GP

GRAND PRODUCTS INC.

301 / BULLSEYE

A PIN BALL CONVERSION KIT

INSTALLATION
&
INSTRUCTION
MANUAL

GRAND PRODUCTS, INC.

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301 BULLSEYE PINBALL CONVERSION KIT

The Bullseye 301 is a Grand Products conversion kit for a Bally standard solid state pinball with a standard cabinet and back box.

Before converting a Bally Pinball game check game for proper mechanical and electronic operation. Bally games with MPU Logic Boards 2518-35 and 2518-17 need a Prom and Jumper change with additional changes. Refer to MPU Board Modification Procedure Sheets.

301 BULLSEYE GAME PREPARATION

1. Remove the Bally playfield, back glass and vacuum inside cabinet.

2. Disconnect and remove Bally Sound Board and wires to Speaker (note earlier games have chimes).

3. Disconnect and remove Bally Auxiliary Lamp Driver Board AS2518-52 found only in later games.

4. Remove all old Proms from MPU Board in sockets U1 through U6.

5. Also, remove old Ball Shooter rubber and replace it with a new one.

6. Clean outside of cabinet and backbox thoroughly, paint it black. Also paint top 3 inches of inside of cabinet black. This will match the cabinet with your new 301 Bullseye playfield.

7. Apply decals to each side of game cabinet. Use standard method applying decals.

301 BULLSEYES ELECTRONIC PREPARATION

1. Mount Auxiliary Lamp Driver 0200-700 with 4 screws and spacers to lower left side of Back Box 3 inches from bottom.

2. Remove connector J4 from Lamp Driver Board AS-2518 and plug into connector J1 of 301 Bullseye Auxiliary Lamp Driver 020-701. (See figure #1)

3. Plug 6 inch adaptor cable from Auxiliary Lamp Driver Connector J4 to Lamp Driver Board connector J4. (See figure #1)

4. Insert the 20 inch single wire from Auxiliary Lamp Driver adaptor cable into pin 8 of connector J1 on MPU Board. (See figure #1)

5. Install Sound Module Board 0200-700 upper right side of back box 2½ inches from top using 4 screws.

6. When the game has a double throw on and off switch solder the 117 VAC Sound Module transformer two wire cable (long) directly to the on and off switch terminals using the control side terminals.

7. If the game has a single throw on and off switch remove the Power Module AS-2877-1 and solder jumper wires connector J2 from pin 3 to pin 6 and pin 4 to pin 7 on rear side of board.

   Also insert the two wire short cable from Sound Module Transformer (117VAC) into connector J2 pin 3 and 4 of Power Module (See figure #1).

8. Plug new sound cable from connector J1 Sound Module Board to connector J5 MPU Board. (See figure #1).

9. Next plug speaker cable into connector J3 Sound Module and Solder the other to speaker terminals (See figure #1).

10. If a speaker is needed use any 8 ohm speaker with a protective screen. Drill speaker opening in bottom of cabinet.

11. The Volume Control is located on the Sound Module Board. (See figure #1).

12. Insert the 301 Bullseye program Proms in position U2 and U6 MPU Board. Check for proper indexing and bent Prom pins.

FINAL GAME PREPARATION

1. Install new Playfield and connect cables. (See figure #1)
   NOTE A. When Power Transformer Assy. is in the Back box the Play field power cable uses an Extension cable with an 8 pin connector. This connector plugs into J1 of Power Transformer Assy.

   B. If the Power Transformer Assy. is in the bottom of the cabinet the Extension cable is not needed. Insert the Playfield Power cable 9 pin connector directly to the Power Transformer Assy. (See figure #1)

   C. When converting a multi level playfield game additional parts and instruction will be needed. This can be ordered when needed. Ask for Multi Level Playfield Kit Part number 900-000-000.

2. Now install your new 301 Bullseye back glass. Use plastic trim from old back glass and check display windows for alignment.
   NOTE A. Cover 4th and 7th display digit with black tape.

