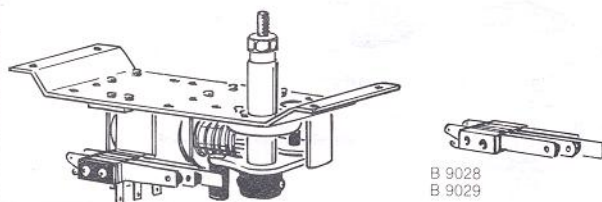
Fn 1,2,3,4,5,6 PENNE FLIPPER



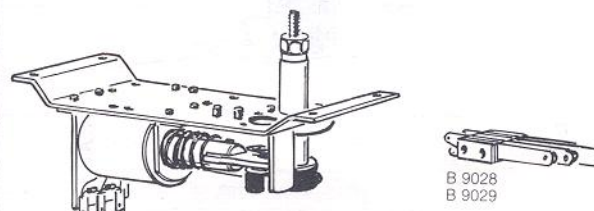
- 1 A 7491 Staffa supporto gruppo penna
 2 B 6100 Squadretto larga con pastiglia
 3 AS 1006 Canotto mm. 44
 4 B 6098 (n1, n2) Bobina D.50 - S.600 - D.14 - S.5.000
 5 B 6179 (n3, n4, n5, n6) Bobina D.355-S.1.000 - D.14-S.6.000
 6 A 5071 Squadretta larga
 7 A 6110 Molla richiamo aletta flipper
 8 A 5188 Pistoncino
 9 A 6184 Tirantino
 10 A 4347 Spina elastica 4 x 12 } B 6243 Tirantino con pistoncino ass.
 11 A 4148 Forcella di 6
 12 A 6336 Squadretta arresto aletta flipper
 13 A 6337 (n1, n2, n3, n4) Perno penna flipper mm. 77

- 14 A 6294 (n5, n6) Perno penna flipper mm.131
 15 AS 1142 (n5, n6) Boccola in plastica
 16 AS 1113 Boccola flipper n.t.
 17 B 6226 (n1, n3, n5) componente aletta flipper ass. sinistro
 18 B 6225 (n2, n4, n6) Componente aletta flipper ass. destro
 19 A 4150 Vite testa cava
 20 A 6020 Piastrina copri pacco lamellare
 21 B 9002 Pacco lamellare distacco flipper
 22 B 9029 Pacco lamellare distacco flipper S.K.
 23 B 9028 Pacco lamellare contatto su flipper
 24 A 4638 Squadretta porta pacchi lamellari
 25 A 7551 (n5, n6) Boccola prolungamento penne

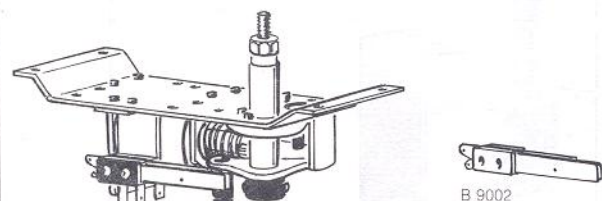
n1 - C 8365 GRUPPO FLIPPER CON CONTATTO SINISTRO



n2 - C 8366 GRUPPO FLIPPER CON CONTATTO DESTRO

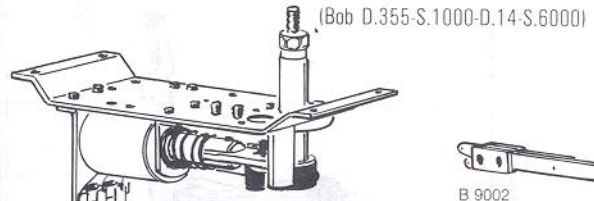


n3 - C 8369 GRUPPO FLIPPER SINISTRO



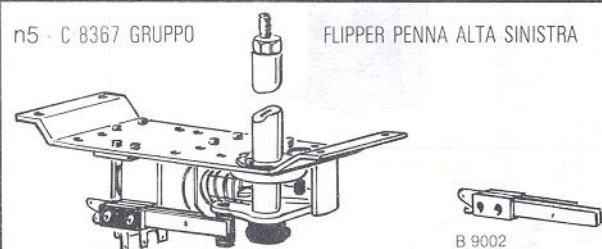
n4 - C 8370 GRUPPO FLIPPER DESTRO

(Bob D.355-S.1000-D.14-S.6000)



n5 - C 8367 GRUPPO

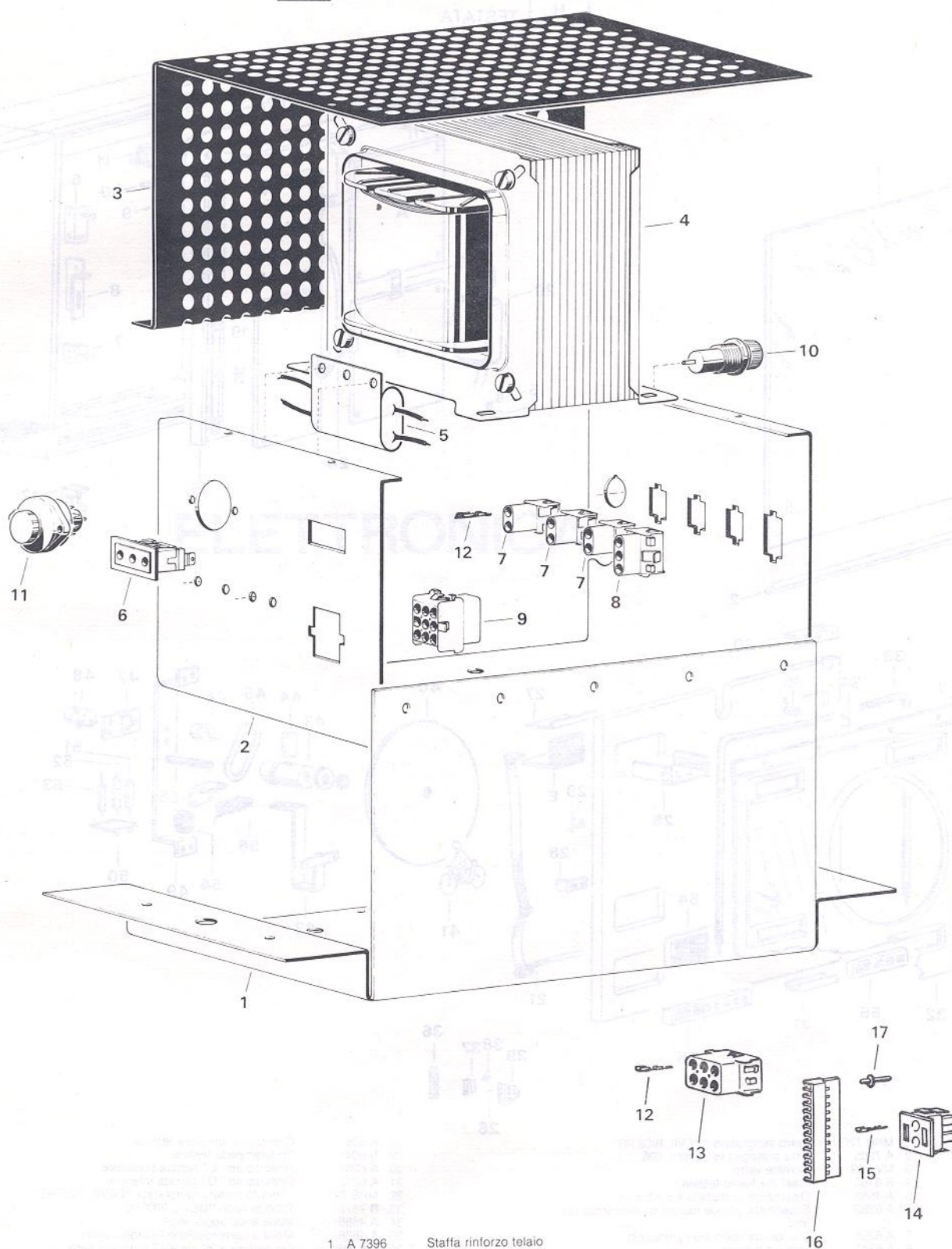
FLIPPER PENNA ALTA SINISTRA

n6 - C 8368 GRUPPO FLIPPER
PENNA ALTA DESTRA

TAV. XIV

G

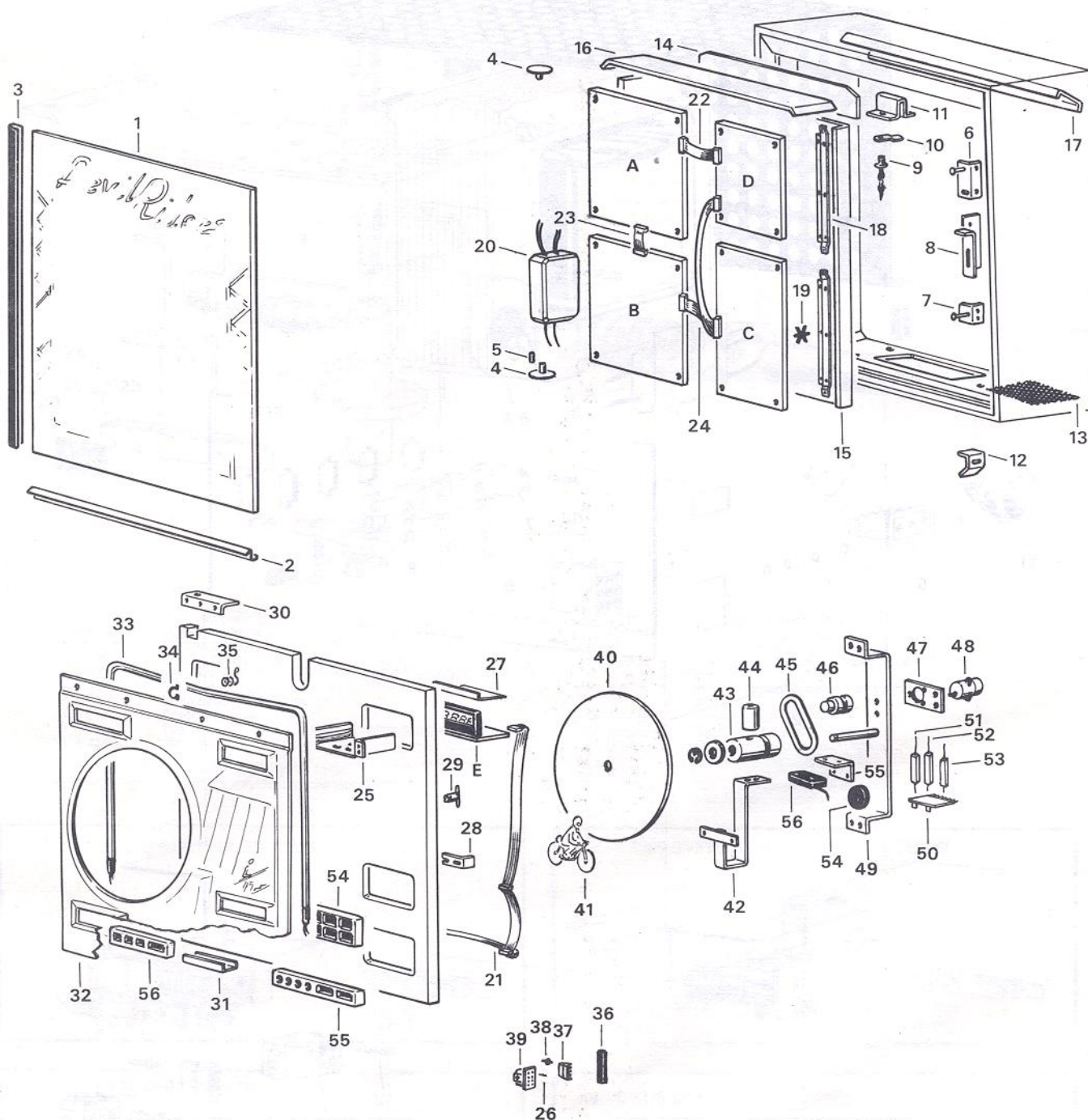
CEC 286 TELAIO ALIMENTAZIONI



- | | | |
|----|---------|--|
| 1 | A 7396 | Staffa rinforzo telaio |
| 2 | A 7395 | Telaio in alluminio |
| 3 | A 7397 | Lamiera forata protezione telaio |
| 4 | C 8189 | Trasformatore 2C 1019 |
| 5 | C 8068 | Filtro di rete 5A |
| 6 | A 6281 | Presa bipolare con massa |
| 7 | CE 1809 | Connettore AMP 2 vie da pannello |
| 8 | CE 1706 | Connettore AMP 3 vie da pannello |
| 9 | CE 1744 | Connettore AMP 9 vie da pannello |
| 10 | CE 1758 | Portafusibili da pannello |
| 11 | CE 1763 | Cambio tensioni |
| 12 | CE 1965 | Contatto AMP femmina |
| 13 | CE 1872 | Connettore 6 vie AMP da pannello |
| 14 | CE 1808 | Connettore 2 vie AMP volante |
| 15 | CE 1966 | Contatto AMP maschio |
| 16 | CE 1985 | Connettore AVG 13 vie femmina, arancio |
| 17 | CE 1993 | Chiave da polarizzazione |

TAV. XV

H TESTATA



- | | | |
|----|---------|---|
| 1 | MRB 720 | Vetro serigrafato "DEVIL RIDERS" |
| 2 | A 7205 | Asta sostegno vetro mm. 695 |
| 3 | MV 009 | Cornice vetro |
| 4 | B 6186 | Piastrina fulcro testina |
| 5 | A 4568 | Distanziale in metallo 4,8 x 8 x 14 |
| 6 | A 6282 | Squadretta grande riscontro catenaccio con foro |
| 7 | A 6255 | Squadretta riscontro catenaccio |
| 8 | A 6342 | Staffa a 3 asole |
| 9 | B 7151 | Serratura |
| 10 | A 4320 | Linguetta aggancio serratura |
| 11 | A 6253 | Riscontro porta serraggio |
| 12 | A 6259 | Squadretta aggancio automatico |
| 13 | A 7220 | Protezione in lamiera stirata mm. 110 x 130 |
| 14 | A 7401 | Lamiera protezione aereazione |
| 15 | A 7322 | Lamiera schermo testata |
| 16 | A 7207 | Piastra parte superiore mm. 600 x 95 |
| 17 | A 7400 | Bandella protezione liquidi |
| 18 | A 7399 | Staffa supporto schede |
| 19 | A 4111 | Supporto per circuiti stampati |
| 20 | C 8304 | Trasformatore per neon |
| 21 | CEB 235 | Fiat Cable a 6 connettori 20 vie femmine D.R. |
| 22 | CEB 141 | Fiat Cable a 2 connettori 20 vie femmine C.P.U. SOUND |
| 23 | CEB 006 | Fiat Cable a 2 connettori 20 vie femmine C.P.U. INTERFACE |
| 24 | CEB 196 | Cablaggio alimentazione schede |
| 25 | B 7137 | Staffa supporto Display |
| 26 | CE 1966 | Contatto AMP maschio |
| 27 | A 6171 | Tettoia protezione Display |

