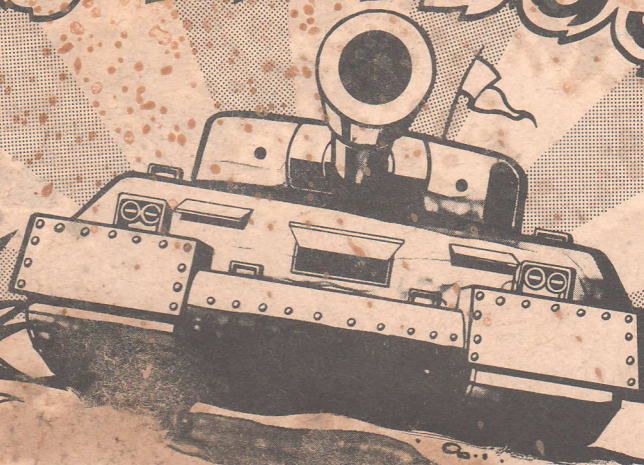


M-79

AMBUSS

BY **ramtek**



OPERATOR'S MANUAL

**SALES & SERVICE
800-538-1733**

ramtek

Our Experience Shows

292 Commercial St.
Sunnyvale, CA. 94086



TABLE OF CONTENTS

1. INTRODUCTION.	1
2. GAME OPERATION.	1
3. INSTALLATION.	3
4. OPERATOR SELECTABLE OPTIONS	4
5. BLOCK DIAGRAM EXPLANATION	5
6. TROUBLE SHOOTING TECHNIQUE.	8

TABLE OF ILLUSTRATIONS

UNPACKING AND SET-UP OF GUN PANEL	FIGURE 1
PULL-OUT SHELF.	FIGURE 2
BLOCK DIAGRAM	FIGURE 3
REAR VIEW OF CABINET.	FIGURE 4
UNDERVIEW OF GUN CONTROL PANEL.	FIGURE 5
LOGIC BOARD	FIGURE 6
INTERFACE BOARD	FIGURE 7
POWER SUPPLY.	FIGURE 8
T.V. MONITOR.	FIGURE 9

1. INTRODUCTION

M-79 Ambush is another Ramtek Amusement Device which is engineered to provide the highest degree of reliability using the most advanced techniques available. All solid-state circuitry ensures years of dependable service.

M-79 Ambush is a one or two player shooting game (\$.25 one player, \$.50 two player) where players use heavy cast aluminum guns to fire at tanks, jeeps and motorcycles and try to avoid hitting a UN truck.

Realistic firing and explosion sounds accompany the sound of the vehicles to provide an exciting audio presentation. Flashing lights occur when vehicles are struck.

Provision is made for extended play for exceeding adjustable scores, and the previous high score is displayed during the attract sequence.

2. GAME OPERATION

While the M-79 Ambush game is not coined, it displays an attract sequence which consists of a tank crossing the screen, a projectile being fired which misses, then a tank crossing the screen from the opposite direction which is fired upon and explodes. Also displayed on the screen are the messages "ONE COIN EACH PLAYER", "GAME OVER" and "PREVIOUS HIGH SCORE".

An actual game begins when the players insert coin(1). A message is then displayed which reads "PRESS START OR ADD COIN PLAYER 2". If the start button is depressed or 12 seconds elapse, the game plays as a one player game (left gun operable). If a second coin is inserted, the game plays as a two player game.

Tanks, jeeps, motorcycles and UN observer trucks now cross the screen horizontally in both directions at two different elevations. Each vehicle has a distinctive sound, and travels at a different rate. Vehicles appear in a random manner, and occasionally a vehicle will stop and reverse.

Two cannons are mounted at opposite corners of front of game. The cannons move in a horizontal plane with a 24° sweep. Players depress fire buttons mounted on the guns and projectiles originate at angles from the corners of the screen, and travel at an angle determined by the position of the cannon.

The firing of a projectile is accompanied by a shot sound, followed by the whistling sound of a moving projectile.

When a projectile strikes a vehicle, the vehicle breaks into discrete pieces. There is an explosion sound, and a light flashes to illuminate the background. Some of these pieces remain on the screen as debris between the travel bands and in the foreground. A second shot removes the debris.

A score appears on the screen when a vehicle is hit:

100 for tank
200 for jeep
700 for motorcycle

Striking the UN observer truck flashes a "PENALTY" message on the screen above the players' score, and prevents that shooter from firing for 3 seconds.

A timer on the screen counts down from 100. The word "TIMER" appears over the score, except during extended play. Actual time for the game is adjustable to 60, 90, 90 or 120 seconds.

Extended play is granted for an adjustable high score of 1500, 2500, 3500, 5000 or never. Extended play is 40% of the regular time. "EXTENDED TIME" flashes on the screen above the timer. Normal time is completed before extended time occurs.

The previous high score is updated and stored in memory. It may be reset to zero by opening the coin door and operating the tilt switch.

3. INSTALLATION

Any shipping container that appears damaged should be unpacked with the Carrier Agent present. Carefully inspect the unit for external damage, then remove the back cover and inspect for internal damage.

If any damage is found, notify the Carrier and Ramtek Corporation immediately. Retain containers for Carrier inspection.

To protect the guns and minimize the size of the shipping container the guns are shipped in a verticle position. To install the guns follow the instructions in Figure 1.

A pull-out shelf is provided for younger players. This shelf can be easily extended as shown in Figure 2.

Plug in the unit and operate to ensure proper operation.

4. OPERATOR SELECTABLE OPTIONS

The characteristics of the game which can be altered by the operator are:

1. The length of time allowed to play each game.
2. The score at which extended time is allowed. The length of the extended time allowed is factory set at 40% of the selected game play time.
3. The number of coins per game.

A component top view of the microprocessor board used on M-79 AMBUSH is shown in Figure 6.

The following chart explains the settings of the eight switches on the DIP switch. A plus(+) in a column means the toggle switch is up on the plus side of the DIP switch.

