

# MAX RPM U.R. 2 PLAYER

*Bally*

MIDWAY MFG. CO.

10601 W Belmont Avenue  
Franklin Park, Illinois 60131  
U S A



Phone (312) 451-9200 Cable Address MIDCO Telex No 72-1596

0C75-00300-0000

**WARNING**

**THIS GAME MUST BE GROUNDED. FAILURE TO DO SO MAY RESULT IN DESTRUCTION TO ELECTRONIC COMPONENTS.**

**WARNING:** This equipment Generates, Uses and can Radiate Radio Frequency Energy and if not installed and used in accordance with the Instructions Manual, may cause interference to Radio Communications. As temporarily permitted by Regulation it has not been tested for compliance to Subpart J or Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference. Operation of this equipment in a Residential Area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

**ELECTRICAL BULLETIN:** FOR ALL APPARATUS COVERED BY THE CANADIAN STANDARDS ASSOCIATION (CSA) STANDARD C22.2 NO. 1, WHICH EMPLOYS A SUPPLY CORD TERMINATED WITH A POLARIZED 2-PRONG ATTACHMENT PLUG.

**CAUTION:** TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

**ATTENTION:** POUR PREVENIR CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR. UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

***Bally*/MIDWAY<sub>T.M.</sub>**

*Invites You To Use*

**OUR TOLL FREE NUMBER FOR  
SERVICE INFORMATION CONCERNING THIS GAME, OR ANY  
OTHER BALLY/MIDWAY™ GAME YOU NOW HAVE ON LOCATION.**

**CALL US FOR PROMPT, COURTEOUS  
ANSWERS TO YOUR PROBLEMS.**

**Video or Pinball - Continental U.S. 800-323-7182**

***Bally*/MIDWAY<sub>T.M.</sub>**

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## SECTION 1

### GAME DESCRIPTION, INSTALLATION AND GENERAL GAME OPERATION INSTRUCTIONS

#### MAX R.P.M. GAME DESCRIPTION

This game displays a simulation of a two car drag race.

The game can be played by one or two people. In a one player game, one car is controlled by the person operating the game, while the other is controlled by the game itself. In a two player game, each car is controlled by a person operating the game.

A person controls his car by means of a steering wheel, 4-speed gear shifter and an accelerator pedal. There are two full sets of these controls on the front side of the cabinet. To play a one player game, a person selects either the controls on the left or the controls on the right. To play a two player game, one person uses the set of controls on the left while the other person uses the set on the right.

The screen is split down the middle to create a separate and different field of vision for each player. Displayed on the screen in front of each player is: 1.) a rear view mirror; 2.) his/her car as seen from a trailing perspective; 3.) the road; 4.) a dash-board equipped with a tachometer, speedometer and shift and draft indicators for optimum performance.

There are several different environments in which the races take place. A suitable starting signal is used, in each environment, to begin the race. Some of the signals used include a girl waving, a traffic light and, of course, a light (Christmas) tree similar to those used in many professional drag races.

When the signal is given, the race is on. The person who controls his/her car more efficiently wins. Other elements also effect the outcome. Drafting which is the trailing car's ability to utilize the deflection of wind created by the lead car, allows the trailing player to gain speed and improve his/her position in the race. To draft, the player needs only to line up his/her car behind the lead car. Players also learn to avoid certain obstacles while utilizing others. When hit, cones, oil drums, bushes and other objects will slow a car down. The red nitrous oxide tanks, on the other hand, will give a player a significant boost in power.

Each race is timed and a player must beat the qualifying time to remain in the race. The GAME/OVER mode is entered individually for each player and occurs when a player fails to beat the qualifying time.

This game incorporates Bally Midway's JOIN THE ACTION feature.

JOIN THE ACTION - Each set of game controls includes a corresponding start button, which is activated independently. This allows a person, after inserting the proper coinage, to begin play at any time including while the other sets of game controls are in use.

## GENERAL INSTRUCTIONS

### FOR

### MAX RPM - 2 PLAYER - U. R.

#### INSTALLATION

1. Remove keys from the taped coin return slot and unlock to open the coin box door.
2. Remove four (4) "CABINET LEVELING LEGS" from inside the coin box.
3. Tip the cabinet to the side and remove the shipping cleats from its bottom.
  - Locate the threaded holes - one in each corner - and install the "CABINET LEVELING LEGS" in them.
  - Level the cabinet.
  - When finished, the cabinet should be stable in the upright position.
4. ◦ Unlock and remove the rear access door to gain access to the 3-pronged line cord. Reinstall the rear access door.
5. Connect the 3-pronged line cord to a 3-slot A.C. wall outlet **to insure proper grounding.**
6. The power ON/OFF switch is located:  
UPRIGHT MODEL:        On top to the right rear of the cabinet as you face the cabinet.

#### TO SERVICE THE STICK SHIFTER PANEL:

1. UPRIGHT MODEL:
  - **Turn the power to the game off.**
  - The stick shift panel is held in place by three (3) latch clamps which provide constant pressure on the strikes.
  - They can be reached through the coin door.
  - To release the clamps, lift up and toward the center of the panel.
  - Once they are released, unhook them from their strikes. The third clamp is located near the center of the stick shifter panel.
  - Disconnect the cabling from the panel.
  - The stick shift panel is now loose and may be removed.
  - To reinstall the stick shifter panel, reverse this procedure.

## TO SERVICE THE CONTROL PANEL

### 1. UPRIGHT MODEL:

**NOTE:** In order to do this, the stick shifter panel **MUST** be removed first. See the "UPRIGHT MODEL" procedure.

- Turn power to the game off and remove the stick shifter panel.
- The control panel is held in place by two (2) spring clamps which provide constant pressure on the strikes.
- With the stick shifter panel removed, the clamps can be reached through the opening between the display glass and the control panel.
- To release the clamps, lift up and toward the center of the control panel.
- Once they are released, unhook them from their strikes.
- Swing out the control panel on it's hinge.
- To remove the control panel:
  - With the control panel in it's open position, disconnect it from it's cabling.
  - Remove the screws which secure the continuous hinge to the cabinet.
  - The control panel is now loose and may be serviced.
  - To reinstall the control panel, reverse this procedure.

## REMOVAL OF THE MAIN-DISPLAY-GLASS

### 1. UPRIGHT MODEL:

**NOTE:** In order to do this, the stick shifter panel **MUST** be removed first. See the "UPRIGHT MODEL" procedure.

- Turn power to the game off and remove the stick shifter panel. This frees the main-display-glass so it can be removed.
- By putting your finger in the hole in the middle of the main-display-glass support, you can lift it up and out.
- To reinstall the main-display-glass, reverse this procedure.

## VOLUME CONTROL POT / OPTION SWITCH LOCATIONS

The volume control pot is located, along with the credit switch and the self-test switch, just inside the cabinet on the right side of the coin door frame. The option switch is located as shown in the attached Monoboard reference drawing. For adjustment, it can be reached through the games rear access door.

To make the sounds louder, turn the volume pot clockwise as you face it.

To make the sounds less loud, turn the volume pot counterclockwise as you face it.

## SELF-TEST MODE

The Self-Test mode is a special mode for checking the game switches and computer functions. It is the most complete way of checking for proper game operation and is quite easy to use.

The Self-Test mode may be entered at any time and from any mode of operation. Simply locate the black slide switch inside the Coin Box compartment and slide it to the Self-Test position. With this switch in the Self-Test position, activate the slam switch located on the Coin Door. The game will enter the Self-Test mode immediately and display the following test menu....

1. SELF DIAGNOSTICS
2. SOUNDS
3. PLAYER INPUT
4. GRID DISPLAY

TO POSITION CURSOR, PUSH "PLAYER 2" (RED CAR) BUTTON.  
TO EXECUTE TEST, PUSH "PLAYER 1" (BLUE CAR) BUTTON.

