# ATTACK

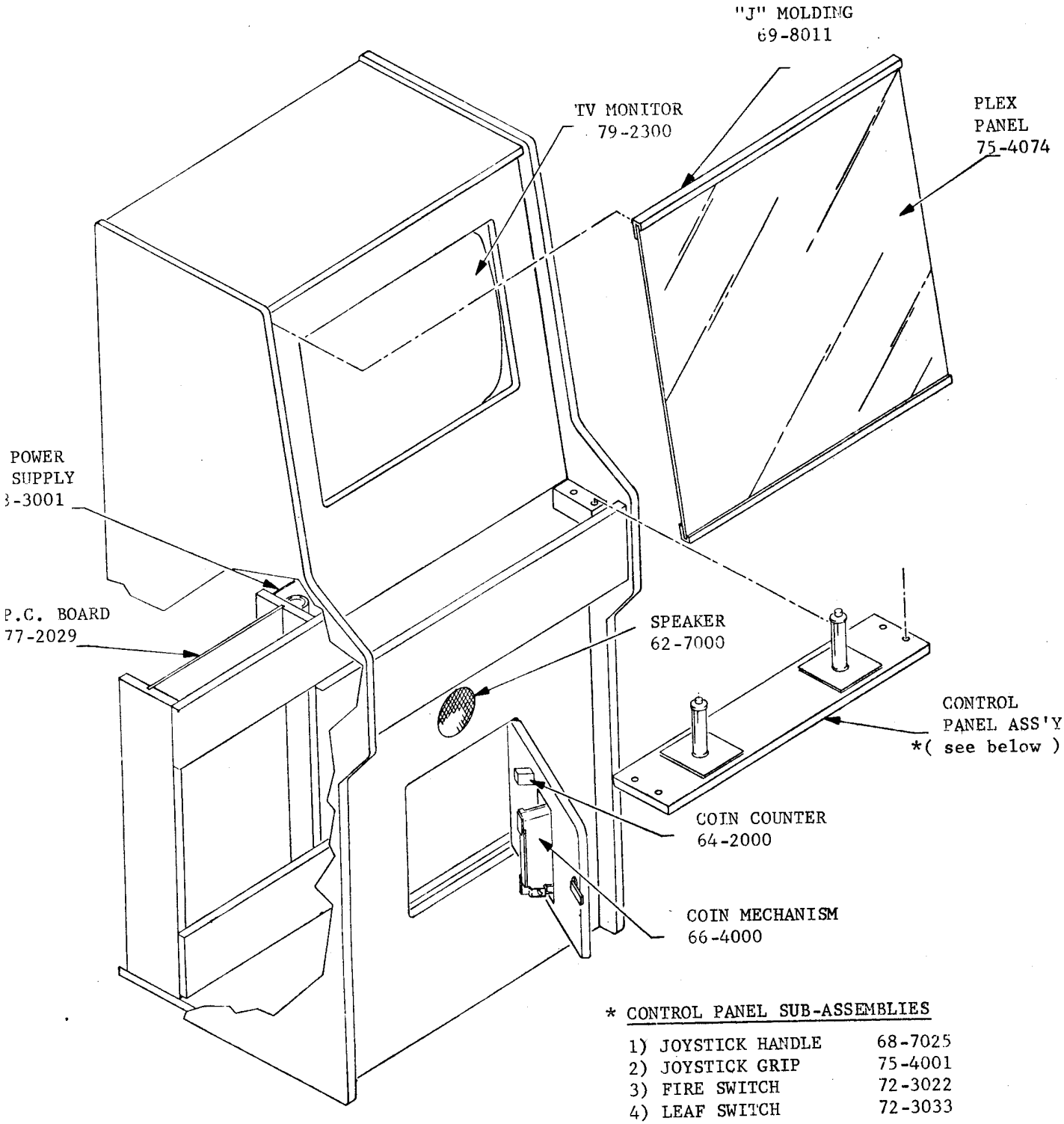
BY *Exidy*

## SERVICE MANUAL

# ATTACK

## Table of Contents

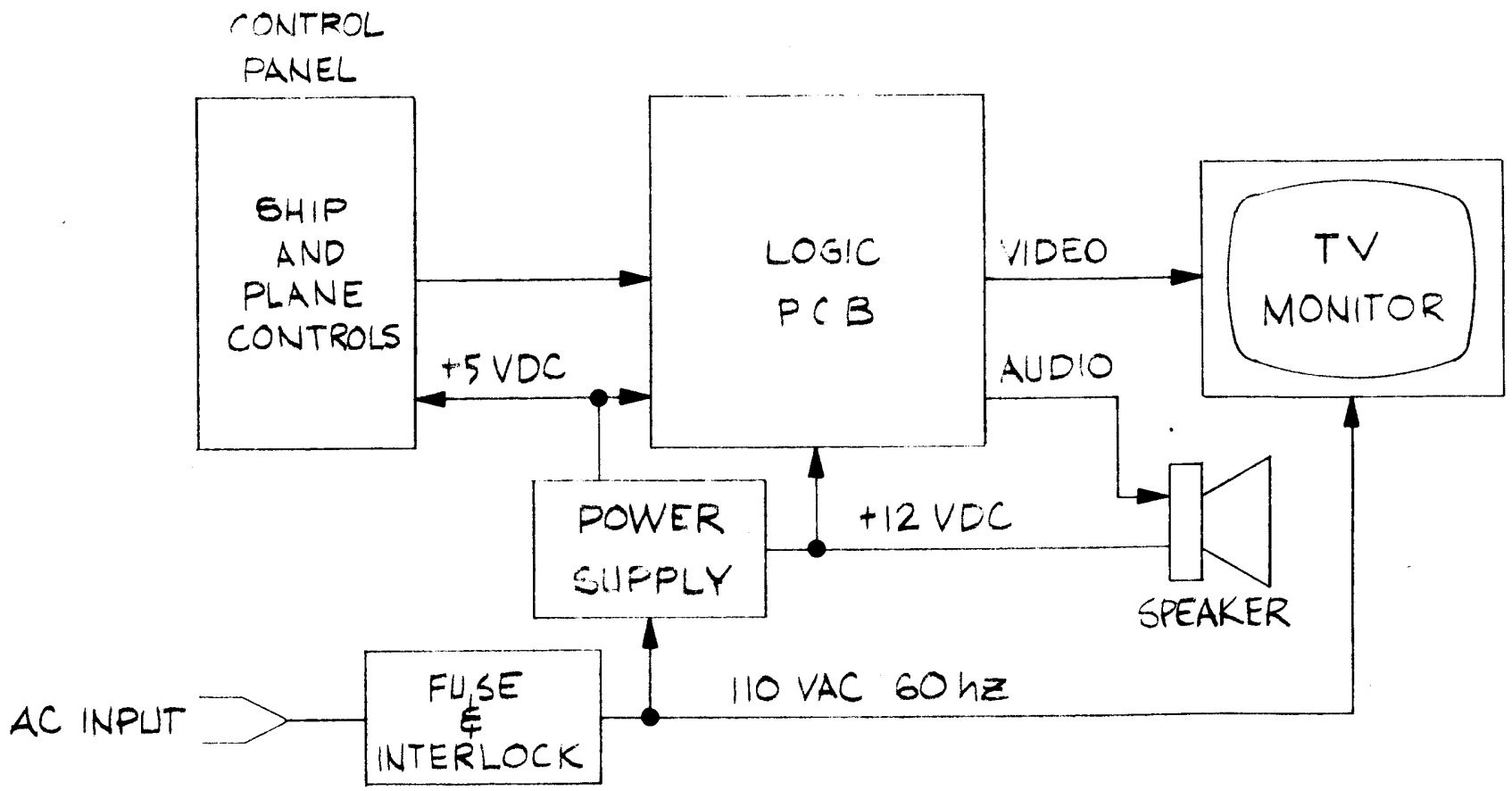

| SECTION | PAGE |
|---|---|
| Illustrated Parts Breakdown..... ..... | 1 |
| System Block Diagram..... | 2 |
| Adjustments..... | 3 |
| Power Supply Adjustment | |
| Volume Adjustment | |
| Game Time Adjustment | |
| Troubleshooting Tips..... | 4 |
| P.C. Board Connector Pinout..... | 5 |
| P.C. Board Logic Diagram..... | Back of Manual |




* CONTROL PANEL SUB-ASSEMBLIES

| | |
|---|---|
| 1) JOYSTICK HANDLE | 68-7025 |
| 2) JOYSTICK GRIP | 75-4001 |
| 3) FIRE SWITCH | 72-3022 |
| 4) LEAF SWITCH | 72-3033 |

# ATTACK
# SYSTEM BLOCK DIAGRAM



## I. Adjustments

### A. Power Supply Adjustment

Proper operation of this game is absolutely dependent on proper adjustment of the +5vdc power supply.

Before attempting to operate or troubleshoot this game, measure and adjust, as necessary, the +5vdc power supply voltage.

Measure voltage with meter leads contacting +5vdc and ground traces on P.C.B., near the 6 pin connector.

The power supply voltage is set at the factory, but shocks due to shipping and handling may cause this setting to vary.

### B. Volume Adjustment

Sound volume is adjustable using the pot on the P.C.B. nearest the 22 pin connector.

### C. Game Time Adjustment

Game time (length of game) is adjustable using the pot on the P.C.B. nearest the 6 pin connector.

ATTACK

Troubleshooting Tips

| SYMPTOM | POSSIBLE CAUSE | SOLUTION |
|---|---|---|
| Nothing happens | Blown fuse | Replace |
| | Interlock switch not closing | check switch alignment |
| | Bad TV Monitor | Repair or replace |
| Game blows fuses | Bad power supply | Repair or replace |
| | Bad P.C.B. | Repair or replace |
| Game has sound but no picture | Bad TV Monitor | Repair or replace |
| | No +5vdc | Check output of power supply for +5vdc. If not present, replace power supply. |
| Game has picture but no sound | Bad P.C.B. | Repair or replace |
| | No +12vdc | Check power supply harness. Wire attached to cap should have +12vdc. |
| | Bad speaker | Replace |
| Game does not start with coin | Bad P.C.B. | Repair or replace |
| | Bad coin mechanism | Check microswitch and mechanism. |
| All controls completely inoperative | Bad P.C.B. | Repair or replace |
| | Ground wire to control harness open (disconnected) | Repair |
| Some controls inoperative | Bad P.C.B. | Repair or replace |
| | Bad leaf switches in control panel | Replace (even if just bent). Once bent, switch is unreliable. |
| Game is erratic. Seems to work OK sometimes, other times not. | Low +5vdc power | Adjust power supply. Measure voltage with test leads on P.C.B. (near 6 pin connector). |
| | Bad P.C.B. | Repair or replace |
| Game is static sensitive | Carpet<br>Weather<br>Nearby devices generating high voltages and/or high frequencies. | Solder 12" long 22 awg. insulated wire to pin 20 of J2 (P.C.B. 22 pin connector). Leave one end hanging loose, taking care that wire is properly insulated. If game shuts off too easily then, trim the wire shorter as necessary. |