- | | | |
|----|---------|---|
| 28 | A 6251 | Catenaccio chiusura testina |
| 29 | B 6041 | Portalamпада testina |
| 30 | A 6261 | Rinforzo ad "L" testata superiore |
| 31 | A 6252 | Rinforzo ad "U" testata inferiore |
| 32 | MRB 721 | Termoformatura serigrafata "DEVIL RIDERS" |
| 33 | B 7379 | Tubo al neon "DEVIL RIDERS" |
| 34 | A 4685 | Molla ancoraggio neon |
| 35 | A 4686 | Molla a compressione fissaggio neon |
| 36 | CE 1984 | Connettore a 20 vie AVG femmina nero |
| 37 | CE 1987 | Connettore a 5 vie AVG femmina arancio |
| 38 | CE 1993 | Chiavetta di polarizzazione |
| 39 | CE 1871 | Connettore AMP vie volante |
| 40 | MRB 723 | Disco in plexiglass 1240 serigrafato DEVIL RIDERS |
| 41 | MRB 724 | Termoformatura motociclista |
| 42 | B 6253 | Staffa piegata fissaggio motociclista con piastrino saldato |
| 43 | B 5081 | Perno 1/22 con boccole inserite |
| 44 | A 4768 | Cilindretto forato 1/25 mm. |
| 45 | A 4773 | Cinghia motore 1/3 |
| 46 | A 4766 | Puleggia motorino 1/22 |
| 47 | A 5391 | Piastrina fissaggio motore |
| 48 | B 7376 | Motoriduttore B12 (A) AF/72 |
| 49 | B 7380 | Staffa a omega per testata con perno |
| 50 | A 4775 | Basetta ancoraggio a 6 posizioni |
| 51 | CE 3347 | Resistenza 820 OHM 5 W |
| 52 | CE 1209 | Resistenza 220 OHM 1/2 W |
| 53 | CE 5267 | Resistenza 1500 OHM 1/4 W |
| 54 | B 6260 | Buzzer tipo PK BO 3AO |
| 55 | A 5298 | Supporto micro buca finale |
| 56 | B 6185 | Microinterruttore ES1-60 BR |

ELETTRONICA

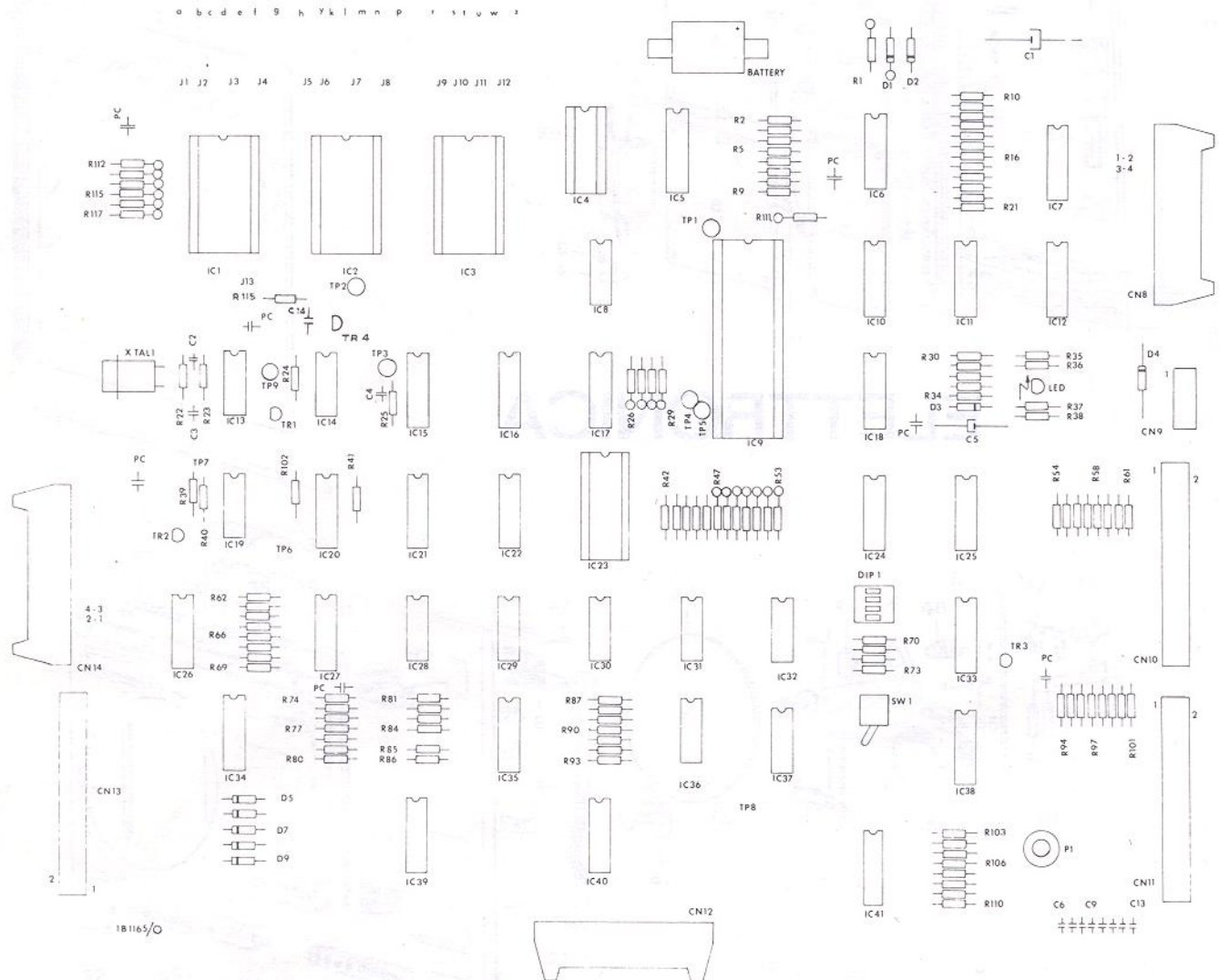
catalogo
ricambi

TAV. XVI

Ha

CEB 222 C.P.U. BOARD ASSEMBLY WITHOUT MEMERIES

CEC 301 C.P.U. BOARD ASSEMBLY WITH MEMORIES "DEVIL RIDERS"



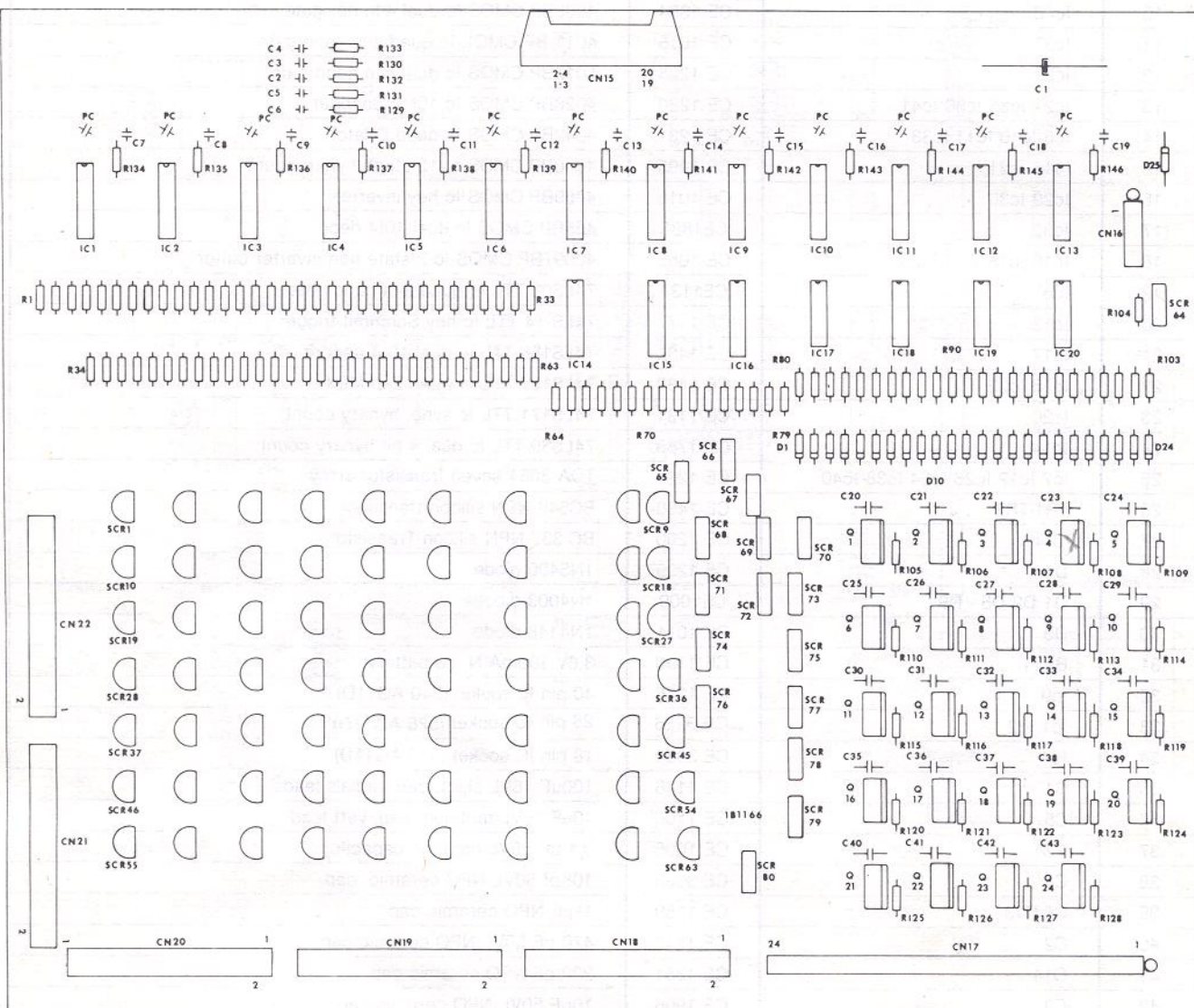
IC1	RE 405	B2764 MOS IC 8192 × 8 EPROM (Type "Devil Riders" N° 1)
IC2	RE 406	B2764 MOS IC 8192 × 8 EPROM (Type "Devil Riders" N° 2)

ITEM. No	PART DESIGNATION	CODE PART No	DESCRIPTION
1	PC 1B 1165/1	CE 2155	Printed circuit board 1B1165/1
2	CN9	CE 1980	4 pin male conn. MTA 640 383-4
3	CN 10 CN 11	CE 1981	20 pin male conn. MTAS4-826379-0
4	CN8 CN12 CN14	CE 1351	20 flat cable male conn.
5	Ic9	CE 1668	2650 - A-1 MOS Ic 8 bit M.Proc
6	Ic23	CE 1227	2101 AL-4 MOSC Ic 256 x 4 RAM
7	Ic5	CE 1661	2114 L MOS Ic 1K x 4 ram
8	Ic4	CE 3004	6414 -9 CMOS Ic 1K x 4 ram
9	Ic19	CE 1014	4001 BP CMOS Ic quad nor gate
10	Ic28	CE 1394	4002BP CMOS Ic dual 4-in nor gate
11	Ic37	CE 1016	4011 BP CMOS Ic quad 2-in nand gate
12	Ic31	CE 1228	4012BP CMOS Ic dual 4-in nand gate
13	Ic27 Ic35 Ic36 Ic41	CE 1230	4028BP CMOS Ic 10f10 decoder
14	Ic6 Ic10 Ic11 Ic33	CE 1231	4042BP CMOS Ic quad D latch
15	Ic15 Ic21	CE 1995	4040BP CMOS Ic 12 stage bynari count
16	Ic29 Ic30	CE 1015	4069BP CMOS Ic hey inverter
17	Ic32	CE1883	455BP CMOS Ic dual 10f4 deco.
18	Ic18 Ic18 Ic24 Ic25	CE 1055	40097BP CMOS Ic 3 state non inverter buffer
19	Ic8	CE1134	74LS00 TTL Ic quad 2-in nand gate
20	Ic13	CE 1177	74LS 14 TTL Ic hey Schmitt trigger
21	Ic17	CE 1432	74LS156 TTL Ic dual 10f4 decord
22	Ic16 Ic22	CE 1433	74LS157 TTL Ic quad 2-in MPX
23	Ic20	CE 1131	74LS171 TTL Ic sync. bynary count.
24	Ic14	CE 1788	74LS39 TTL Ic dual 4 bit bynary count
25	Ic7 Ic12 Ic26 Ic34 Ic38 Ic40	CE 1225	TDA 3081 seven transistor array
26	TR1-TR3	CE 1438	BC548 NPN silicon transistor
27	TR4	CE 1290	BC 337 NPN silicon Transistor
28	D4	CE 1299	1N5400 diode
29	D1 D2 D5 - D9	CE1009	1N4003 diodes
30	D3	CE 1011	1N4148 diode
31	BATT	CE 1396	3,6V 100mA N. cd battery
32	Ic9	CE 1245	40 pin Ic socket (540 AG11D)
33	Ic1 Ic2	CE 3236	28 pin IC socket /528 AG11D)
34	Ic4	CE 3080	18 pin IC socket (518 AG11D)
35	C1	CE 1118	100uF 16VL elect. cap. radials leads
36	C5	CE 1100	10uF 16VL tantalum cap. vert lead
37	PC	CE 1005	0,1 uF 50VL ceramic capacitors
38	C4	CE 3095	10Kpf 50VL NPO ceramic. cap.
39	C6-C13	CE 1159	1kpF NPO ceramic cap.
40	C2	CE 1513	470 pF 50VL NPO ceramic cap.
41	C14	CE 1381	220 pF NPO ceramic cap.
42	C3	CE 1906	10pF 50VL NPO ceramic cap.
43	R2-R9-R25-R42-R102 R113 R117	CE 1171	10K 1/4W 5% carbon resistors
44	R10-R21 R24 R35 R39 R40 R54-R69 R74-R93 R103 R111	CE 1023	5,6K 1/4 5% carbon resistors
45	R26-R34	CE 1164	2,2K 1/4W 5% carbon resistors
46	R27 R70-R73 R94-R101	CE 1170	1K 1/4W 5% carbon resistors
47	R22 R23	CE 1392	680 1/4W 5% carbon resistor
48	R36	CE 1269	390 1/4W 5% carbin resistor
49	R1	CE 1409	100 1/4W 5% carbon resistor
50	R38	CE 3094	22 1/2W 5% carbon resistor
51	R115	CE 1194	22 K 1/4 W 5% carbon resistor
52	XTAL 1	CE 1743	6MHZ cristal quartz Hc 18/U
53	DIP 1	CE 1356	Dip swirch 4 way
54	LED 1	CE 1542	FLV110 red led
55	Ic1 Ic2	CE 1962	B2764 MOS IC 8192 x 8 EPROM

