

**STAR THE**  
**EMPIRE**  
**STRIKES BACK**  
**WAR**

## MANUAL : "THE EMPIRE STRIKES BACK"

### A. GENERAL GAME OPERATION

#### 1. Power-Up Sequence

When power is applied to the machine there is a short delay of approximately 10 seconds before the machine plays a "power-up" tune to announce that it is ready to play. During the power-up period the machine is performing six tests on its own hardware, the successful completion of each being signalled by a single flash of a LED on the M.P.U. module (A1) and a simultaneous tone from the sound system. After power-up the machine goes into attract mode waiting for a game to be played.

#### 2. Attract Mode

In this mode the four score windows display the player's score for the last game, alternating with the highest score to date. Some lamp flashing will occur on the playfield. As coins are inserted a "coin-in" tune will sound and the accumulated credit will be shown in the credit window.

#### 3. Game Start

A game is started by pressing the credit button located on the front end of the cabinet. The first player's score flashes '00', a '1' appears in the ball-in-play window, the credit display is reduced by one and a "player-up" tune is played. Additional players are posted each time the credit button is pressed. Up to four players can play at a time, each player's turn being indicated by the flashing of score display. The credit button has no effect after the fourth player has been added or the credit display reads '0'. Pressing the credit button after the first player has scored cancels the game and posts the first player for a new game.

When a game is started a background sound may be produced depending on game option switch 11.

The background sound will increase in pitch periodically while the ball is in play as long as scoring occurs.

#### 4. Game Scoring

Shooting the ball initiates play. Bumpers and spinners score 100 points or 1000 points when lit. Side kickers score 10 points. Rebound switches score 50 points. Outlanes score 5000 points.

- i) Outside return lanes - Scores 500 points plus 1 bonus advance or 5 000 points, 3 bonus advances and lights wedge for Planet Bespin eject hole when lit.
- ii) Inside return lanes - Scores 500 points plus 1 bonus advance or 5 000 points, 3 bonus advances and lights wedge for Planet Dagobah eject hole when lit.
- iii) Single drop target - Scores 500 points plus 1 bonus advance or 50 000 points when 50 000 points wedge is flashing.
- iv) Ball shooter lane - Resets single drop target, performs bonus countdown and then resets bonus to previous value. If single drop target is down and 50 000 points wedge is flashing ball shooter lane scores 50 000 points.
- v) Six central targets - Score 1 000 points.  
Completing all six targets for the first time lights two pop bumpers, both spinner targets and flashes the inserts of the inside ball return lanes.

Completing all six targets for the second time lights remaining pop bumpers and flashes the inserts of the outside ball return lanes.

- vi) Three drop targets - Score 500 points and 1 bonus advance.  
Completing all three drop targets -
  - for the first time scores 10 000 points
  - for the second time scores 15 000 points
  - for the third time scores 20 000 points
  - for the fourth time scores 25 000 points
  - for the fifth time and successive times score 25 000 points and special

Option switch 14 can be used to link fourth and fifth times together

- vii) Dagobah eject hole - Scores the value of the three drop targets. When lit performs bonus countdown and then resets bonus value to previous value.
- viii) Bespin eject hole - first time scores 10 000 points  
second time scores 20 000 points  
third time scores 30 000 points  
fourth time and successive times scores 50 000 points  
When Bespin wedge lit extra ball is scored.

ix) Top target - Scores 1 000 points plus 1 bonus advance or value of lit insert.

x) 4 top lanes - Scores 500 points plus 1 bonus advance.  
The player has control over the position of the 4 top lane lamps. By operating the right hand flipper the lit lamps will move to the right one position at a time. The lit lamp in top lane '4' will move to top lane '1'.

Completing all 4 top lanes for the first time lights the 2x multiplier and lights the 10 000 points insert for the top target.

Completing all 4 top lanes for the second time lights the 3x multiplier and lights the 20 000 points insert for the top target.

Completing all 4 top lanes for the third time lights the 4x multiplier and lights the 30 000 points insert for the top target.

Completing all 4 top lanes for the fourth time lights the 5x multiplier

Option switch 12 allows the status of the top lanes to be remembered throughout the player's game.

xi) Bonus - Once the maximum bonus of 39 000 points is achieved, no more bonus points can be accumulated. Bonus lamps score 1 000 points each. The value of the multiplier lit determines how many times the bonus is counted off. The bonus is collected when the ball enters the outhole.

Memory option exists for Bonus multiplier to be remembered throughout the player's game.

## 5. Outhole Sequence

After the ball returns to the outhole and there is only one player the "ball-in-play" number will advance by one. If there is more than one player, "ball-in-play" will remain the same and the next player's turn is indicated by the flashing score. However, if the ball enters the outhole without scoring it is returned to the same player for replay. The game continues until each player has played the allowable number of balls (adjustable). The "game-over" light will then be lit and an optional "game-over" tune will sound. A random "match" number appears and the match light is lit (optional). If the number is the same as the last two digits in the player's score, a free game is awarded.

6. Extra Balls

When a player wins an extra ball a unique tune is played and the "shoot-again" light on the playfield will flash during the play of the regular ball. Once this ball enters the outhole, the score display will flash to prompt the same player and the "ball-in-play" number will not advance.

7. Tilt

If the machine is tilted during play a tilt sound is made, all scoring will stop and the bumpers, flipper and kickers are disabled. Bonus points are not collected. The player only resumes control of the machine after the current ball enters the outhole.

8. Slam

Slamming the machine will result in a more severe penalty. The current game is cancelled, score displays and feature lights go out and the machine will remain "dead" for approximately 10 seconds. After this delay the "power-up" tune is played, the "game-over" light is lit and the machine returns to attract mode.

B. SELF TEST SEQUENCE

Self test can be entered at any time by pressing the push button on the inside of the front door. By pressing the button once the sequence is started with the test number 1. Subsequent tests are activated by re-pressing the button. For all except the first test, the self test number is displayed in the "ball-in-play" window. Tests 1 to 5 are routine maintenance checks. Tests 6 to 17 are bookkeeping functions, designed to help the operator perform certain accounting tasks.

1. Routine Maintenance Tests

Test 1 - Display Test : All five displays cycle 0 - 9 and repeat continuously.

Test 2 - Feature Lamp Test : All switched lamps flash on and off continuously.

Test 3 - Solenoid Test : All solenoids are activated one at a time in a continuous sequence. The flipper solenoids may be tested by holding both flipper buttons in during the test. Solenoid identification numbers are shown in the player score displays. Refer to Appendix 1 for a Solenoid Identification Chart.

Test 4 - Switch Test : The switch assembly is searched for stuck contacts. If any are found the identification number of the first set encountered is flashed on the player score displays. The number remains until the fault is cleared. Other numbers may follow if more stuck contacts are present. Once stuck switches are found "00" is displayed. Refer to Appendix 2 for a switch identification chart.