# ATTACK

## P.C. BOARD CONNECTOR PINOUT

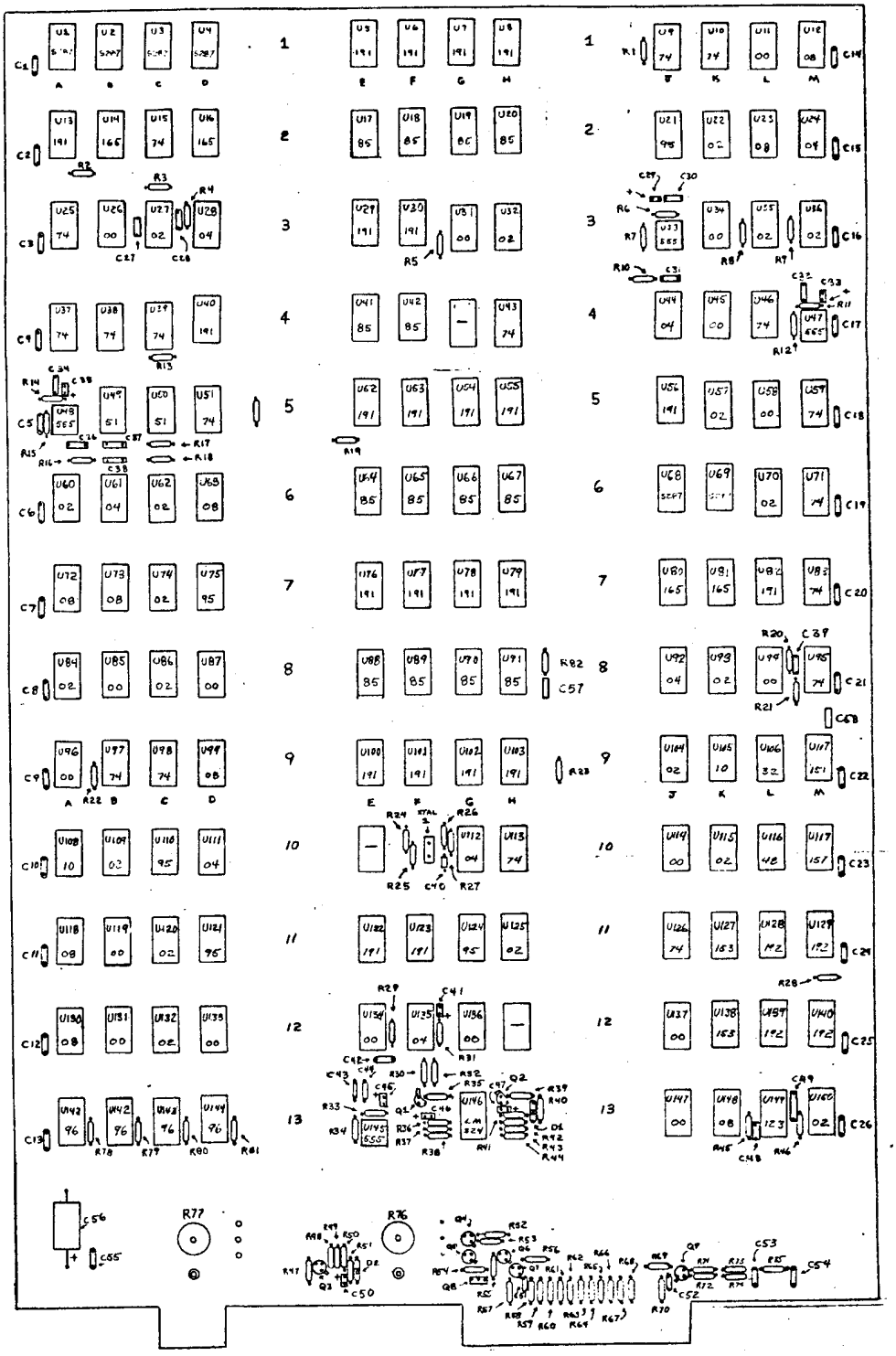
| | |
|---|---|
| 1. 2. | GND |
| 3. 4. | +5V |
| 5. 6. | GND |

1. +12v (and one side of SPKR)
2. SPKR (direct)
3. GND
4.
5.
6.
7. *SML.....(ship move left)
8. *SMR.....(ship move right)
9. *SHP GR.....(ship gun right)
10. *SHP GL.....(ship gun left)
11. *SBF NO.....(ship button fire)
12. SBF NC.....(ship button fire)
13. *PBF NO.....(plane button fire)
14. *PBF NC.....(plane button fire)
15. *PLN SPD FST...(plane speed fast)
16. *PLN RCCW.....(plane rotate counter-clockwise)
17. *PLN RCW.....(plane rotate clockwise)
18. COIN.....(coin drop)
19. GND
20. ANT.....(anti-static antenna)
21. VIDEO RETURN
22. TV VIDEO