TAV. XVII

Hb

CEC 181 INTERFACE BOARD ASSEMBLY

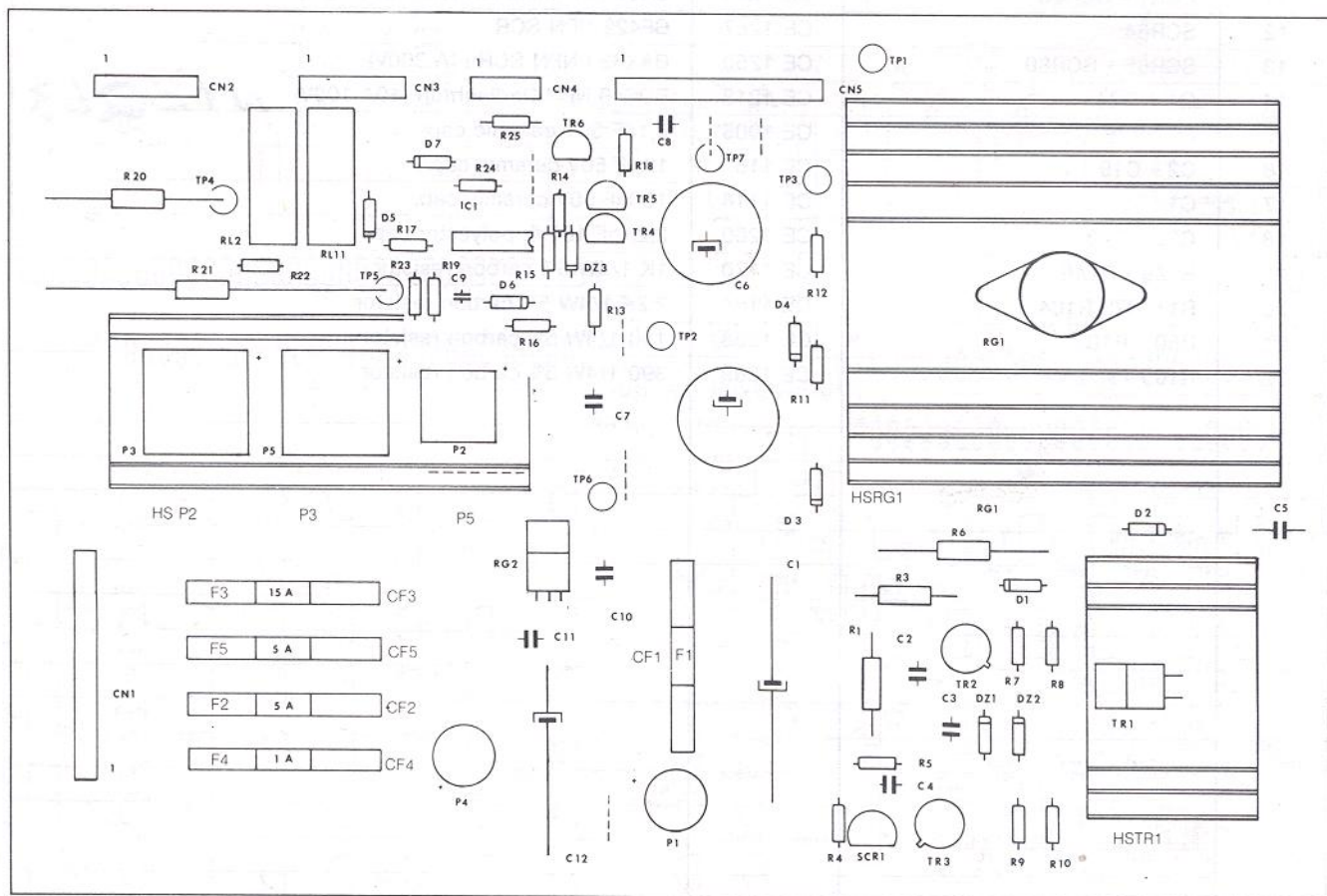


NTE 263

TAV. XVIII

Hc

CEC 179 POWER BOARD ASSEMBLY (Vers. /0)

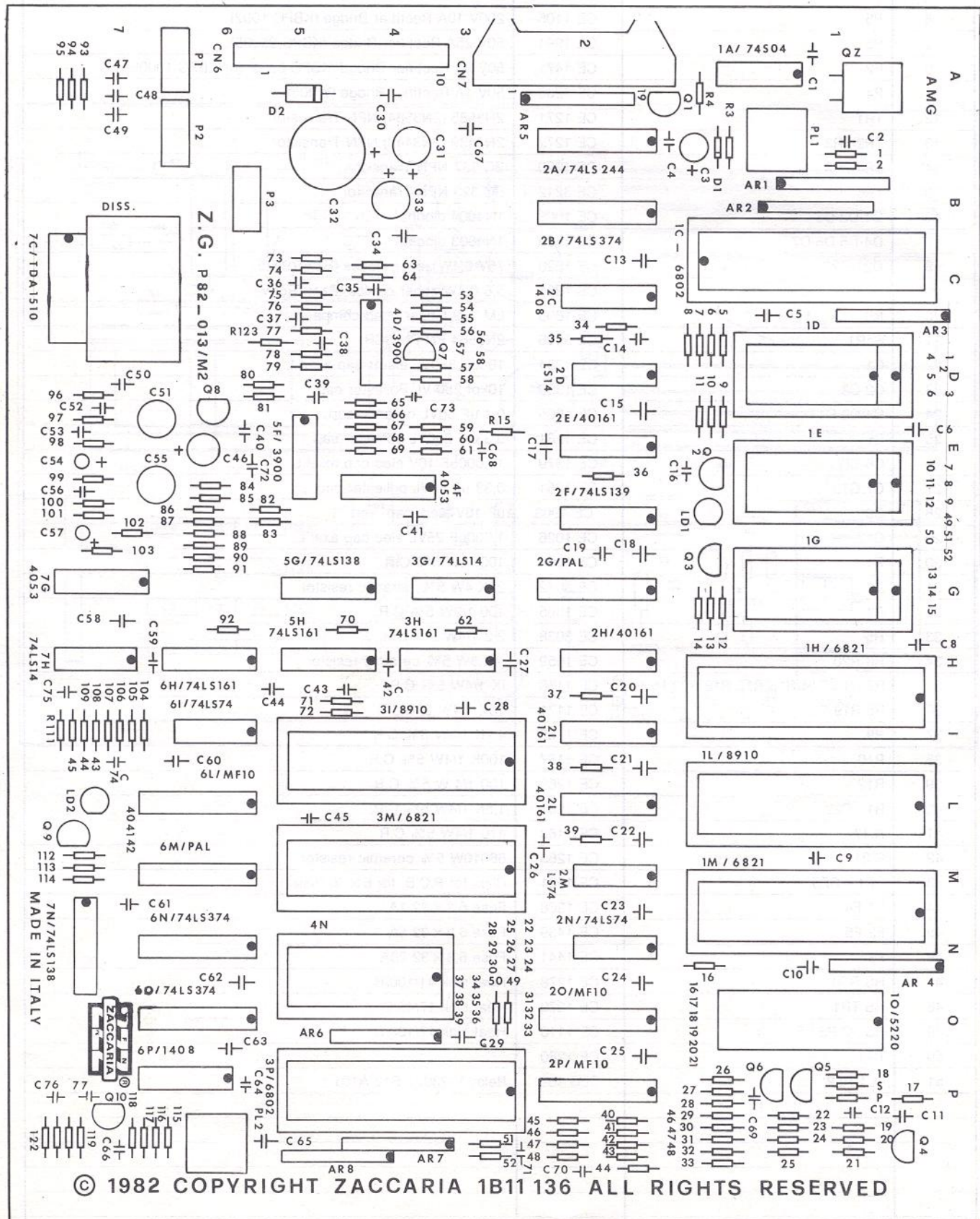


27

TAV. XIX

Hd CEB 223 SOUND & SPEECH BOARD ASSEMBLY WITHOUT MEMORIES

CEC 302 SOUND & SPEECH BOARD ASSEMBLY WITH MEMORIES "DEVIL RIDERS" «ITALIANO»
 CEC 303 SOUND & SPEECH BOARD ASSEMBLY WITH MEMORIES "DEVIL RIDERS" «FRANCESE»
 CEC 304 SOUND & SPEECH BOARD ASSEMBLY WITH MEMORIES "DEVIL RIDERS" «INGLESE»
 CEC 305 SOUND & SPEECH BOARD ASSEMBLY WITH MEMORIES "DEVIL RIDERS" «TEDESCO»



ITEM No	PART DESIGNATION	CODE PART No	DESCRIPTION
1	P.C 1B11 136	CE 2242	Printed circuit P82-013/M2
2	CN6	CE 3069	Male connector 1-640383-0
3	CN7	CE 1351	Male connector 20PIN 90° F.C.
4	IC1A	CE 1647	Integrated circuit 74S04
5	IC1C	CE 1714	Integrated circuit 6802P
6	IC1D-1E-1G		Integrated circuit see note 1
7	IC1H-1M	CE 1715	Integrated circuit 6821P
8	IC 1L	CE 1844	Integrated circuit AY-3-8910
9	IC10	CE 3330	Integrated circuit TMS 5220NL Speech
10	IC2A	CE 1589	Integrated circuit 74LS244
11	IC 2B	CE 1843	Integrated circuit 74LS374
12	IC 2C	CE 1730	Integrated circuit MC 1408L6 (8N)
13	IC2D-3G	CE 1177	Integrated circuit 74LS14
14	IC2E-2H-2I-2L	CE 1131	Integrated circuit MC 74LS161
15	IC2F	CE 1670	Integrated circuit 74LS139
16	IC2G	CE 3297	Pal 14L4 or 14H4-or 16L8
17	IC2M-2N	CE 1141	Integrated circuit 74LS74
18	IC20	CE 3296	Integrated circuit MF10CN
19	IC4D-5F	CE 1148	Integrated circuit LM3900N
20	IC4F	CE 1435	Integrated circuit 4053B
21	IC5G	CE 1144	Integrated circuit 74LS138
22	IC7C	CE 3045	Integrated circuit TDA1510
23	R1-2-12-85	CE 1448	Carbon Resistor 470 1/4W
24	R3	CE 1408	Carbon Resistor 27K 1/4W
25	R4-37 ÷ 39	CE 1165	Carbon Resistor 4K7 1/4W
26	R5 ÷ 11-14-34	CE 1024	Carbon Resistor 3K3 1/4W
27	R13	CE 1576	Carbon Resistor 8K2 1/4W
28	R23-29-36-43-48-56-59 ÷ 61-93-94-81	CE 1171	Carbon Resistor 10K 1/4W
29	R18-53-55-66-67-80-82-83-98 ÷ 100-102-103	CE 1167	Carbon Resistor 100K 1/4W
30	R17-19-20 ÷ 22-24-25-58-69-73-101-15	CE 1164	Carbon Resistor 2K2 1/4W
31	R26 ÷ 28-40 ÷ 42-45 ÷ 47	CE 1251	Carbon Resistor 33K 1/4W
32	R16-33-44	CE 1417	Carbon Resistor 3K9 1/4W
33	R35	CE 1214	Carbon Resistor 3M3 1/4W
34	R54-64	CE 1196	Carbon Resistor 470K 1/4W
35	R57	CE 1194	Carbon Resistor 22K 1/4W
36	R63-65-75 ÷ 78-R123	CE 1034	Carbon Resistor 820K 1/4W
37	R68	CE 1193	Carbon Resistor 47K 1/4W
38	R74	CE 1252	Carbon Resistor 220K 1/4W
39	R79	CE 1056	Carbon Resistor 1M8 1/4W
40	R96-99	CE 1306	Carbon Resistor 4,7
41	R97	CE 1392	Carbon Resistor 680
42	ICR1 ÷ 4	CE 1936	Resistor networks LO9-1R-10K
43	ICR5	CE 3031	Resistor networks LO9-1R-4K7
44	C1-4 ÷ 11-13-15-18-20 ÷ 25-30-34-35-40-41-47-48-50-52-56-67	CE 1005	Capacitor 0,1 uF disc ceramic
45	C2-17-19-26	CE 1159	Capacitor 1000 pF disc Ceramic
46	C3-54	CE 1375	Capacitor 4,7 uF Elect. Vert.
47	C12	CE 1298	Capacitor 22pF disc Ceramic
48	C14-C37-C38-C39	CE 1721	Capacitor 47pF disc Ceramic
49	C16	CE 1029	Capacitor 10.000 pF disc Ceramic
50	C31-C33-C51-C55	CE 1118	Capacitor 100 uF elect. vert 16V
51	C32	CE 1580	Capacitor 1000 uF elect vert. 16V
52	C36	CE 1513	Capacitor 470 pF disc ceramic
53	C46	CE 1610	Capacitor 47 uF electr. vert. 16V

ITEM No	PART DESIGNATION	CODE PART No	DESCRIPTION
54	C53	CE 1473	Capacitor 330 pF disc ceramic
55	C57-C68 ÷ C73	CE 1541	Capacitor 0,22 uF Tantalium
56	P2-P3	CE 1598	Trimmer 10K
57	Q1-Q7-Q8	CE 1438	Transistor BC 548
58	Q2	CE 1732	Transistor 2N4401
59	Q3-Q4	CE 1694	Transistor 2N3904
60	Q5-Q6	CE 1814	Transistor BC327
61	D1	CE 1011	Diode 1N4148
62	D2	CE 1299	Diode 1N5402/1
63	QZ1	CE 3066	Crystall oscillator 3,579 Mhz
64	PS1	CE 1277	Push button N.O.
65	LE1	CE 1542	Leed FLV 110
67	HS1	CE 3100	Heat Sink for TDA 1510 ML9/30
68	20-2P	CE 3305	20 Pin Socket for I.C.
69	1D-1E-1G-10	CE 3236	28 Pin Socket for I.C.
70	IC-1H-1L-1M	CE 1245	40 Pin Socket for I.C.
71		A 5299	Vite 3MA x 8 TC
72		A 4023	Vite 3MA x 12 TC
73		A 4132	Dado 3MA
74		A 4161	Rondella dentellata 3MA