1. SELF DIAGNOSTICS: This test is designed to effectively locate and identify any malfunction of the on-board computer. When selected, the game enters this mode immediately and begins scanning the memory stored in rom and ram. If a defective component is found during the scan, that component and its location will be displayed on screen. It will take about 15 seconds to perform the entire test.
2. SOUNDS: When selected, this test will display a menu of sounds. The first two selections on the menu are ALL and EXIT. If you move the cursor to select ALL the game will automatically perform a test of all the sounds on the menu. If you move the cursor to select EXIT, the game will exit the sound test and return to the main menu page. While in the sound test, any selection on the sound menu may be tested individually by positioning the cursor next to that sound and pressing the SELECT button.
3. PLAYER INPUT: This test is designed to confirm the operation of all player inputs and devices in the game. For example, when you wish to test the coin switches on the coin door, you would enter this test and activate the coin switches. If the switches are operating properly, the screen will display the words COIN CHUTE 1 or COIN CHUTE 2 depending on which coin switch has been activated. All inputs, pin controls, service switches, etc. may be tested in the same manner. To exit this test, activate the coin door slam switch.
4. GRID DISPLAY: This test was designed to display a crosshatch pattern used in adjusting the color monitor. This pattern may be used to adjust convergence, color balance, vertical linearity, and vertical/horizontal size. To exit this test, activate the coin door slam switch.

**IMPORTANT NOTE: There is NO battery back up provided for this game. All logic & memory functions will be retained thru dip switch settings.**

MAX R.P.M. 2 PLYR U.R.

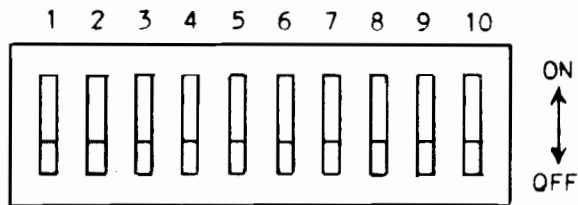
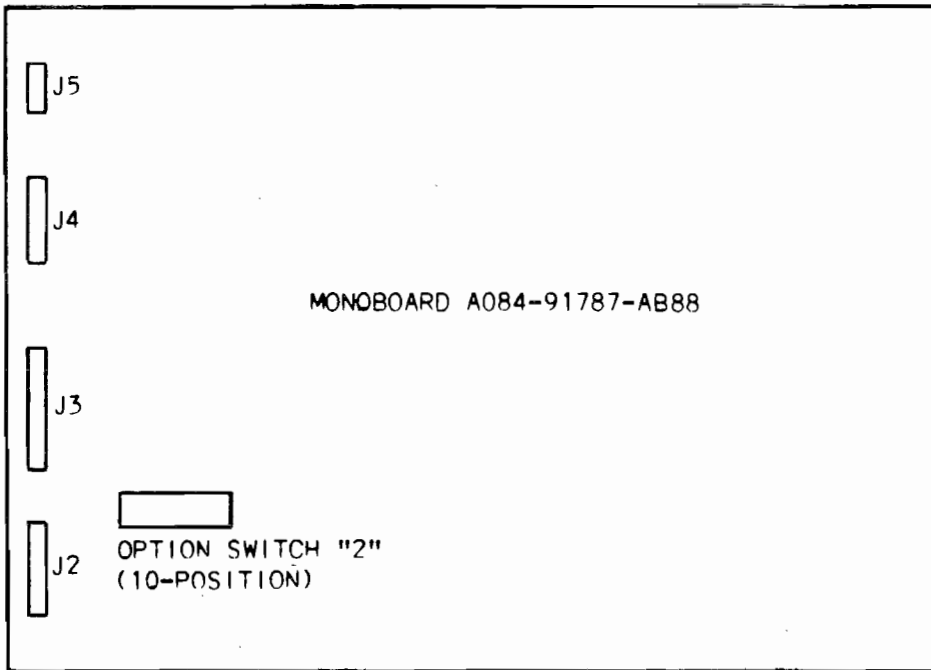
OPTION SWITCH SETTINGS

//////////////////////////////////SWITCH NO. 2 - AT A 13 - LOCATED ON MONOBOARD//////////////////////////////////

DURING GAME PLAY:	<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u> NOT USED	<u>SW#5</u> NOT USED	<u>SW#6</u> NOT USED	<u>SW#7</u> NOT USED	<u>SW#8</u> NOT USED	<u>SW#9</u> NOT USED	<u>SW#10</u> NOT USED
** NO FREE PLAY FREE PLAY	OFF ON									
** 1 COIN / 1 CREDIT 1 COIN / 2 CREDIT 2 COINS/ 1 CREDIT	OFF ON OFF	OFF OFF ON								
** NORMAL OPERATION FREEZE VIDEO										OFF ON
										PART NO. M051-00C75-A007

P.C. BOARD REFERENCE DRAWING

FOR MONOBOARD SYSTEM





## INTRODUCTION

This manual offers generalized troubleshooting procedures for common types of malfunctions which can be applied to most video games. We will not attempt to give you specific instructions for troubleshooting particular games because this would involve hundreds of pages of more repetitive instructions, differing only in the specific details of each game.

The most common problems occur in harness components such as the coin acceptor, player controls, interconnecting wiring, etc. These areas are covered in moderate detail.

The TV Monitor and Game Logic Printed Circuit Boards (PCB's) provide their fair share of problems too, but not to the extent of the harness and its component parts.

As you already know, the Game Logic PC Boards are complex devices. Each contains a great number of different interrelated circuits. The major changes which give each game its own particular individuality are accomplished in the EPROMS and other Integrated Circuit devices that are installed on each of these PC Boards.

## GENERAL TROUBLE SHOOTING SUGGESTIONS

The first step in troubleshooting is to correctly identify the malfunctions symptoms. This includes not only the circuits or features malfunctioning, but also those still operational. A carefully trained eye will pick up other clues to what's wrong as well. For instance, a game in which the computer functions fail completely just after money was collected may have a quarter shorting the PCB traces. Often an experienced troubleshooter will be able to spot the cause of a problem even before opening the cabinet.

After all the clues are carefully considered, the possible malfunctioning areas can be narrowed down to one or two good suspects. Those areas can be examined by a process of elimination until the cause of the malfunction is discovered.

## HARNESS COMPONENT TROUBLESHOOTING

Typical problems falling in this category are coin and credit problems, power problems, and failure of individual features.

**NO GAME CREDIT** -- For example, a prospective game player inserts a quarter or token and is not awarded a game. The first thing to check is whether or not the quarter or token is returned. If it was returned, the malfunction most certainly lies in the coin acceptor itself. First, use a set of test coins (both old and new) to ascertain that the player's coin is not undersize or underweight. If your test coins are also returned, coin acceptor servicing is indicated. Generally, the cause of this particular problem is a maladjusted magnet gate. Normally, this will mean slightly closing the magnet gate by turning the adjusting screw out a bit.

If the quarter or token is not returned and there is no game credit, the cause of the malfunction may be in one of several areas. First, try operating the coin return button; if the coin is returned, the problem is most likely in the magnet gate. Enlarge the gap according to the coin acceptor manufacturers service procedures. If this does not cure the problem, remove the coin acceptor, clean it, and perform the manufacturers suggested major adjustment procedure.

If the trapped coin is not returned when the wiper lever is actuated, you may have an acceptor jammed by a slug, gummed up with beer, a jammed coin chute, or mechanical failure of the acceptor mechanism. In this case, first check for the slug that will generally be trapped against the magnet. If a slug is found, simply remove it and test the acceptor. If the chute is blocked, remove the acceptor and remove the jammed coins. If there is actual failure of the acceptor, remove the unit and repair as indicated by the acceptor manufacturers service procedures.

If the coin is making its way through the acceptor (that is, falling into the coin box), yet there is still no game credit, you either have a mechanical failure of the coin switch or electrical failure of the coin and credit circuits. The first place to begin is by checking the coin switch. Most of these switches are the make/break variety of micro switch. They are checked for continuity between the "NO", "NC", and "C" terminals. When **not** actuated, the "NC" and "C" terminals should be continuous and the "NO" terminal open. When actuated, the "NO" and "C" terminals should be continuous and the "NC" terminal open. If the coin switch checks good, inspect the solder connections to the coin switch terminals to be sure there is good contact at this point. If necessary, use a continuity tester and check from the terminal lug on the switch to the associated PCB trace. This will tell you if there is a continuous line all the way to the credit circuit.

If the coin switch wires do check good, the problem is in one of the game logic boards -- most likely in the coin and credit circuitry.