# ATTACK

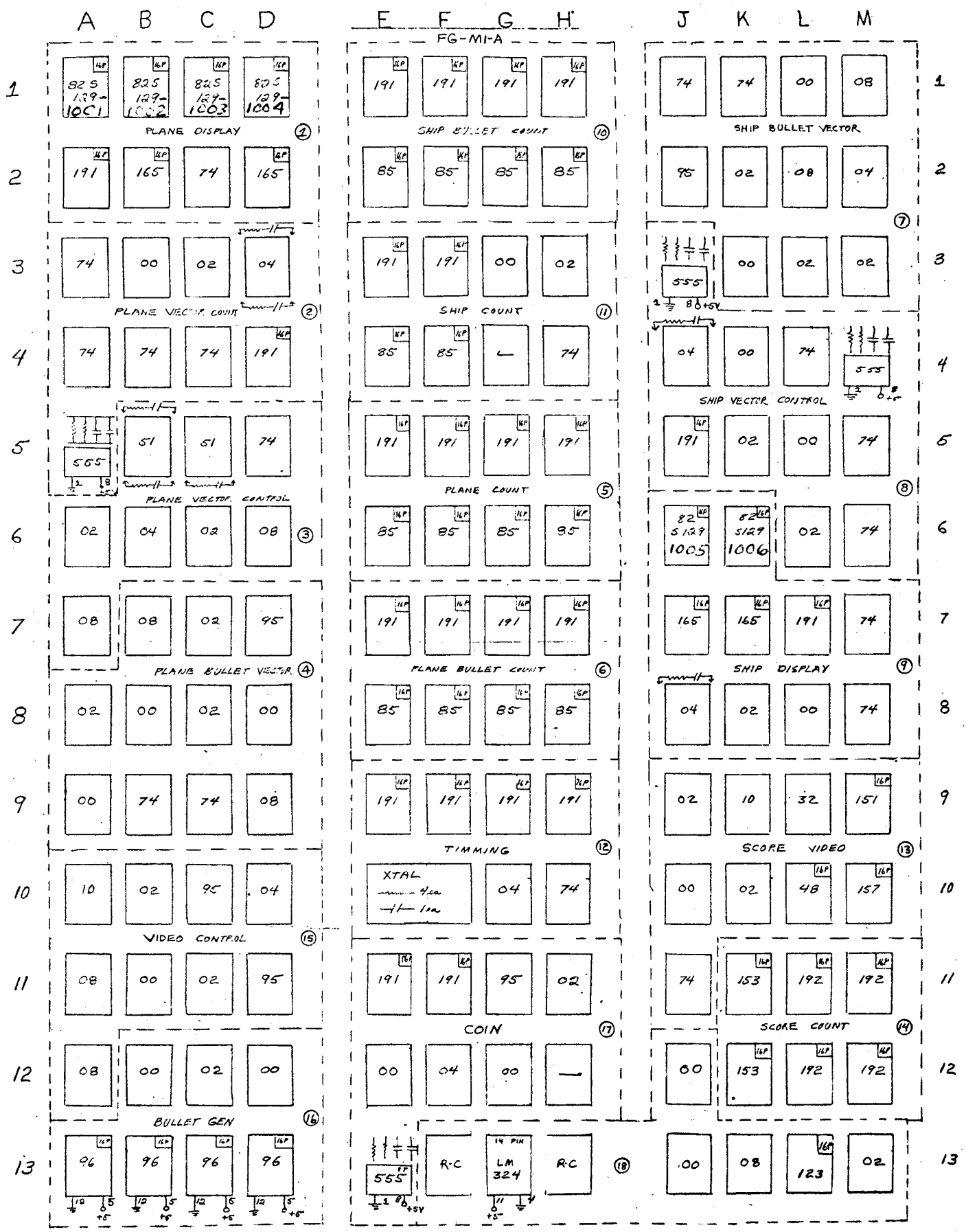
BY *Exidy*

LOGIC DIAGRAM 1A



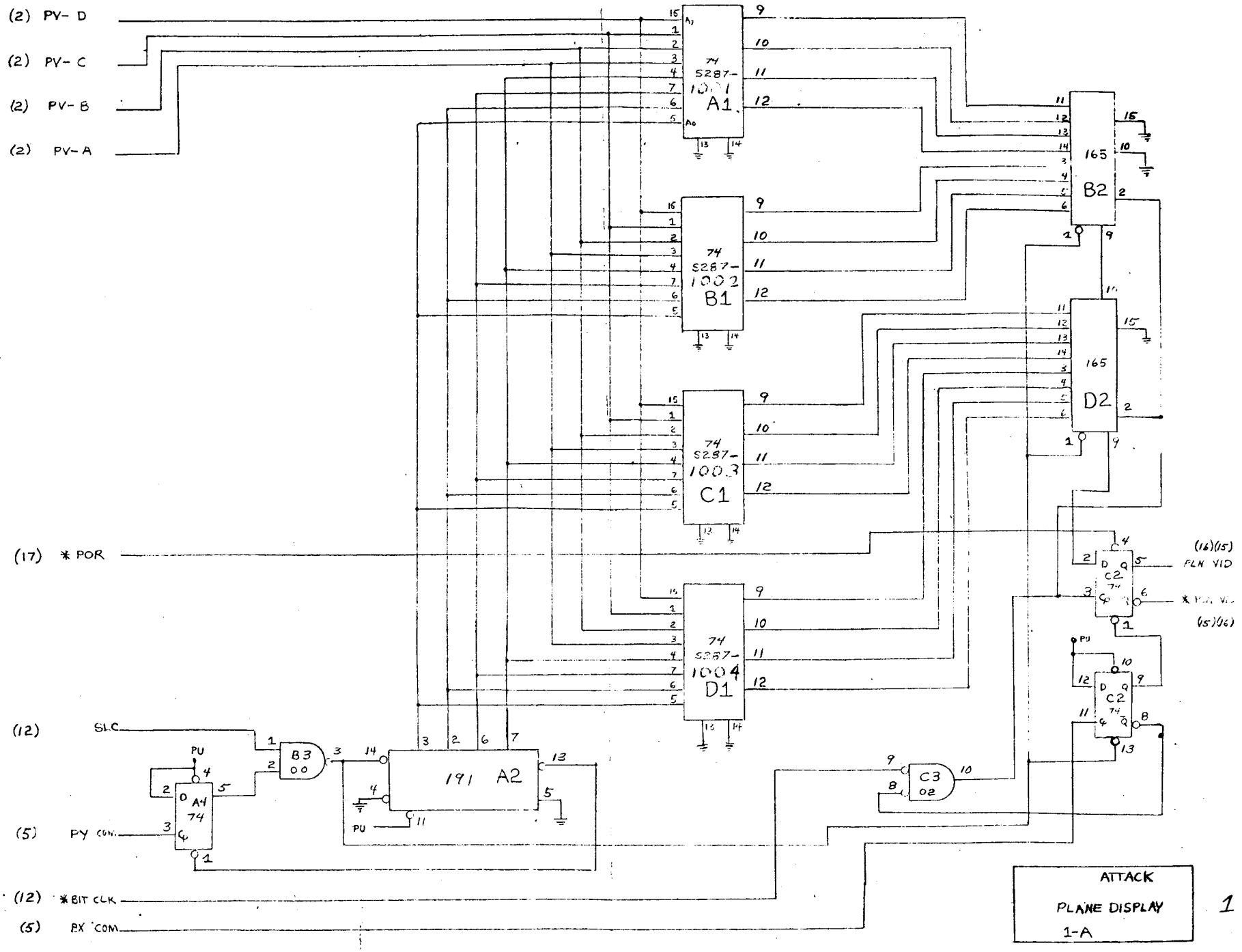
COMPONENT LOCATION

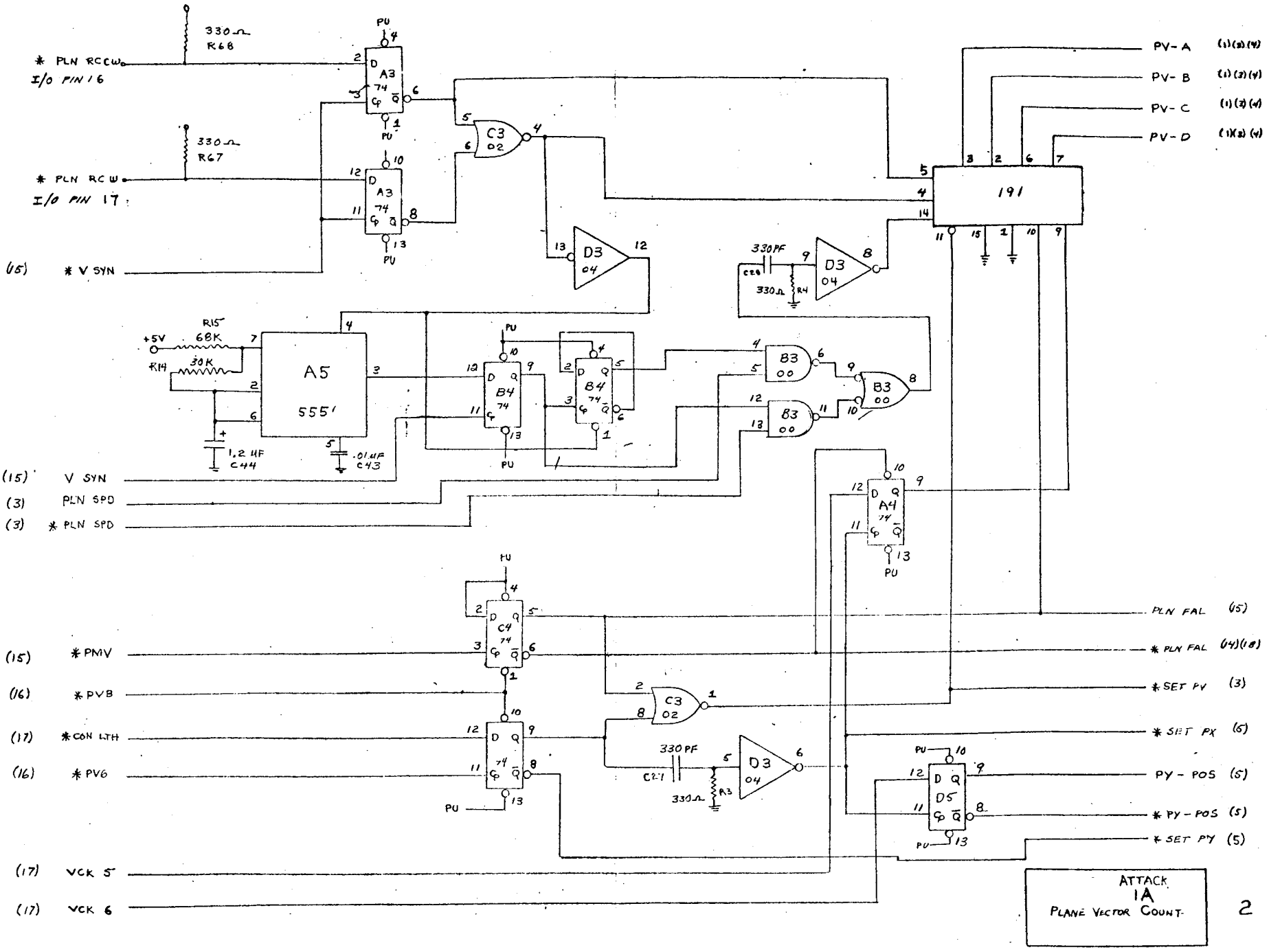
1-A ATTACK

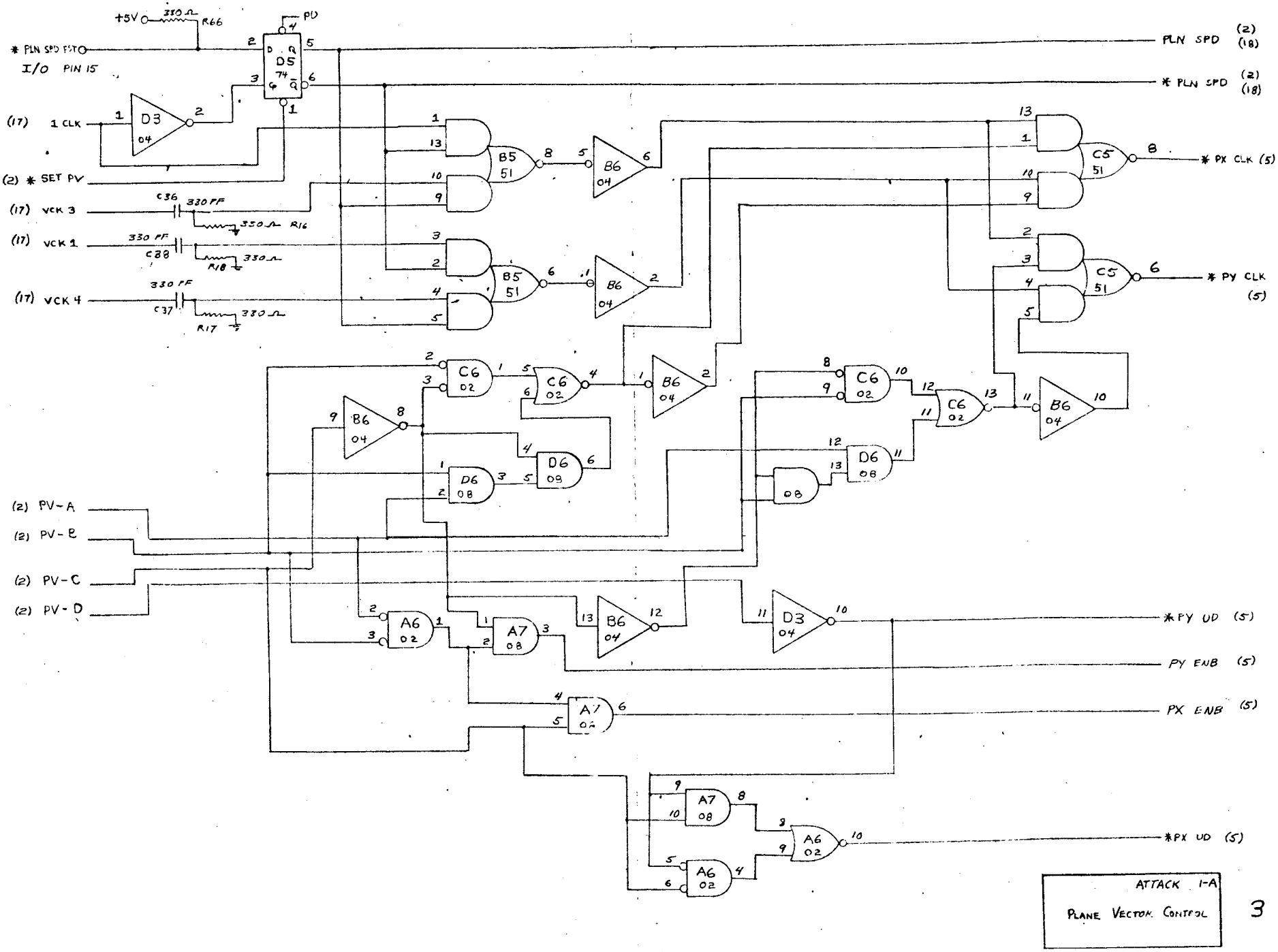


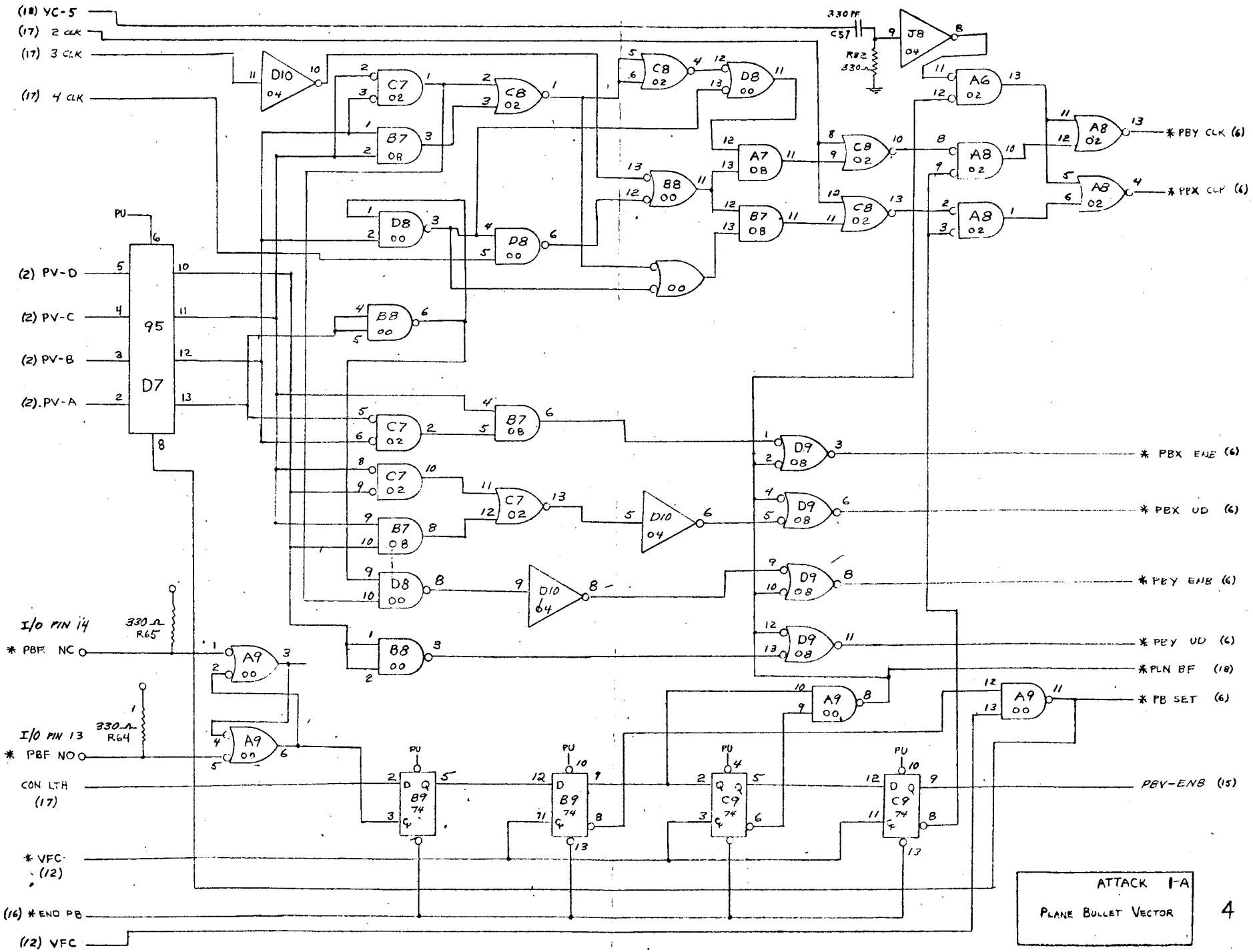

1-A IC Location

ATTACK


(2) PV- D
(2) PV- C
(2) PV- B
(2) PV- A
74 S287- 1001 A1
74 S287- 1002 B1
74 S287- 1003 C1
74 S287- 1004 D1
165 B2
165 D2
C2
C2
(17) * POR
(16)(15) FLN VID
(5)(06)
PU
(12) SLC
B3 00
A4 74
191 A2
C3 02
(5) PY COM
(12) * BIT CLK
(5) BX COM
ATTACK
PLANE DISPLAY
1-A
1