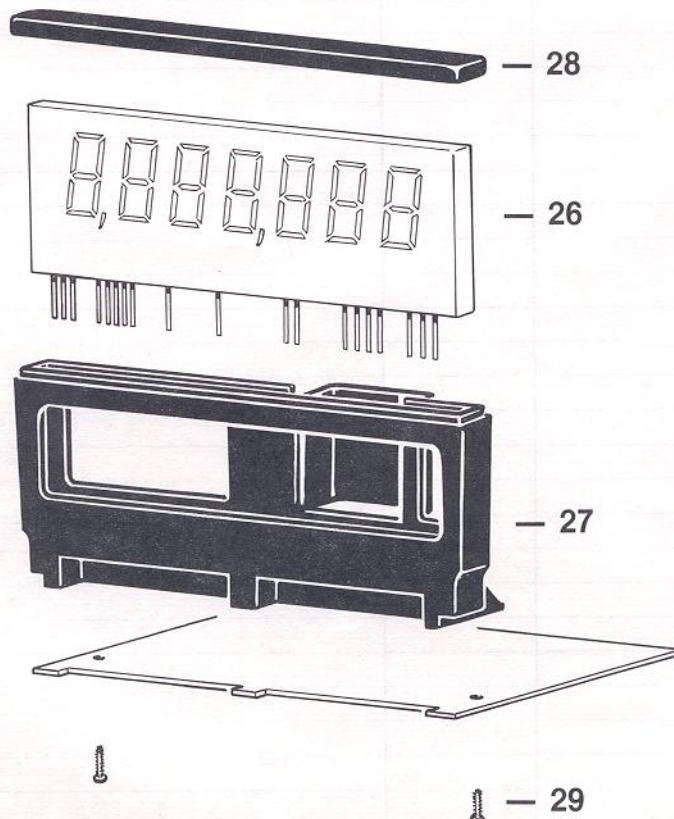
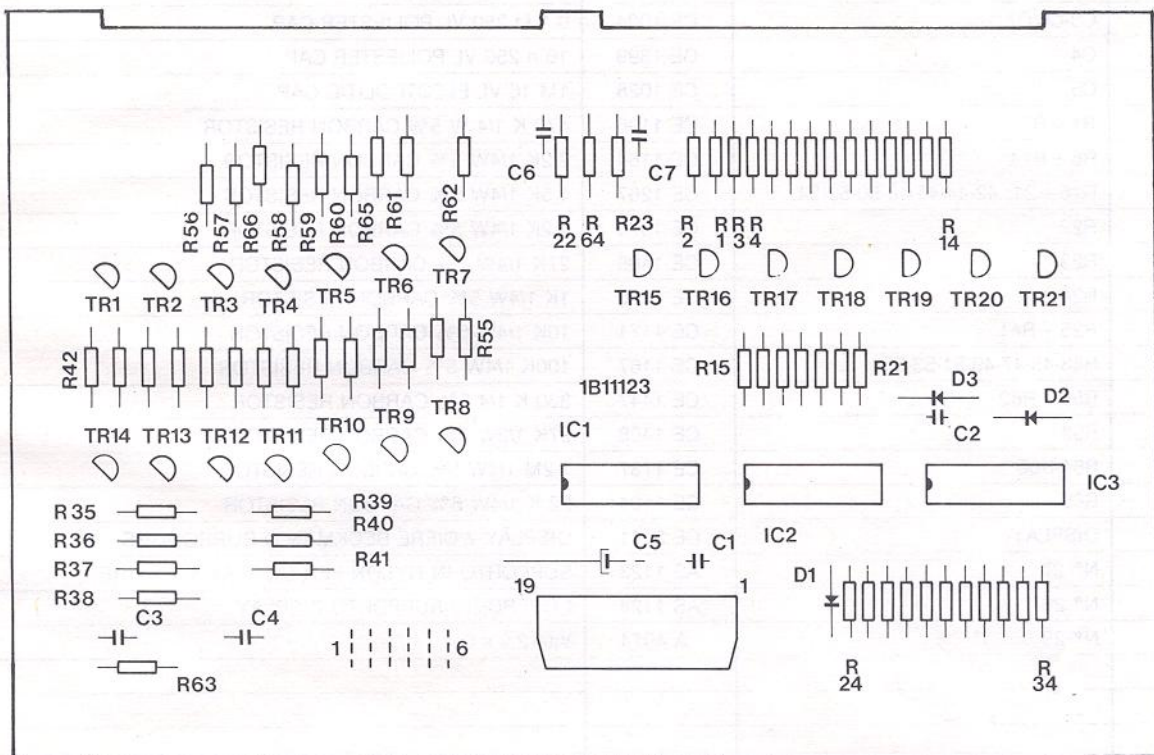
Note 1: Of above integrated circuits, only ics for game sounds are assembled.

1D RE 407 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Italiano n. 1)
 1E RE 408 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Italiano n. 2)
 1G RE 409 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Italiano n. 3)
 1D RE 410 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Inglese n. 1)
 1E RE 411 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Inglese n. 2)
 1G RE 412 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Inglese n. 3)
 1D RE 413 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Tedesco n. 1)
 1E RE 414 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Tedesco n. 2)
 1G RE 415 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Tedesco n. 3)
 1D RE 416 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Francese n. 1)
 1E RE 417 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Francese n. 2)
 1G RE 418 B 2764 MOS IC 8192 x 8 EPROM (Type "Devil Riders" Francese n. 3)

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CEC 247 DISPLAY BOARD ASSEMBLY 7 DIGIT



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ROUTINE MAINTENANCE ON LOCATION

The purpose of this chapter is to give a general line to follow, so as to maintain the machine in proper operation. The operations shown have to be carried out each time one operates on the machine, even when on power-up.

1. Carefully check that securing screws of electronic boards do not work loose as well as all connectors of the plate.
 - Check and if necessary tighten the screws of the rubber post.
 - Check the conditions of the rubber rings and if necessary change them (remember to check the adjustment of contacts each time the rubber rings are replaced).
 - Carefully clean playfield. Do not use highly caustic cleaners.
2. Playfield (lower part).
 - Check flipper assembly (tie rod, pin joints and contacts).
 - Check bumpers.
 - Check contact adjustments.
 - Check wiring harness to avoid stresses on the wires and obstacles to the moving parts.
3. Check and adjust tilt sensitivity.
Remember: an efficient periodic maintenance greatly improves the pintable lifetime and avoids the possibility of damages.

NOTE

Games are factory programmed, according to the special requirements of their designation. The main programming elements may be changed, however, by following procedures below.

We remind you that these procedures shall be performed EXCLUSIVELY by skilled technicians, because wrong programming could cause malfunctions.

GENERAL TECHNICAL INFORMATION

To avoid that any cause (battery discharged or others) causes the loss of the data stored in RAM C-MOS, and thus the failure of the pintable, the basic program contains some typical programmings (to replace the switches that had been used with the precedent series).

When the microcomputer notes that the programming data of RAM C-MOS do not apply anymore, recall one of the 8 lists of typical programming (see table I).

For the CHOICE OF THE TYPICAL LIST, that will be called in case of necessity, the DIP SWS. 1, 2 and 3 are used, that are mounted on the C.P.U. board (see figure 1).

On the sound board there are 2 trimmers provided for the separate tuning of the max. volume of sounds and talking.

For the final tuning of the loud-speaker volume, both for sound and for talk, there is a potentiometer provided, that is located inside the cabinet on the right side of the door. At the front board of the cabinet there is a plug for the headset, whose volume shall be adjusted on the headset itself (see figure 3).

To operate on the «TESTS» with the pintable in GAME OVER position, on the door there is an «ADVANCE-RETURN» switch with central rest position (or 2 push-buttons, of which one «ADVANCE» and the other one «RETURN»). By acting on «ADVANCE» at each control the tests progress 1 by 1 from 0 through 37 and then again 0, 1, 2 etc. When pushing again «RETURN», each time the test number is decreased by one (contrary to what happens with «ADVANCE»).

The test number is indicated on the 2 figures of the «BALLS TO PLAY» display (see fig. 2). To leave the test, and return thus to GAME OVER, it is sufficient to stop and then start again the game, or to push ADVANCE or RETURN until the display shows 00.

To clear the «accounting» tests or in any case to amend the programming tests, it is necessary that SW n. 4 on the C.P.U.-board (see fig. 1) points to ON (PROGRAM), and then call the test to be changed, and act on the «CREDIT» push-button. After having cleared or programmed the test, to return in GAME OVER condition and thus to be able to play, call test 00 and then put SW n. 4 in OGG (GAME) position.

If the SW n. 4 has not been reset, and you are still in ON (PROGRAM) condition with the 00 (GAME OVER) test, there will be a buzzing sound and the TILT lamp will be blinking, to inform on the anomalous condition that doesn't allow to use the game.

IMPORTANT: each time the battery or RAM C-MOS 6514-9 are replaced, or in any case of interruption of the memory feeding, it is necessary to act as follows to enter the new program:

- a) Clear the accounting tests (6, 7, 8, 9) even if they apparently are already cleared.
- b) Program the tests from 10 through 37, without forgetting to program also those tests that apparently are already programmed.
For example, if you wish to program the test 10 with 00, and on the display 00 has already appeared, then push the CREDIT push-button until 00 appears again.

Once the programming has been terminated, the GAME OVER LAMP shall remain lit.

If it is blinking this means that the programming has not been accepted, and thus it has to be repeated in the proper way.

TESTS

Now we are going to analyse the technical performances in a detailed manner, starting with the self-test function, followed by the accounting functions and eventually the various programming functions.

SELF TEST

DISPLAY (Test n1). By this we check optically the proper operation of the display (5 groups of 7 figures each covering a total of 35 figures). The 5 groups are the following: **1st player display; 2nd player display; 3rd player display; 4th player display; HIGHEST SCORE TO DATE display or DISPLAY CREDIT, TIME BONUS and BALLS TO PLAY.** When this test is entered, all the figures show the same numbers, starting, with «0» that immediately becomes «1» then «2» and so on until «9»; then they restart at «0» and so on. By acting on CREDIT push-button the 7 figures of each display indicate 7 numbers in continuous succession.
Example: 6 5 4 3 2 1 0
7 6 5 4 3 2 1

CONTACTS: (Test n. 2). By this test function it is possible to check the proper operation of the 64 INPUT contacts numbered from 00 through 64. When this test is entered, on the 2 figures of the CREDIT display appears the "closed" contact highest in number, and after having opened it, follows the number of the closed contact next in order. If none of the 64 contacts is "closed" no number is indicated. Under these circumstances it is possible to check whether all the contacts work properly, by closing them one by one and making sure that each time the corresponding number appears on the special display provided.
For the numbering of contacts see fig. 4

LAMPS (Test n. 3). All the «piloted» lamps, that have been divided into two groups, are lit and extinguished alternatively at regular intervals. Check whether there are any lamps that are not operative.

SOLENOIDS (Test n. 4). All the solenoids (coils) are energized in sequence from 1 through 24. The number of the energized solenoid appears on the CREDIT display in that very moment.
NOTE THAT EACH SINGLE PINTABLE MODEL MAY USE ONLY PART OF THE 24 AVAILABLE SOLENOIDS.
In the test all the solenoids are treated in the same way (either used or not), and thus on the CREDIT display the numbers of all the 24 possible solenoids are indicated. Those that are not operative and are missing do not cause any effect (mechanical noise).
The number of employed solenoids is indicated on fig. 6.

SOUND AND TALKING (Test n. 5). This test serves to hear the various sounds and phrases programmed for the model and to check whether they are correct; in the same time on the CREDIT display appears the number of the sound or of the phrase being executed.
To check the proper operation of the SOUND board, use the special self-test program, that is on the board itself (see paragraph self-test sound and talking board).

ACCOUNTING FUNCTIONS

TIME (Test n. 6). Same contains the accounting data relevant to the time (minutes) of pintable operation (1st player display), to the actual duration of the game (minutes) (2nd player display), the number of TILTS (3rd player display) and to the average duration of games (4th player display). The average duration of games is expressed in minutes, and is determined by the ratio between the play time and the number of games that have been played.
The above accounting functions can be cleared simultaneously, by keeping pressed the CREDIT push-button for about 5 seconds, provided SW n. 4 on the C.P.U. board is on ON (PROGRAM).

TAKINGS (Test n. 7). The number of coins collected by the first coin chute (on the left side) is indicated on the 1st player display. The number of coins collected by the second coin chute (on the right side) is shown on 2nd player display. The 3rd player display accounts for the number of coins introduced into the third coin chute (the central one). On the 4th player display the number of «service» games is reported, that is those games obtained by pressing the «SERVICE» push-button that is located inside the door on the left side.
NOTE THAT THE «SERVICE» PUSH-BUTTON DOES NOT CHANGE THE NUMBER OF CREDITS, BECAUSE IT ENTERS DIRECTLY FROM 1 THROUGH 4 GAMES, AND ALSO THE ELECTROMECHANICAL COIN COUNT IS NOT AFFECTED.
To clear it, SW n. 4 on the C.P.U. board (see figure 1) shall be in position ON (PROGRAM), and then act on the CREDIT push-button for about 5 seconds.

WINNINGS (Test n. 8 and 9). Test n. 8 indicates the winnings listed per types, that is: on the 1st player is indicated the overall quantity of games that have been played (the addition of the paid games, the won ones and the SERVICE games).
On the 2nd player display appear the won games.
On the 3rd player display one can see the number of won balls. Finally the 4th player display shows the quantity of awarded SUPERBONUS.
— The test n. 9 shows how the winnings have been obtained.
The 1st player display indicates how many times the HIGHEST SCORE has been exceeded (NORMAL if test 10 is programmed with 00, RANDOM if test 10 is programmed with 01).
The 2nd player display shows the number of winnings obtained with winning scores.
The 3rd player display shows the number of winnings obtained with SPECIAL 1. Finally, on the 4th player display appears the number of winnings obtained with SPECIAL 2.
To clear the winnings, SW n. 4 shall be in position ON (PROGRAM); then enter test n. 8 and act on the CREDIT push-button for about 5 seconds; then enter test n. 9 and again press the CREDIT push-button for about 5 seconds.

COINS (Tests n. 11, 12, 13, 14, 15, 16). To meet the requirements due to the various types and values of coins used in the different countries, a highly sophisticated method for programming the cost of one «credit» (one game) has been adopted. The main features of this method are:

- a) the possibility of giving one credit with several coins,
- b) same number of allowances if the value of the introduced coins is the same, regardless of their number and type,
- c) the possibility of establishing a cost per credit that differs from the value of the various coins.

To achieve proper programming of the cost of one credit, when allowances shall be granted, it is necessary to keep in mind that the cost ratio between the more expensive credit and the less expensive one shall be less than «2».

The tests 11, 13 and 15 shall be given the unit «value» of the coins that can be introduced respectively into coin chute n. 1 (on the left side), coin chute n. 2 (on the right side) and coin chute n. 3 (in the middle).