If you do get a game credit when a coin is deposited, but the game will not start when the one or two player start button is pressed, there may be a problem in the start switch, the interconnecting wiring, or the game logic boards. First, check the switch. If the switch is OK, proceed to check the wiring. Again, make sure you go from the terminal lug on the switch to the PCB trace. This way, you will check the terminal contact as well as the PCB edge connector contact. If the wiring is continuous, proceed to check the PCB credit circuit. If not, check each section of the wiring, until the discontinuity is located. If the wiring is OK, the problem must lie in the games logic boards.

#### TRANSFORMER AND LINE VOLTAGE PROBLEMS

Your game **MUST** have the correct line voltage to operate properly. If the line voltage drops too low, one of the games logic circuits will disable the credit acceptance circuit. The point at which the games logic circuits will fail to function is approximately 105 volts AC.

Low line voltage may have many causes. Line voltage normally fluctuates a certain amount during the day as the total usage varies. Peak usage times occur mainly at dawn and/or dusk. So if your games problem seems to be related to the time of day, this may be a factor. A large load connected to the same line as the game (such as a large air conditioner or other device with an exceptionally large electric motor) may drop the line voltage significantly when starting up. This drop can result in an intermittent credit problem. In addition, poor connections in the location wiring, plug, or line cord may also cause a significant drop in power. Cold solder joints in the games harness, especially in areas like the transformer connections, interlock switch, or fuse block, may also produce the same results, although probably on a more permanent basis.

Sometimes location owners (especially in bars) replace light switches with dimmer rheostats, and the game is sometimes on the same line. Obviously, the voltage available to the game is going to drop dramatically when the dimmer is turned down.

In any case, the way to check for proper line voltage is with your VOM. Set the VOM to the 250 VAC scale and stick the probes into the wall outlet the game was connected to. If it's OK here, check the transformer primary connections. If you do not get 117 VAC, examine the solder joints on the transformer, fuse block, and interlock switch. If you do get 117 VAC, the problem must be either in the transformer, harness connections, or in the PCB power supply.

If you suspect the transformer, check its secondaries with the VOM set to the 50 VAC scale and correlate the readings with the legend on the side of the transformer. The transformer must also be correctly grounded, so check the ground potential as well, especially if there is a hum bar rolling up or down the Monitor screen.

**NO POWER, NO PICTURE** -- If the Monitor screen is completely dark, first look in back of the Monitor to see if the CRT filament is glowing. If it is, try adjusting the brightness control. If no luck here, put your ear near the Monitor and listen for the high-pitched B+ hum produced by the flyback transformer. If you get the hum but no picture, and you have tried adjusting the brightness, major Monitor servicing is indicated.

If the monitor seems completely dead, check the rest of the game to see if it has power. If it doesn't, go directly to the wall outlet and check there. If OK there, check the game fuse(s), interlock switch, and interconnecting wire lengths.

Sometimes it is difficult to tell if a slow-blow fuse has blown. If in doubt, check it using any of the VOM "R" scales.

**HARNESS PROBLEMS** -- Other harness problems include blowing fuses and malfunctioning controls. The repeating blown-fuse problem can sometimes be quite exasperating to solve. Short circuits have the tendency to occur in areas almost impossible to find. First, try inserting a new fuse as old fuses age and sometimes blow without cause. If the new fuse also blows, you definitely have a short.

The best way to approach this problem is by disconnecting devices that may be causing the problem, such as the TV Monitor, the various PCB's one at a time, and the isolation transformer. Disconnect the devices by FIRST turning the game off, disconnecting it from its wall outlet. Remove the blown fuse and connect your VOM across the terminals of the fuse block (this will save blowing a fuse each time you want to check the circuit). Set your VOM to one of its resistance scales. You should be reading a short. If not you probably have a part that only shorts out after it is heated up - we'll cover this in a minute. So, assuming you are reading a short on your VOM, disconnect the components from their cabling one at a time, checking the VOM after each one is disconnected. When the short disappears, you have just disconnected the bad component. If all components are disconnected and the short still remains, the problem is in the harness and only patient exploration will reveal its location. Carefully examine all the wiring, looking for terminals that may be touching, metal objects such as coins shorting the connections, or burned insulation. If necessary, use the VOM to check each suspected wire.

OK, now lets assume that you connected your VOM across the fuse block terminals as stated above and you did not read a short. This most likely means that you have a component somewhere in that game that **ONLY** goes bad **AFTER** it heats up. It checks good when its cold. In this case, turn the game off and disconnect **ALL** of its components. Install a known good fuse in the fuse block. And turn the game on. If the fuse does not blow after a few minutes, you know that it is not anything to do with the wire harness. (In this instance, it shouldn't be, actually. But it never hurts to check.) Next, turn the game off again and reconnect **ONE** component. Turn the game back on and wait a few minutes to see if the fuse blows. If it does not, turn the game off again and reconnect another single component.

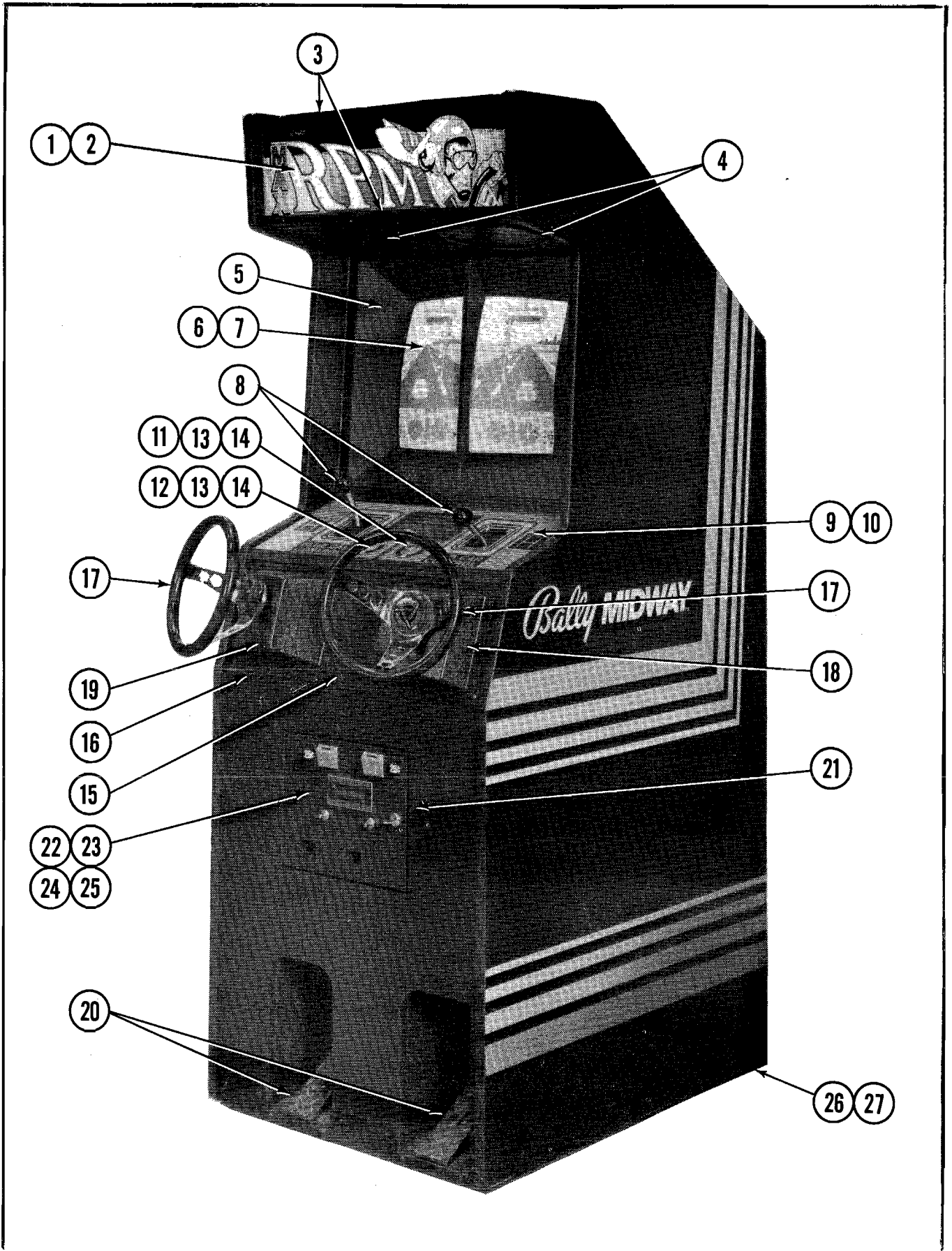
Turn the game back on and wait a few minutes to see if the fuse blows. Repeat this procedure until the fuse blows. When it does blow, the last component you connected has the part on it that is going bad after it warms up and is shorting out.