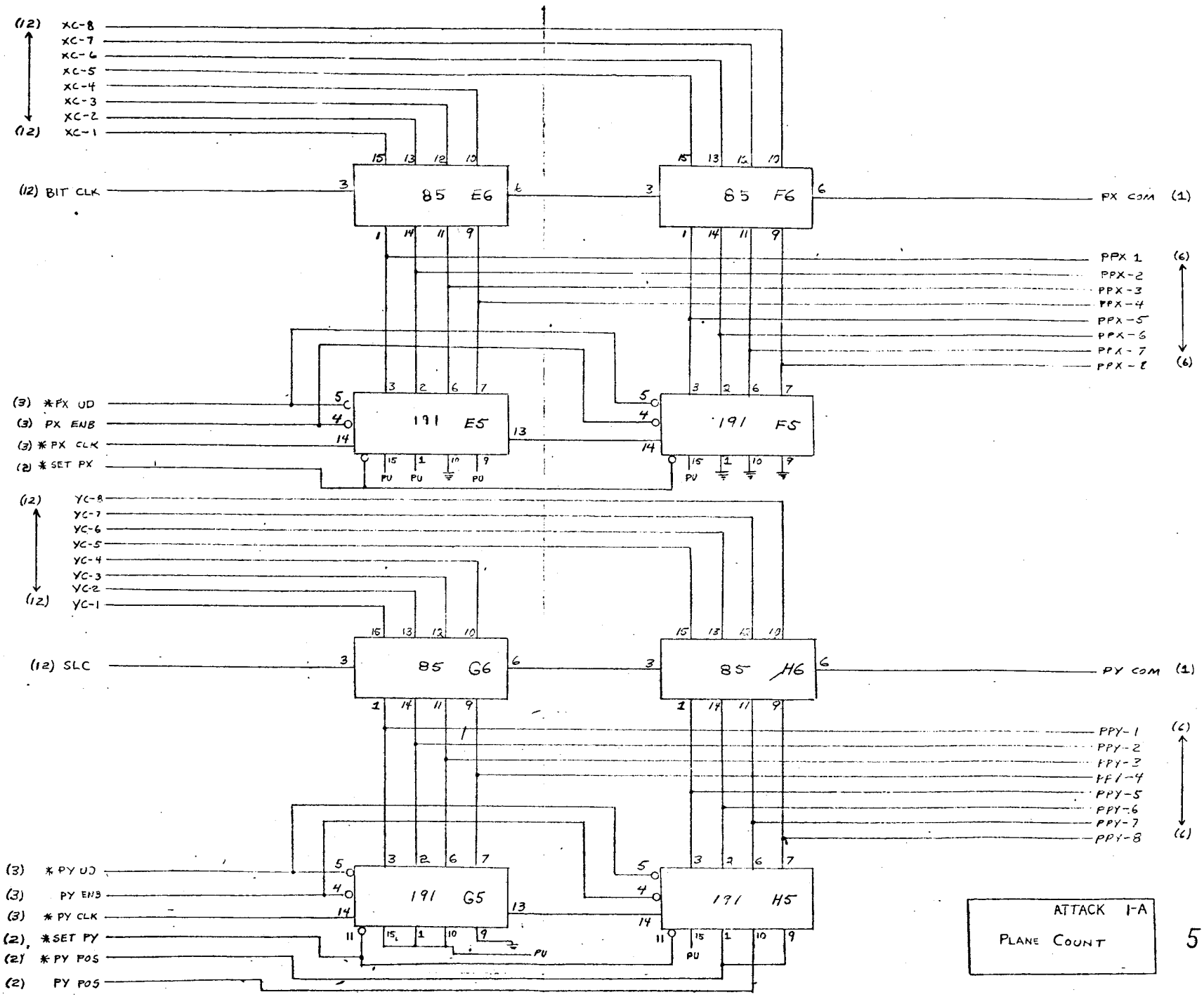

* PLN RCCW
I/O PIN 16
330Ω R66
* PLN RC W
I/O PIN 17
330Ω R67
(15) * V SYN
A3 74
C3 02
D3 04
330PF C66
330Ω R4
191
PV-A (1)(2)(4)
PV-B (1)(2)(4)
PV-C (1)(2)(4)
PV-D (1)(2)(4)
R15 68K
R14 30K
A5 555
1.2 UF C44
.01 UF C43
B4 74
B3 00
(15) V SYN
(3) PLN SPD
(3) * PLN SPD
A4 74
C4 74
(15) * PMV
(16) * PVB
(17) * CON LTH
(16) * PV6
330PF C21
330Ω R3
D5
PLN FAL (5)
* PLN FAL (4)(18)
* SET PV (3)
* SET PX (6)
PY - POS (5)
* PY - POS (5)
* SET PY (5)
(17) VCK 5
(17) VCK 6
ATTACK
1A
PLANE VECTOR COUNT-
2

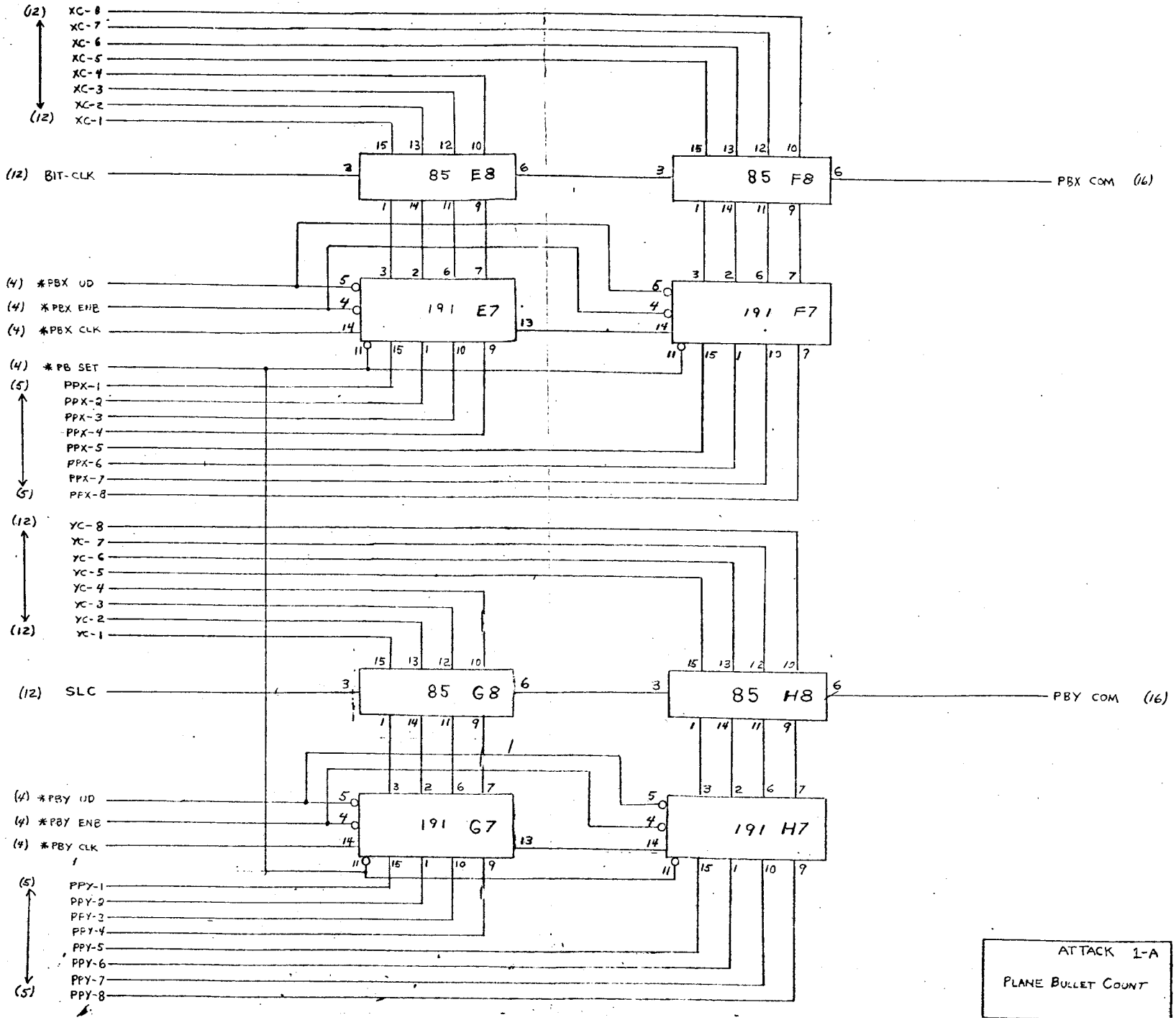

+5V
330 Ω
R66
PD
* PLN SPD FST
I/O PIN 15
D5
74
PLN SPD (2) (18)
* PLN SPD (2) (18)
(17) 1 CLK
D3
04
(2) * SET PV
(17) VCK 3
C36 330 PF
330 Ω R16
(17) VCK 1
330 PF C38
330 Ω R18
(17) VCK 4
330 PF C37
330 Ω R17
B5 51
B6 04
C5 51
* PX CLK (5)
* PY CLK (5)
C6 02
D6 08
D6 09
A6 02
A7 08
D3 04
(2) PV-A
(2) PV-B
(2) PV-C
(2) PV-D
* PY UD (5)
PY ENB (5)
PX ENB (5)
* PX UD (5)
ATTACK I-A
PLANE VECTOR CONTROL
3