Do not forget that the coins shall be introduced into the 3 coin chutes in GROWING ORDER. The coin with the lowest value shall be introduced into the first coin chute, to the second coin chute can be assigned a coin of the same or higher value than the first one.

The third coin chute shall receive the coin that has or higher or at least the same value as the coin introduced into the second coin chute.

The tests, 12, 14 and 16 shall be programmed with the number of credits to be given to each coin introduced respectively into coin chutes 1, 2 and 3.

If several coins are needed to get one credit, it is necessary to program 00.

The coin attributed to the third coin chute, shall have the same or higher value than the cost of one credit. (The figure to be programmed on test n. 16 shall be equal to or higher than 1).

THE UNIT VALUE OF COINS IS THE FIGURE OBTAINED BY DIVIDING THE ACTUAL VALUE OF THE COINS BY THE MAX. COMMON DIVISOR.

Example: 10 p; 50 p; 10 = 1 + 5
100 L.; 200 L.; 500 L.: = 1 + 2 + 5

As a further guidance for the operators on Table II some actual coin chute programming examples are reported, that are used for some European countries.

HIGHEST SCORE (Tests n. 10, 17 and 25). There exists the possibility to choose among 2 different types of H.S.: NORMAL (Test 10 = 00) and RANDOM (Test 10 = 01). NORMAL H.S. represents the max. score value achieved by one player. When this score is exceeded by one or more players, it is replaced by the score obtained by the player who has totalled the highest score. The players that follow shall exceed the new H.S. value to have their winning score recorded.

RANDOM H.S. on the contrary consists of a casual score, ranging within an area of 12.000.000 points, that is set forth at the beginning of each game.

The minimum value is given by the figure programmed with test 17, and that can range from 0.000.000 through 7.990.000

The same test is used to program a NORMAL H.S. at the beginning, when the pintable is installed, or in any case to clear or change the existing H.S. value. To do so, press several times the CREDIT push-button, if slow progressing is required, otherwise keep it pressed for fast progress. To change the initial value of Random H.S. it is necessary that SW4 on the C.P.U. board is in ON (PROGRAM) position, while it may be both on ON (PROGRAM) or OFF (GAME) to change the initial value of NORMAL H.S. The player who exceeds the NORMAL or RANDOM H.S. wins the prize established by the programming of test n. 25, with the following possibilities:

Test 25 = 00 = no win
01 = 1 replay
02 = 2 replays
03 = 3 replays
04 = 1 superbonus

Both test 10 and test 25 require SW n. 4 to be in ON (PROGRAM) position to change their programming, and then it is necessary to press the CREDIT push-button.

FOR NORMAL H.S., THE WIN IS AWARDED ONLY TO THE PLAYER WHO OBTAINS THE HIGHEST SCORE, EVEN WHEN THE PLAYERS EXCEEDING THE PRESET HIGHEST SCORE VALUE ARE MORE THAN ONE.
IN THE CASE OF RANDOM H.S. THE WIN IS GIVEN TO ALL THE PLAYERS WHO EXCEED THE PRESET H.S. VALUE.

MAX CREDIT (Test n. 19). Same represents the max. number of credits that can be recorded before the coin chute locking mechanism is released, thus preventing further introduction of coins. Same represents also the figure beyond which the credits are not increased anymore because of any won games. It is programmable from 10 through 30 by acting on the CREDIT push-button, provided SW4 is set on ON (RANDOM).

BALLS (Test n. 20). Same represents the number of balls that are available during each game. It can be programmed from 01 through 02 by acting on the CREDIT push-button while SW4 shall be on ON.

MATCH (Test n. 20). Match is the possibility to award one replay to the player or to the players, who have managed to get a score on their display the two right end figures correspond to those of MATCH (see figure 2). If it is programmed with 00, it is excluded, while if the programmed figure is 01, it is connected. To change the programming act on the CREDIT push-button. SW n.4 shall be set ON (PROGRAM).

WINNING SCORES (Test n. 22, 23, 24 and 26). There are three scores, that can be programmed within a range from 0.00 through 9.990.000, respectively with tests 22, 23 and 24. The player or the players who exceed one or more (max. 3) winning scores, are awarded a prize as determined on test n. 26, for each exceeded winning score.

The scores programmed with 0,0 to are not enabled (they do not award any, win even when test 26 is programmed for wins). The test n. 26 determines the type of win at each winning score limit, that can be chosen among:

Test 26 = 00 = non win
01 = 1 bonus ball
02 = 1 replay
03 = 1 superbonus
04 = 500.000 points

For the programming of these tests it is necessary that SW n.4 is on ON (PROGRAM), and then act on CREDIT push-button.

For the scores (test 22, 23, 24) push repeatedly the CREDIT push-button to progress 1 by 1 (corresponding each to 10.000 points). When the button is kept pressed, the progress is fast.

SPECIAL 1 (RED SPECIAL) (Tests 27 and 33). Difficulty can be adjusted for obtaining the special, by using test 33 properly. This way the number of functions necessary to light the special lamp, can be varied.

- 00 = Hit targets 12 times
- 01 = Hit targets 6 times
- 02 = Hit targets 4 times
- 03 = Hit targets 3 times

For adjustment or changes, act on CREDIT button when SW 4 is ON (PROGRAM).

Test 27 determines the type of win to be awarded when the Special target is hit while corresponding lamp is lit.

- 00 = no win
- 01 = 1 bonus ball
- 02 = 1 replay
- 03 = 1 superbonus
- 04 = 1.000.000 points

For adjustment or changes, act on CREDIT button when SW 4 is ON (PROGRAM).

SPECIAL 2 ORANGE SPECIAL (Test 28, 34). Difficulty can be adjusted for lighting the "orange special" lamp by modifying test n. 34.

- 00 = Knock down the same banks 3 times
- 01 = Knock down one of the 2 bank 3 times
- 02-03 = Knock down one of the 2 banks once

Test n. 28 determines the type of win to be awarded when the orange Special target is hit while the corresponding lamps is lit.

- 00 = no win
- 01 = 1 bonus ball
- 02 = 1 replay
- 03 = 1 superbonus
- 04 = 300.000 points

For adjustment or changes, act on CREDIT button when SW 4 is ON (PROGRAM)

BACKGROUND SOUND AND ATTRACTION SENTENCES (Test 29). Background sound is to be adjusted when on play, sentences and sounds when in game over.

- 00 = Sound disconnected, sentences connected
- 01 = Sound connected, sentences connected
- 02 = Sound disconnected, sentences disconnected
- 03 = Sound connected, sentences disconnected

COIN METER (Test n. 30). Same is an electromechanical impulse meter, to be connected with the circular 8-way connector located in the cabinet and that the «UNIT VALUE» of the coins introduced into 3 coin chutes.

It is never modified by the wins or the service games (obtained through the SERVICE push-button). The game can be played regularly both with connected and cut-off coin meter, if the test it programmed with 00. Note that the impulse meter is programmed with 00. Note that the impulse meter is always operatin regardless of the type of programming used for test 30.

To program or to change, act on CREDIT push-button, provided SW 4 is in ON (PROGRAM) position.

The impulse meter and relevant wiring are available upon request

GAME TIME BONUS (Test n. 31). After having used the available balls (see test 20 + possible wonned balls), it is possible to get a game time extention that may range from a minimum of 10 seconds to a maximum of 99 seconds, determined by the play of the last normal ball. This time is indicated by 2 digits in the center of the HIGHEST SCORE TO DATE display (see figure 2). Upon play time ezipiry, all the controis are stopped, and thus the ball to play runs straight to the hole.

If the test has been programmed 00, the game is terminated normally (game time bonus excluded), while with 01 programming game time bonus is connected. To program or change, act on CREDIT push-button, provided SW 4 is in ON (PROGRAM) position.

BONUS BALL NUMBER VARIATION (Test 32). Maximum number of possible bonus balls, while one ball on play, is determined.

- 00 = 1 bonus ball
- 01 = 3 bonus ball
- 02 = 3 bonus ball
- 03 = 3 bonus ball

To program or change, act on CREDIT push-button, provided SW 4 is set on ON (PROGRAM).

REACT FUNCTION VARIANT (Test 35) Difficulty for lighting react lamps again is to be determined.

- 00 = Hit 1 target
 - 01 - 02 - 03 = Knock down one target bank
- To program or modify, act on credit push button when SW 4 in ON (Program)
Note: Tests 18, 36 and 37 are not utilized on "DEVIL RIDERS"

SOUND AND TALK BOARD SELF TEST

With the pintable in GAME OVER condition, act on push-button located on the AUDIO-board; the LED shall start blinking, and each blinking indica-tes the proper performance of a test, covering a total of 5 blinkings (5 tests).

The 1st blinking indicates that the RAM store inside the microprocessor is regularly operating.

The 2nd blinking indicates that PIA 1 (IC 15) that is to be used for the dialogue with the «generated sound» (AY-3-8910) is operating.

The 3rd blinking indicates that PIA 2 (IC 14) that serves for the dialogue with the «speech synthetizer» (TMS 5200) is operating.

The 4th blinking indicates that the «sound generator» (AY-3-8910) is operating

The 5th blinking indicates that the «special synthetizer» is operating.

If everything operates properly, LID 1 is extinguished and remains in such conditions only after a certain number of sample phrases.

Keep in mind, that the completion of the SELF TEST does not mean at all that the AUDIO-board is correctly operating in all its parts, but it supplies avery good indication.

SELF TEST			
N. TEST	FUNCTION	N. FUNCTION IN TEST	DESCRIPTION
01	Test Display	/	1° All the displays show equal figures that follow each other 0,1,2,...,9,0 and so on. 2° By keeping the «CREDIT» push-button pressed, the displays show numbers in succession.
02	Contact test	88	Number of closed contact
03	Lamp test	/	All the piloted lamps are continuously lit and extinguished.
04	Solenoid test	88	The solenoids (from 1 through 24) are energized one after another. The figure indicates the energized solenoid. When it is operative it must be perceived.
05	Sound and talking test	88	Sounds and works are repeated one after another. The figure indicates the sound and the phrase being executed.

ACCOUNTING			
N. TEST	FUNCTION	DESCRIPTION	HOW TO CLEAR
06	Duration	Player 1 display = Time of pintable operation (minutes) Player 2 display = Game time (minutes) Player 3 display = Tilt number Player 4 display = Average game duration expressed in minutes	Whith SW4 on ON (PRO GRAM) push-button about 5 sec.
07	Takings	Player 1 display = Coins in coin chute 1 Player 2 display = Coins in coin chute 2 Player 3 display = Coins in coin chute 3 Player 4 display = SERVICE games	With SW4 ON act on CREDIT push-button abt. 5 sec.
08	Wins	Player 1 display = Games played in total Player 2 display = Won games Player 3 display = Won balls Player 4 display = Won superbonus	With SW4 ON act on CRE-DIT push-button for abt. 5 sec.
09	Wins	Player 1 display = H.S. is exceeded Player 2 display = Winning scores are exceeded Player 3 display = Special 1 Player 4 display = Special 2	With SW4 in ON act for about 5 seconds on CRE-DIT button.

PROGRAMMING				
N. TEST	FUNCTION	PROGRAMMED VALUE	DESCRIPTION	DATA FOR THE PROGRAMMER
10	High-Score types	00 01	NORMAL H.S. or max. scores achieved by one player. RANDOM H.S. or casual scores that may change at the beginning of each game.	With SW4 on ON act on CREDIT-push-button.
11	Coin value 1st coin chute.	from 01 to 10	Value of the coins for the 1 st coin chute (at the left side close to the hinge).	Whit SW4 on ON act on CREDIT-push-button.
12	Coin credits 1st coin chute.	from 00 to 15	Credits per each single coin introduced into the first coin chute.	
13	Coin value 2nd coin chute.	from 01 to 10	Value of the coins for the 2nd coin chute (at the right side, close to the key).	
14	Coin credits 2nd coin chute	from 00 to 15	Credits per each single coin introduced into the second coin chute.	
15	Coin value 3rd coin chute	from 01 to 10	Value of the coin for the 3rd coin chute (in the center).	
16	Coins credit 3rd coin chute	from 00 to 15	Credits per each single coin introduced into the third coin chute	
17	Hihg-Score initial value	from 0.00 to 9.99	When test 10 is programmed with 00, initial NORMAL H.S. is programmed. If test 10 is programmed 01, the min. RANDOM H.S. is programmed.	NORMAL H.S. can be preset also in Game-over (SW4 in OFF), RANDOM H.S. can be preset only in PROGRAM SW4 in ON), Push CREDIT keep pushed for fast progress.

Segue: PROGRAMMING

N. TEST	FUNCTION	VALUE PROGRAMMED	DESCRIPTION	DATA FOR THE PROGRAMMER
18	Not used			
19	Max credits	from 10 to 30	Max number of credits beyond which coin chutes are locked, and no won games are attributed anymore	Act on CREDIT push-button with SW4 on ON
20	Balls	from 01 to 07	Balls per play	Act on CREDIT push button with SW 4 on ON
21	MATCH	00 01	Match excluded (no wins) Match connected (1 Replay)	Act on CREDIT push-button with SW4 on ON
22	1st winning scores	from 0.00 to 9.99	1st winning score, which awards the win programmed on test n.26 when exceeded. 0,0,0 = no win	With SW4 on ON act stepwise on CREDIT push-button for slow progress. For fast progress keep it pressed
23	2nd winning scores	from 0.00 to 9.99	2nd winning score which awards the win programmed on test n. 26 when exceeded. 0,00 = no win	
24	3rd winning scores	from 0.00 to 9.99	3rd winning score which awards the win programmed on test n.26 when exceeded, 0,00 = no win.	
25	Wins with HIGHEST SCORE	00 01 02 03 04	No win 1 Replay 2 Replay 3 Replay 1 Superbonus	With SW4 on ON act on CREDIT push-button
26	Wins with scores (see test 22, 23, 24)	00 01 02 03 04	No win 1 Bonus Ball 1 Replay 1 Superbonus 500.000 points	With SW4 on ON act on CREDIT push-button
27	Wins with Special 1	00 01 02 03 04	No win 1 Bonus Ball 1 Replay 1 Superbonus 1.000.000 points	With SW4 on ON act on CREDIT push-button
28	Wins with Special 2	00 01 02 03 04	No win 1 Bonus Ball 1 Replay 1 Superbonus 300.000 points	With SW4 on ON act on CREDIT push-button
29	Background Sound and Attraction sentences	00 01 02 03	Sound disconnected, sentences connected Sound connected, sentences connected Sound disconnected, sentences disconnected Sound connected, sentences disconnected	With SW 4 on ON act on CREDIT push-button
30	Coin meter	00 01	Normal operation both with excluded and with connected impulse meter When impulse meter is disconnected the pin table cannot be used	With SW4 on ON act on CREDIT push-button
31	Game Time Bonus	00 01	«Game time bonus» disconnected Count down connected	With SW4 on ON act on CREDIT push-button
32	Bonus Ball number variation	00 01 02 03	1 bonus ball 3 Bonus Balls 3 Bonus Balls 3 Bonus Balls	Press CREDIT button when SW4 is ON
33	Red Special	00 01 02 03	Hit targets 12 times Hit targets 6 times Hit targets 4 times Hit targets 3 times	Press CREDIT button when SW4 is ON
34	Special 2 ORANGE	00 01 02-03	Knock down the same bank 3 times Knock down one of the 2 banks 3 times Knock down one of the 2 banks once	Press CREDIT button when SW4 is ON
35	React function variant	00 01-02-03	Hit 1 target Knock down one target bank	Press CREDIT button when SW4 is ON
36	Not used			
37	Not used			

IMPORTANT: With SW4 in ON (PROGRAM) position, the pin table cannot enter a game, even though there may be credits.