**MALFUNCTIONING CONTROLS** - - The most common problem here is the bad potentiometer (pot). Typically, a bad pot will cause the image on the screen to jump when it reaches a certain point. The only cure for this one is to install a new pot.

If a feature that is operated by a switch (for example, joysticks, foot pedals, control panel buttons) does not operate at all, check the switch with a VOM or continuity tester to verify its operation. If the switch does not check good, replace it. If the switch is OK, you should suspect the input to the switch from the PCB. In this case, get out the harness and logic schematics and check to see what kind of input is supposed to be at this switch. In many cases, the input will be +5 volts DC. If so, use the VOM to check its presence with the game turned on. Normally, the switch is used to pull a +5 volt DC line LOW to GROUND or to pull a LOW line HIGH. If the PCB output is missing, check the wire length from the PCB. If you find the signal at the PCB trace, the wire length or connection is at fault. If there is no signal at the PCB trace, begin exploring the PCB using the logic schematics and game manual.

SECTION 2  
ILLUSTRATED PARTS BREAKDOWN

MAX RPM U.R. - 2 PLAYER - FRONT



MAX RPM U.R. - 2 PLAYER - FRONT PARTS LIST

ORDER BY PART NUMBER ONLY

ITEM	PART NO.	DESCRIPTION
1	0C75-00900-00XF	HEADER GLASS: SCREENED
2	A595-00011-0000	HEADER FLUORESCENT LIGHT ASSY.
3	0574-00903-0400	HEADER RETAINING BRKT. (2 REQ'D.)
*	0017-00101-0138	#8 X 5/8 TORX TAMPER PROOF SCREW (10 REQ'D.)
*	0017-00009-0522	LONG ARM KEY T-20 (FOR ABOVE SCREW)
4	Q130-00002-0000	BLACK SPEAKER GRILLE W/SLOTS (2 REQ'D.)
*	0017-00003-0461	6" X 9" SPEAKER - 4 OHM, 15W (2 REQ'D.) (NOT SHOWN)
5	AC75-00021-0000	MONITOR MASK ASSEMBLY
	0C75-00906-0100	MASK (PAPER)
	0C75-00906-0200	DIVIDER (PAPER)
6	0C75-00901-00XF	MAIN VIEWING GLASS
7	0017-00003-0465	WELLS-GARDNER-19" COLOR DUAL SYNCH HORIZONTAL MTG. MONITOR
	AC75-00022-0000	SHIFTER PANEL ASSY. (INCLUDES ITEMS 8 THRU 14)
8	AC75-00024-0000	GEAR SHIFTER ASSY. (2 REQ'D.)
9	AC75-00010-00XF	SHIFTER PANEL - WELD ASSY.
10	0C75-00907-0000	OVERLAY: SHIFTER PANEL
11	0017-00042-0256	BUTTON: PUSH: ROUND: RED
12	0017-00042-0262	BUTTON: PUSH: ROUND: BLUE
13	0017-00032-0093	PUSHBUTTON SWITCH W/HOLDER, WHITE (2 REQ'D.) (NOT SHOWN)
14	0017-00003-0054	5/8 X 11 PAL NUT (2 REQ'D.) (NOT SHOWN)
	0C75-00004-0000	CONTROL SHELF ASSY. (INCLUDES ITEMS 15 THRU 19)
*		NOT PART OF ABOVE ASSEMBLY & MUST BE ORDERED SEPARATELY

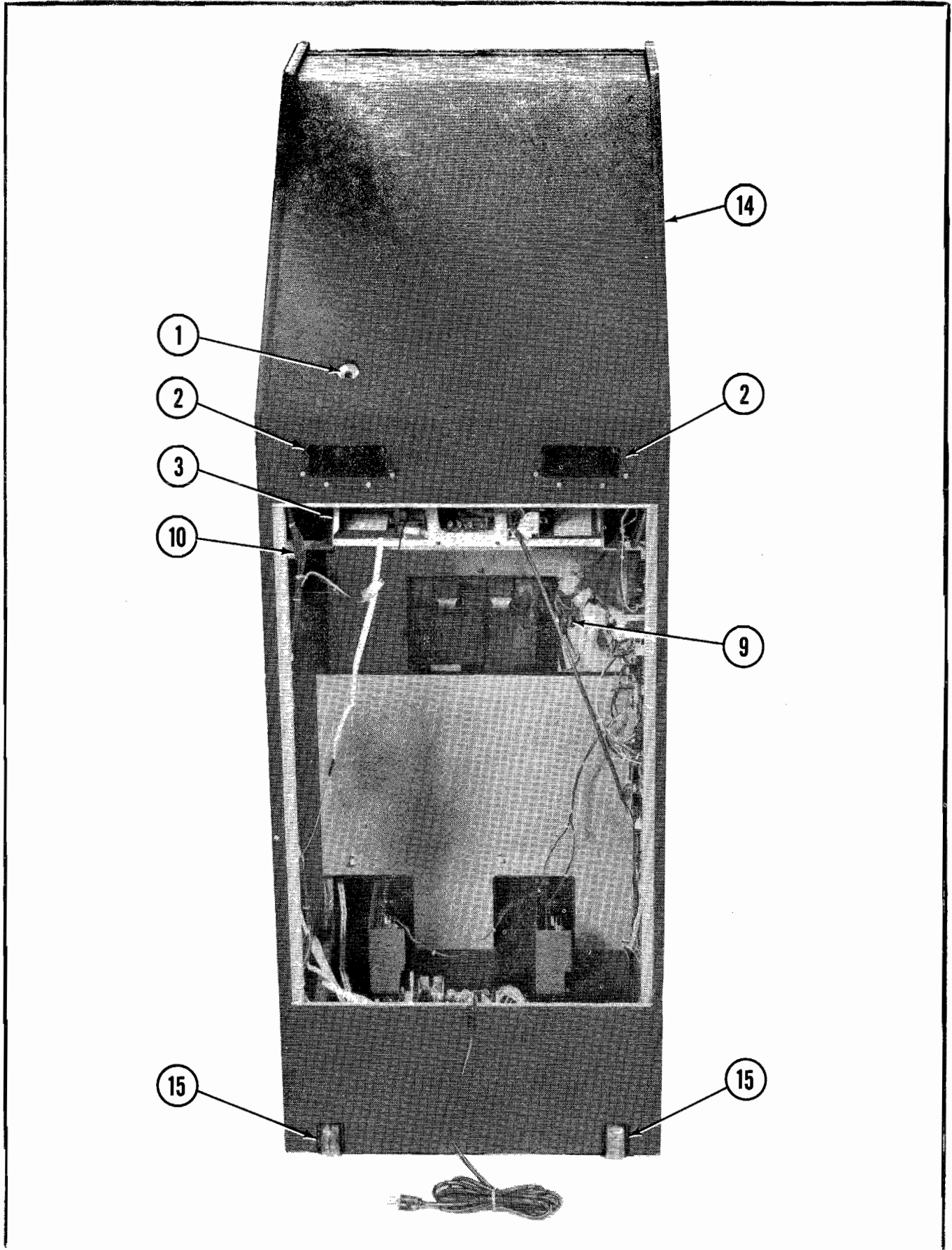
MAX RPM U.R. - 2 PLAYER - FRONT PARTS LIST, CONT'D.