Test 5 - Sound Test : The 10 points sound is pulsed continuously.

## 2. Bookkeeping Functions

The bookkeeping functions are displayed in the all player score windows. The test number appears in the "ball-in-play" window.

Test 6 - First High Score Level : The game is designed to award a free game or extra ball (optional) at each of three score levels. Any desired level from 10 000 to 999 000 can be set. The level can be increased by 10 000 points at a time by holding in the credit button. It can be decreased by 1 000 points at a time by holding in the slam switch inside the coin door. The level can be reset to "00" by simultaneously operating the slam and coin door switches.

Test 10 - This test displays the total number of times the coin switches have operated with the coin door open. The number is normally not resettable.

Test 11 - This test displays the total coins through both chutes with the coin door closed. The number is normally not resettable.

Test 12 - Number of free games awarded with the coin door closed. This figure can be reset by simultaneously operating the slam and coin door switches.

Test 13 - Number of paid games with the coin door closed. This figure can be reset as for test 12.

Test 14 - Number of times the Highest Score to Date changes with the coin door closed. Can be reset as for test 12.

Test 15 - Number of extra balls awarded with the coin door closed. Can be reset as for test 12.

Test 16 - Number of tilts and slams with coin door closed. Can be reset as for test 12.

Test 17 - This test displays the percentage of free games to paid games awarded with the coin door closed. The percentage can be reset as for test 12. It should be noted that the number of free games and paid games displayed in tests 12 and 13 are not affected when the percentage is reset. The ratio is calculated using separate date areas.

Pressing the self test button once more while in test 17 causes the game to return to attract mode after performing the power-up sequence. For a more rapid return to attract mode, self test can be aborted at any stage by turning the power off, then on.

A self test time out feature is built into the machine so that it can never be left in any test mode. After about two minutes in any self test the game automatically resets by going through the power-up sequence. (For maximum flexibility, however, this time-out feature can be disabled by first switching power off, then setting switch 24 on the M.P.U. board, A1 to the OFF position).

C. GAME FEATURE ADJUSTMENTS

Each game has twenty four switches located on the M.P.U. board, A1, that allow play to be customised to the location. The switches are contained in 3 packages and numbered S1-S8, S9-S16 and S17-S24. Game adjustments must be made while the power is turned off.

Credits/Coin Adjustments : The credits/coin options are set by means of switches 1, 2 and 3. There are 8 different settings as shown below.

<u>Switches</u>			<u>Credits/Coin</u>
1	2	3	
OFF	OFF	OFF	1/1
ON	OFF	OFF	1/2
OFF	ON	OFF	1/3
ON	ON	OFF	1/4
OFF	OFF	ON	1/1, 3/2 *
ON	OFF	ON	1/2, 2/3 *
OFF	ON	ON	2/3, 4/5 * #
ON	ON	ON	2/5 #

\* Coin Counter reset at first score of each ball

# No credits until third coin dropped

# No credit until fifth coin dropped

High Score Award : At each of the three high score levels, the game can be programmed to give either an extra ball or a free game by setting switch 4.

<u>Switch 4</u>	<u>Award</u>
OFF	FREE GAME
ON	EXTRA BALL

Match Feature : With this feature on a random number appears in the "ball-in-play" window at game over. If this number matches the tens digit in the player's score, a free game is awarded. The feature is controlled by switch 5.

<u>Switch 5</u>	<u>Match Feature</u>
ON	ON
OFF	OFF

High Score to Date Award

<u>Switch</u>		<u>Award</u>
	<u>6</u> <u>7</u>	
OFF	OFF	NO AWARD
ON	OFF	1 FREE GAME
OFF	ON	2 FREE GAMES
ON	ON	3 FREE GAMES

Coin Alarm Sound

The alarm sound may be turned ON or OFF by switch 9.

<u>Switch 9</u>	<u>Alarm Sound</u>
OFF	DISABLED
ON	ENABLED

Background Sound Feature

A background sound may be produced during play depending on the setting of switch 11.

<u>Switch 11</u>	<u>Background Sound</u>
OFF	DISABLED
ON	ENABLED

Top Lane Memory

The lit lamps of the 4 top lanes may be remembered from ball to ball using option switch 12

<u>Switch 12</u>	<u>Top 4 Lane Memory</u>
OFF	DISABLED
ON	ENABLED



Multiplier Memory

Option switch 13 enables the 2x, 3x, 4x and 5x multiplier to be remembered throughout the player's game.

<u>Switch 13</u>	<u>Multiplier Memory</u>
OFF	DISABLED
ON	ENABLED

Bottom 3 Drop Target

25 000 point insert and special insert may be linked together by option switch 14.

<u>Switch 14</u>	<u>25000 point/special</u>
OFF	NOT LINKED
ON	LINKED

Coin Alarm

A coin alarm is available using switch 15. This sets a maximum time for coin travel through the coin chute. If this time is exceeded the credit is not incremented and an alarm sound can occur depending on the setting of switch 9. This fundion only operates with the coin door closed.

<u>Switch 15</u>	<u>Coin Alarm</u>
OFF	DISABLED
ON	ENABLED

Balls per Game

<u>Switch 16</u>	<u># Balls/Game</u>
OFF	3
ON	5

Maximum Credits

The limit on the number of games that can be accumulated by either inserting coins or winning free games is set by switches 17 and 18.

<u>Switch</u>		<u>Maximum Credits</u>
<u>17</u>	<u>18</u>	
OFF	OFF	5
ON	OFF	10
OFF	ON	15
ON	ON	20

- Note:
1. When lowering the credit limit any surplus credits are lost
  2. Coin counters operate regardless of maximum credit settings

Free Game Sound

<u>Switch 22</u>	<u>Sound When Free Game Awarded</u>
OFF	SPECIAL TUNE
ON	KNOCKER

Self-Test Time-Out Option

The machine can be set by switch 24 to automatically exit self-test after 2 minutes in any one test

<u>Switch 24</u>	<u>Time Out Feature</u>
OFF	DISABLED
ON	OPERATIVE

Note: Any unused switches should be turned OFF

APPENDIX 1

Solenoid Identification Chart for "The Empire Strikes Back"

The following chart may be used with self test number 3 to identify the solenoids of the game.