TROUBLE SHOOTING

CONDITION	CAUSE	REMEDY	NOTES
The game cannot be started	- No voltage available - Plug is off - The 3-way connector (CN-«line») of the feeder rack is not connected - Mains fuse burned - The 9-way connector (CN «Ja») on the feeder rack disconnected - Mains switch open - Connector (CN 1) on feeder and connectors (CN «J1»-«J2»-«J3») on feeder rack disconnected - Voltage change over not or insufficiently connected	- Plug in - Connect - Replace - Replace - Close - Connect - Correct	If they burn again, this means that there is a short circuit The voltage change over unit contains also the mains fuse
All stationary lamps are not lit	- Fuse F2 on the feeder rack thrown out. - CN J1-J2-J3 connector not connected - Electric wire disconnected	- Replace - Plug in - Connect	Shall not be more than 20A; if it is thrown out again there is a short-circuit
All the piloted lamps are not operating	5 VRM is not available - The connector between C.P.U. and the interface is disconnected - Interface (CN 16) feeding connector is not plugged in - The connectors of the lamps on Interface (CN 18-19-20-21-22) are not connected - The connectors at the feeder board output are disconnected (CN 2-3-4) - At the C.P.U. input and at the Interface 5,6 V d.c. are missing - C.P.U. is always cleared - Others	- Fuse F3 (15A) on Power-board is burned - Tighten the loose connectors - Fuse F2 (5A) is burned and shall therefore be replaced. If it is thrown out again, there is a short circuit. Replace feeder board. Replace feeder and then replace C.P.U. Replace interface	Test carefully with tester
All displays are extinguished.	+ 170 V d.c. is missing because fuse F1 (1A) is burned. - Or high voltage regulator is damaged. - Or high voltage regulator safety circuit is actuated. - At C.P.U. -input +5,6 V is missing - CN 14 or all connectors of displays are disconnected - Display damaged - C.P.U. damaged	- Replace the fuse. - Check with the tester whether the high-voltage feeder operates. When safety device is actuated, try to disconnect the displays. If the feeder operates at 170 V this means that on the displays there exists a short circuit. To restore +170 V it is necessary to stop the pintable and then to start it again - Check and if necessary replace the F2 (5A) fuse on the feeder board - Plug in connectors	
On all the displays wrong figures are appearing	- Cable damaged - C.P.U. damaged	- Replace the cable - Replace C.P.U.	
One or more figures on one or more displays are wrong.	- Display damaged - Cabel damaged		
All figures are too bright	+170 V feeder damaged	Replace the feeder board	
All the solenoids do not work	39 VRM input is missing - CN 17 connector is not plugged in - Interface damaged - C.P.U. damaged	- Reset the fuse . - If it is thrown out again there is a short circuit. - Plug in the connector - Replace the Interface - Replace the C.P.U.	
One or more solenoids do not work	- Coils burned - Darlington burned - Electric wires loose - The fuses under the playfield have been thrown out	- Replace coil and the relevant Darlington - Replace the Darlington and check the diode on the coil. - Connect the loose wires - Reset the burned out fuses	
One or more solenoids are always energized	- Interface-board damaged - C.P.U. damaged - Short circuit	- Replace the Interface-board - Replace the C.P.U. board	
All the contacts remain inactive	- CN 10-11 connectors are loose - C.P.U. is damaged	- Plug in - Replace C.P.U.-board	

CONDITION	CAUSE	REMEDY	NOTES
One or more contacts do not work	- Loose wires - Interrupted or loose - Contact oxydized	Connect all the loose wires Reset the diode Clean the contact	
One or more contacts are wrongly read	- The contact wires are short circuited and also with respect to the lamp and solenoid wires - Diode contacts are short circuited - C.P.U. is damaged	Eliminate the short circuit Replace the short circuited diode Replace C.P.U.	
All sounds and words are missing	- The loudspeaker is not connected or damaged - Loudspeaker potentiometer cut off - CN 6 connector (Sound board) disconnected 5 V d.c. feeding voltage is missing +12 V d.c. feeding voltage missing +5 V d.c. feeding voltage missing - Sound and talk board damaged	Connect, if necessary replace Replace another one having similar features Plug in the connector Replace fuse F4 (1A) on the feed board, if burned Replace fuse F2 (5A) on the feed board, if burned If +5 V d.c. are missing, but +12 V d.c. are available, replace the regulator 78H05 Replace the sound and talk board	

VERY IMPORTANT. Never connect or disconnected the connectors while the game is running

The game is supplied with a special plug to connect a print-out unit that is very useful to print on paper all the most important accounting functions, as well as the serial number of the game.
 Hereafter a fac-simile print out.
 The same plug is to be used also for the coin meter.

DEVIL RIDERS

SERIAL N 1532
 WON G 000000
 PLAYED G 000003
 COINS # 1 000003
 COINS # 2 000003
 COINS # 3 000003

CONNECTOR CARD FOR "DEVIL RIDERS"
INPUT/OUTPUT POSITION ON THE CONNECTOR
FEEDER BOARD

CONNECTOR	PIN	WIRE COLOUR	SIGNAL
-----------	-----	-------------	--------

POWER Board

CN1	→ 1 2 3 4 5 6 7 8 9 10 11 12	☐ Red Red Brown Brown Yellow Yellow Blue Blue White White Green Green	— 165 Vac 0,3 A 165 Vac 0,3 A 10 Vac 0,5 A 10 Vac 0,5 A 10,5 Vac 6 A 10,5 Vac 6 A 43 Vac 5 A 43 Vac 5 A 6,5 Vac 15 A 6,5 Vac 15 A 6,5 Vac 15 A 6,5 Vac 15 A
CN2	→ 1 2 3 4 5 6	☐ — Black — Violet Pink White	— — GND — +39 Vrm common for al the solenoid in the cabinet Cabinet - Playfield interconnections For flipper control
CN3	→ 1 2 3 4 5 6	☐ White Pink — Brown Violet —	— Cabinet - Playfield interconnections For flipper control — +5 Vrm common all controlled playfield lamps +39 Vrm common for playfield solenoids —
CN4	→ 1 2 3 4	☐ — Brown Violet —	— — +5 Vrm common light board controlled lamps + 39 Vrm common for head solenoids —
CN5	→ 1 2 3 4 5 6 7 8 9 10 11 12	☐ Orange Black Black Red Red White Black Yellow Black Green Red Blue	— Flipper Relay GND GND + 5,6 Vdc + 5,6 Vdc Power Failure GND 170 Vcc GND — 5 Vdc + 5,6 Vdc + 12 Vdc

SOUND Board

CN6-T	→ 1 2 3 4	☐ Black Green Red Blue	— GND — 5 Vdc + 5,6 Vdc + 12 Vdc
CN6-C	5 6	Yellow-grey Violet-whitw	Output Sound e Speech Output Sound e Speech

C.P.U. board

CN9	→ 1 2 3 4	☐ Yellow Black White Red	— 170 Vcc GND Power Faillure + 5,6 Vdc
CN10	1 2 3 4 5 6 7	Yellow-orange Grey-yellow White-pink Pink-black — White Grey	Printer — RX + Printer — RX — Printer — TX — Printer — TX + — Contacts — row ø Contacts — row 1

CONNECTOR	PIN	WIRE COLOUR	SIGNAL
CN10	8	—	—
»	9	—	—
»	10	White-grey	Contacts - column Ø
»	11	Black-white	Contacts - column 1
»	12	Red-green	Contacts - column 2
»	13	Black-yellow	Contacts - column 3
»	14	Black-orange	Contacts - column 4
»	15	Red-yellow	Contacts - column 5
»	16	—	—
»	17	Violet-brown	Contacts - column 6
»	18	Yellow-violet	Contacts - column 7
»	19	—	—
»	20	—	—
CN11	1	—	—
»	2	—	—
»	3	Red	Contacts - row 2
»	4	Yellow	Contacts - row 3
»	5	Black	Contacts - row 4
»	6	Green	Contacts - row 5
»	7	Blue	Contacts - row 6
»	8	—	—
»	9	Orange	Contacts - row 1
»	10	Grey-white	Contacts - column Ø
»	11	Black-white	Contacts - column 1
»	12	Red-green	Contacts - column 2
»	13	Black-yellow	Contacts - column 3
»	14	Black-orange	Contacts - column 4
»	15	Red-yellow	Contacts - column 5
»	16	Brown-violet	Contacts - column 6
»	17	Yellow-violet	Contacts - column 7
»	18	—	—
»	19	—	—
»	20	—	—

INTERFACE Board

CN16	1	Black	GND
»	2	Red	+ 5,6 Vdc
»	3	Black	GND
»	4	Orange	Flipper Relay
CN17-C	1	Pink-white	Knocker
»	2	White-red	Coin mechanism coil
CN17-P1	3	Yellow-Pink	2nd moving target right bank
»	4	White-Violet	Left fricher flipper
»	5	Yellow-White	Left pop
»	6	Brown-White	Out hole
»	7	White-Blue	Right kicher flipper
CN17-P2	8	Green-White	Right flap
»	9	Green-Brown	Left flap
»	10	Red-Green	Top right pop
»	11	Yellow-Orange	1st moving target right bank
»	12	White-Orange	Right bank
»	13	Yellow-Brown	Right pop
»	14	Grey-White	Left bank
»	15	Black-White	Right move ramp
»	16	Black-Green	2nd moving target left bank
»	17	Yellow-Grey	Left move ramp
»	18	Pink-White	Top left pop
»	19	Red-White	1st moving target left bank
»	20	Yellow-Pink	3rd moving target right bank
»	21	Yellow-White	3rd moving target left bank
CN17-T	22	Yellow-White	Head little bell
»	23	Brown-White	1st speed move rider
»	24	Blue-White	2nd speed move rider
CN18	1	Yellow-white	Bonus 4
»	2	Light blue	Pop 2
»	3	Blue-Yellow	Bonus 8
»	4	Light green-Grey	Bonus 9
»	5	Pink-White	Pop 1
»	6	Pink-Brown	Bonus 6
»	7	Orange-Grey	Playfield relay
»	8	Green-Violet	Bonus 3
»	9	Yellow-Orange	Bonus 2
»	10	Green-White	Bonus 5
»	11	Red-White	Bonus 7
»	12	Light green-Orange	1st left bank
»	13	White	1st right bank
»	14	Brown	Right "react"
»	15	Blue-Red	3rd left button
»	16	Orange-Violet	Bonus 1
»	17	Blue-Grey	Special left bank
»	18	Red-Black	2nd left bank
»	19	Blue-Orange	2nd right bank
»	20	Blue-White	Left "react"
CN19	1	Pink	Left advance multiplier
»	2	Orange-White	1st left button
»	3	Light green-White	2nd left button
»	4	Violet-Red	1st right button
»	5	Violet-Orange	Right advance multiplier
»	6	Brown	Special right bank

CONNECTOR	PIN	WIRE COLOUR	SIGNAL
CN19	7	Brown-Orange	2nd right fixed target
"	8	Pink-Violet	3rd right button
"	9	Yellow-Grey	3rd right fixed target
"	10	Green-Blue	Bonus ball
"	11	Yellow-Brown	2nd right button
"	12	Violet	2nd left fixed target
"	13	Violet-Blue	1st right fixed target
"	14	Black-Grey	"V" red special
"	15	Black-Blue	"S" red special
"	16	Pink-Blue	1st left fixed target
"	17	Red-Grey	Right "E" red special
"	18	Pink-Yellow	3rd left fixed target
"	19	Pink-Black	"L" red special
"	20	Green-Yellow	Right "D" red special
CN20	1	Yellow-White	X 10
"	2	Light Blue	X 20
"	3	Brown-Blue	Orange special
"	4	Light green-Grey	Left "E" red special
"	5	Pink-White	Left "I" red special
"	6	Pink-Brown	Bottom "R" red special
"	7	Orange grey	Right 20.000 PTS
"	8	Light green-Violet	Left 20.000 PTS
"	9	Yellow-Orange	Right advance red special
"	10	Green-White	Left advance red special
"	11	Black-Violet	X 5
"	12	Brown-White	Left "D" red special
"	13	Black-Green	Bonus 20.000 PTS
"	14	Blue-Yellow	Right "I" red special
"	15	Blue-Red	Red special
"	16	—	—
"	17	—	—
"	18	—	—
"	19	Blue-Orange	Top "R" red special
"	20	—	—
CN21	1	—	—
"	2	—	—
"	3	—	—
"	4	—	—
"	5	—	—
"	6	—	—
"	7	—	—
"	8	—	—
"	9	Blue-Green	8th move rider
"	10	—	—
"	11	—	—
"	12	Red-White	5th move rider
"	13	Grey-Blue	7th move rider
"	14	Violet-White	2nd move rider
"	15	Black-Grey	4th move rider
"	16	Orange-Brown	3rd move rider
"	17	Black-Red	6th move rider
"	18	Red-Violet	1st move rider
"	19	—	—
"	20	—	—
CN22	1	—	—
"	2	Blue-White	Bonus ball 2
"	3	Violet-Brown	UP game time bonus
"	4	Orange-Black	Balls to play
"	5	Yellow-Red	Credit
"	6	Yellow-Black	Match
"	7	—	—
"	8	Green	Can play 1
"	9	Violet-Pink	Bonus ball 3
"	10	Black-White	Tilt
"	11	—	—
"	12	Yellow	Can play 2
"	13	Black	Can play 4
"	14	Violet - Yellow	Down game time bonus
"	15	White-Grey	Game over
"	16	Green-Red	Super bonus
"	17	Red	Can play 3
"	18	Blue	Highest score
"	19	Green-Blue	Bonus ball 1
"	20	—	—