ORDER BY PART NUMBER ONLY

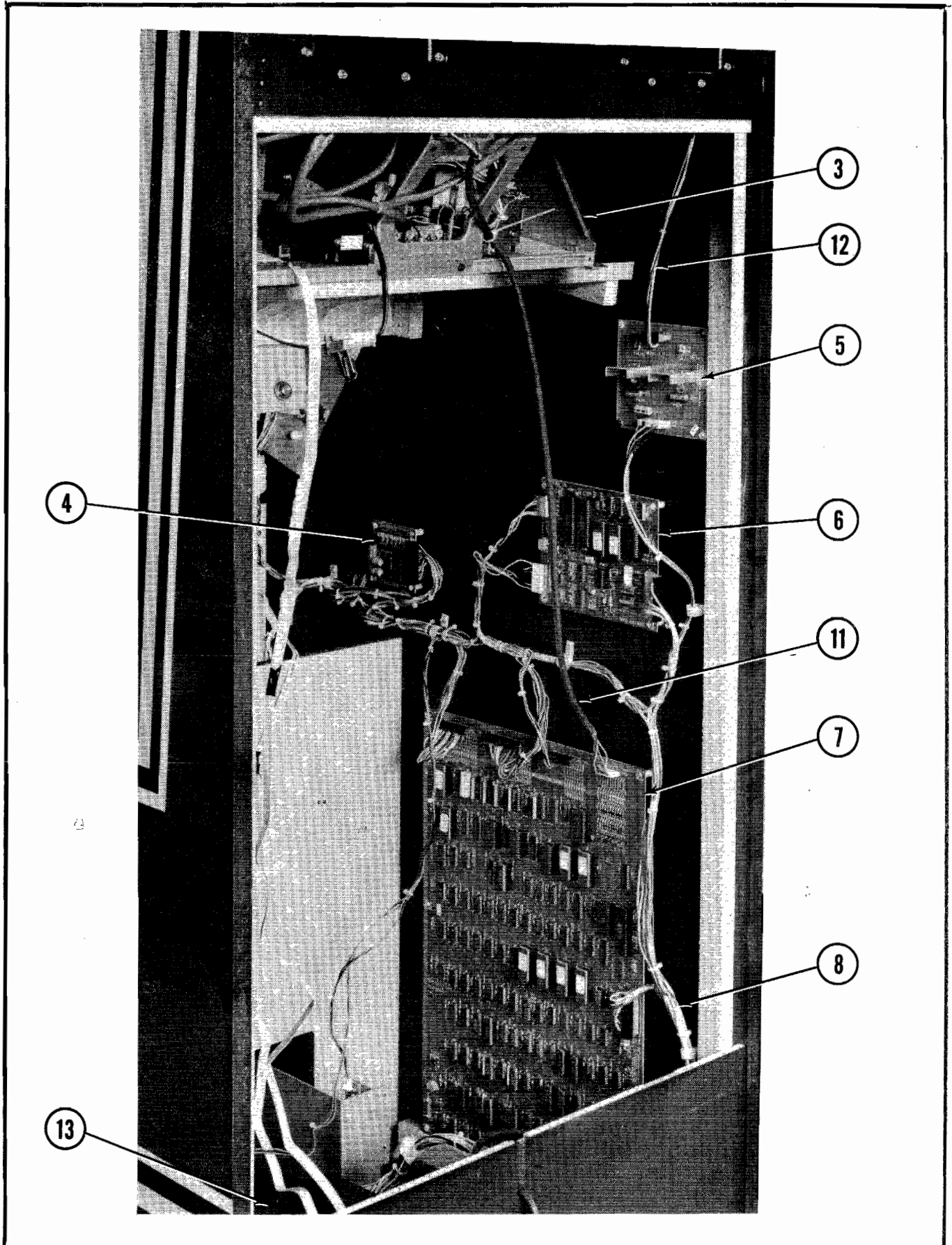
ITEM	PART NO.	DESCRIPTION
15	0C75-00501-0000	CONTROL SHELF
16	0C75-00125-0000	HINGE: CONTROL
17	AC75-00018-0000	STEERING WHEEL ASSY. (2 REQ'D.)
18	0C75-00903-0100	CONTROL COVER: RIGHT
19	0C75-00903-0200	CONTROL COVER: LEFT
*	0017-00101-0138	#8 X 5/8 TORX TAMPER PROOF SCREW (8 REQ'D.)
*	0017-00009-0534	BASSICK CLAMP (5 REQ'D.) (NOT SHOWN)
*	0555-00901-0000	PIN: LOCATING (MOLDED) (4 REQ'D.) (NOT SHOWN)
20	AC75-00016-00XF	ACCELERATOR PEDAL ASSY. (2 REQ'D.)
21	0090-00002-04XF	COIN DOOR FRAME: LARGE BLACK DOUBLE
22	A982-00014-0000	U.S.A. 25¢ COIN DOOR & CABLE ASSY.
23	0017-00009-0477	CASH BOX: MOLDED (NOT SHOWN)
24	0950-00112-0000	COVER: COIN BOX (NOT SHOWN)
25	0950-00901-0000	BASKET: COIN BOX - WIRE (NOT SHOWN)
26	0017-00102-0048	LEG LEVELERS (4 REQ'D.)
27	0017-00103-0026	NUT 3/8 - 16 HEX (FOR LEG LEVELERS) (4 REQ'D.)
*		NOT PART OF ABOVE ASSEMBLY & MUST BE ORDERED SEPARATELY



MAX RPM U.R. - 2 PLAYER - REAR ACCESS



MAX RPM U.R. - 2 PLAYER - REAR ACCESS



MAX RPM U.R. - 2 PLAYER - REAR ACCESS PARTS LIST

ORDER BY PART NUMBER ONLY

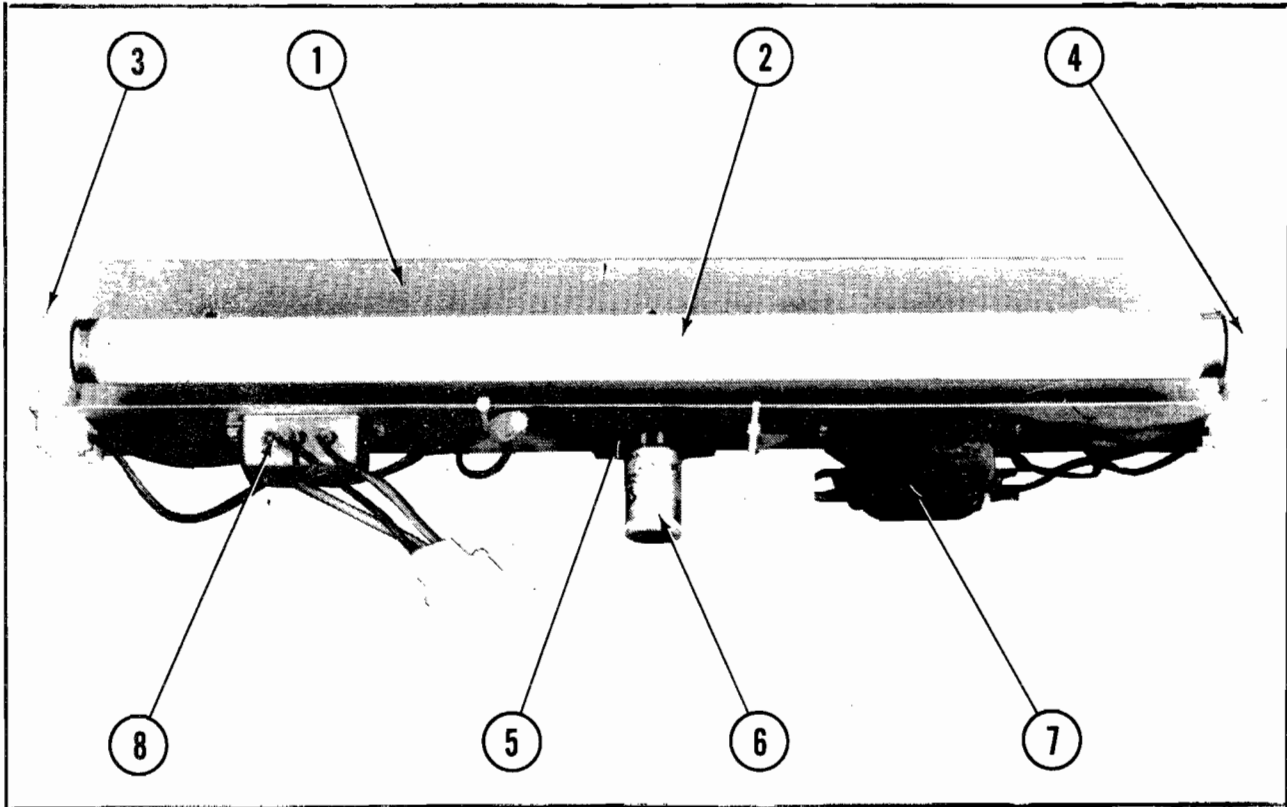
ITEM	PART NO.	DESCRIPTION
1	A945-00062-0000	ON-OFF SWITCH & PLATE ASSY.
	0017-00032-0105	SWITCH: 2PST 6 AMP
	0567-00106-0500	PLATE: MTG. - SWITCH
2	0894-00916-0000	PLASTIC PULL & VENT (2 REQ'D')
3	0017-00003-0465	WELLS-GARDNER - 19" COLOR DUAL SYNCH HORIZONTAL MTG. MONITOR
4	B084-91854-B000	REFLECTIVE SENSOR CONTROL P.C.B.
5	AA11-00017-0000	DUAL POWER AMP P.C.B. W/SPACERS
	B084-90910-F000	DUAL POWER AMP P.C.B. ASSY.
	0017-00042-0320	SPACER: SELF RETAINING FOR #8 SCREW (4 REQ'D.)
6	AC75-00012-0000	TURBO CHEAP SQUEAK P.C.B. W/SPACERS
	B084-91779-AC75	PROGRAMMED TURBO CHEAP SQUEAK P.C.B.
	0017-00042-0320	SPACER: SELF RETAINING FOR #8 SCREW (4 REQ'D.)
7	AC75-00011-0000	MONOBOARD W/SPACERS ASSY.
	B084-91787-AC75	PROGRAMMED MONOBOARD ASSY.
	0017-00042-0320	SPACER: SELF RETAINING FOR #8 SCREW (6 REQ'D.)
8	AC75-00006-0000	MASTER CABLE W/BRKT. ASSY. (INCLUDES ITEM 9)
9	A515-00021-0000	MULTIFUNCTION SW. BRKT. ASSY.
	0017-00032-0007	SWITCH: SPDT SLIDE 4 AMP
	0515-00107-0000	BRKT: CREDIT: TEST-SWITCH: VOLUME
	0017-00032-0051	BUTTON: SWITCH, RED
	105E-00001-0017	POT: 0-1K CBN 1/2W
10	AC75-00008-0000	HIGH VOLTAGE CABLE ASSY.
11	AA11-00014-0000	VIDEO CABLE ASSY.