ATTACK I-A

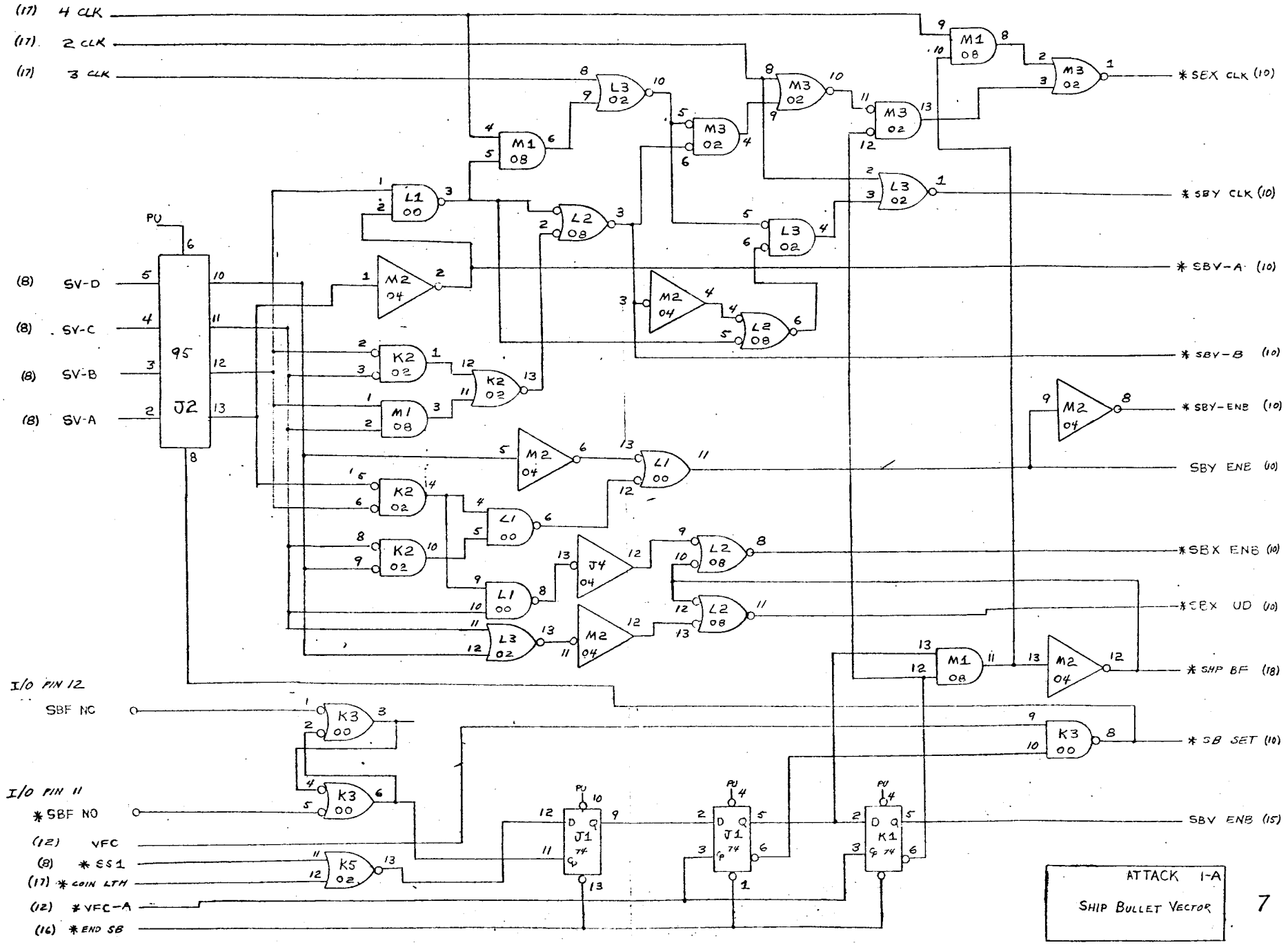
PLANE BULLET VECTOR

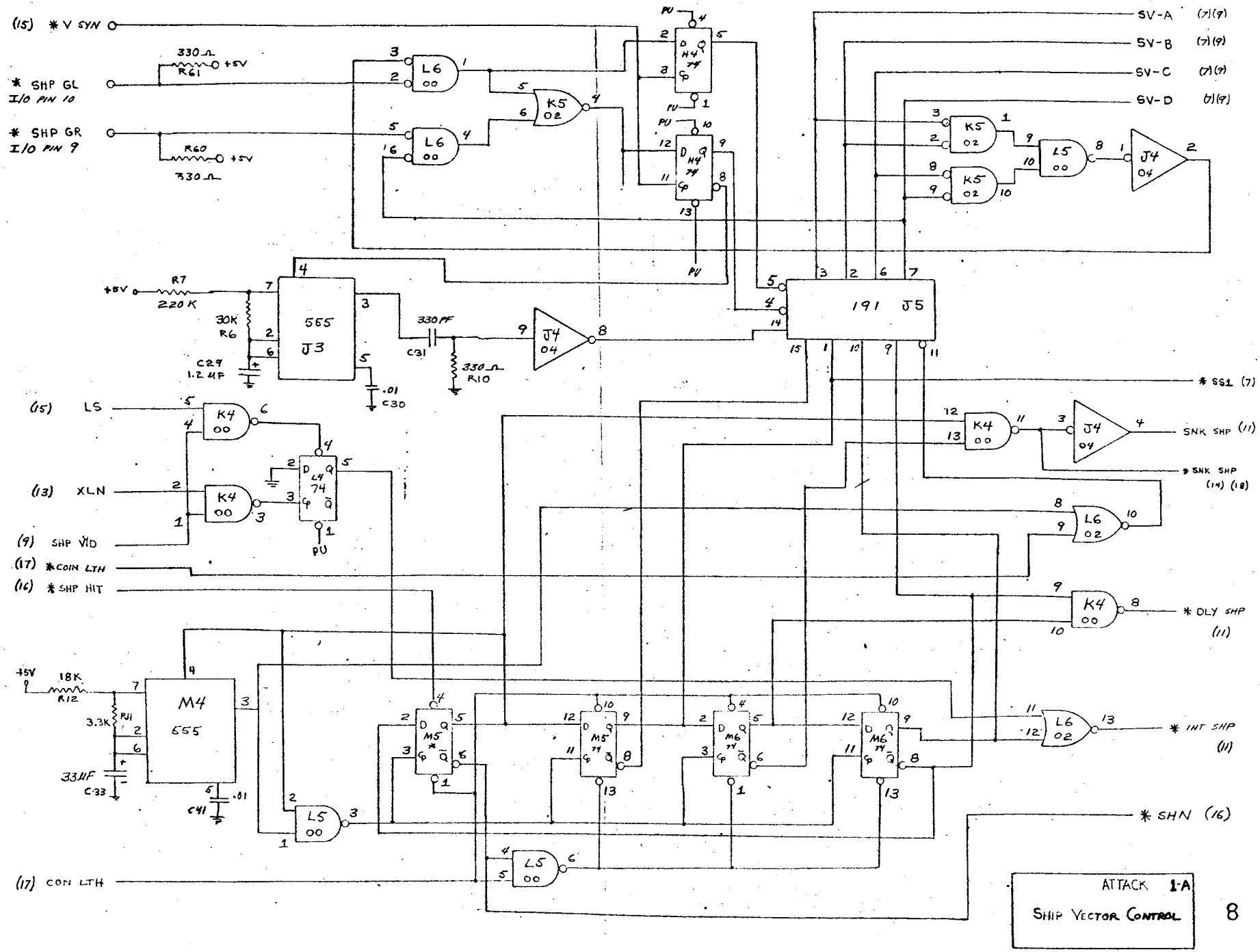

(12) XC-8
XC-7
XC-6
XC-5
XC-4
XC-3
XC-2
(12) XC-1
(12) BIT CLK
85 E6
85 F6
PX COM (1)
PPX 1
PPX-2
PPX-3
PPX-4
PPX-5
PPX-6
PPX-7
PPX-8
(6)
(3) *PX UD
(3) PX ENB
(3) *PX CLK
(2) *SET PX
191 E5
191 F5
PU
(12) YC-8
YC-7
YC-6
YC-5
YC-4
YC-3
YC-2
(12) YC-1
(12) SLC
85 G6
85 H6
PY COM (1)
PPY-1
PPY-2
PPY-3
PPY-4
PPY-5
PPY-6
PPY-7
PPY-8
(8)
(3) *PY UD
(3) PY ENB
(3) *PY CLK
(2) *SET PY
(2) *PY POS
(2) PY POS
191 G5
191 H5
ATTACK I-A
PLANE COUNT