CABINET

Printer service optional	A	Red	43 Vac
»	B	Black	43 Vac
»	C	Yellow-violet	Column 7
»	D	Grey	Row 1
»	E	Yellow-orange	Printer RX +
»	F	Yellow-grey	Printer RX—
»	G	White-pink	Printer TX—
»	H	Black-pink	Printer TX +
J4	1	Brown	Electric wier
»	2	Yellow	Service socket
»	3	Red	Service socket
»	4	Yellow-green	Electric wier
»	5	Red	43 Vac
»	6	Black	Electric filter
»	7	Light blue	Electric wier
»	8	Black	43 Vac
»	9	Blue	Electric filter

TAV. I

Programmi base

Basic programs

Programmes de base

Grundprogramme

N° test	ITALIA 1			ITALIA			GREAT BRITAIN			FRANCE			DEUTSCH.			BELGIQUE			JUGOSLA.			U. S. A.		
	SW			SW			SW			SW			SW			SW			SW			SW		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
	on	on	on	off	on	on	on	off	on	off	off	on	on	on	off	on	off	on	off	off	off	off	off	off
10 High score	0			1			0			0			0			0			0			0		
11	01			01			01			01			01			01			01			01		
12	00			00			00			00			01			00			01			01		
13	02			02			05			05			02			02			02			01		
14	01			00			03			03			03			01			02			01		
15	02			03			05			10			05			02			02			01		
16	01			01			03			07			07			01			02			01		
17	3,00			4,00			4,00			4,00			4,00			4,00			4,00			4,00		
18	—			—			—			—			—			—			—			—		
19	15			15			15			15			15			15			15			15		
20	03			03			03			03			03			03			03			03		
21	1			1			1			1			1			1			1			1		
22	1,00			1,50			1,50			1,50			1,50			1,50			1,50			1,50		
23	2,00			3,00			3,00			3,00			3,00			3,00			3,00			3,00		
24	000			000			000			000			000			000			000			000		
25	1			1			1			1			1			1			1			1		
26	1			2			2			2			2			2			2			2		
27	2			2			2			2			2			2			2			2		
28	1			1			1			1			1			1			1			1		
29	1			1			1			1			1			1			1			1		
30	0			0			0			0			0			0			0			0		
31	1			1			1			1			1			1			1			1		
32	1			1			1			1			1			1			1			1		
33	1			1			1			1			1			1			1			1		
34	1			1			1			1			1			1			1			1		
35	1			1			1			1			1			1			1			1		
36	—			—			—			—			—			—			—			—		
37	—			—			—			—			—			—			—			—		

TAV. II

ACTUAL PROGRAMMING EXAMPLES

NATION	EMPLOYED COINS	COST OF CREDITS	FIRST COIN		SECOND COIN		THIRD COIN		Multiplication factor imp. count. (coin count.)
			Value Test 11	Credits Test 12	Value Test 13	Credits Test 14	Value Test 15	Credits Test 16	
ITALY	1 coin m. = 100 £	2x100 = 1 Pl.	01	00	01	00	02	01	x 100 £
	2 coin m. = 100 £	3x100 £ = 1 Pl.	01	00	01	00	03	01	
	1 coin m. = 100 £ 2 coin m. = 200 £	2x100 £ = 1 Pl. 1x200 £ = 1 Pl.	01	00	02	01	02	01	x 100 £
		3x100 £ = 1 Pl. 1x200 £ = 1 Pl. +1x100 £ =	01	00	02	00	03	01	x 100 £
	1 coin m. = 200 £	1x200 £ = 1 Pl.	01	01	01	01	01	01	x 200 £
	2 coin m. = 200 £	3x200 £ = 2 Pl.	02	00	02	00	03	01	x 200 £
ENGLAND	1 coin m. = 10 p 2 coin m. = 50 p	1x10 p = 1 Pl. 1x50 p = 6 Pl.	01	01	05	06	05	00	x 10 p
		2x10 p = 1 Pl. 1x50 p = 3 Pl.	01	00	05	03	05	03	x 10 p
BELGIUM (AUSTRIA) (HUNGARY)	1 coin m. = 5 FRS 2 coin m. = 10 FRS	2x5 FRS = 1 Pl. 1x10 FRS = 1 Pl.	01	00	02	01	02	01	x 5 FRS
		3x5 FRS = 1 Pl. 1x10 FRS = 1 Pl. +1x5 FRS	01	00	02	00	03	01	x 5 FRS
FRANCE (DANM.) (SWEDEN)	1 coin m. = 1 FR 2 coin m. = 5 FR 3 coin m. = 10 FR	2x1 FR = 1 Pl. 1x5 FR = 3 Pl. 1x10 FR = 7 Pl.	01	00	05	03	10	07	x 1 FR
WEST. GERM. (SWITZERL.)	1 coin m. = 1 DM 2 coin m. = 2 DM 3 coin m. = 5 DM	1x1 DM = 2 Pl. 1x2 DM = 5 Pl. 1x5 DM = 14 Pl.	01	02	02	05	05	14	x 1 DM (FS)
		1x1 DM = 1 Pl. 1x2 DM = 3 Pl. 1x5 DM = 7 Pl.	01	01	02	03	05	07	x 1 DM (FS)
YUGOS.	1 coin m. = 5 DIN 2 coin m. = 10 DIN	1x5 DIN = 1 Pl. 1x10 DIN = 2 Pl.	01	01	02	02	02	02	x 5 DIN
		2x5 DIN = 1 Pl. 1x10 DIN = 1 Pl.	01	00	02	01	02	01	x 5 DIN
SWITZERL.	1 coin m. = 1 FS 2 coin m. = 2 FS	1x1 FS = 2 Pl. 1x2 FS = 5 Pl. 5 FS = 14 Pl.	01	02	02	05	05	14	x 1 FS
		1x1 FS = 1 Pl. 1x2 FS = 3 Pl. 5 FS = 7 Pl.	01	01	02	03	05	07	x 1 FS

FIG.1

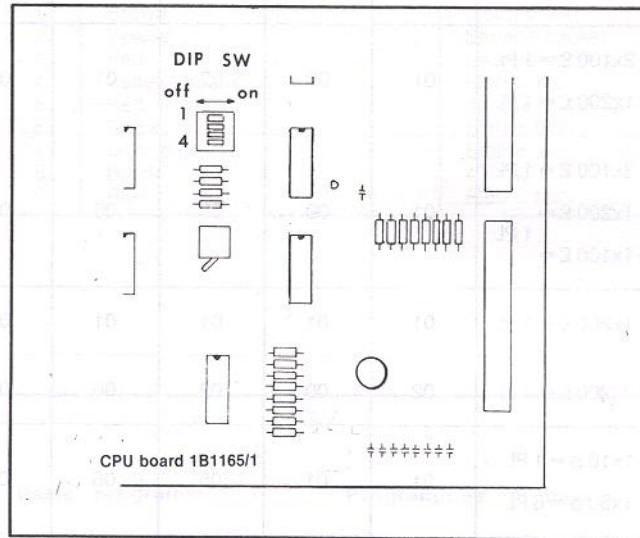
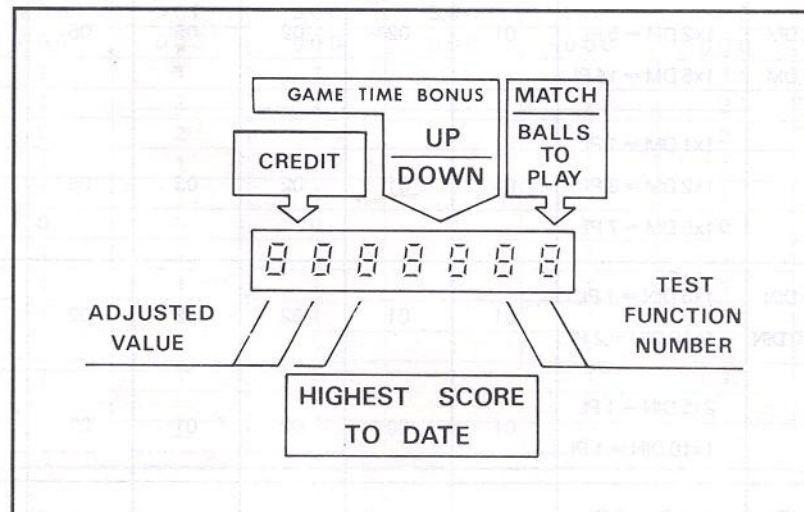
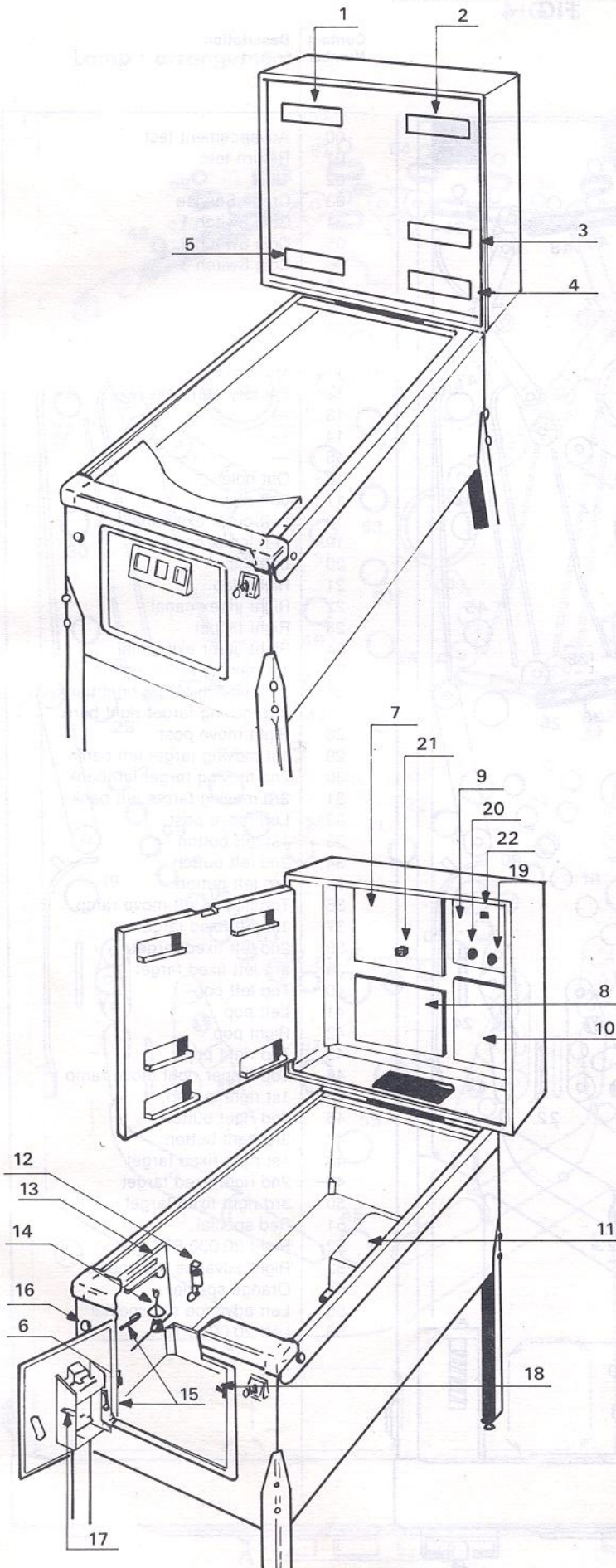


FIG.2



ASSEMBLY DRAWING



1. 1st player display
Highest score display

2. 2nd player display

3. Credit display
Display ball to play
Match
Game time bonus

4. 4th player display

5. 3rd player display

6. Service button

7. C.P.U. board

8. Interface board

9. Sound board

10. Power board

11. Transformer

12. Knocker

13. Roll ball tilt

14. Bob tilt

15. Antichoc tilt

16. Credit button

17. Advance & Return test

18. General vol.

19. Maximum speech vol.

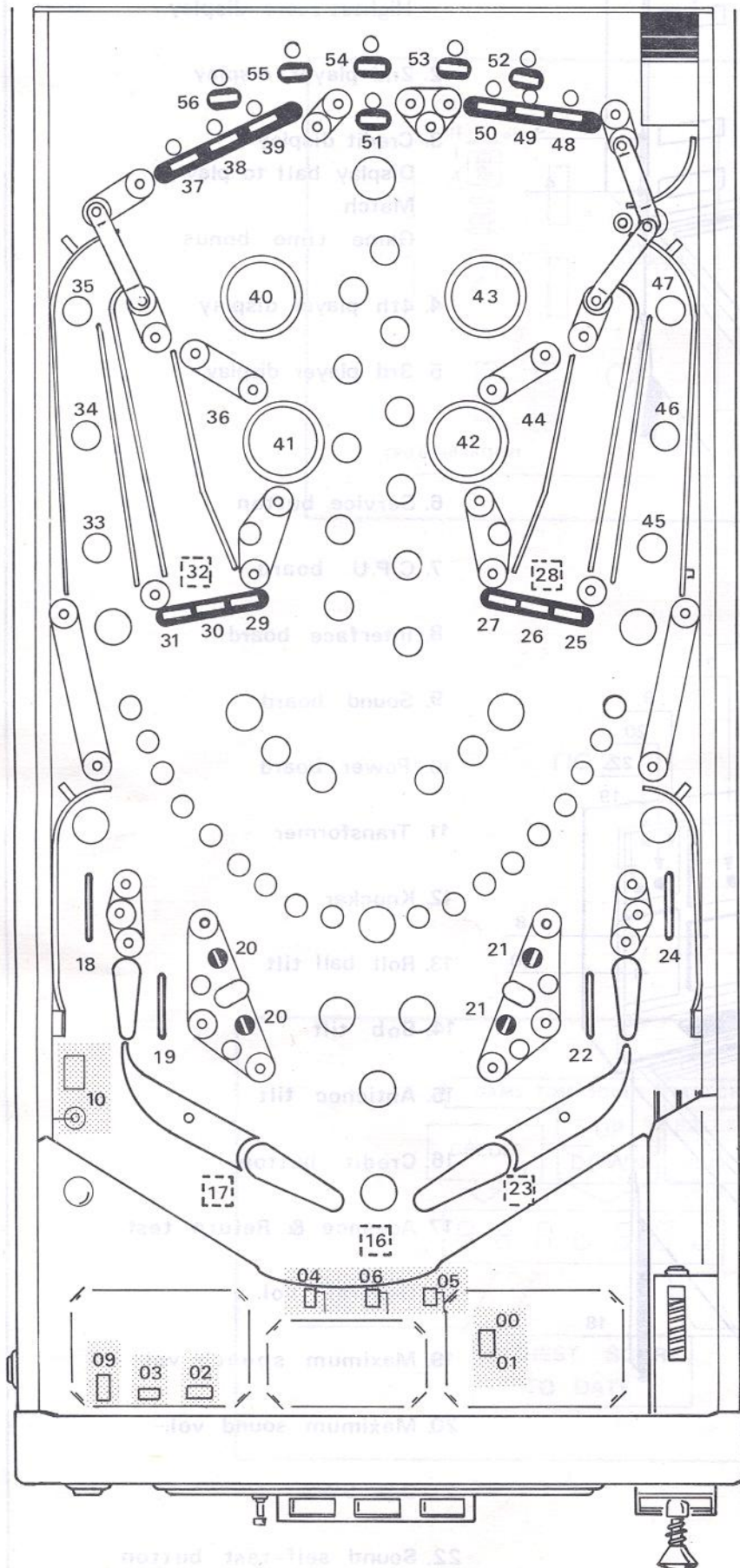
20. Maximum sound vol.