MAX RPM U.R. - 2 PLAYER - REAR ACCESS PARTS LIST, CONT'D.

ORDER BY PART NUMBER ONLY

ITEM	PART NO.	DESCRIPTION
12	AC75-00003-0000	AUDIO CABLE ASSY.
13	A945-00059-0200	POWER CHASSIS: 130 VA - SWITCHING W/O SWITCH
	AC75-00500-0000	CABINET ASSY. (INCLUDES ITEMS 14 & 15)
14	0C75-00500-0000	CABINET ASSY.
15	A961-00007-0000	CASTER-WHEEL ASSY. (2 REQ'D.)
		<b>ADDITIONAL PARTS LIST</b>
	0C75-00300-0000	CATALOG: MAX-RPM
	M051-00C75-A007	TAG: OPTION SWITCH SETTINGS
	AC75-00009-0000	REAR DOOR ASSY. (INCLUDES 5 FOLLOWING ITEMS)
	0A59-00501-0000	REAR DOOR (WOOD)
	0017-00005-0050	DOOR LOCK W/2 INDIVIDUAL KEYS
	0017-00005-0209	LOCK PLATE
	0017-00009-0490	VENT GRILLE - 5-5/8 SQ. IN. (4 REQ'D.)
	0639-00116-00XF	CAM: OFFSET 30 DEGREES

**HEADER FLUORESCENT LIGHT ASSEMBLY  
PART NO. A595-00011-0000**

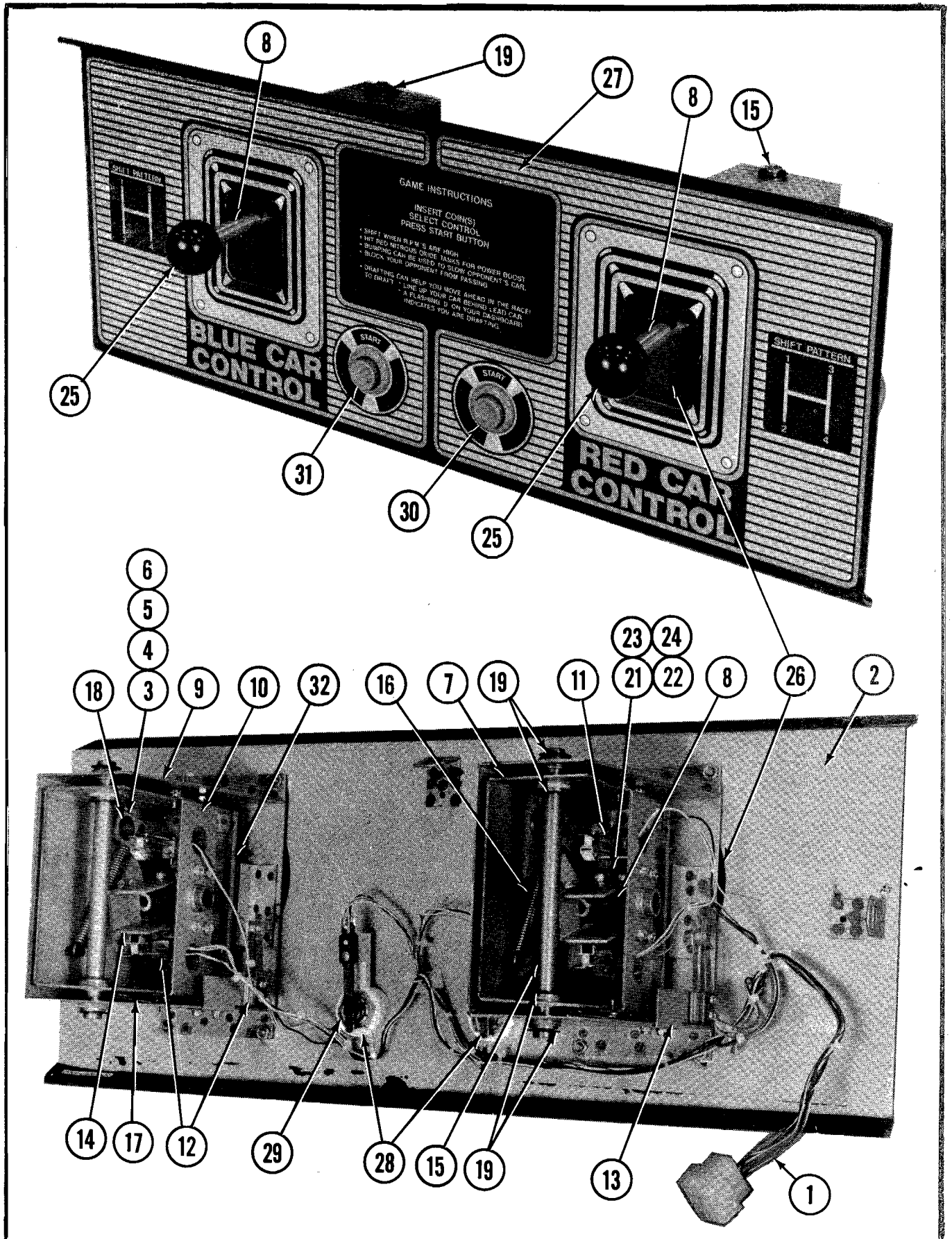


**HEADER FLUORESCENT LIGHT ASSY.-PARTS LIST  
PART NO. A595-00011-0000**

ORDER BY PART NUMBER **ONLY**

ITEM	PART NO.	DESCRIPTION
1	0595-00105-0000	FLUORESCENT BRKT.
2	0017-00003-0043	18" COOL WHITE FLUORESCENT LAMP
3	0017-00003-0445	LAMP LOCKS (2 REQ'D.)
4	0017-00031-0036	FLUORESCENT SOCKET (2 REQ'D.)
5	0017-00003-0412	FLUORESCENT STARTER HOLDER W/LEADS
	0017-00101-0347	#6-32 X 1/2 PHIL. RND. HD. M.S. (4 REQ'D.)
6	0017-00003-0019	FLUORESCENT STARTER
7	0017-00003-0026	BALLAST
	0017-00101-0598	#8-32 X 5/16 SLT. HEX HD. SCR. (4 REQ'D.)
8	A961-00042-0000	LINE FILTER ASSY.