SWITCHES			
	12	345	678
<u>Length of Game (seconds)</u>			
60	00		
90	0+		
90	+0		
120	++		
<u>Points for Extended Time</u>			
1500		000	
2500		+00	
3500		0+0	
5000		++0	
NO extended time		+++	
<u>Coins per Game</u>			
Free play - two players			0++
One Coin - two players			0+0
One coin - each player			000
Two coins - each player			+00

Based on extensive tests on location, the factory settings for the most universal combination are:

60 second long game	12345678
2500 points for extended play	00+00000
One coin each player	

The sound level of the game may also be adjustable as shown on Figure 7 of the interface board.

5. BLOCK DIAGRAM DESCRIPTION

The block diagram in Figure 3 basically describes the major components of M-79 AMBUSH game. The functional description of each block is as follows:

COIN DOOR

Coin drop provides a logic signal to the logic board to initiate the game when a coin drop is sensed through the switch closer. A tilt switch is provided to reset the game if the unit is abused. The tilt switch is also used to reset the game to remove the previous high score.

TRANSFORMER ASSEMBLY

The transformer assembly generates all the unregulated DC voltages required for the regulators located on the interface board. The assembly also contains a solid-state relay to actuate the incandescent bulb on command from the logic board.

GUN CONTROLS

The gun controls provide a logic signal indicating the gun position. They also provide a signal to logic board when a gun is fired. See Figure 5 for more detail.

LOGIC BOARD

The logic board contains the necessary logic circuitry to enable M-79 AMBUSH operation. Its heart is an 8080 microprocessor.

The logic board receives input signals from the gun controls and the coin door. It provides output signals to the interface board to generate sounds, the T.V. monitor to generate the video display, and the solid-state relay in the transformer assembly to turn on the explosion light. See Figure 6 for more detail.

INTERFACE BOARD

The interface board contains the circuitry to generate the sound signals and the DC voltage regulators. It receives input signals from the logic board and provides sound signals to the speaker. See Figures 7 for more detail.

MONITOR

The monitor provides the video display of the signal from the logic board. See Figure 9 for schematic.

SPEAKER

Provides the sound.

FLOURESCENT LIGHT

Provides header and general game illumination.

INCANDESCENT LIGHT

Provides flash of light during the explosion.

INTERLOCK SWITCH

Disconnects AC power when the back door is removed.

COIN COUNTER

Counts the coins put in the game.

6. TROUBLE SHOOTING TECHNIQUES

The following diagrams are provided to assist in trouble shooting the unit:

Figure 4	Rear View of Cabinet
Figure 5	Underview of Gun Control Panel
Figure 6	Logic Board
Figure 7	Interface Board
Figure 8	Power Supply

Make sure the power cord is plugged in the wall socket and the interlock switch is ON. The interlock switch is on when it is fully depressed -- this requires the back cover to maintain closure; or when the switch is pulled fully out -- maintains self in this position.

Check all four(4) fuses in the game -- the system power fuse located on the transformer filter board and three(3) fuses mounted on the T.V. monitor.

Check the brightness and contrast control on the monitor, and turn them in the direction to give maximum brightness and contrast. Adjust the Vertical and Horizontal Holds if necessary.

Disconnect P-7 and turn brightness and contrast up. Check to see that screen lights up indicating the monitor is working properly.

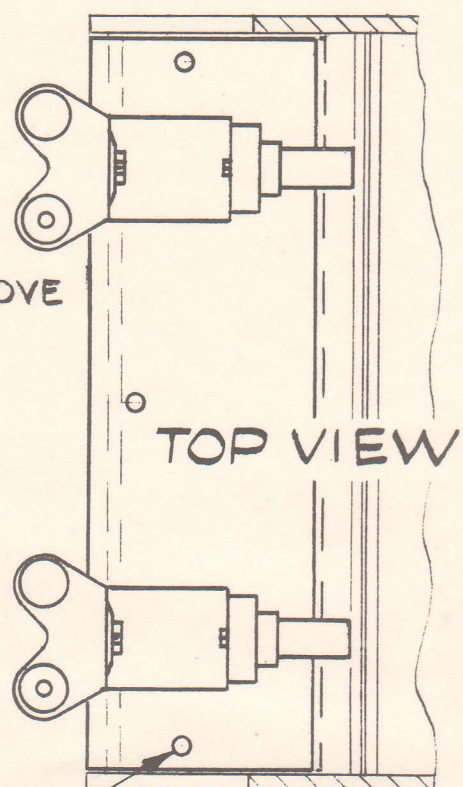
If there is no sound associated with the game, check the volume control located on the interface board. See Figure 7. Check the +23V DC at (+)side of the 250uF capacitor directly below P-7.

Whenever the game malfunctions, the +5V, -5V and +12V DC supplies should be checked. Use any standard voltmeter. The +5V can be measured by using any two buss bars in rows three through seven. The -5V can be measured from ground to S2-A. The +12V can be measured from ground to S3-A. Be careful not to short these supplies when making measurements.

IN THE EVENT THE PROBLEM IS ASSOCIATED WITH THE LOGIC OR INTERFACE BOARDS, RETURN BOTH BOARDS ALONG WITH THE INTERCONNECTING CABLE FOR REPAIR.

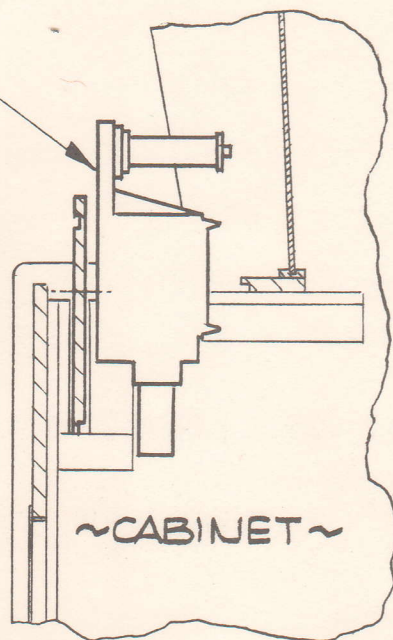
- ① USING CARE NOT TO DAMAGE WIRING HARNESS, REMOVE 'GUN ASSY.' FROM SHIPPING POSITION BY LIFTING TO CLEAR CABINET.
- ② REMOVE 'WING NUTS' & WASHERS FROM UNDERSIDE OF GUN MTG BOARD & REMOVE COIN BOX.
- ③ MAKE SURE WIRING HARNESS IS CLEAR AND POSITION 'GUN ASSY.' AS SHOWN, WITH LEADING EDGE OF GUN MTG. BOARD UNDER LIP IN CABINET AND GROOVE DOWN OVER TOP EDGE OF 'FRONT PANEL'.
- ④ INSTALL WASHERS & 'WING NUTS' ON CARRIAGE BOLTS USING OPEN 'COIN DOOR' FOR ACCESS.