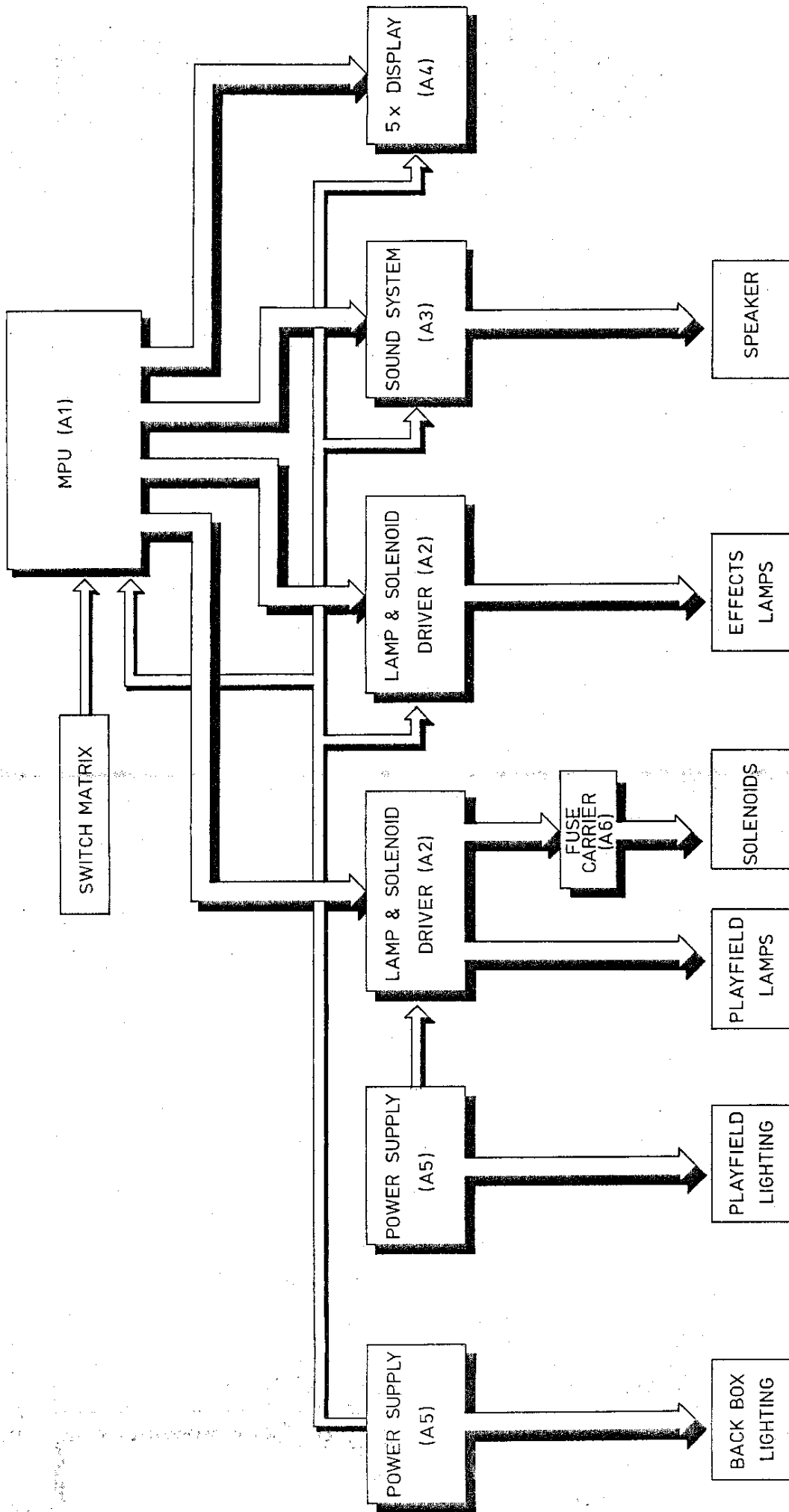
<u>Identification Number</u>	<u>Solenoid Description</u>
01	KNOCKER (if installed)
02	3 DROP TARGET
03	DAGOBAH EJECT HOLE
04	BESPIN EJECT HOLE
05	'1' DROP TARGET
06	RIGHT BOTTOM BUMPER
07	OUTHOLE KICKER
08	NOT USED
09	LEFT TOP BUMPER
10	RIGHT TOP BUMPER
11	LEFT BOTTOM BUMPER
12	RIGHT SLINGSHOT
13	NOT USED
14	LEFT SLINGSHOT
15	COIN LOCKOUT
16	FLIPPER ENABLE RELAY
17	

APPENDIX 2

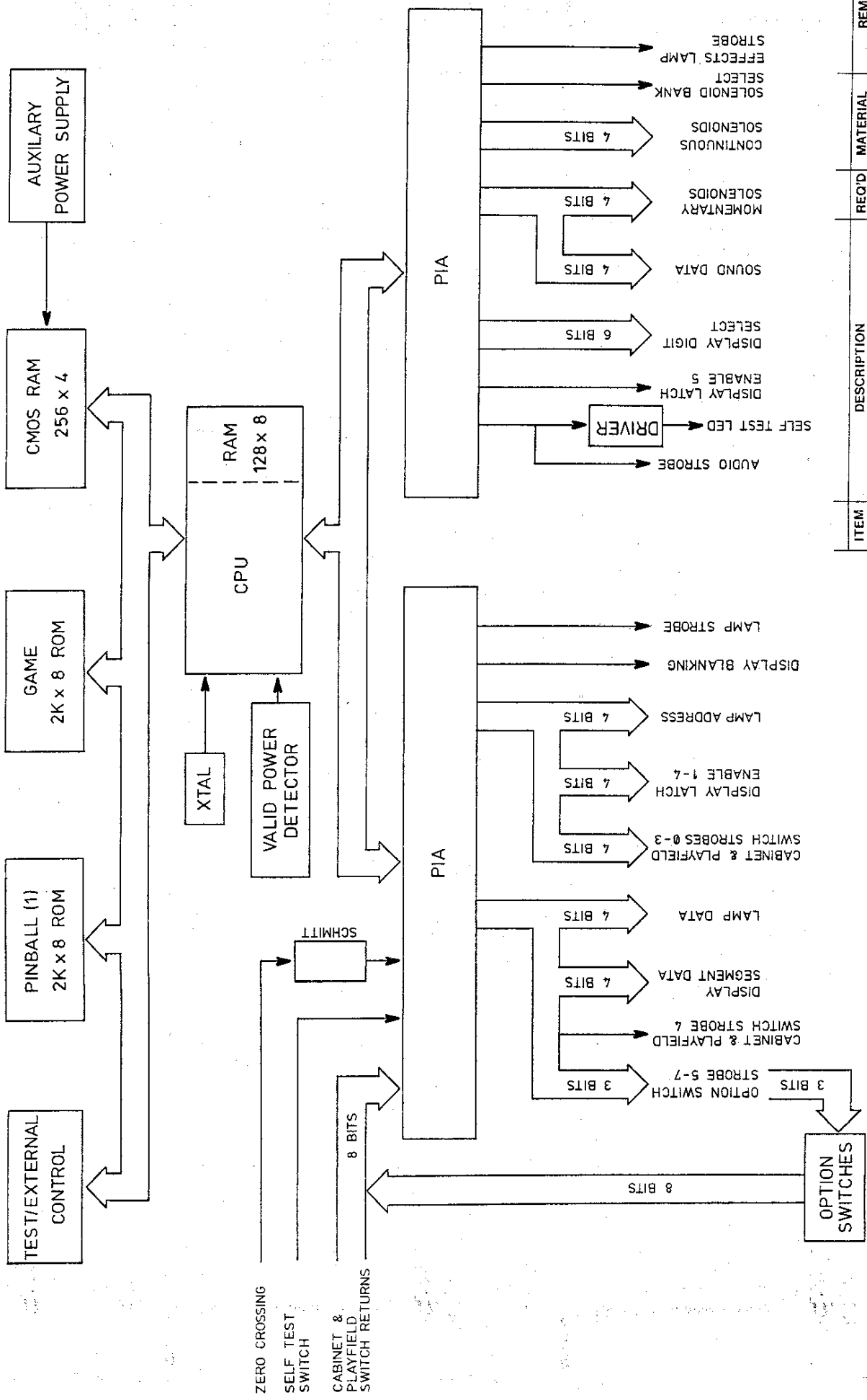
Switch Identification Chart for "The Empire Strikes Back"