21. Dip SWS

22. Sound self-test button

FIG. 4

Contact arrangement

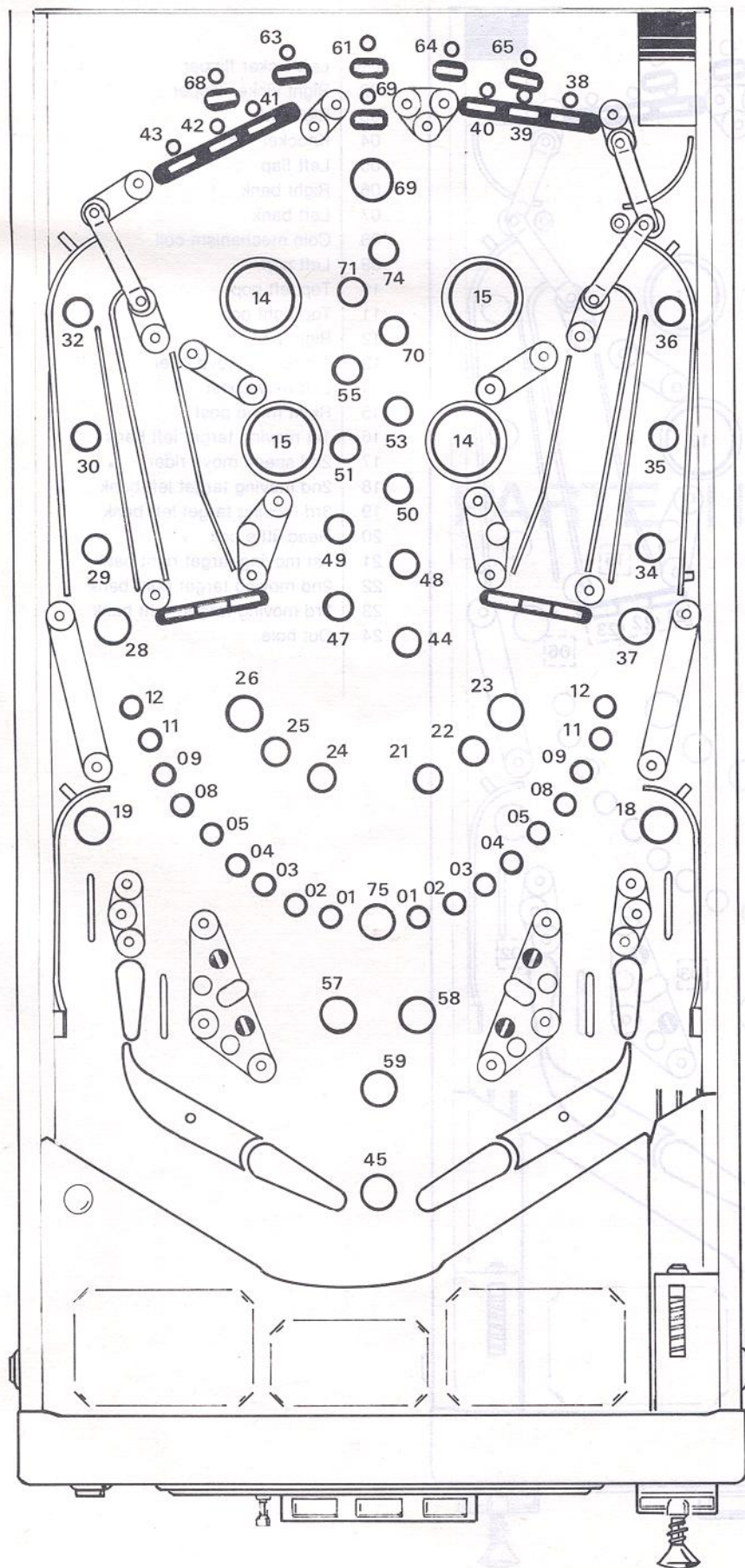


Contact Number	Description
00	Advancement test
01	Return test
02	Tilt 2
03	Credit Service
04	Coin Switch 1
05	Coin Switch 2
06	Coin Switch 3
07	—
08	—
09	Credit
10	Tilt
11	Move rider
12	Factory burn test
13	—
14	—
15	—
16	Out hole
17	Left flipper
18	Left outer exit canal
19	Left innex canal
20	Left flap
21	Right flap
22	Right innex canal
23	Right flipper
24	Right outer exit canal
25	1st moving target right bank
26	2nd moving target right bank
27	3rd moving target right bank
28	Right move post
29	1st moving target left bank
30	2nd moving target left bank
31	3rd moving target left bank
32	Left move post
33	1st left button
34	2nd left button
35	3rd left button
36	Top flipper left move ramp
37	1st left fixed target
38	2nd left fixed target
39	3rd left fixed target
40	Top left pop
41	Left pop
42	Right pop
43	Top right pop
44	Top flipper right move ramp
45	1st right button
46	2nd right button
47	3rd right button
48	1st right fixed target
49	2nd right fixed target
50	3rd right fixed target
51	Red special
52	Right 20.000 PTS
53	Right advance red special
54	Orange special
55	Left advance red special
56	Left 20.000 PTS

Inside cabinet contacts

FIG. 5

Lamp arrangement

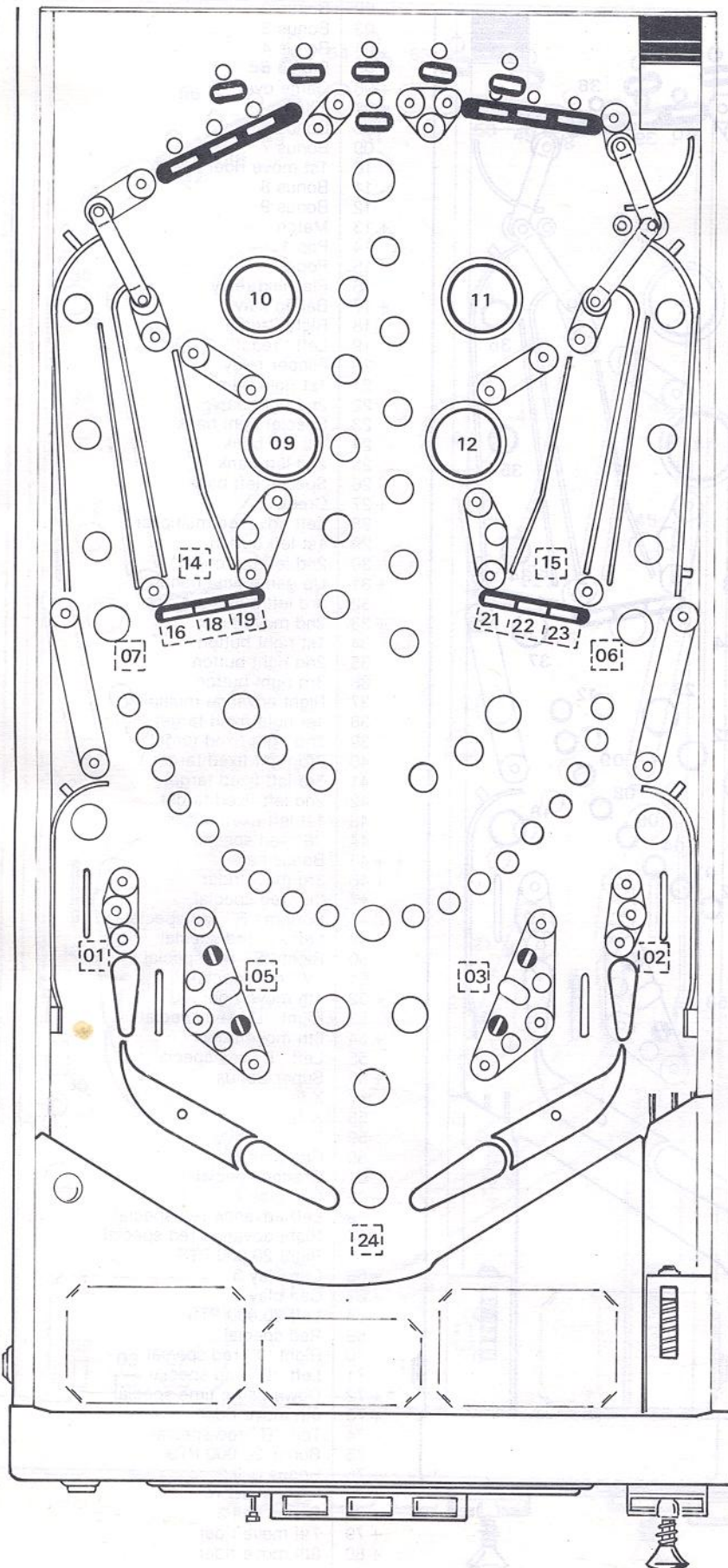


Lamp	Description
01	Bonus 1
02	Bonus 2
03	Bonus 3
04	Bonus 4
05	Bonus 5
+ 06	Game over
+ 07	Tilt
08	Bonus 6
09	Bonus 7
10	1st move rider
11	Bonus 8
12	Bonus 9
+ 13	Match
14	Pop 1
15	Pop 2
16	Playfield relay
+ 17	Ball to play
18	Right "react"
19	Left "react"
20	Flipper relay
21	1st right bank
22	2nd right bank
23	Special right bank
24	1st left bank
25	2nd left bank
26	Special left bank
+ 27	Credit
28	Left advance multiplier
29	1st left button
30	2nd left button
+ 31	Up game time bonus
32	3rd left button
+ 33	2nd move rider
34	1st right button
35	2nd right button
36	3rd right button
37	Right advance multiplier
38	1st right fixed target
39	2nd right fixed target
40	3rd right fixed target
41	3rd left fixed target
42	2nd left fixed target
43	1st left fixed target
44	"S" red special
+ + 45	Bonus ball
+ 46	3rd move rider
47	"L" red special
48	Bottom "R" red special
49	Left "I" red special
50	Right "E" red special
51	"V" red special
+ 52	4th move rider
53	Right "D" red special
+ 54	5th move rider
55	Left "E" red special
+ 56	Super Bonus
57	X 5
58	X 10
59	X 20
+ 60	Can play 1
61	Orange special
+ 62	Can play 2
63	Left advance red special
64	Right advance red special
65	Right 20,000 PTS
+ 66	Can play 3
+ 67	Can play 4
68	Left 20,000 PTS
69	Red special
70	Right "I" red special
71	Left "D" red special
+ 72	Down game time special
+ 73	6th move rider
74	Top "R" red special
75	Bonus 20,000 PTS
+ 76	Bonus ball 2
+ 77	Highest score
+ 78	Bonus ball 3
+ 79	7th move rider
+ 80	8th move rider

+ : head lamps
+ + : head and playfield lamps

FIG. 6

Solenoid arrangement



Sol n°	Description
01	Left kicker flipper
02	Right kicker flipper
03	Right flap
04	Knocker
05	Left flap
06	Right bank
07	Left bank
08	Coin mechanism coil
09	Left pop
10	Top left pop
11	Top right pop
12	Right pop
13	1st speed move rider
14	Left move post
15	Right move post
16	1st moving target left bank
17	2nd speed move rider
18	2nd moving target left bank
19	3rd moving target left bank
20	Head little bell
21	1st moving target right bank
22	2nd moving target right bank
23	3rd moving target right bank
24	Out hole

INSTALLATION

ASSEMBLING

Assembling should be done as follows:

1. Bolt legs to the cabinet (use special bolts in coin box).
2. Gently extract electric cable and place in the proper cavity, checking that non-skid knot is there.
3. Remove the elastic strip that secures the light board and lift it to a vertical position. During this operation make sure that the cable is not crushed between the parts. The light board has an automatic coupling that keeps it in a vertical position, to ease the fitting of the 4 bolts with the relevant washers, that can be found in the coin box too.

VISUAL INSPECTIONS

On all games there are certain points that should be always checked after transport. Same are visual inspections which may be helpful to avoid some time consuming service work later. Minor damages caused by rough handling during the transport are practically unavoidable. Cable connectors may be loosened, switches (especially tilt switches) may lose their proper adjustment. Especially the plumb bob tilt switch should always be adjusted after game is set on location.

1. Check whether cabinet cable is connected to the light board cable.
2. Check for any wires that may have become disconnected.
3. Make sure that the cables do not obstacle the moving parts.
4. Check that all fuses are making good contact.
5. Check whether the transformer is connected for the proper main voltage.
6. Check and adjust the sensitivity of tilt contacts as follows.
 - A. Plumb bob tilt switch.
Adjust the plumb bob tilt length according to the required sensitivity.
 - B. Rail tilt and ball.
Put the ball into the rail and check whether it moves properly and closes the contact when the cabinet is raised.
 - C. Shockproof tilt
There are two:
The first one near plumb bob tilt, the second one near coin chutes. Adjust contact distance to desired sensitivity.

GENERAL GAME OPERATION

1. Put one the ball into the bottom hole
Connect voltage and start the game.
2. The «GAME OVER» lamp is lit (if the TILT lamp lights up, check the sensitivity of the normally open tilt contacts).
3. Check whether the machine accepts properly the coins and increments the relevant credits. Please keep in mind that the machine shall not accept any coins when turned off or if the number of credits has reached the max. programmed amount.
4. If after having started the game the GAME OVER lamp is lit, it is necessary to carry out some control functions, because the data stored in the battery memory, are not valid anymore. If the game has been disconnected for many weeks, this is very likely to happen.
If on the other hand the machine has been recently used, and the GAME OVER lamp blinks, it is possible that the battery or its reloading circuit are out of order.
In any case, before starting the machine it is advisable to reprogram it.
5. Act on credit push-button. The «GAME OVER» lamp shall extinguish.
 - A. First player lamp shall be lit.
 - B. The credits are decreased by one.
 - C. «BALLS TO PLAY» lamp shall be lit.
 - D. The playfield is ready and the ball is ejected from the hole.
6. Each time the credit push-button is operated, the number of credits is decreased by one and the number of players is updated.
7. The max. number of credits available is four.

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Devil Riders