IMPORTANT: TIGHTEN WING NUTS SECURLY!



CARRIAGE BOLT

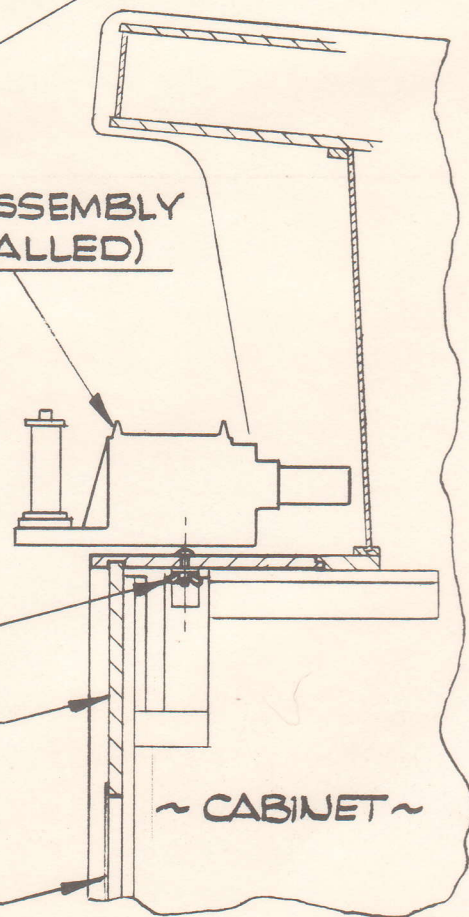
GUN ASSEMBLY
(AS SHIPPED)



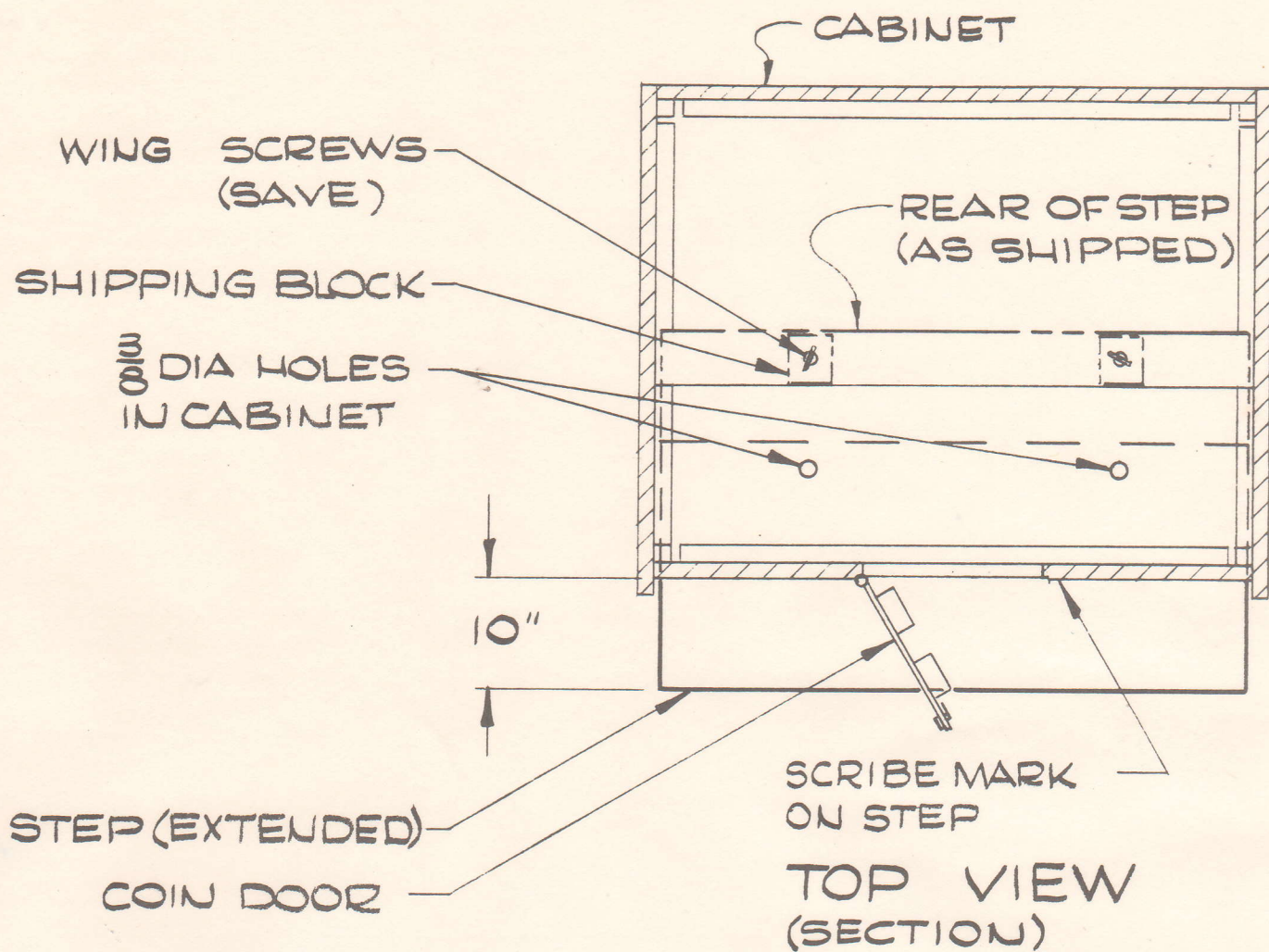
GUN ASSEMBLY
(INSTALLED)