The following chart may be used with self test number 4 to identify the switches of the game.

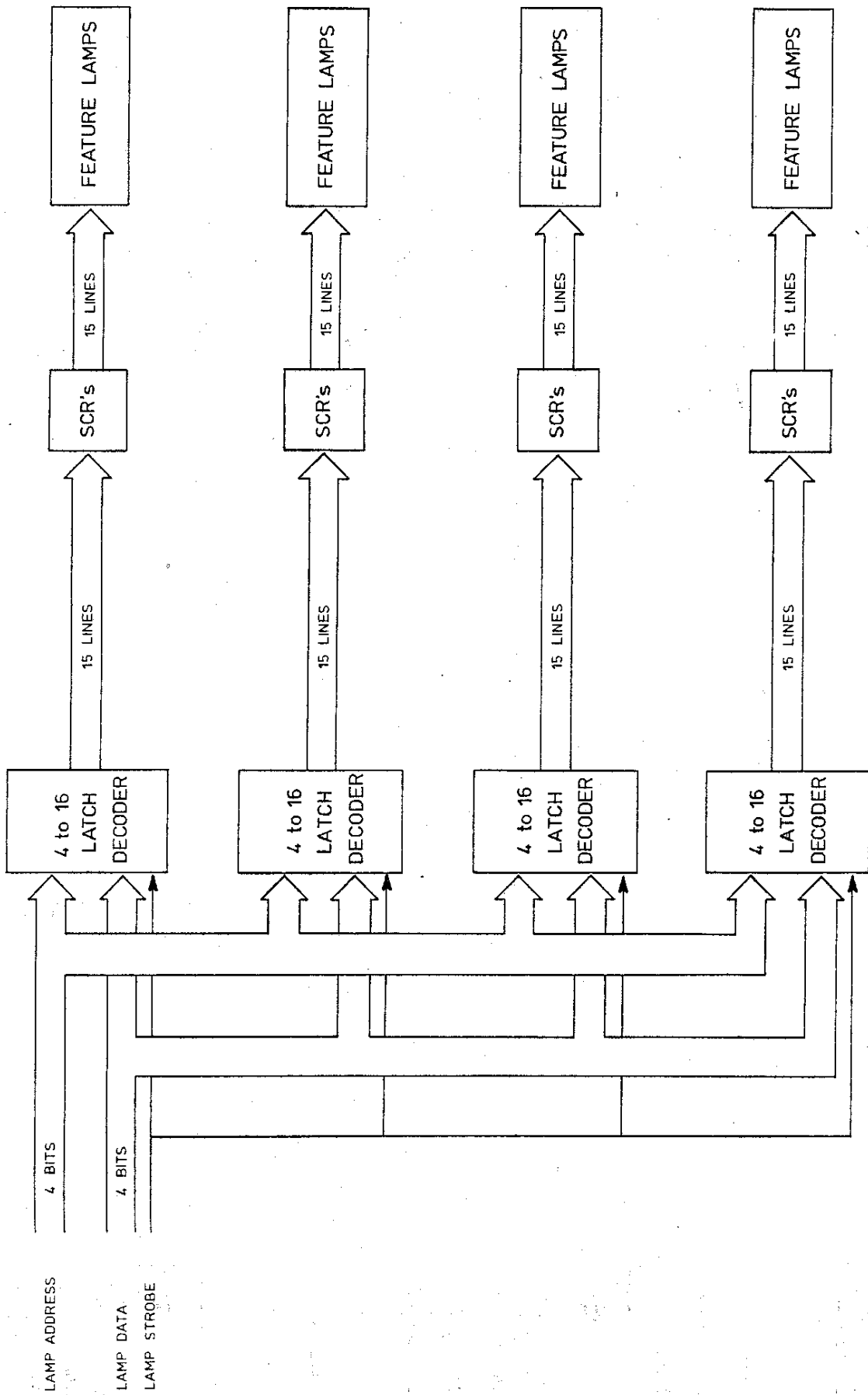
<u>Id. Number</u>	<u>Switch Description</u>
01	RIGHT FLIPPER
02	TILT
03	CREDIT
04	RIGHT OUTLANE
05	LEFT OUTLANE
06	RIGHT INSIDE RETURN LANE
07	RIGHT SPINNER
08	LEFT SPINNER
09	SLAM
10	COIN DOOR
11	TOP LANE 1
12	RIGHT OUTSIDE RETURN LANE
13	TOP LANE 2
14	TOP LANE 3
15	TOP LANE 4
16	COIN SWITCHES
17	LEFT INSIDE RETURN LANE
18	CENTRE TARGET
19	TARGET 1
20	TARGET 2
21	TARGET 3
22	TARGET 4
23	TARGET 5
24	TARGET 6
25	3 DROP TARGET 1
26	3 DROP TARGET 2
27	3 DROP TARGET 3
28	DROP TARGET 1
29	LEFT OUTSIDE RETURN LANE
30	BESPIN EJECT HOLE
31	REBOUND
32	DAGOBAN EJECT HOLE
33	TOP LEFT BUMPER
34	TOP RIGHT BUMPER
35	LEFT BOTTOM BUMPER
36	LEFT SLINGSHOT
37	RIGHT SLINGSHOT
38	RIGHT BOTTOM BUMPER
39	BALL SHOOTER LANE
40	OUTHOLE