   B. Tape back glass display window when needed.

   C. Modify back box insert for Game-Over, Tilt and Hi-Score lights when needed.

3. Insert Playfield instruction and Replay cards.

4. Clean and replace Playfield glass.

5. Check out game electrically.
   A. Set MPU board settings and replay level settings. Refer to operating manual for recommended switch settings. (See figure I)

   B. Games starting with Fatham (1981) the tilt wiring must be altered to operate our 301 Bullseye game program.

   1. Unsolder the Red Green double wire from Ball Tilt Roll cage switch. (Tape and do not split wires).

   2. Add a new wire from Credit Reset Button Switch Red-Yellow on Coin Door to Ball Tilt Roll Cage (Removed wire)

BULLSEYE 301

FEATURE OPERATION AND SCORING

1. **BULLSEYE 301 SCORING FEATURE**
Bullseye 301 game can be played with increasing or decreasing scores.

Switch #6	Score increases or decreases
On:	Score increases from 0 to 301
Off:	Score decreases from 301 to 0

2. **"301 GAME" AND GRAND DART FEATURE**
A total of 19 "301 Game" can be won. Every time the score is increased or decreased to 301 by making targets, lower saucers or top saucer bullseye. Making top saucer when grand dart is flashing awards an instant "301" win.

3. **DOUBLE AND TRIPLE FEATURE**
Making the top left rollover 2X or 3X when flashing double or triple the value of the next number hit.

4. **BULLSEYE AND D-A-R-T FEATURE**
Making top saucer awards a bullseye which scores 50 points. Spelling D-A-R-T flashes saucer for "Grand Dart", which awards an instant "301" win.

5. **"301 GAME" EXTRA BALL**
Every time 2 "301 Game" are won, the inside lanes lights for extra ball. Making either lane awards an extra ball.

Switch	#30	#31	#32	Award Level
	OFF	OFF	OFF	2
	ON	OFF	OFF	3
	OFF	ON	OFF	4
	ON	ON	OFF	5
	OFF	OFF	ON	6
	ON	OFF	ON	7
	OFF	ON	ON	8
	ON	ON	ON	

6. **"301 GAME" SPECIALS**
Every time 5 "301 Game" are won, the outside lanes lights for special, making either lane awards a special. On the following "301 Games" won the "301 Game" special is awarded.

Switch	#27	#28	#29	Award Level
	OFF	OFF	OFF	5
	ON	OFF	OFF	6
	OFF	ON	OFF	7
	ON	ON	OFF	8
	OFF	OFF	ON	9
	ON	OFF	ON	10
	OFF	ON	ON	11
	ON	ON	ON	12

GAME ADJUSTMENTS

A. Playfield Panel Post Adjustments:

Post that control left outlane opening on panel can be removed to make access to outlanes easier or harder for ball to enter. See Figure II.

Easier entry will decrease playing time and scoring (conservative).
Harder entry will increase playing time and scoring (liberal).

B. Back Box Game Adjustments:

Each game has thirty-two switches located on A4, the MPU module, located in the back box, that allow play to be customized to the location. See Figure III. Credits per coin, maximum credits, credit display, balls per game, match feature, high game feature, special award and melody are selectable by means of the switches. The switches are contained in four-sixteen lead packages numbered S1-8, S9-16, S17-24, and S25-32 for easy identification. The "ON" position is marked on the assembly. **Turn off power before making adjustments.**