WING
NUT
FRONT
PANEL

COIN
DOOR

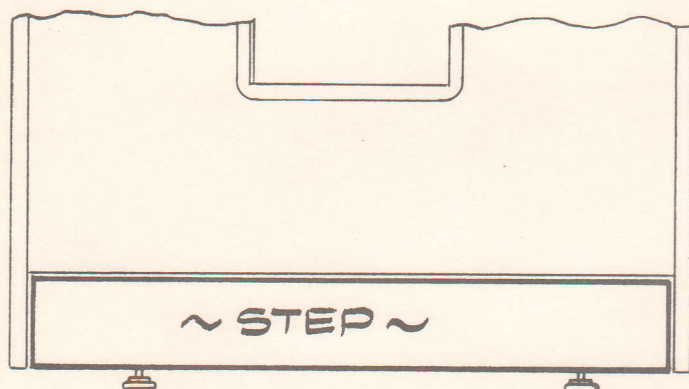


UNPACKING AND SET-UP
OF GUN PANEL
FIGURE I



TO EXTEND STEP:

- ① OPEN 'COIN DOOR' FOR ACCESS.
- ② REMOVE COIN BOX.
- ③ REMOVE 'SHIPPING BLOCKS' FROM STEP.
- ④ PULL STEP OUT TO TEN (10") INCHES OR 'SCRIBE MARK', AS SHOWN.
- ⑤ TO LOCK STEP IN PLACE, INSERT 'WING SCREWS' THRU $\frac{3}{8}$ " DIA HOLES IN CABINET AND TIGHTEN.

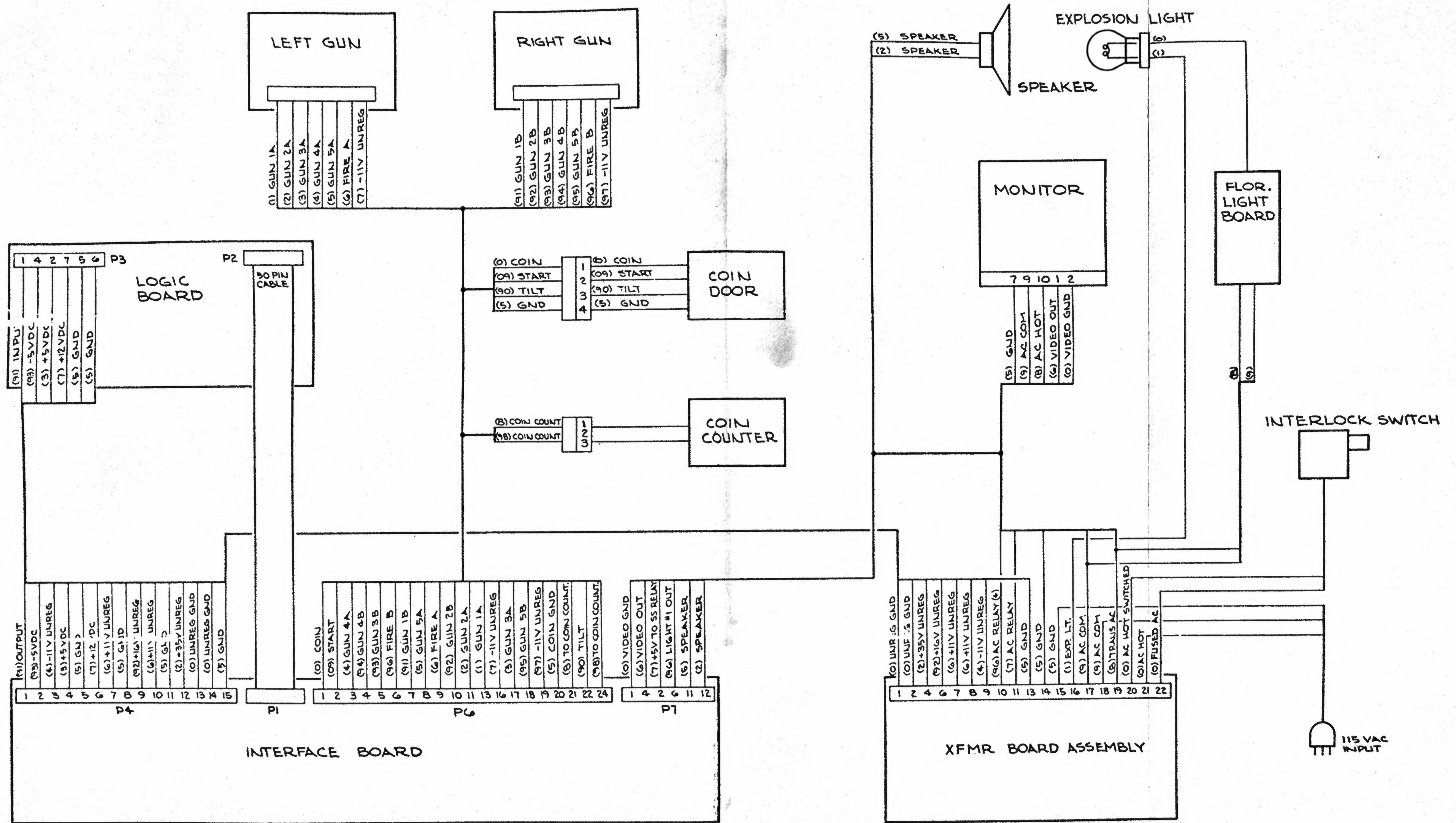


FRONT VIEW

NOTE: IF INSTALLED ON CARPET, TILT CABINET BACK BEFORE PULLING STEP OUT.