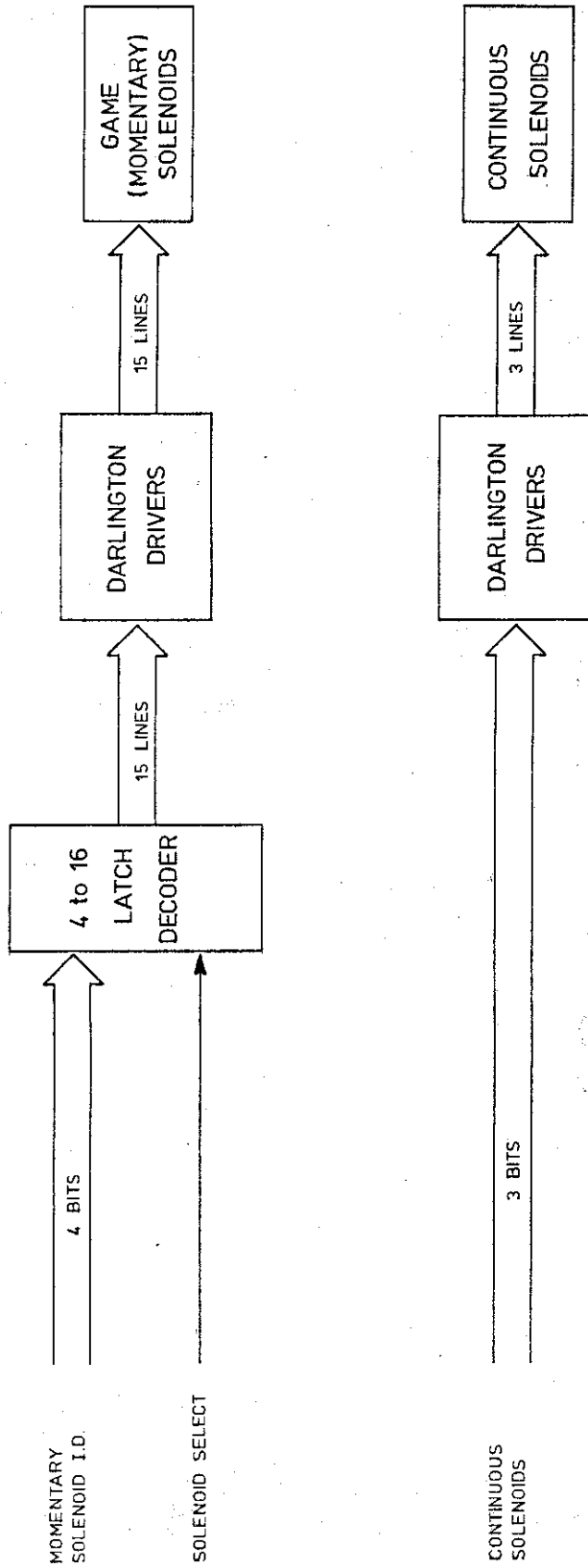
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STAR WARS SYSTEM ARCHITECTURE		DRAWN	G.T.	DRAWING NUMBER HD1114	
		TRACED	A.P.		
		CHECKED			



ITEM	DESCRIPTION	REMARKS	
		PASSED	DATE
	A. Hankin & Co. Pty. Ltd.		3/19/80
STAR WARS MPU BLOCK DIAGRAM		REQ'D	MATERIAL
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		DRAWN	G.T.
		TRACED	A.P.
		CHECKED	
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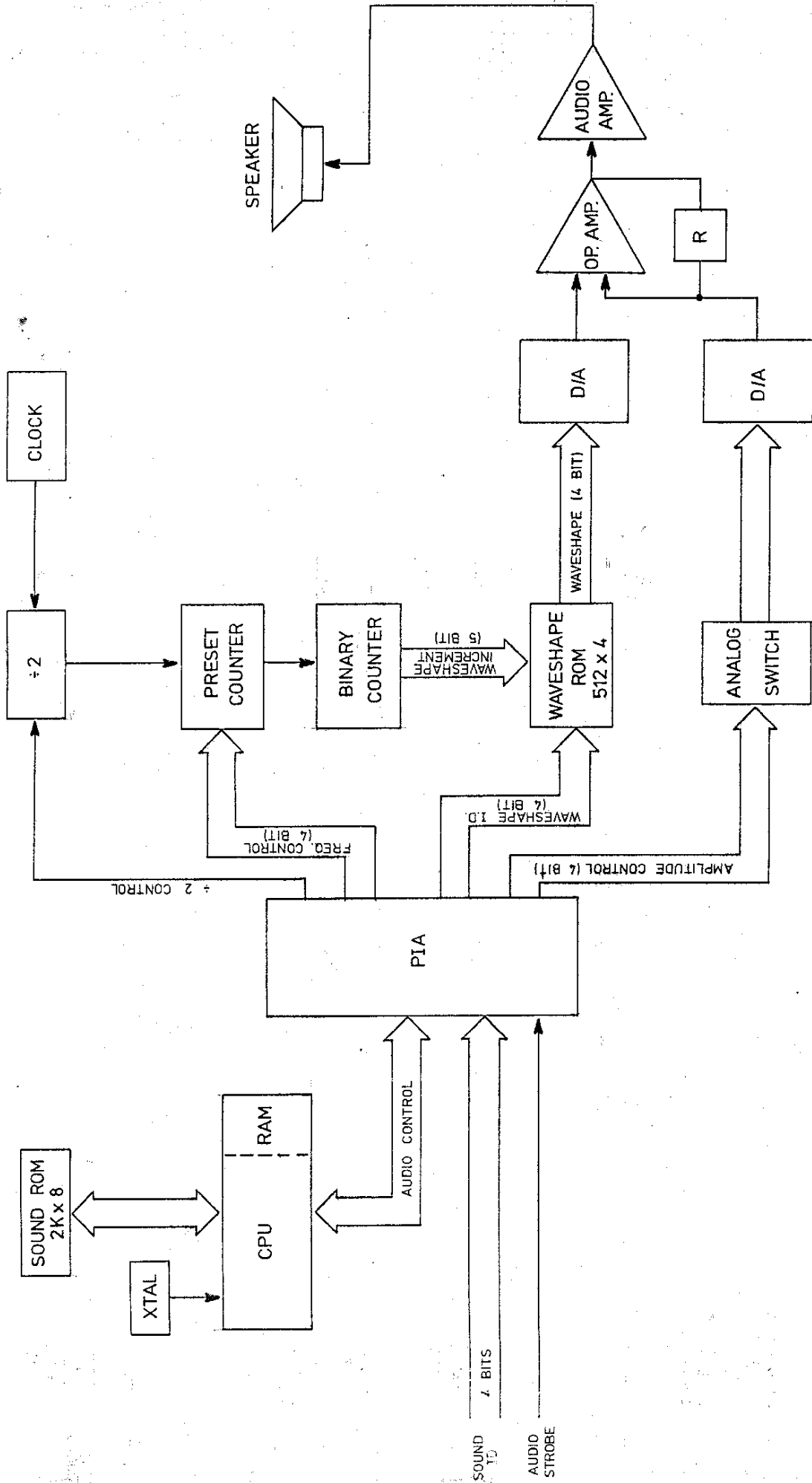


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LAMP DRIVER BLOCK DIAGRAM		DRAWN	PG.	DRAWING NUMBER HD1056	
		TRACED	A.P.		
		CHECKED			