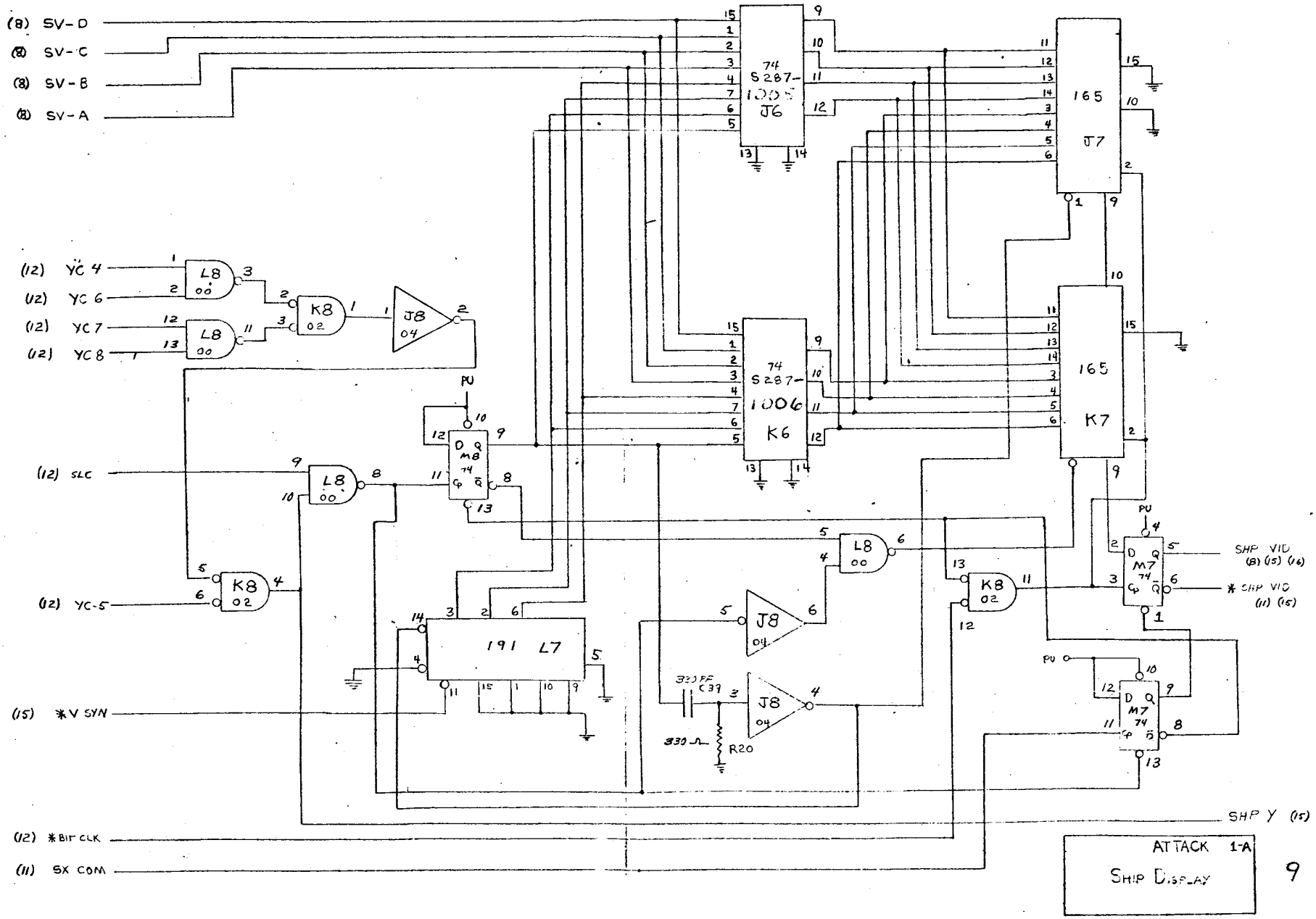


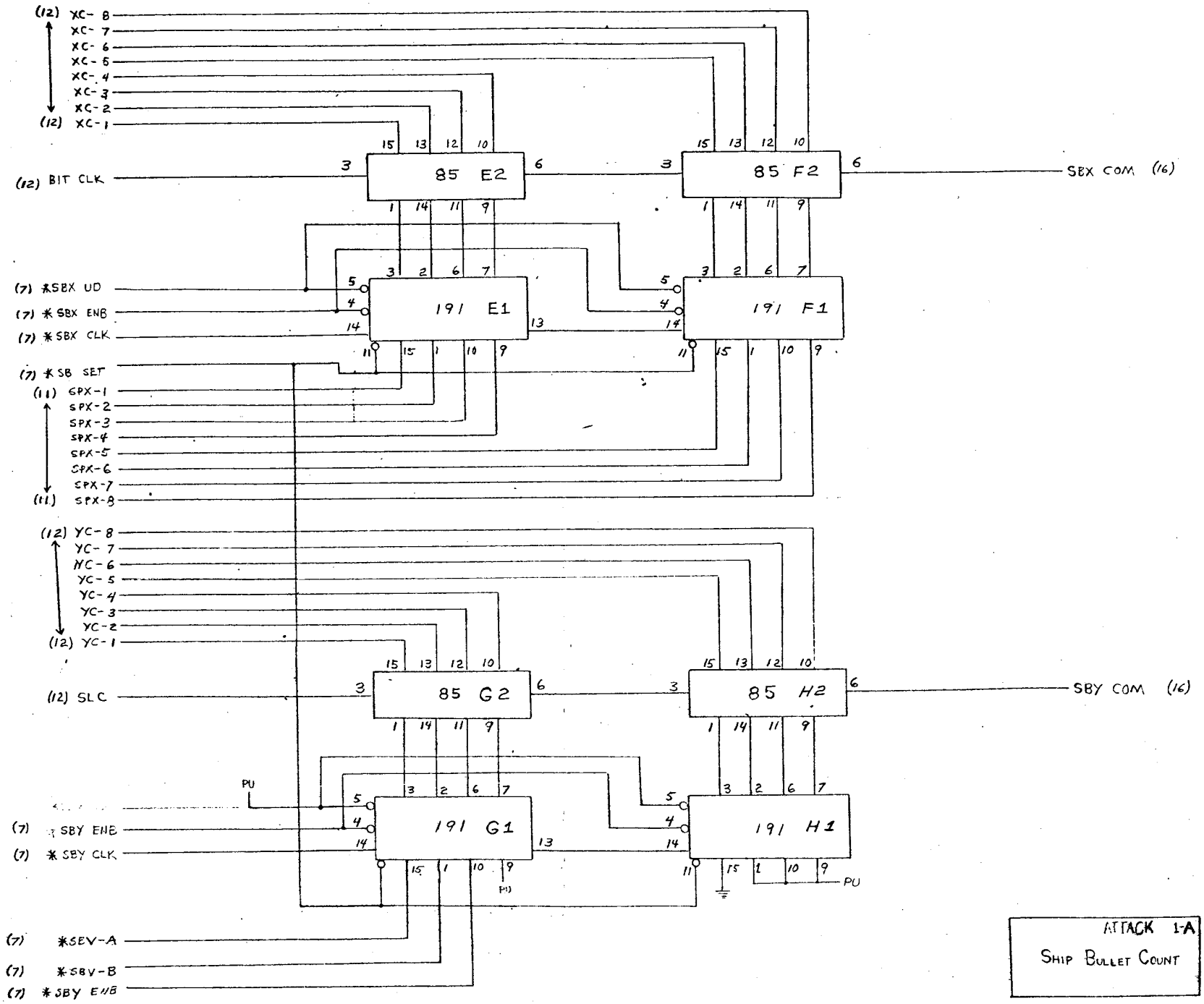

ATTACK 1-A

PLANE BULLET COUNT

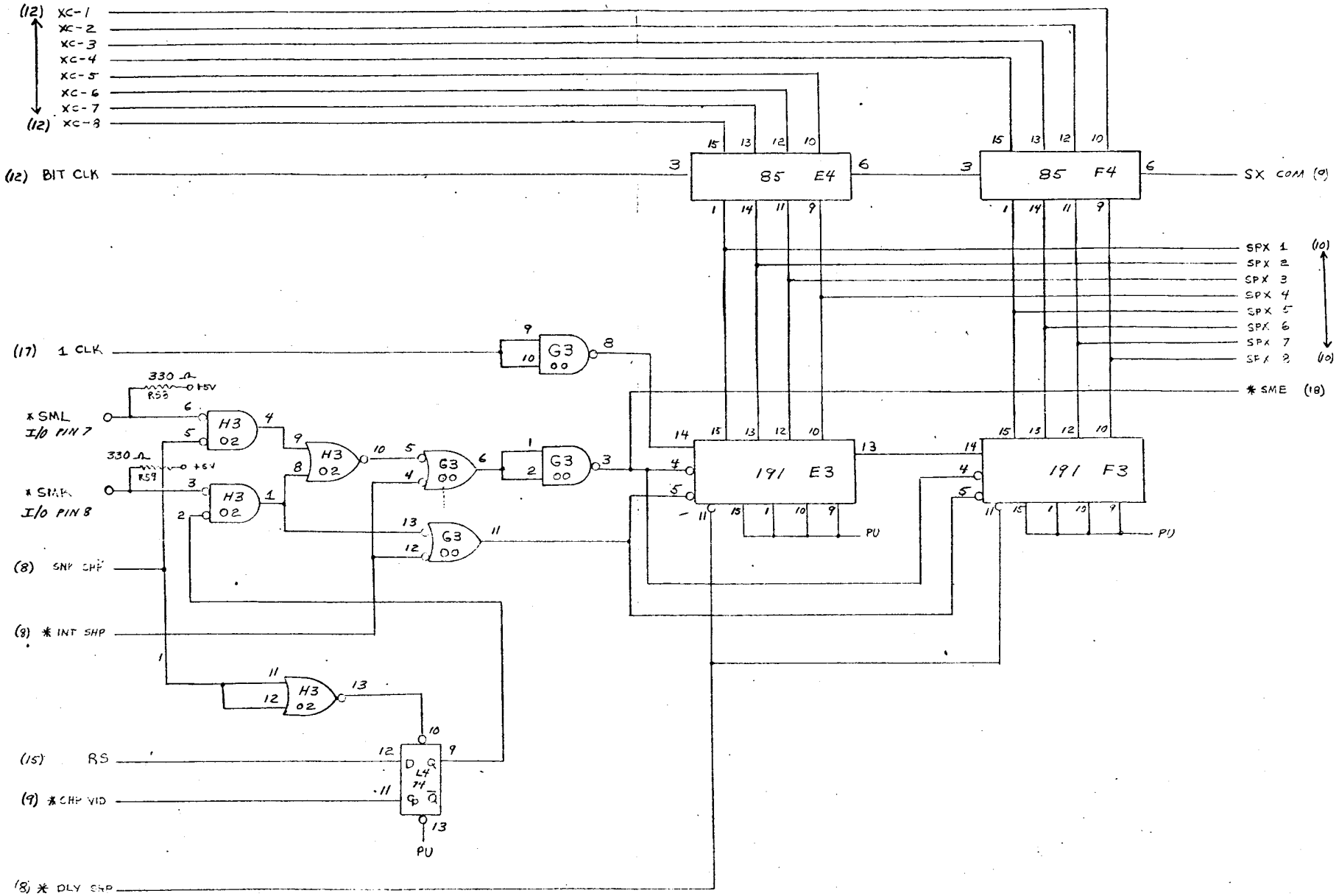

(17) 4 CLK
(17) 2 CLK
(17) 3 CLK
(8) SV-D
(8) SV-C
(8) SV-B
(8) SV-A
95 J2
PU
I/O PIN 12
SBF NC
I/O PIN 11
*SBF NO
(12) VFC
(8) *SS1
(17) *COIN LTH
(12) *VFC-A
(16) *END SB
*SEX CLK (10)
*SBY CLK (10)
*SBY-A (10)
*SBY-B (10)
*SBY-ENB (10)
SBY ENB (10)
*SBX ENB (10)
*SEX UD (10)
*SHP BF (18)
*SB SET (10)
SBY ENB (15)
ATTACK 1-A
SHIP BULLET VECTOR
7


(15) * V SYN
* SHP GL
I/O PIN 10
* SHP GR
I/O PIN 9
330Ω R61 +5V
R60 +5V 330Ω
L6 00
K5 02
H4 74
PU
SV-A (7)(9)
SV-B (7)(9)
SV-C (7)(9)
SV-D (7)(9)
K5 02
L5 00
J4 04
+5V R7 220K
30K R6
C29 1.2 MF
565 J3
330 PF C31
330Ω R10
.01 C30
191 J5
* SS1 (7)
(15) LS
(13) XLN
(9) SHP VID
K4 00
L4 74
SNK SHP (11)
* SNK SHP (14)(18)
L6 02
(17) *COIN LTH
(16) * SHP HIT
* DLY SHP (11)
+5V 18K R12
3.3K R11
33 MF C33
M4 555
C41 .01
M5 74
M6 74
L5 00
* INT SHP (11)
* SHN (16)
(17) COIN LTH
ATTACK 1-A
SHIP VECTOR CONTROL
8


(8) SV-D
(8) SV-C
(8) SV-B
(8) SV-A
74 S287-1005 J6
74 S287-1006 K6
165 J7
165 K7
(12) YC 4
(12) YC 6
(12) YC 7
(12) YC 8
L8 00
K8 02
J8 04
PU
(12) SLC
M8 74
(12) YC-5
191 L7
(15) *V SYN
330 PF C39
330Ω R20
M7 74
SHP VID (8) (15) (16)
* SHP VID (11) (15)
SHP Y (15)
(12) *BIT CLK
(11) SX COM
ATTACK 1-A
SHIP DISPLAY
9