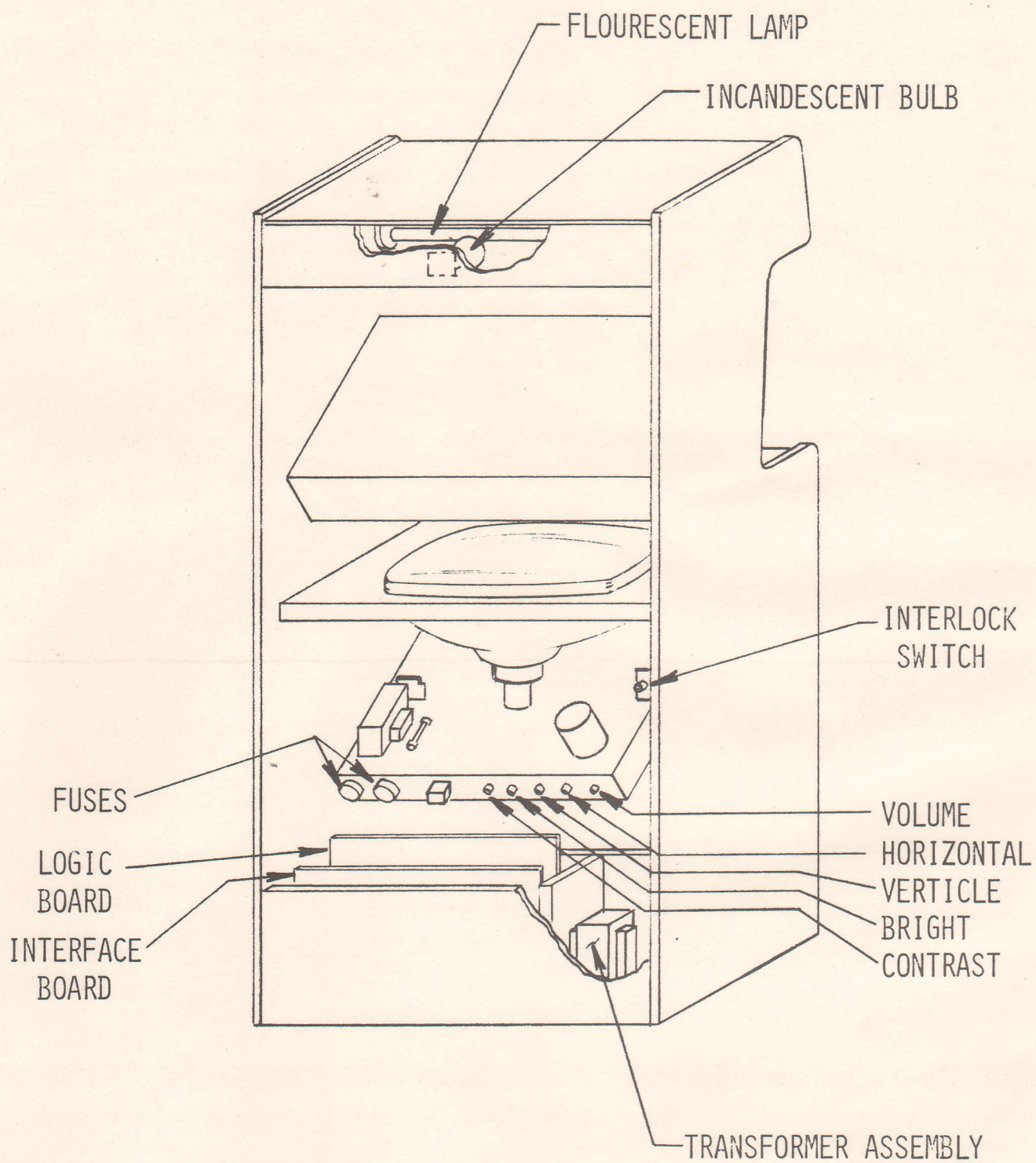
PULL OUT SHELF

FIGURE 2

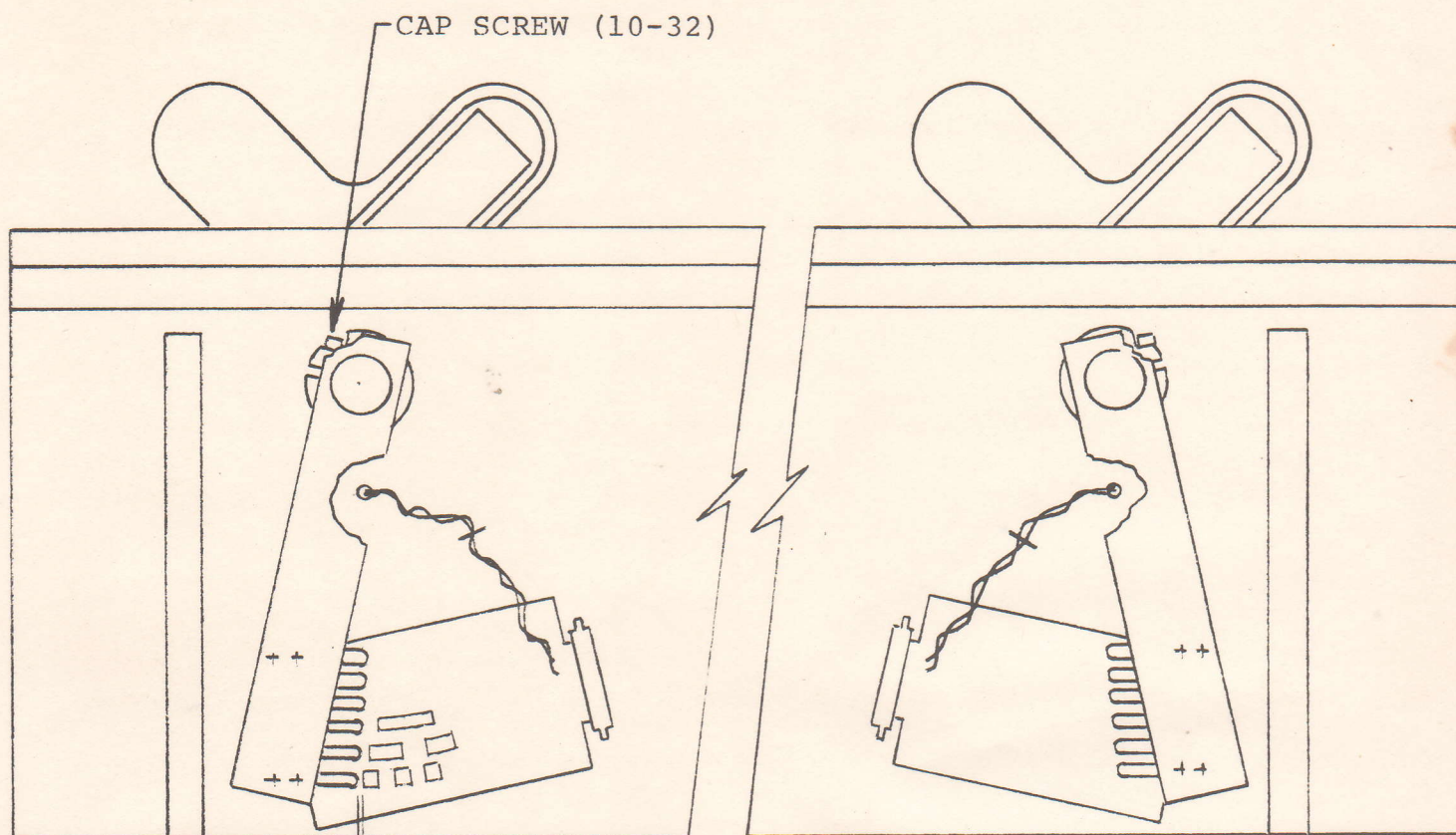


BLOCK DIAGRAM

FIGURE 3



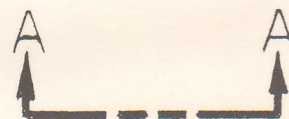
REAR VIEW OF CABINET
FIGURE 4



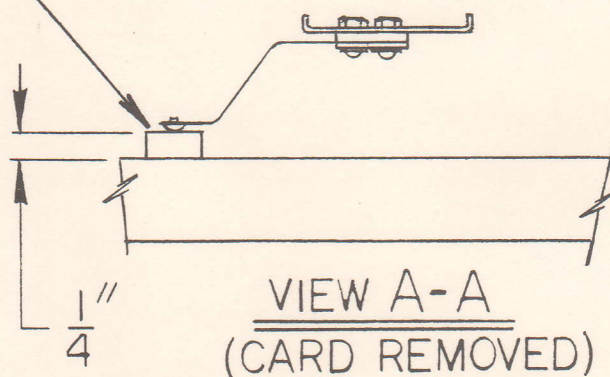
$\frac{1}{16}$ "

GUN ALIGNMENT:

WITH GUNS APPROXIMATELY PERPENDICULAR TO FRONT OF CONTROL PANEL AND AGAINST BUMPER STOP, ALIGN WIPER SWITCH MOUNTING PLATE SO