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SOLENOID DRIVER BLOCK DIAGRAM		DRAWN	P.G.				
		TRACED	A.P.				
		CHECKED					
						DRAWING NUMBER	
						HD1055	



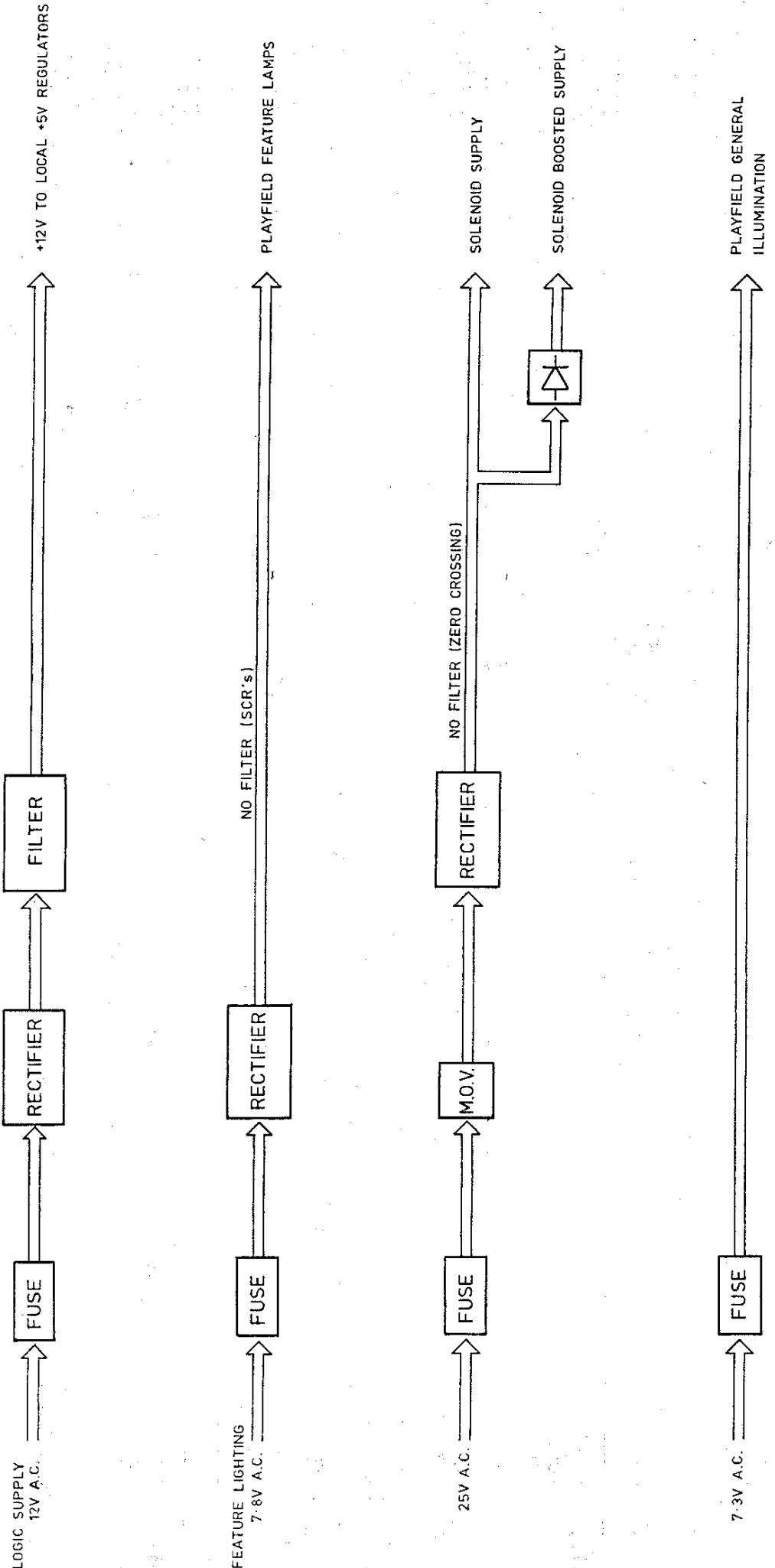


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				HD1054

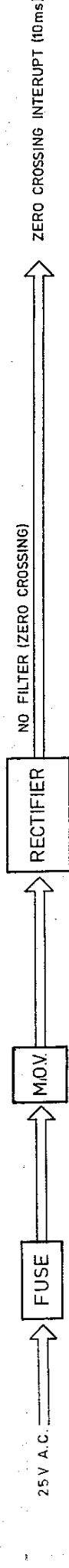
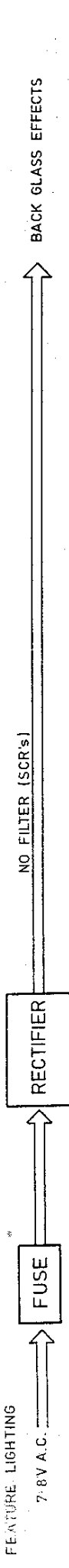
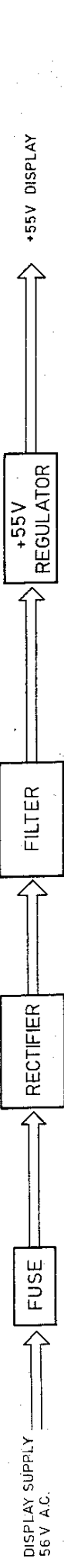
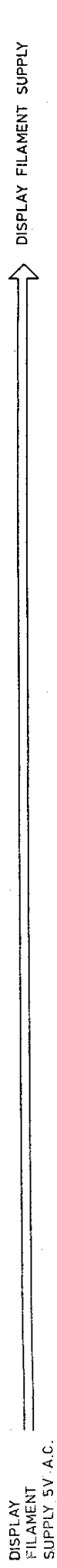
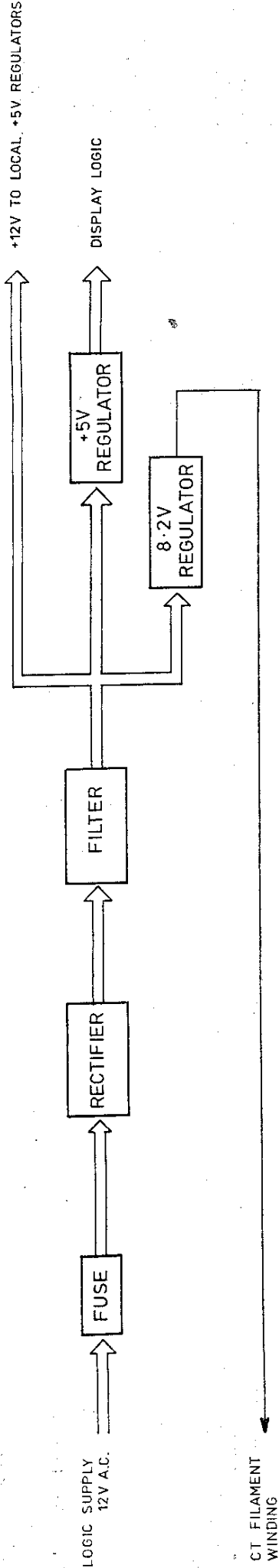
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DRAWN	P.G.	DRAWING NUMBER
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TRACED	A.P.	CHECKED