CREDITS/COIN ADJUSTMENTS

COIN CHUTE #1 (HINGE SIDE) OR #3	SWITCHES					CREDITS/COIN
	5 13	4 12	3 11	2 10	1 9	
	OFF	OFF	OFF	OFF	OFF	3/2 COINS**
	OFF	OFF	OFF	OFF	ON	3/2 COINS**
	OFF	OFF	OFF	ON	OFF	1/COIN
	OFF	OFF	OFF	ON	ON	1/2 COINS*
	OFF	OFF	ON	OFF	OFF	2/COIN
	OFF	OFF	ON	OFF	ON	2/2 COINS*
	OFF	OFF	ON	ON	OFF	3/COIN
	OFF	OFF	ON	ON	ON	3/2 COINS*
	OFF	ON	OFF	OFF	OFF	4/COIN
	OFF	ON	OFF	OFF	ON	4/2 COINS*
	OFF	ON	OFF	ON	OFF	5/COIN
	OFF	ON	OFF	ON	ON	5/2 COINS*
	OFF	ON	ON	OFF	OFF	6/COIN
	OFF	ON	ON	OFF	ON	6/2 COINS*
	OFF	ON	ON	ON	OFF	7/COIN
	OFF	ON	ON	ON	ON	7/2 COINS*
	ON	OFF	OFF	OFF	OFF	8/COIN
	ON	OFF	OFF	OFF	ON	8/2 COINS*
	ON	OFF	OFF	ON	OFF	9/COIN
	ON	OFF	OFF	ON	ON	9/2 COINS*
	ON	OFF	ON	OFF	OFF	10/COIN
	ON	OFF	ON	OFF	ON	10/2 COINS*
	ON	OFF	ON	ON	OFF	11/COIN
	ON	OFF	ON	ON	ON	11/2 COINS*
	ON	ON	OFF	OFF	OFF	12/COIN
	ON	ON	OFF	OFF	ON	12/2 COINS*
	ON	ON	OFF	ON	OFF	13/COIN
	ON	ON	OFF	ON	ON	13/2 COINS*
	ON	ON	ON	OFF	ON	14/COIN
	ON	ON	ON	OFF	ON	14/2 COINS*
	ON	ON	ON	ON	OFF	15/COIN
	ON	ON	ON	ON	ON	15/2 COINS

COIN CHUTE #2 CREDITS/COIN TABLE

S21	S22	S23	S24	CREDITS/COIN
OFF	OFF	OFF	OFF	1/1
OFF	OFF	OFF	ON	2/1
OFF	OFF	ON	OFF	3/1
OFF	OFF	ON	ON	4/1
OFF	ON	OFF	OFF	5/1
OFF	ON	OFF	ON	6/1
OFF	ON	ON	OFF	7/1
OFF	ON	ON	ON	8/1
ON	OFF	OFF	OFF	9/1
ON	OFF	OFF	ON	10/1
ON	OFF	ON	OFF	11/1
ON	OFF	ON	ON	12/1
ON	ON	OFF	OFF	13/1
ON	ON	OFF	ON	14/1
ON	ON	ON	OFF	15/1
ON	ON	ON	ON	16/1

BOOKKEEPING FUNCTIONS

The game is designed to help the operator perform certain accounting functions. The game can display the number of total plays and replays (free games). It can display the number of coins dropped down each coin chute. The bookkeeping functions are displayed on all player score displays simultaneously. An identification number 05 to 11 appears on the Match/Ball in Play window as follows:

05—	00 to —	40	= Current Credits
06—	00 to —999		= Total Plays (Paid & Free Games)
07—	00 to —999		= Total Replays (Free Games)
08—	00 to —999		= Total times 'High Score to Date' is beat
09—	00 to —999		= Coins Dropped thru Coin Chute #1
10—	00 to —999		= Coins Dropped thru Coin Chute #2
11—	00 to —999		= Coins Dropped thru Coin Chute #3

The game displays the first bookkeeping entry if the Self-Test switch (See Fig. III) on the inside of the front door is pressed nine times. Alternately push and release the Self-test button at one second intervals. The number 05 appears in the 'Match/Ball in Play' window. Current credits appear on the player score displays. Each additional press of the button causes the next entry to be displayed.

After the data in each bookkeeping register is recorded, it can be set to zero simply by pressing switch button S33, located on A4, the MPU module in the back box. (See Fig. III). Any or all registers can be cleared by alternating between the Self-Test button and the switch button on the MPU module. The operator is given this option as a possible convenience and can elect to use or not use it as his needs direct.

Pressing the button once more with the eleventh entry displayed causes the game to power-up and light the Game-Over light.

**If Coin Chute is not used in game, number displayed (if other than 00) on Player Score displays has no significance.

MAXIMUM CREDITS:

The maximum credits accepted by the machine limits the number of games that can be accumulated by coining, by winning replays or both. The maximum number of credits is selectable by means of switches 17 and 18. Four credit limits are available. Switch settings are listed below.