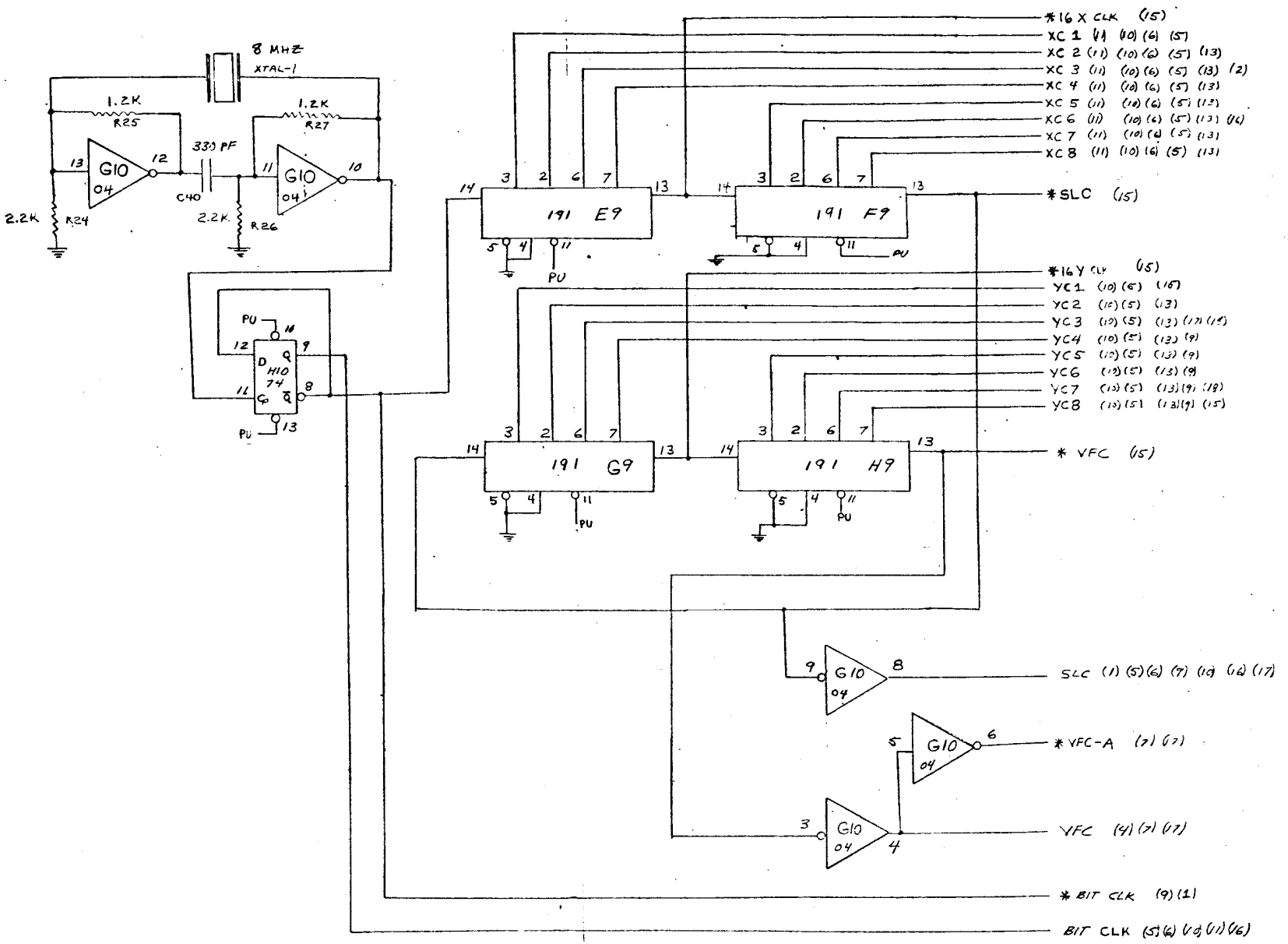

ATTACK 1-A
SHIP BULLET COUNT




ATTACK 1-A

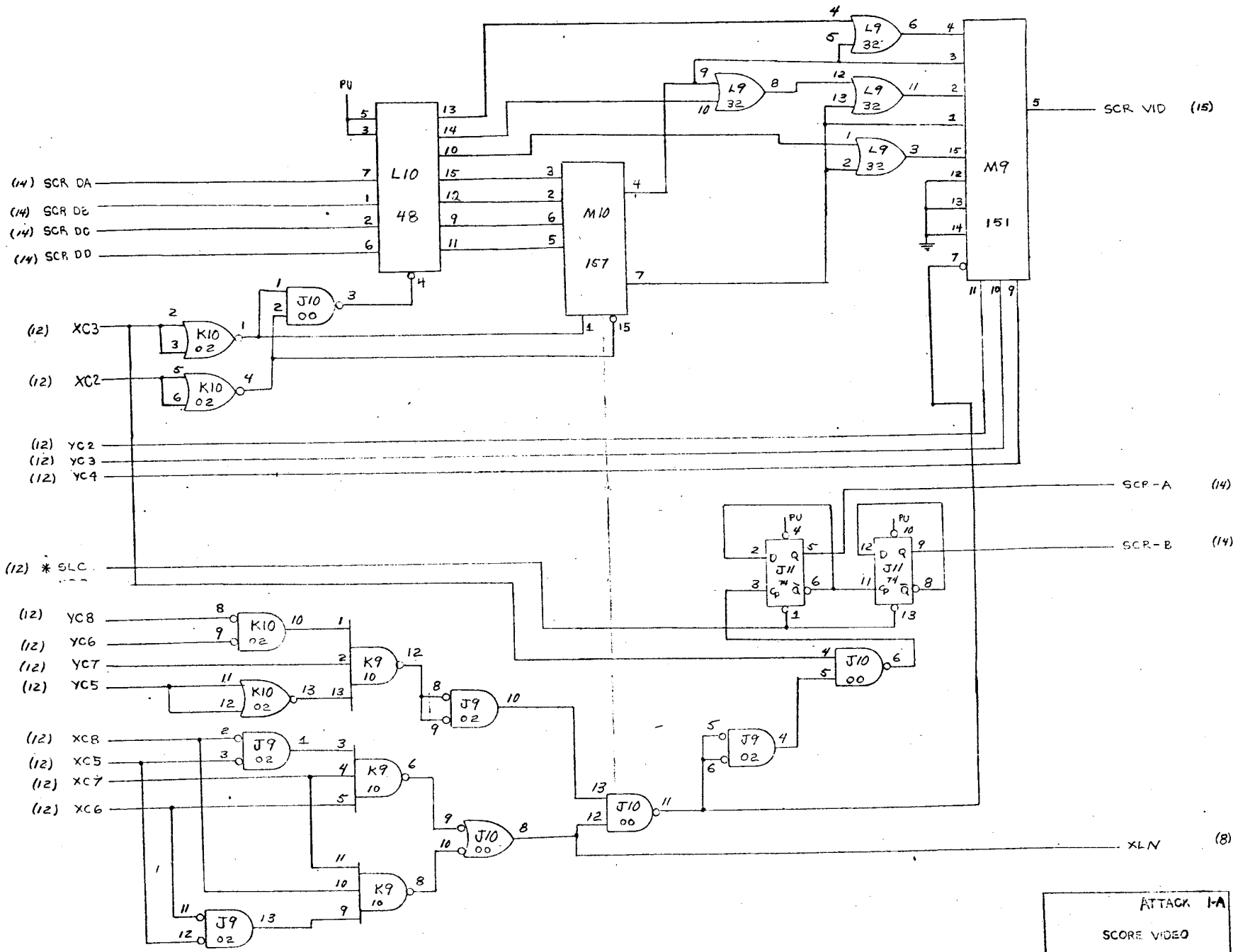
SHIP X COUNT

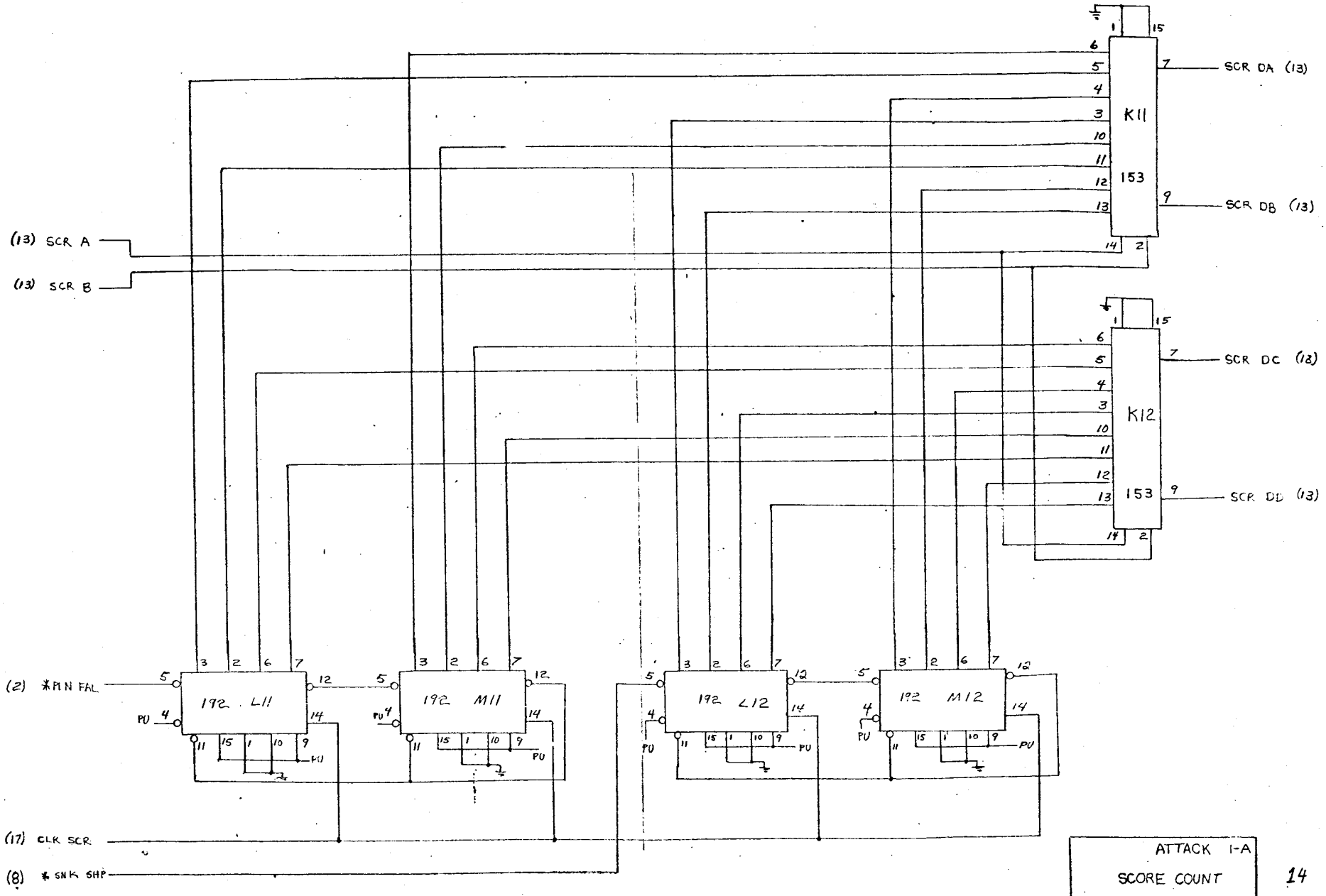
11




ATTACK 1-A

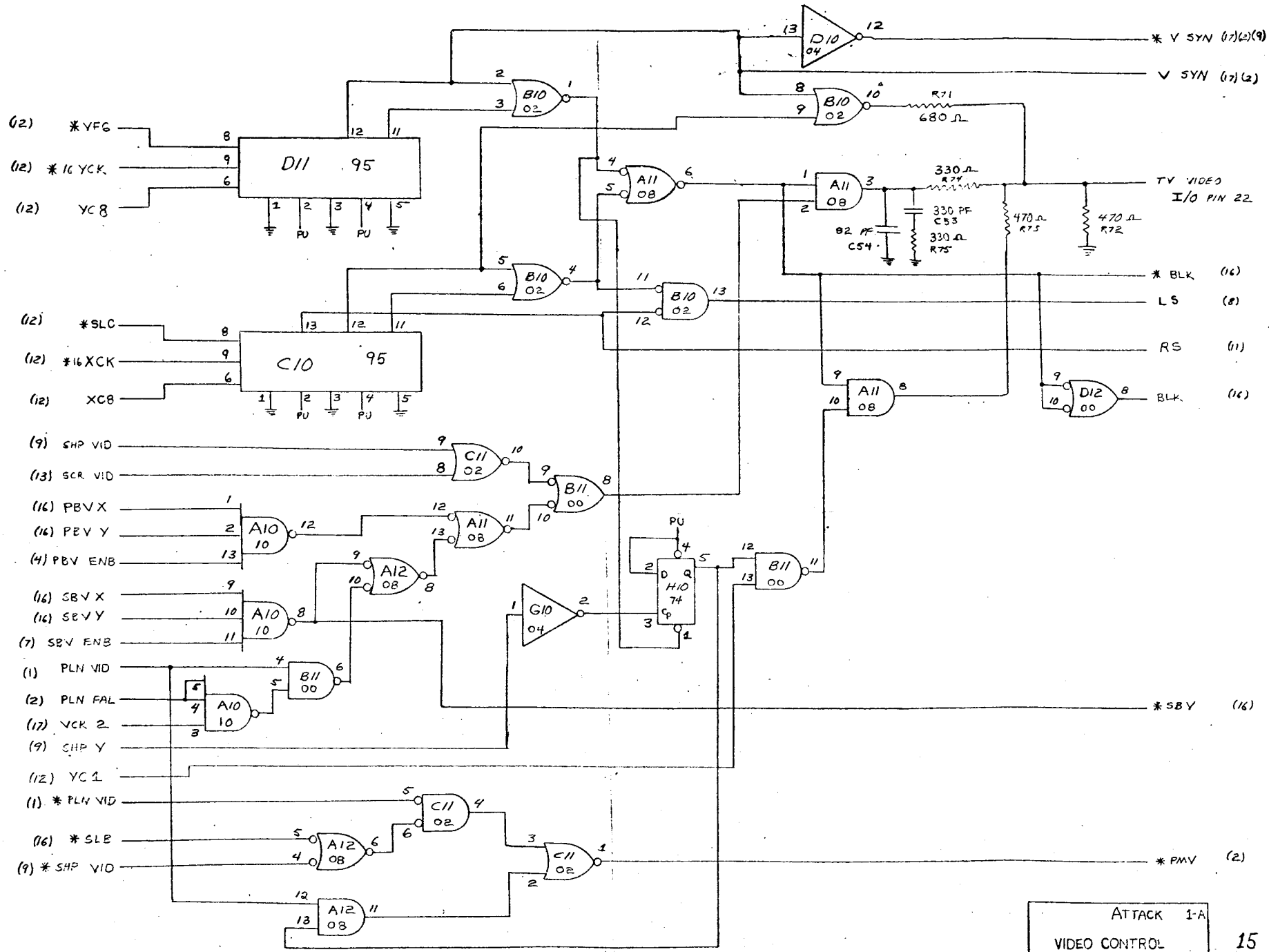
TIMING

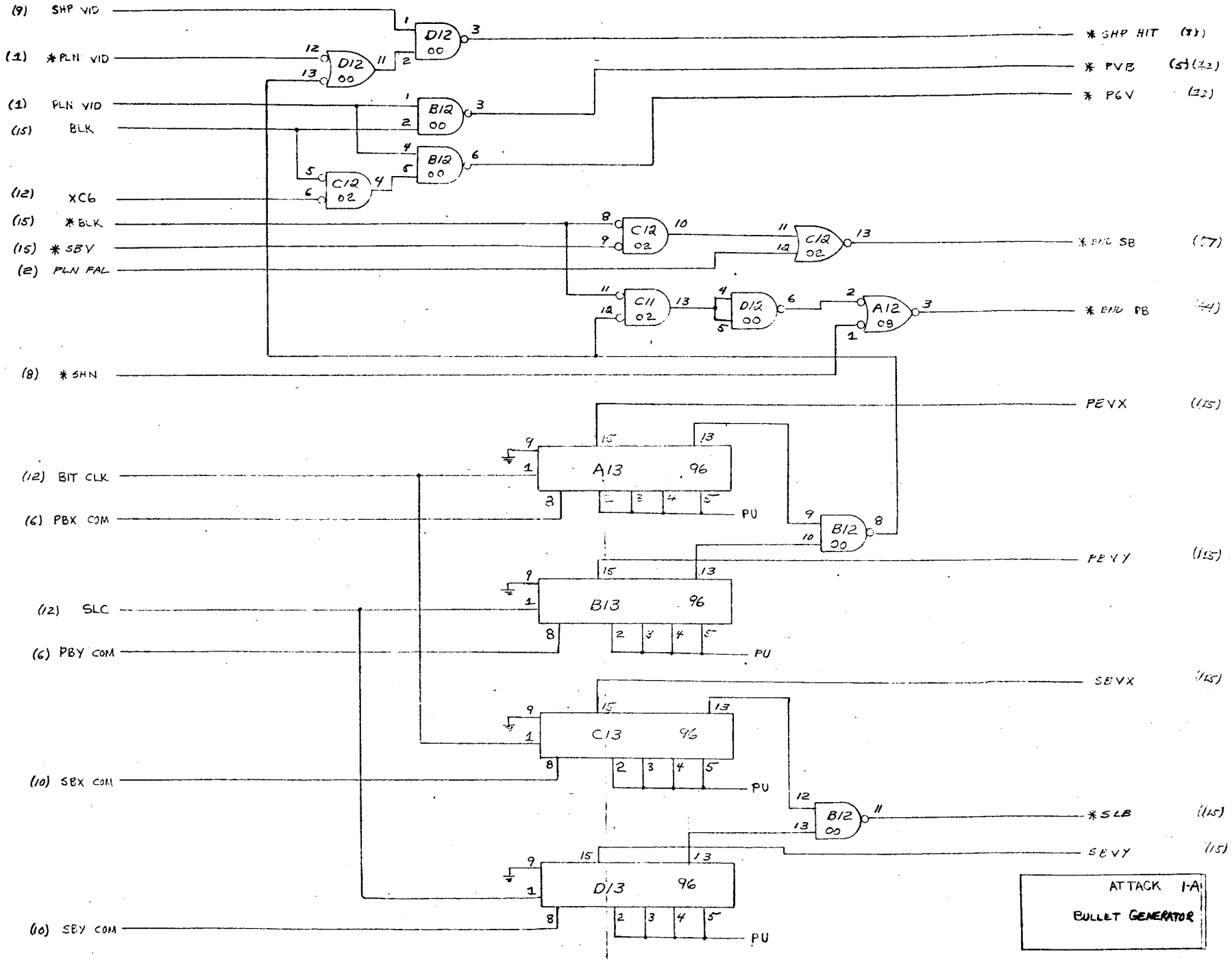

PU
L10
48
M10
157
M9
151
L9
32
J10
00
K10
02
K9
10
J9
02
J11
74
(14) SCR DA
(14) SCR DB
(14) SCR DC
(14) SCR DD
SCR VID (15)
(12) XC3
(12) XC2
(12) YC2
(12) YC3
(12) YC4
SCR-A (14)
SCR-B (14)
(12) * SLC
(12) YC8
(12) YC6
(12) YC7
(12) YC5
(12) XC8
(12) XC5
(12) XC7
(12) XC6
XLN (8)
ATTACK I-A
SCORE VIDEO