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		CHECKED		
				HD1112

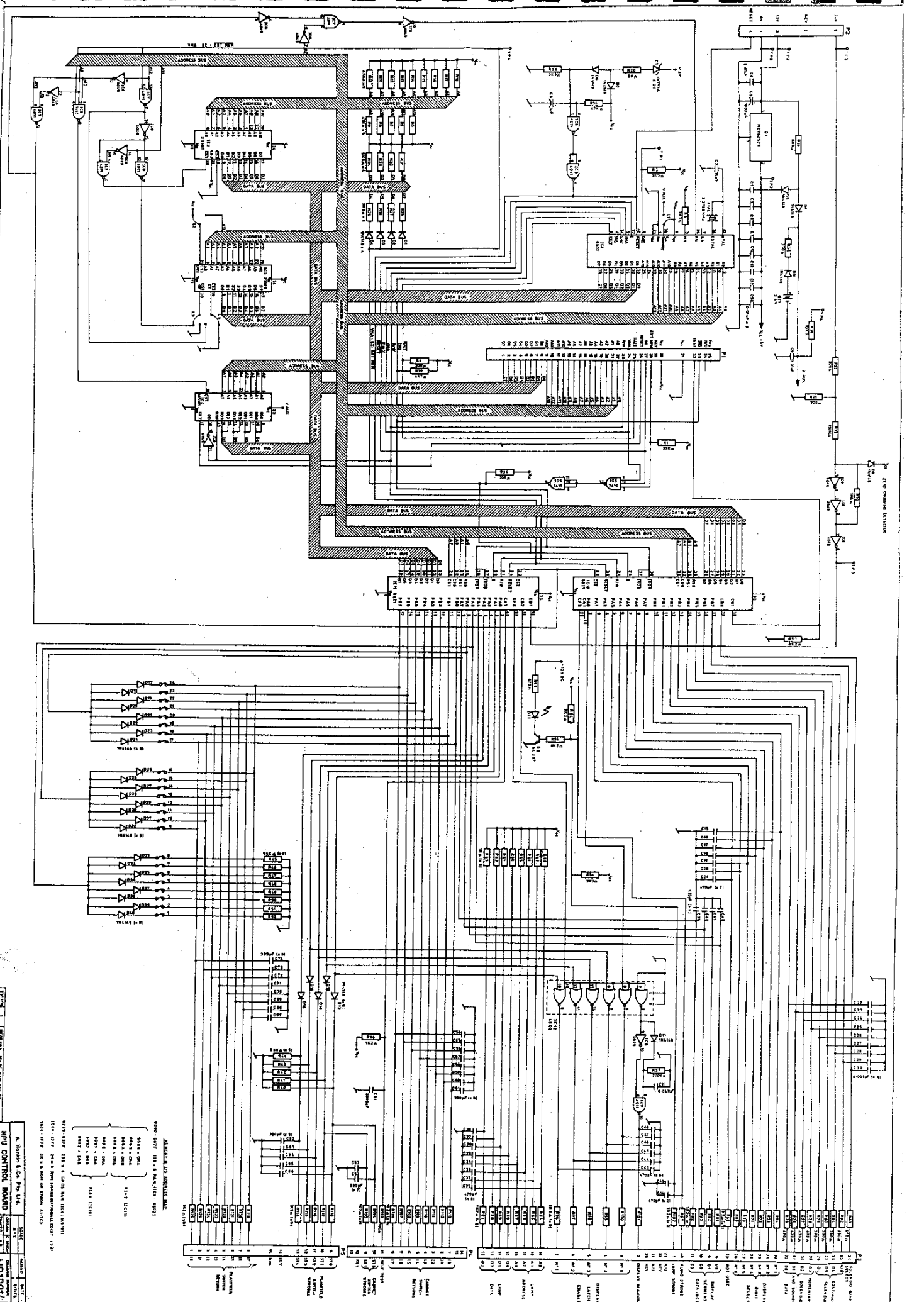


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		CHECKED		

HD 1111







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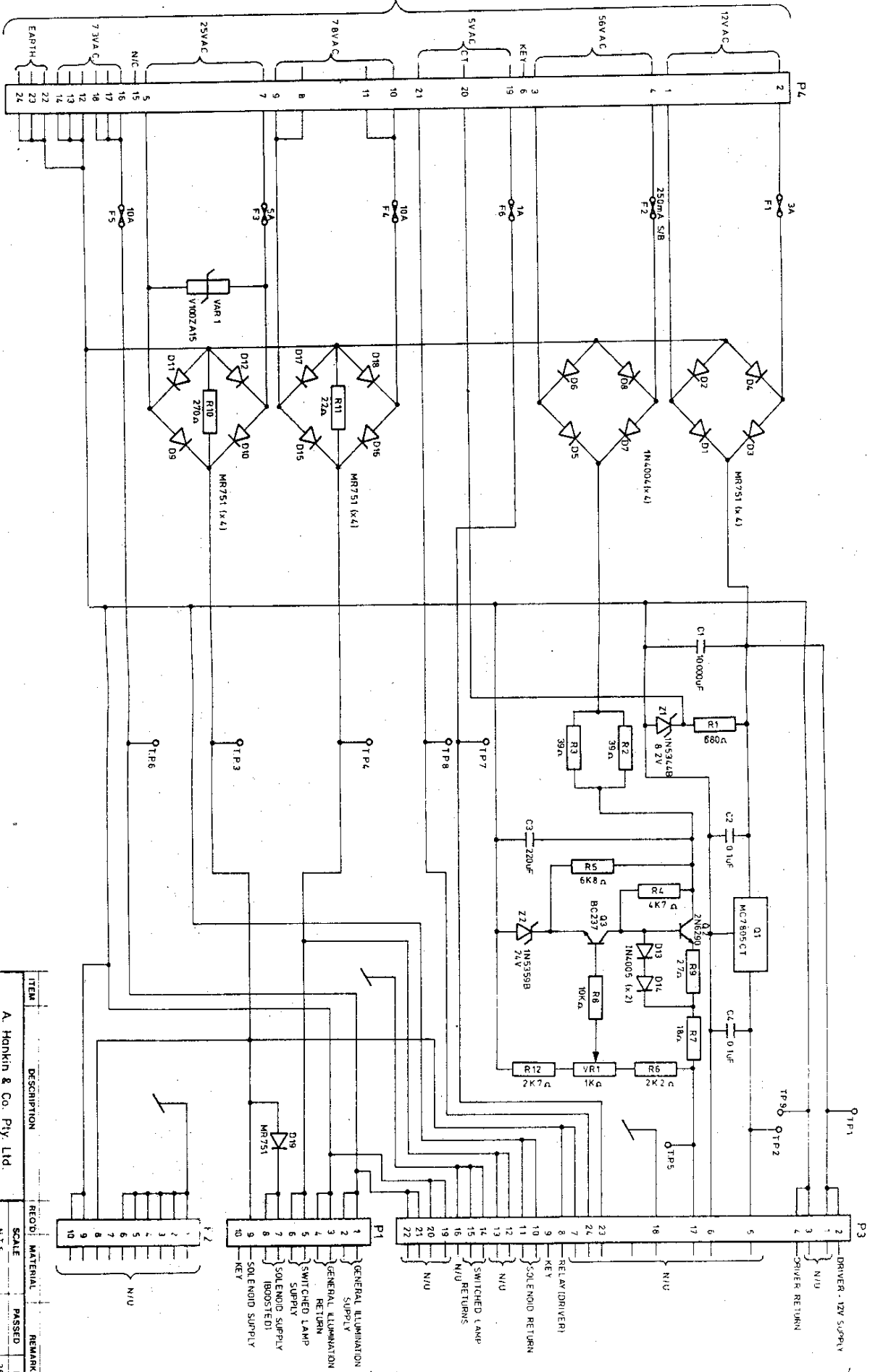
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 1000-0284  
 1000-0285  
 1000-0286  
 1000-0287  
 1000-0288  
 1000-0289  
 1000-0290  
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 1000-0292  
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 1000-0297  
 1000-0298  
 1000-0299  
 1000-0300