MAXIMUM CREDITS	SWITCHES 17	18
10	OF	OFF
20	OFF	ON
30	ON	OFF
40	ON	ON

BALLS PER GAME:

#BALLS/GAME	SWITCH 16
5	ON
3	OFF

MATCH FEATURE:

When the Match Feature is ON, a random number appears in the 'Match/Ball in Play' window and the word MATCH is illuminated. If the number matches the tens digit in a player's score, a free game is awarded. The Match feature creates an incentive to play.

MATCH	SWITCH 26
ON	ON
OFF	OFF

CREDIT DISPLAY:

CREDITS DISPLAYED	SWITCH 25
YES	ON
NO	OFF

HIGH GAME FEATURE:

The game is designed to award an Extra Ball or Free Game at each of the three score levels. See Front Door Game Adjustments.

AWARD	SWITCH 19	SWITCH 20
EXTRA BALL	OFF	OFF
REPLAY	ON	OFF
NO AWARD	ON	ON
NOVELTY	OFF	ON

HIGH GAME TO DATE FEATURE:

The game is designed to award free games as an option if high score to date is beat. Each time this happens, the winning score becomes the new high game score to beat. This score is displayed on all 4 player score displays at the end of each game as an incentive to play. Recommended setting is underlined.

HIGH GAME TO DATE FEATURE	SWITCH 15	SWITCH 14
No Award (Novelty)	OFF	OFF
One Credit	OFF	ON
Two Credits	ON	OFF
Three Credits	ON	ON

RECOMMENDATION ON 3/5 BALLS

Instruction, score cards and high game feature setting, to be used on Bullseye 301.

3 BALL		5 BALL	
REPLAYS		**REPLAYS**	
Instruction Card	200-800A	Instruction Card	200-800A
Score Card	200-800C	Score Card	200-800E
1 Replay for each 5 "301" win		1 Replay for each 8 "301" win	
1 Replay for each 7 "301" win		1 Replay for each 10 "301" win	

EXTRA BALL

Instruction Card	200-800F
Score Card	200-800E
1 Extra Ball at 5 "301" win	
1 Extra Ball at 7 "301" win	

REPLAYS	ADDITIONAL CARDS	
200-800J	200-800N	**EXTRA BALL**
200-800K	200-800O	200-800H
200-800L	200-800P	200-800I
200-800M		

Instruction Card, Novelty
200-800D

RECOMMENDED SETTINGS

Recommended Replay GAme Setting For

		3 Ball	5 Ball
Out/Return Lanes	SW. 7	ON	OFF
"301" Game" Special	Sw. 19	ON	ON
	Sw. 20	OFF	OFF
Out Lanes Special Award	Sw. 27	OFF	OFF
	Sw. 28	OFF	ON
	Sw. 29	OFF	OFF
Inside Lanes X-Ball Award	Sw. 30	OFF	OFF
	Sw. 31	OFF	ON
	Sw. 32	OFF	OFF

REPLAYS	3 BALL	5 BALL
Instruction Card	200-800A	200-800A
Score Card	200-800C	200-800E
Match	SW 21 ON	SW 21 ON
High Game To Date	SW 14 ON	SW 14 ON
	SW 15 ON	SW 14 ON
Major More	SW 25 OFF	SW 25 OFF
	SW 26 ON	SW 26 ON

X-BALL

	3 BALL	5 BALL
Instruction Card		200-800F
Score Card		200-800E
Major More		SW 25 ON
		SW 26 OFF
Match		SW 21
High Game To Date		SW. 14
	SW. 15	OFF

NOVELTY

NOVELTY	3 BALL	5 BALL
Instruction	200-800D	200-800E
Major More	SW. 22 OFF	SW. 22 OFF
	SW. 23 ON	SW. 23 ON
Match	SW. 22 OFF	SW. 21 OFF
High Game To Date	SW. 14 OFF	SW. 14 OFF
	SW. 15 OFF	SW. 15 OFF

SPECIAL REPLAY / X-BALL / NOVELTY MODES

Switches 19 and 20 give the operator flexibility to award a credit extra ball of 301 Game (Novelty) when a special is scored. A combination of extra ball, novelty can be obtained through the following switch settings.