THE OUTSIDE CONTACT IS APPROXIMATELY $\frac{1}{16}$ " FROM THE OUTSIDE PAD ON WIPER BOARD. THEN TIGHTEN CAP SCREW IN COLLAR (5/32 ALLEN WRENCH).

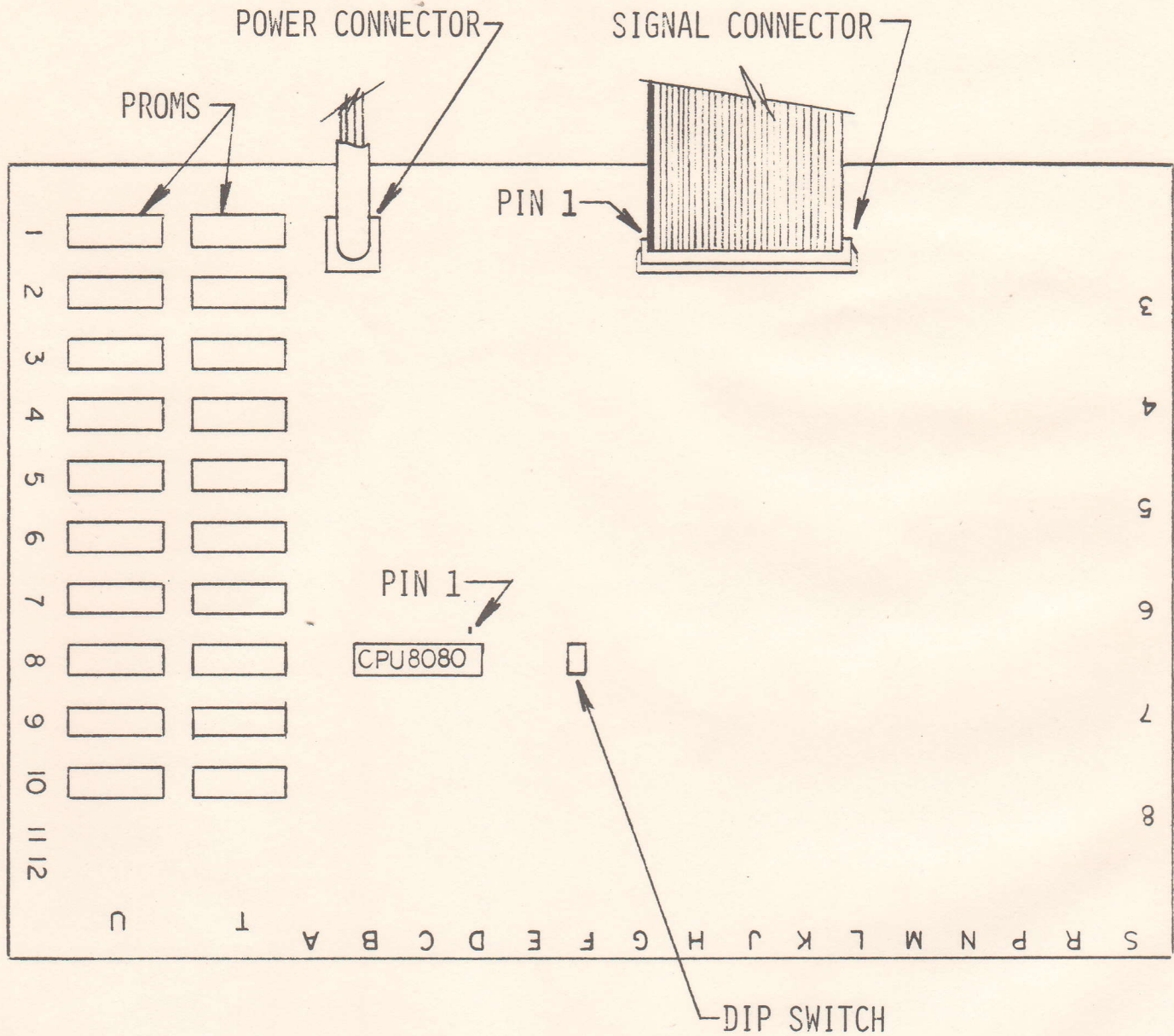


WITH WIPER BOARD REMOVED, USE SPACER BLOCK TO SET WIPER BLADES $\frac{1}{4}$ " FROM CONTROL PANEL - CARE MUST BE TAKEN NOT TO INTERFERE WITH WIPER BLADE OR WIPER BLADE MOUNTING PLATE SETTING WHEN REINSTALLING WIPER BOARD.