**STICK SHIFTER PANEL ASSEMBLY  
PART NO. AC75-00022-0000**



**STICK SHIFTER PANEL ASSEMBLY - PARTS LIST**  
**PART NO. AC75-00022-0000**

ORDER BY PART NUMBER ONLY

74646

ITEM	PART NO.	DESCRIPTION
1	AC75-00005-0100	CONTROL SHELF CABLE ASSY.
2	AC75-00010-00XF	SHIFTER PANEL - WELD ASSY. (DEGREASED)
	AC75-00024-0000	GEAR SHIFTER ASSY. (2 REQ'D.) (INCLUDES ITEMS 3 THRU 24)
* 3	AC75-00023-0000	FOLLOWER/POST ASSY.
* 4	OC75-00113-0000	BRACKET: DETENT CAM (NOT SHOWN)
* 5	OC75-00114-0000	CAM: FOLLOWER (NOT SHOWN)
* 6	OC75-00700-0000	FOLLOWER: CAM (NOT SHOWN)
7	AC75-00026-0000	SHIFTER BRKT. & TOP PLATE WELD ASSY.
8	AC75-00027-0000	SHIFT-ROD & PIVOT-BUSHING ASSY. (INCLUDES FOLLOWING 3 ITEMS)
	OC75-00703-00XF	ROD: GEAR SHIFT
	OC75-00706-00XF	BUSHING: PIVOT
	0017-00007-0068	PIN 3/32 X 14 ROLL
9	AC75-00031-0000	CRADLE WELD & BEARING ASSY.
10	AC75-00025-0000	SWITCH & BEARING SUPPORT PLATE ASSY.
11	A941-00022-0100	ROLLER-SWITCH ASSY.: LEFT
12	A941-00022-0200	ROLLER-SWITCH ASSY.: RIGHT (2 REQ'D.)
13	OC75-00109-0000	BRACKET: SIDE SWITCH
14	OC75-00111-0000	BRACKET: SWITCH ACTIVATING
15	OC75-00702-00XF	ROD: PIVOT
16	0010-00287-0000	SPRING: CENTERING CAM
17	0010-00300-0000	SPRING: TORSION
18	0017-00100-0037	E-RING .375"
19	0017-00100-0050	E-RING .500" (4 REQ'D.)



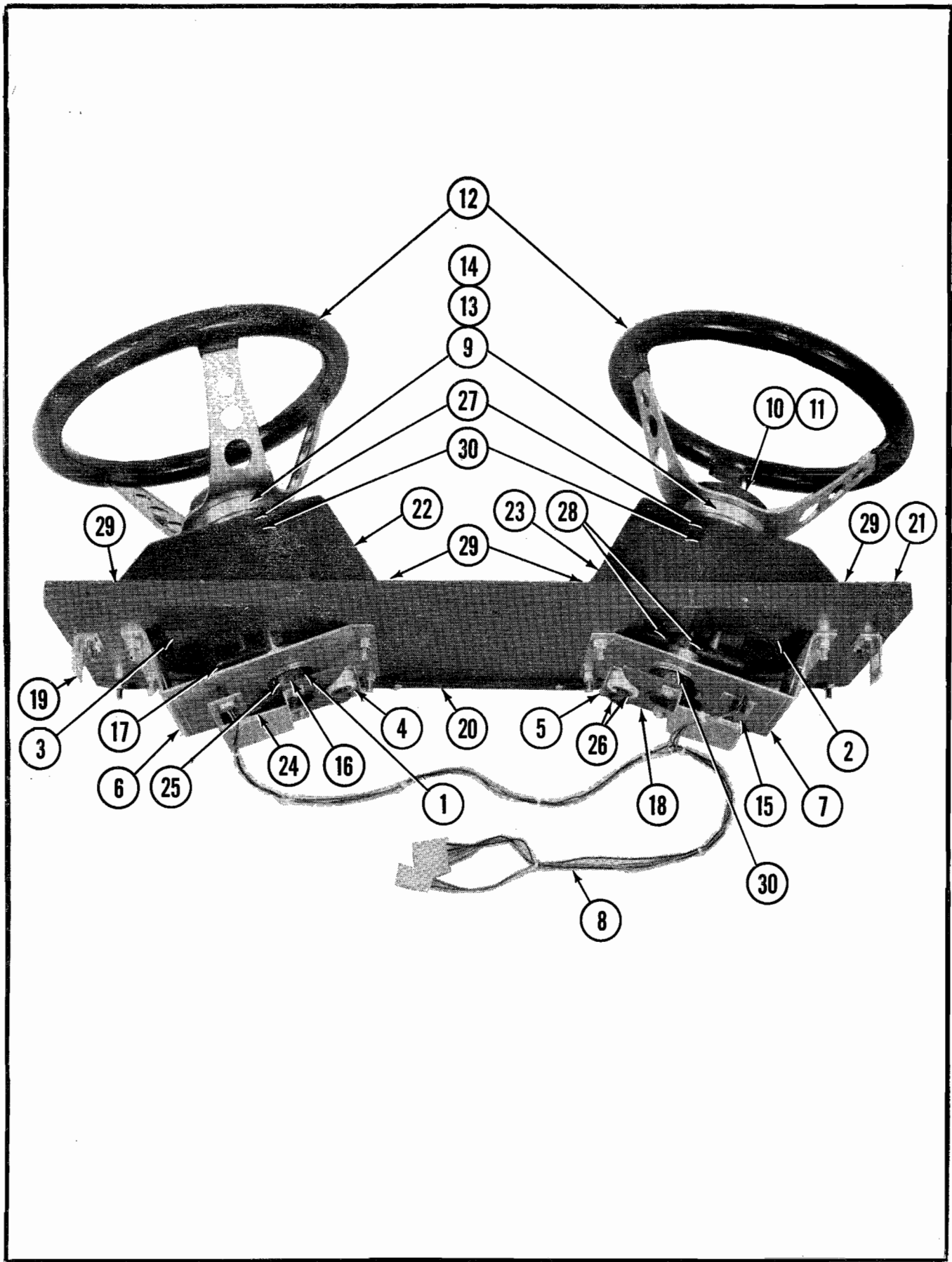
**STICK SHIFTER PANEL ASSEMBLY - PARTS LIST (CONT'D.)**  
**PART NO. AC75-00022-0000**

ORDER BY PART NUMBER ONLY

ITEM	PART NO.	DESCRIPTION
20	0017-00104-0073	WASHER: SPRING .515 I.D., .875 O.D., .013 TH. (NOT SHOWN)
21	0941-00905-0000	BUMPER: CAST RUBBER (4 REQ'D.)
22	0941-00704-00XF	SPACER (4 REQ'D.) (NOT SHOWN)
23	0017-00101-0668	10-32 X 1" HEX ALLEN SOCKET HD. SCREW (4 REQ'D.) (NOT SHOWN)
24	0017-00104-0004	WSHR: SPLIT LOCK .200 I.D., .334 O.D., .047 TH. (4 REQ'D.) (NOT SHOWN)
25	0017-00009-0561	BALL-KNOB: BLACK/ROUND
26	0C75-00902-0000	SLIDE: SHIFTER PANEL
27	0C75-00907-0000	OVERLAY: SHIFTER PANEL
28	0017-00032-0093	SWITCH: W/HOLDER, WHITE (2 REQ'D.)
29	0017-00103-0054	NUT 5/8-11 PAL (2 REQ'D.)
30	0017-00042-0256	BUTTON: PUSH: ROUND: RED
31	0017-00042-0262	BUTTON: PUSH: ROUND: BLUE
32	0017-00081-0286	TAPE: BLK., ADHESIVE-BACKED 1/2" W.X 1/8 TH. X 2-1/4 L. (2 REQ'D.)