SW. 19	SW. 20	
OFF	OFF	X-Ball = Ball, Special = Ball, Score = Ball
ON	OFF	X-Ball = Ball, Special = Credit, Score = Credit
OFF	ON	X-Ball = Softs, Special = Softs, Score = 100 Pts.
ON	ON	Same As Above

GAME FEATURE OPTION

Score 0 to 301 or 301 to 0 adjustment

Sw. 6 ON - Score 0 to 301
Sw. 6 OFF - Score 301 to 0

Out/Return Lanes Adjustment

Liberal	Sw. 7 ON	Both X-Ball and special lights on
Conservative	Sw. 7 OFF	One X-Ball and special light on.

"301 Game" Special Award Adjustment

Liberal   Sw. 19 & Sw. 20

	ON	OFF	Credit

Conservative: Off   Off   X-Ball

Outlanes Special Award Level Adjustment

Liberal:	Sw. 27	Sw. 28	Sw. 29	Award Level
	OFF	OFF	OFF	5
	ON	OFF	OFF	6
	OFF	ON	OFF	7
	ON	ON	OFF	8

CONSERVATIVE:	SW. 27	SW. 28	SW. 29	Award Level
	OFF	OFF	ON	9
	ON	OFF	ON	10
	OFF	ON	ON	11
	ON	ON	ON	12

Inside Lanes X-Ball Award Level Adjustment.

Liberal	Sw. 30	Sw. 31	Sw. 32	Award Level
	OFf	OFF	OFf	2
	ON	OFF	OFF	3
	OFF	ON	OFF	4
	ON	ON	OFF	5