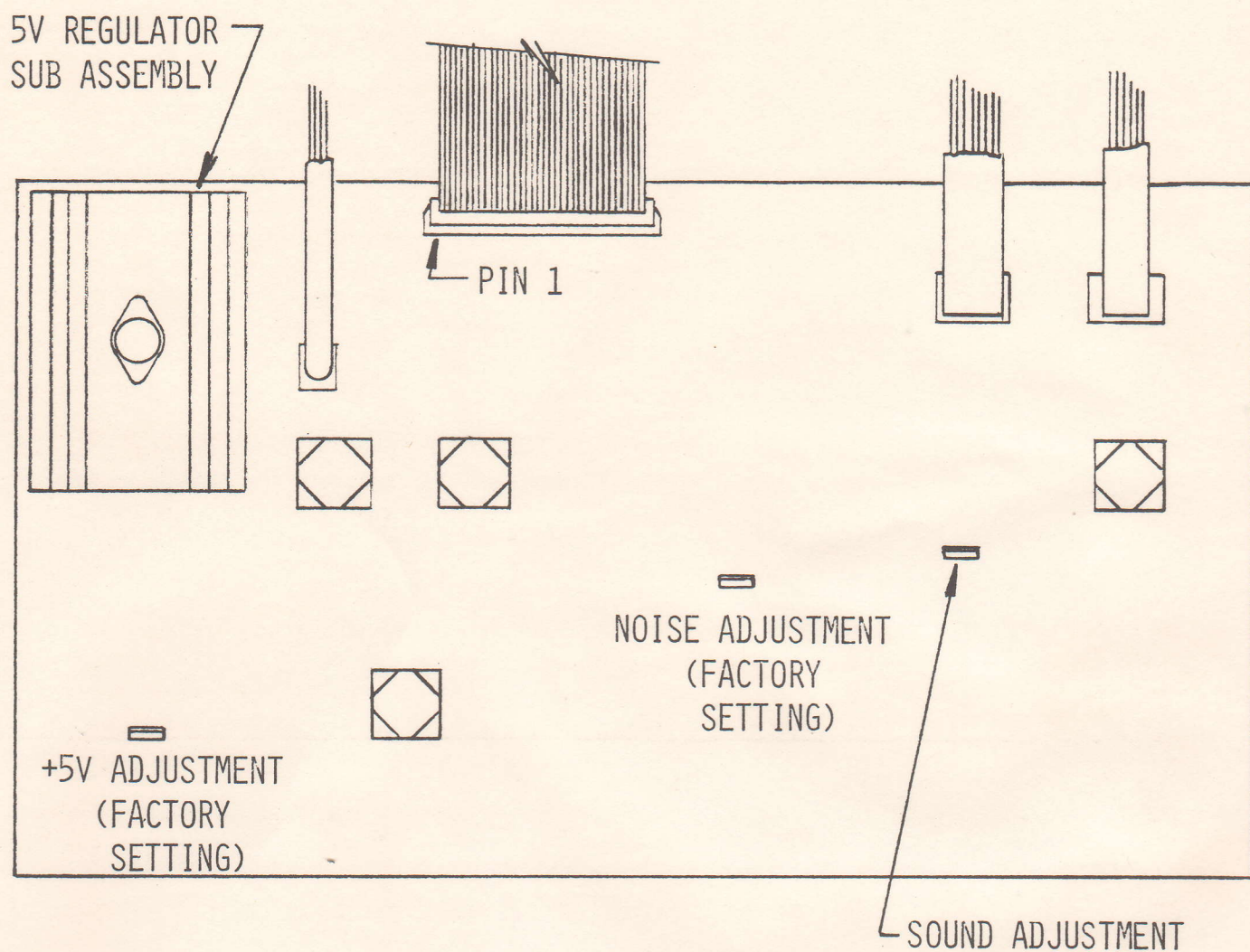


UNDERVIEW OF GUN CONTROL PANEL
FIGURE 5

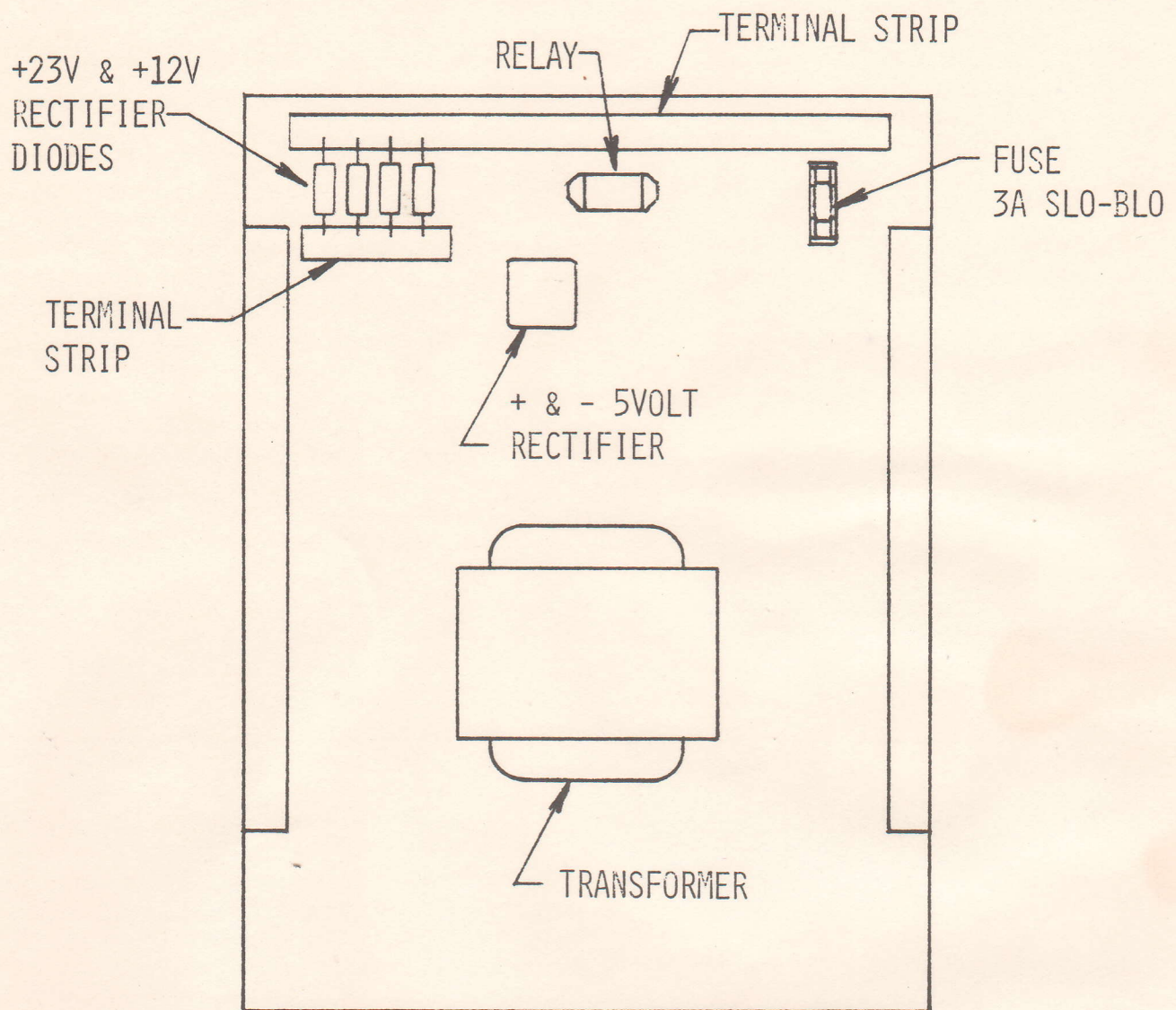
LOGIC BOARD AS POSITIONED IN CARD CAGE



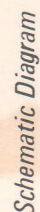
LOGIC BOARD
FIGURE 6



INTERFACE BOARD
FIGURE 7



TRANSFORMER ASSEMBLY
FIGURE 8



1
 2
 3
 4
 5
 6
 7
 8
 9
 10
 11
 12
 13
 14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 26
 27
 28
 29
 30
 31
 32
 33
 34
 35
 36
 37
 38
 39
 40
 41
 42
 43
 44
 45
 46
 47
 48
 49
 50
 51
 52
 53
 54
 55
 56
 57
 58
 59
 60
 61
 62
 63
 64
 65
 66
 67
 68
 69
 70
 71
 72
 73
 74
 75
 76
 77
 78
 79
 80
 81
 82
 83
 84
 85
 86
 87
 88
 89
 90
 91
 92
 93
 94
 95
 96
 97
 98
 99
 100
 101
 102
 103
 104
 105
 106
 107
 108
 109
 110
 111
 112
 113
 114
 115
 116
 117
 118
 119
 120
 121
 122
 123
 124
 125
 126
 127
 128
 129
 130
 131
 132
 133
 134
 135
 136
 137
 138
 139
 140
 141
 142
 143
 144
 145
 146
 147
 148
 149
 150
 151
 152
 153
 154
 155
 156
 157
 158
 159
 160
 161
 162
 163
 164
 165
 166
 167
 168
 169
 170
 171
 172
 173
 174
 175
 176
 177
 178
 179
 180
 181
 182
 183
 184
 185
 186
 187
 188
 189
 190
 191
 192
 193
 194
 195
 196
 197
 198
 199
 200
 201
 202
 203
 204
 205
 206
 207
 208
 209
 210
 211
 212
 213
 214
 215
 216
 217
 218
 219
 220
 221
 222
 223
 224
 225
 226
 227
 228
 229
 230
 231
 232
 233
 234
 235
 236
 237
 238
 239
 240
 241
 242
 243
 244