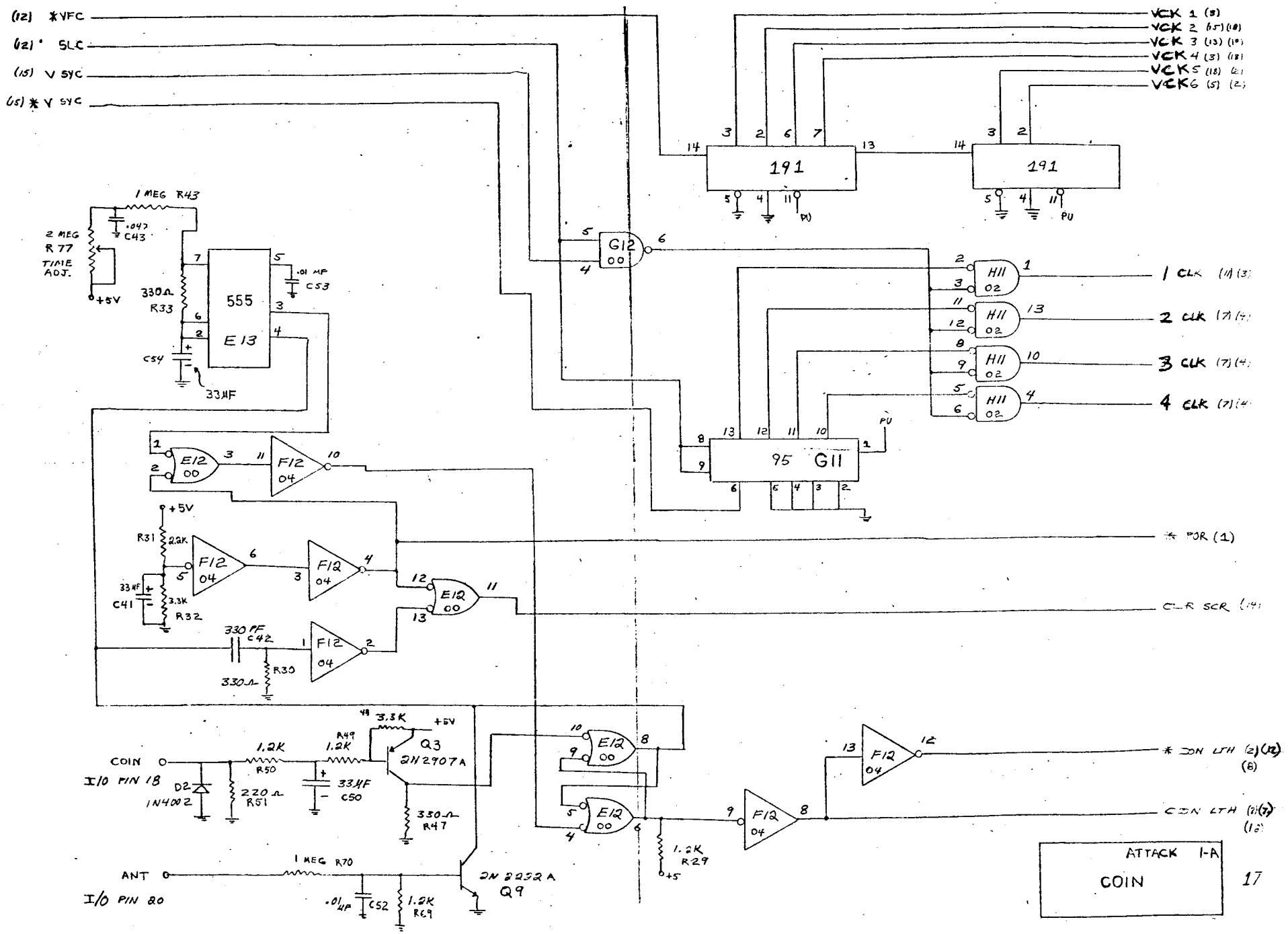


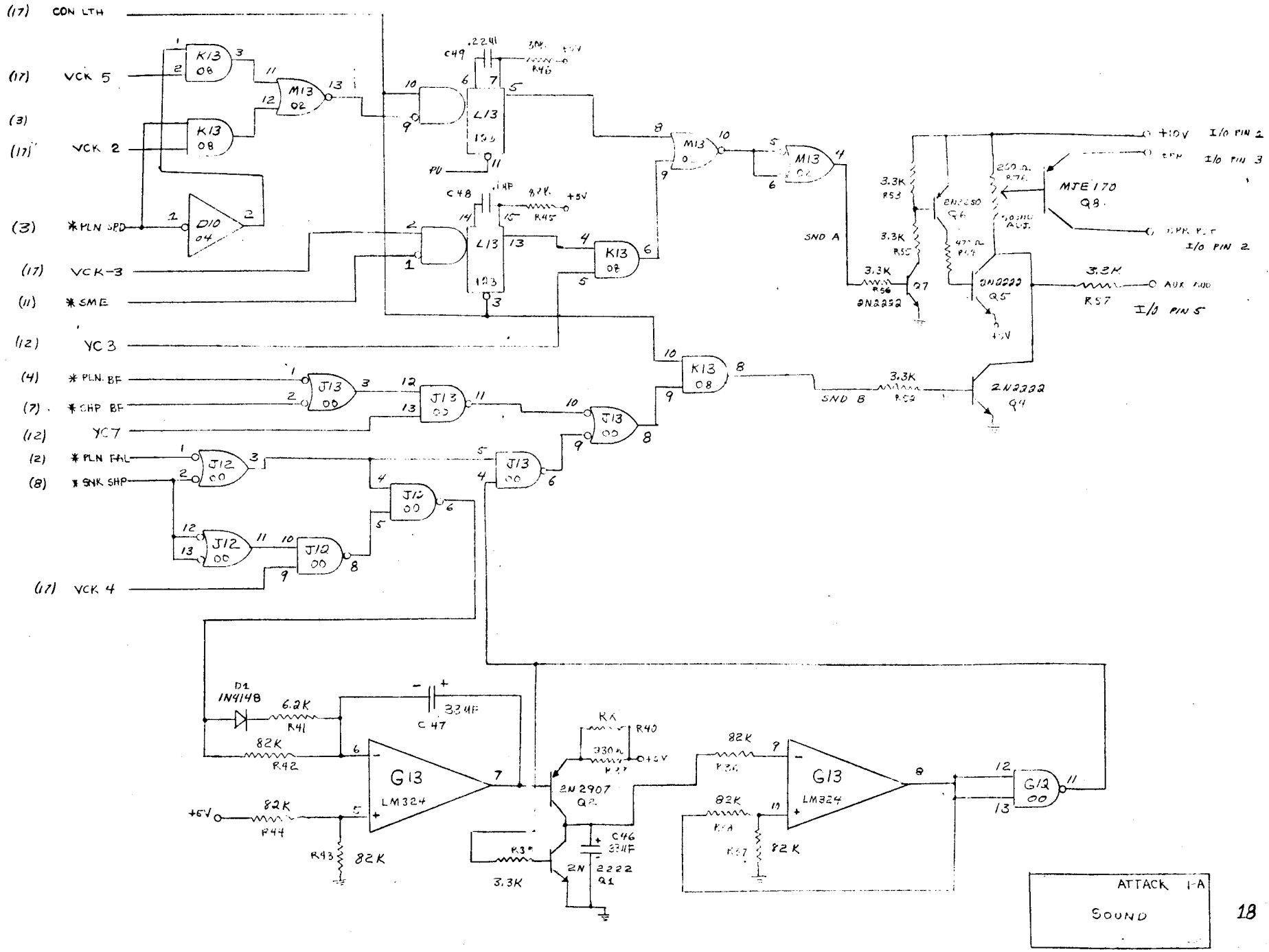

ATTACK I-A

SCORE COUNT


(12) *VFG
(12) *16 YCK
(12) YC 8
D11 95
(12) *SLC
(12) *16XCK
(12) XC8
C10 95
PU
(9) SHP VID
(13) SCR VID
(16) PBV X
(16) PBV Y
(4) PBV ENB
(16) SBV X
(16) SBV Y
(7) SBV ENB
(1) PLN VID
(2) PLN FAL
(17) VCK 2
(9) SHP Y
(12) YC 1
(1) * PLN VID
(16) * SLB
(9) * SHP VID
D10 04
B10 02
A11 08
330Ω R74
330 PF C53
82 PF C54
330Ω R75
470Ω R73
470Ω R72
680Ω R71
TV VIDEO I/O PIN 22
* V SYN (17)(2)(9)
V SYN (17)(2)
* BLK (16)
LS (8)
RS (11)
BLK (16)
D12 00
C11 02
B11 00
A10 10
A12 08
G10 04
H10 74
* SBV (16)
* PMV (2)
ATTACK 1-A
VIDEO CONTROL


(9) SHP VID
(1) *PLN VID
(1) PLN VID
(15) BLK
(12) XCG
(15) *BLK
(15) *SBV
(2) PLN FAL
(8) *SHN
(12) BIT CLK
(6) PBX COM
(12) SLC
(6) PBY COM
(10) SBX COM
(10) SBY COM
D12 00
B12 00
C12 02
C11 02
D12 00
A12 08
A13 96
B13 96
C13 96
D13 96
PU
*SHP HIT (7)
* PVB (5)(22)
* PGV (22)
*END SB (17)
*END PB (44)
PEVX (115)
PEVY (115)
SBVX (115)
*SLB (115)
SBVY (115)
ATTACK I-A
BULLET GENERATOR
16


(12) *VFC
(12) * SLC
(15) V SYC
(15) * V SYC
VCK 1 (9)
VCK 2 (15) (18)
VCK 3 (13) (19)
VCK 4 (3) (18)
VCK 5 (18) (2)
VCK 6 (5) (2)
191
191
PU
1 MEG R43
.047 C43
2 MEG R77 TIME ADJ.
+5V
330Ω R33
555 E13
.01 MF C53
C54
33MF
G12 00
H11 02
1 CLK (1) (3)
2 CLK (7) (4)
3 CLK (7) (4)
4 CLK (7) (4)
95 G11
E12 00
F12 04
R31 2.2K
33MF C41
3.3K R32
330 PF C42
R30 330Ω
* POR (1)
CLR SCR (14)
COIN I/O PIN 18
D2 IN4002
1.2K R50
220Ω R51
R49 1.2K
3.3K
Q3 2N2907A
33MF C50
330Ω R47
1.2K R29
* COIN CTH (2) (12) (8)
COIN CTH (2) (7) (12)
ANT I/O PIN 80
1 MEG R70
.01MF C52
1.2K R69
2N2222A Q9
ATTACK 1-A
COIN
17


(17) CON LTH
(17) VCK 5
(3)
(17) VCK 2
(3) *PLN SPD
(17) VCK-3
(11) *SME
(12) YC 3
(4) *PLN. BF
(7) *CHP BF
(12) YC7
(2) *PLN FAIL
(8) *SNK SHP
(17) VCK 4
K13 08
M13 02
D10 04
L13
C49 .22µf
C48 .1µF
8.2K
R46
R45
J13 00
J12 00
K13 08
M13
SND A
SND B
3.3K R53
3.3K R55
3.3K R56
2N3252 Q7
2N2222 Q6
MJE 170 Q8
250 Ω R52
470 Ω R54
+10V I/O PIN 1
I/O PIN 3
I/O PIN 2
3.2K R57
AUX AUD
I/O PIN 5
2N2222 Q4
D1 IN4148
6.2K R41
82K R42
82K R44
82K R43
.33µF C47
G13 LM324
R40
330Ω R39
+5V
2N2907 Q2
R38*
3.3K
C46 .33µF
2N 2222 Q1
82K R36
82K R37
G13 LM324
G12 00
ATTACK I-A
SOUND
18