CONSERVATIVE	Sw. 30	Sw. 31	Sw. 32	Award Level
	OFF	OFF	ON	6
	ON	OFF	ON	7
	OFF	ON	ON	8
	ON	ON	ON	9

MODIFICATION PROCEDURE FOR AS-2518-17

March 25, 1986

MICROPROCESSOR MOD'S

Board Revision - 17

- Cut out pin 4 of U18 — FIG #1 - removes VUA -Ø2-A12 from U6 & U2 Pin 18
- Short pins 4 & 5 of U18 — FIG #2 - connect A11 to U6 & U2 pin 18
- Cut trace below U11 — FIG # 2 - isolates A12 from U7 + U18 + U17
- Cut trace to U18 pin 15 — FIG #2 - isolates A9 line
- Cut trace to U1 pin 20 — CUT AS SHOWN IN FIG 2 isolates A12 to rom
- Connect U9 23 to U18 11 — FIG #2 A13 → old A12 line
- Connect U9 22 to U1 20 — FIG #2 A12 → old A10 line (Rom)
- Connect U9 20 to U2 21 — FIG #2 A11 → old A9 line (Rom)
- Connect E3 to E4 — FIG #1 A11 → Pin 20 U2
- Connect E6 to E7 — '' '' A9 → Pin 22 U2
- Connect E1 to E2 — '' '' A9 → Pin 22 U6
- Connect E8 to E10 — '' '' A11 → Pin 20 of U3 & U4
- Cut trace to U7 pin 10 — FIG #2 remove A9 line from U6 C50
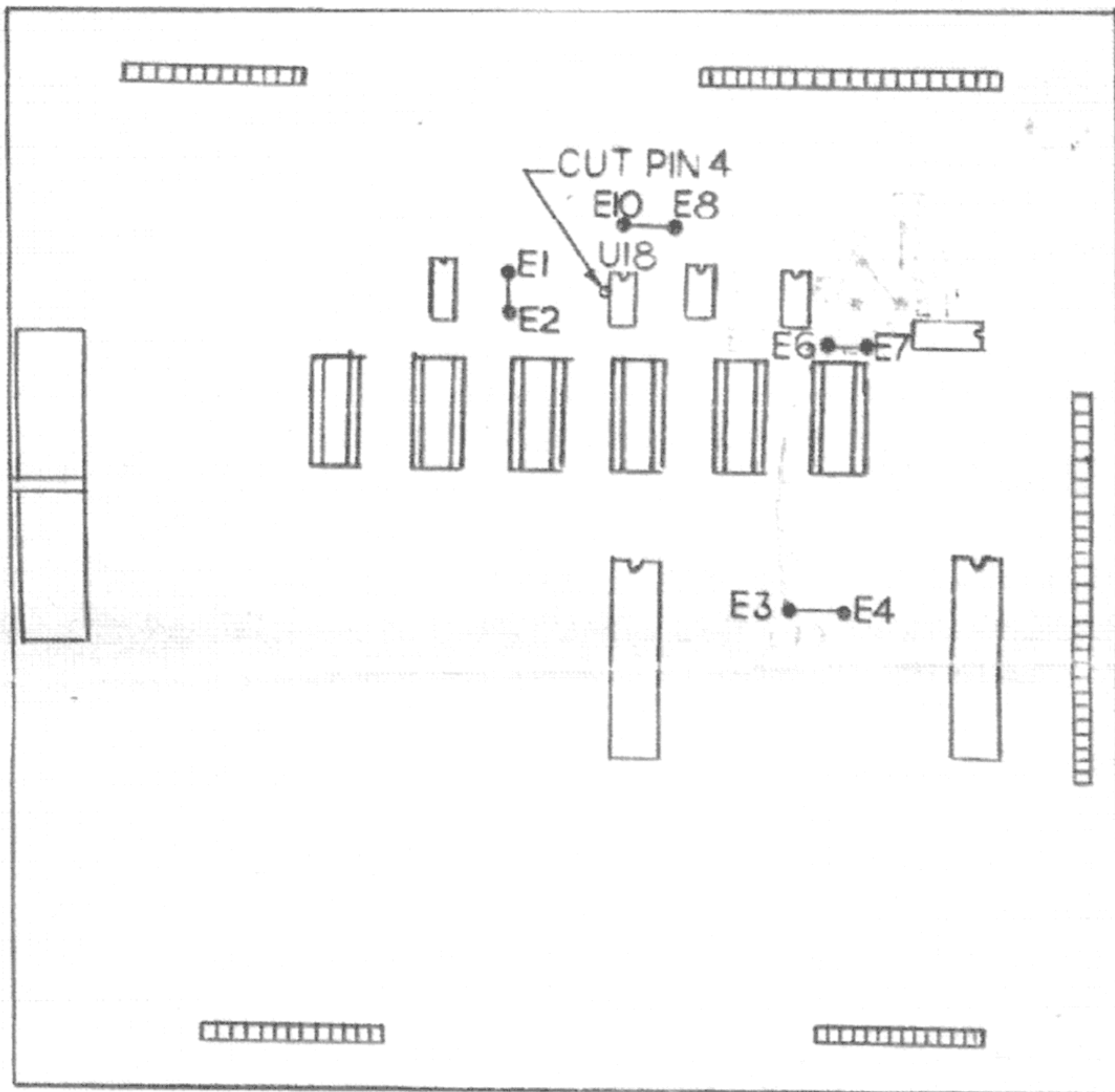- Connect U18 15 to U7 10 — FIG #2 connect A9 to U7 C50 (real)

BE CARE FULL !!!