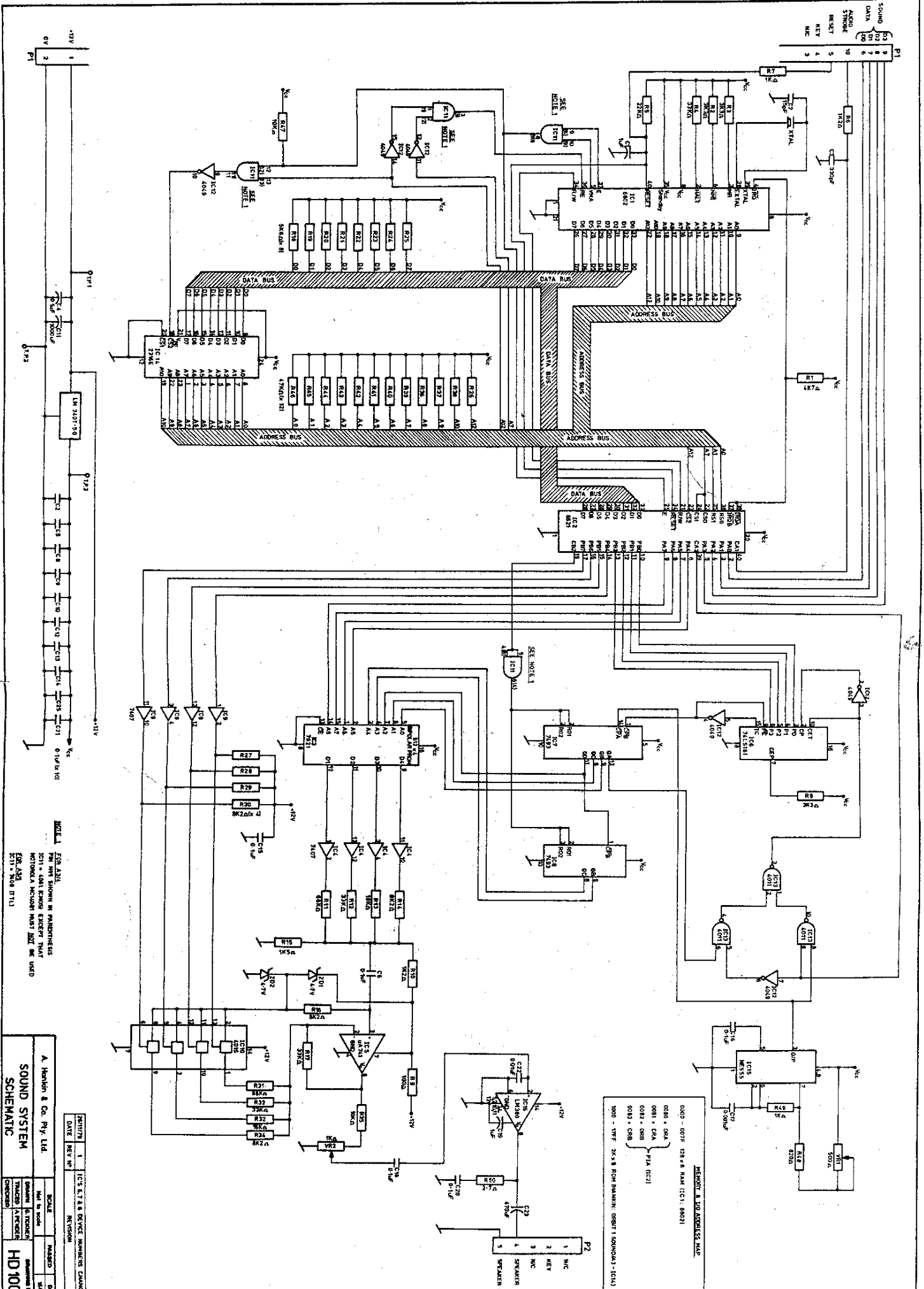
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 1000-0313  
 1000-0314  
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 1000-0318  
 1000-0319  
 1000-0320

FROM TRANSFORMER



ITEM	DESCRIPTION	RECD.	MATERIAL	REMARKS
	A. Hankin & Co. Pty. Ltd.			
	POWER SUPPLY AS			
	SCHEMATIC - CABINET			
	SCALE			
	DATE			
	DRAWN			
	CHECKED			
	DATE			

DRAWING NO. HD11055



NOTE 1 FOR A.M.I.  
PIN NUMBERS IN PARENTHESES  
DO NOT APPLY EXCEPT THAT  
MOTOROLA MICROCHIPS MUST BE USED  
FOR A.M.I.  
E.T.I. NO. 0111

MEMORIC 310 ADDRESS MAP  
0000 - 007F 128 x 8 RAM (IC1: 80021)  
0080 - 008A {  
008B - 008E } P.M.A. (IC2)  
008F - 009B  
009C - 009F }  
00A0 - 00FF 256 x 8 ROM (RAMIN: ORBIT 150000A3-101A1)

DATE	REV	BY	CHKD	DESCRIPTION
	1			IC'S 8, 7 & 8 DEVICE NUMBERS CHANGED

A. Hamilton & Co. Pty. Ltd.  
 SOUND SYSTEM  
 SCHEMATIC  
 HD 1001