 245
 246
 247
 248
 249
 250
 251
 252
 253
 254
 255
 256
 257
 258
 259
 260
 261
 262
 263
 264
 265
 266
 267
 268
 269
 270
 271
 272
 273
 274
 275
 276
 277
 278
 279
 280
 281
 282
 283
 284
 285
 286
 287
 288
 289
 290
 291
 292
 293
 294
 295
 296
 297
 298
 299
 300
 301
 302
 303
 304
 305
 306
 307
 308
 309
 310
 311
 312
 313
 314
 315
 316
 317
 318
 319
 320
 321
 322
 323
 324
 325
 326
 327
 328
 329
 330
 331
 332
 333
 334
 335
 336
 337
 338
 339
 340
 341
 342
 343
 344
 345
 346
 347
 348
 349
 350
 351
 352
 353
 354
 355
 356
 357
 358
 359
 360
 361
 362
 363
 364
 365
 366
 367
 368
 369
 370
 371
 372
 373
 374
 375
 376
 377
 378
 379
 380
 381
 382
 383
 384
 385
 386
 387
 388
 389
 390
 391
 392
 393
 394
 395
 396
 397
 398
 399
 400
 401
 402
 403
 404
 405
 406
 407
 408
 409
 410
 411
 412
 413
 414
 415
 416
 417
 418
 419
 420
 421
 422
 423
 424
 425
 426
 427
 428
 429
 430
 431
 432
 433
 434
 435
 436
 437
 438
 439
 440
 441
 442
 443
 444
 445
 446
 447
 448
 449
 450
 451
 452
 453
 454
 455
 456
 457
 458
 459
 460
 461
 462
 463
 464
 465
 466
 467
 468
 469
 470
 471
 472
 473
 474
 475
 476
 477
 478
 479
 480
 481
 482
 483
 484
 485
 486
 487
 488
 489
 490
 491
 492
 493
 494
 495
 496
 497
 498
 499
 500
 501
 502
 503
 504
 505
 506
 507
 508
 509
 510
 511
 512
 513
 514
 515
 516
 517
 518
 519
 520
 521
 522
 523
 524
 525