6810 RAM $\overline{A9} + \overline{A10} + \overline{A11} + VMA \cdot \overline{\emptyset L} + \overline{A7} + \overline{A13}$
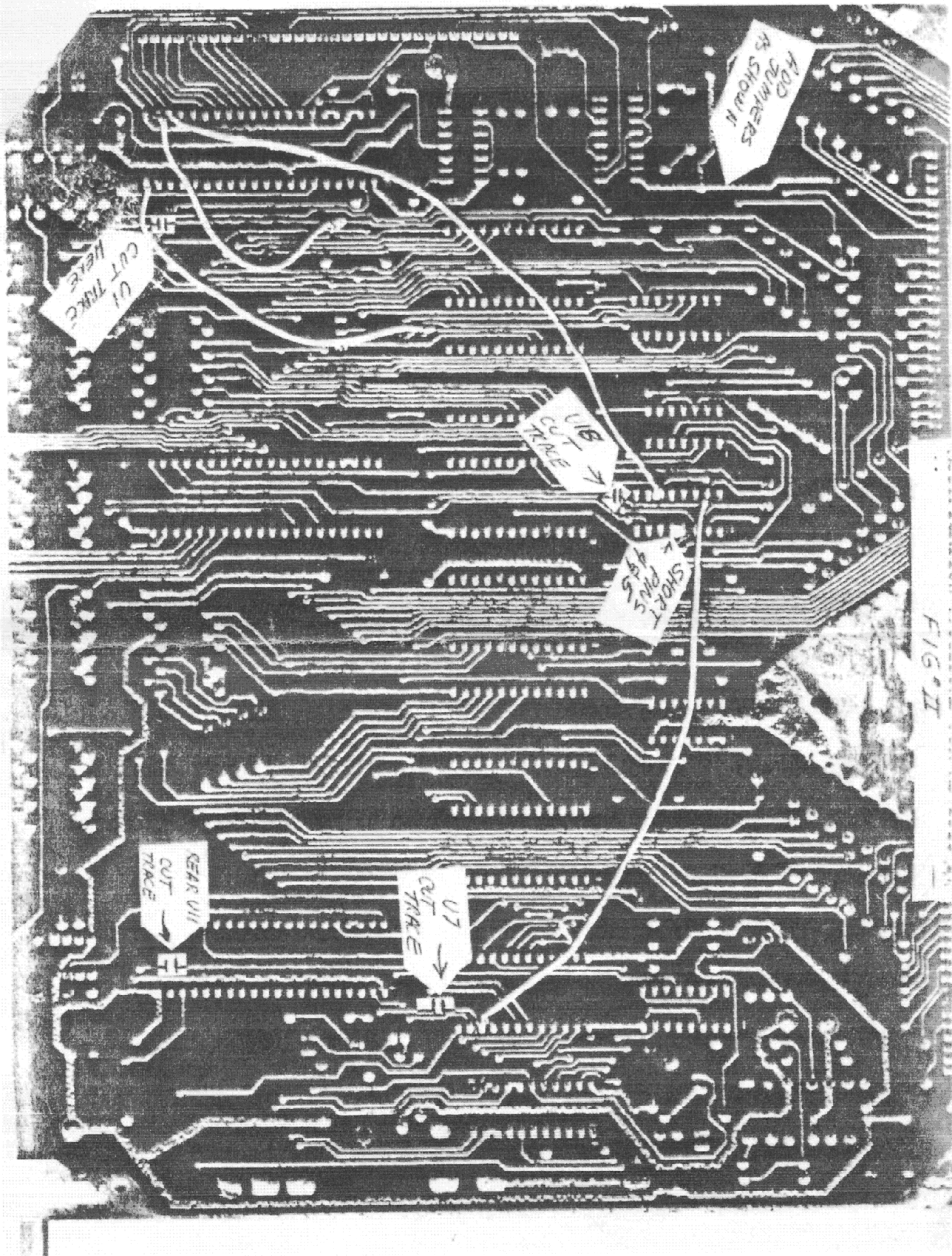
U6 - 7000 -7FFF
U2 -?

fluke

2000 -3FFF   E379

2000 -2FFF   F8EF

3000 -3FFF   2EB7

FIGURE I

CUT PIN 4

E10 E8

E1

U18

E2

E6 E7

E3 E4

MPU BOARD AS 2518-17

ADD JUMPERS AS SHOWN

U1 CUT TRACE HERE

U8 CUT TRACE

SHORT PINS 4&5

REAR U11 CUT TRACE

U7 CUT TRACE

FIG. 2

March 25, 1986

MICROPROCESSOR MOD'S

Board Revision -35

Cut trace below U11 (REAR)

Cut trace to U14 pin 3 (REAR

Cut trace to U5 pin 20

SEE
Fig #1

Connect U9 23 to U18 11 (REAR)

Connect U9 22 to U14 3 (REAR)

Connect E33 to E35

SEE
FIG #II

Connect E12 to E33

Connect E7 to E8

Connect E31 to E32

Connect E13 to E15
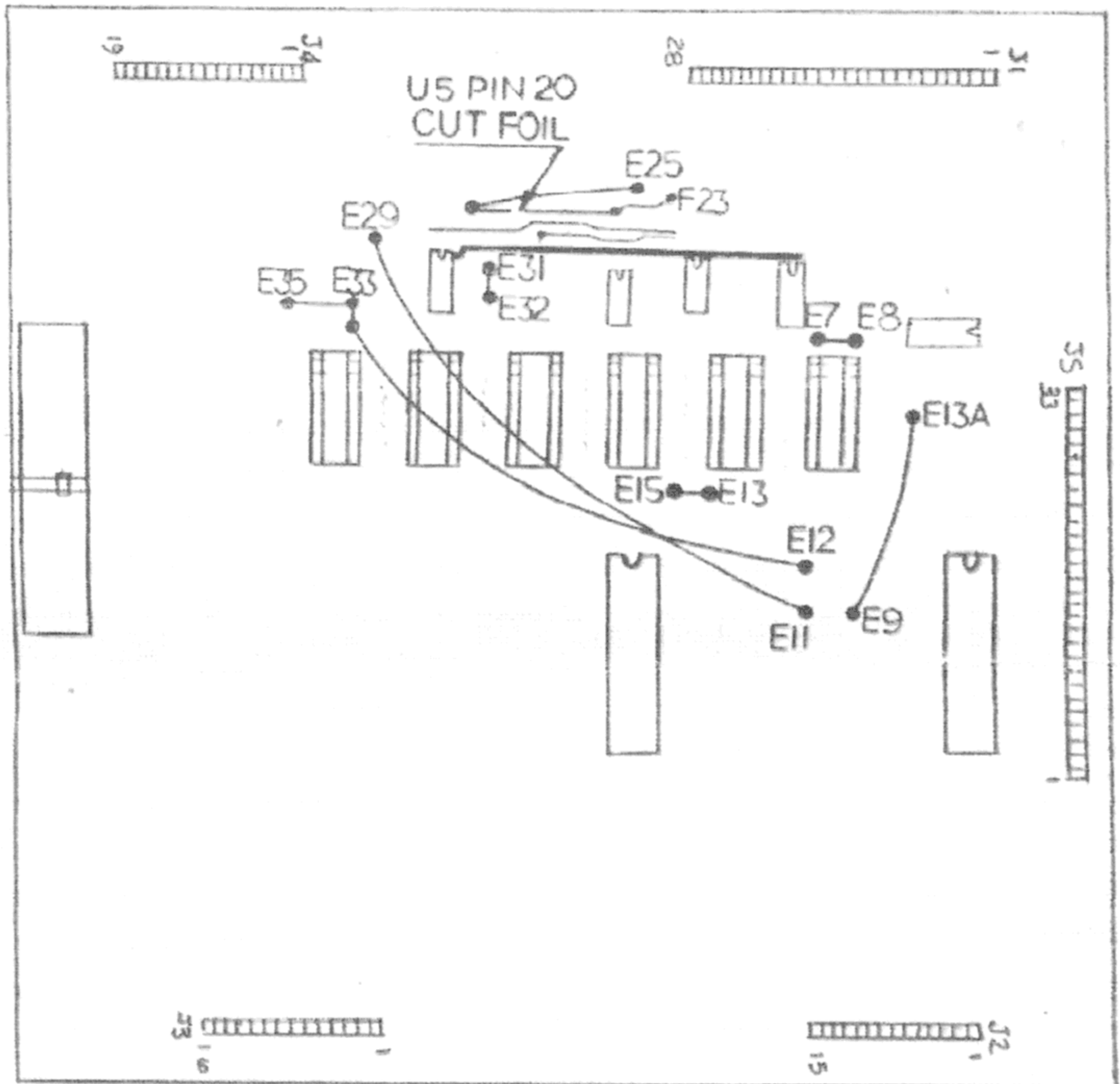
Connect E13A to E9

Connect E11 to E29

Connect E25 to U5 20 thru

SEE
Fig #1

feedthru hole

FIGURE I

U5 PIN 20
CUT FOIL

E25
F23
E29
E35 E33
E31
E32
E7 E8
E13A
E15 E13
E12
E11 E9

MPU BOARD AS2518-35

MODIFICATION PROCEDURE FOR AS-2518-35

FIG. #2

CUT TRACE U10

REAR U11 CUT TRACE

ADD JUMPERS AS SHOWN