CONTROL SHELF ASSEMBLY  
PART NO. AC75-00004-0000



74646

**CONTROL SHELF ASSEMBLY - PARTS LIST**  
**PART NO. AC75-00004-0000**

ORDER BY PART NUMBER ONLY

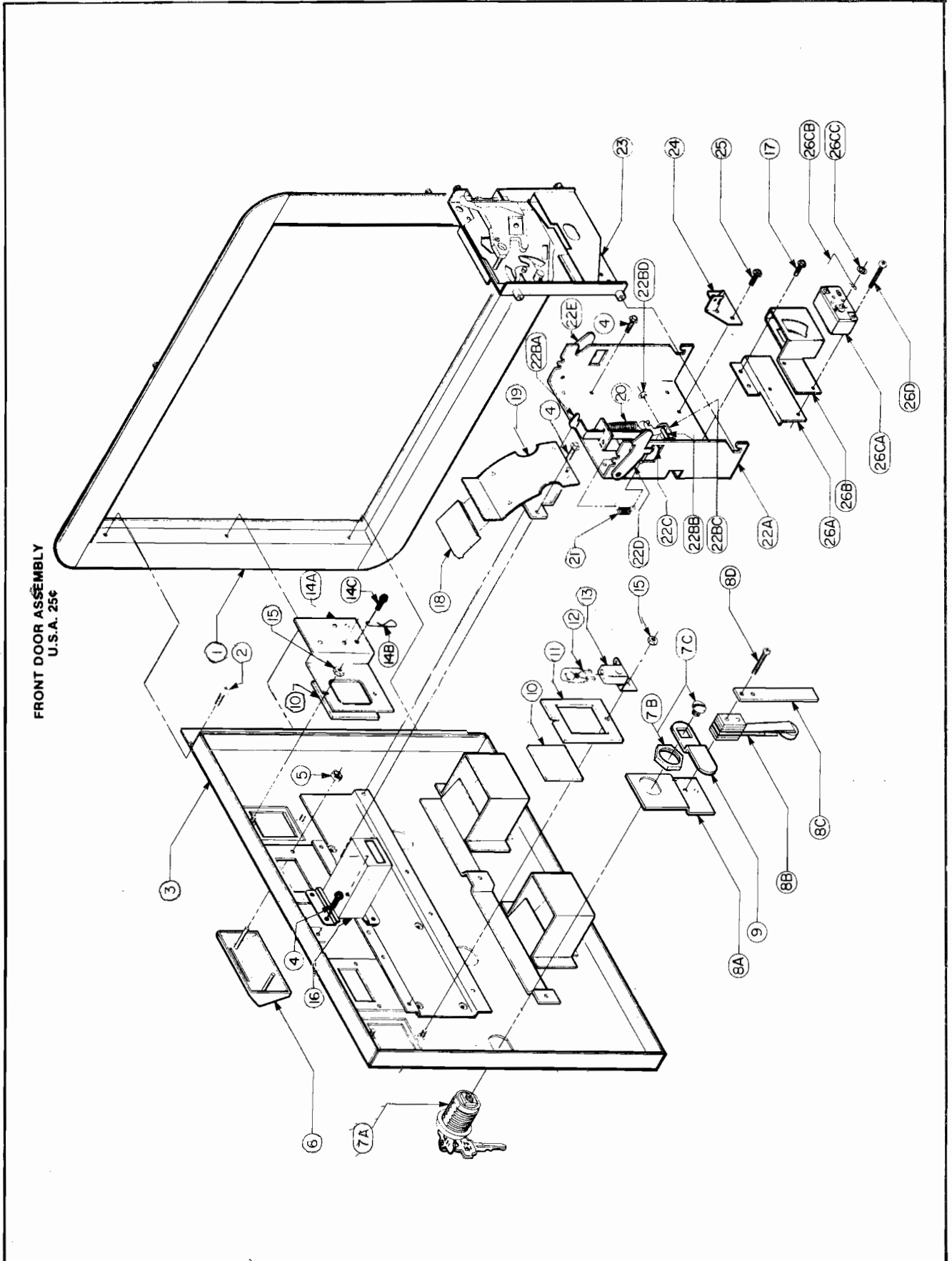
ITEM	PART NO.	DESCRIPTION
1	AA79-00021-00XF	HUB-TO-CENTERING CAM ASSY. (2 REQ'D.)
2	AA79-00028-0100	FRONT MTG. BRKT. ASSY.: RIGHT (INCLUDES FOLLOWING 3 ITEMS)
	0017-00100-0031	E-RING .312 (6 REQ'D.)
	0307-00914-0000	BUMPER: RUBBER 1" BLACK (2 REQ'D.)
	0017-00007-0008	5/16 PUSH NUT (2 REQ'D.)
3	AA79-00028-0200	FRONT MTG. BRACKET ASSY.: LEFT (INCLUDES FOLLOWING 3 ITEMS)
	0017-00100-0031	E-RING .312 (6 REQ'D.)
	0307-00914-0000	BUMPER: RUBBER 1" BLACK (2 REQ'D.)
	0017-00007-0008	5/16 PUSH NUT (2 REQ'D.)
4	AA79-00030-0100	CAM FOLLOWER BRKT. BEARING TO HUB ASSY.: RIGHT
5	AA79-00030-0200	CAM FOLLOWER BRKT. BEARING TO HUB ASSY.: LEFT
6	AC75-00033-0100	BEARING & POSTS TO REAR BRKT.: RIGHT
7	AC75-00033-0200	BEARING & POSTS TO REAR BRKT.: LEFT
8	AC75-00005-0200	CONTROL SHELF CABLE ASSY. - B
	AC75-00018-0000	STEERING WHEEL ASSY. (2 REQ'D.) (INCLUDES ITEMS 9 THRU 14)
9	AC75-00019-00XF	PINNING ASSY.
10	0B96-00702-00XF	CAP: SAND - CASTING
11	0C48-00903-0000	INLAY: STEERING WHEEL (NOT SHOWN)
12	0017-00019-0208	STEERING WHEEL
13	0017-00101-0271	1/4-20 X 3/4 HEX ALLEN SOCKET HD. SCREW (3 REQ'D.) (NOT SHOWN)
14	0017-00101-0098	WSHR:INT. TOOTH LOCK .262 I.D.,.472 O.D., .025 TH.
		(3 REQ'D.) (NOT SHOWN)
15	B084-91853-A000	REFLECTIVE SENSOR BD. ASSY. (2 REQ'D.)

**CONTROL SHELF ASSEMBLY - PARTS LIST, CONT'D.**  
**PART NO. AC75-00004-0000**

ORDER BY PART NUMBER ONLY

ITEM	PART NO.	DESCRIPTION
16	0A79-00702-00XF	PIN: CAM (2 REQ'D.)
17	0A79-00714-00XF	PIN: BUMPER (2 REQ'D.)
18	0A79-00909-0000	CAM: FOLLOWER (2 REQ'D.)
19	0C75-00123-0000	STRIKE (2 REQ'D.)
20	0C75-00125-00XF	HINGE: CONTROL
21	0C75-00501-0000	CONTROL SHELF
22	0C75-00903-0100	COVER: RIGHT
23	0C75-00903-0200	COVER: LEFT
24	0010-00287-0000	SPRING: CENTERING CAM (2 REQ'D.)
25	0017-00100-0025	E-RING .250 (4 REQ'D.)
26	0017-00100-0037	E-RING .375 (4 REQ'D.)
27	0017-00100-0107	E-RING 1.0 (2 REQ'D.) (NOT SHOWN)
28	0017-00100-0127	C-RING .375 (4 REQ'D.)
29	0017-00101-0138	#8 X 5/8-TORX TAMPER PROOF SCREW (8 REQ'D.) (NOT SHOWN)
30	0017-00104-0152	FLAT WASHER 1.0 I.D., 1.50 O.D., .032 TH.
		(6 REQ'D.) (NOT SHOWN)

FRONT DOOR ASSEMBLY - U.S.A. 25c  
PART NO. A982-00014-0000



**FRONT DOOR ASSEMBLY - U.S.A. 25¢ - PARTS LIST**  
**PART NO. A982-00014-0000**

ORDER BY PART NUMBER **ONLY**

ITEM	PART NO.	DESCRIPTION
1	0090-00002-04BK	DOUBLE ENTRY COIN DOOR FRAME
2	0017-00101-0121	#6-32 X 5/16 PHIL. TRS. HD. SCR. (3 REQ'D.)
3	A090-00072-06BK	DOUBLE ENTRY COIN DOOR
4	0017-00101-0123	#8 X 1/4 UNSLOT. HEX HD. SCREW (12 REQ'D.)
5	0017-00103-0059	PUSH NUT (4 REQ'D.)
6	0090-00912-0000	COIN ENTRY PLATE - 25¢ (2 REQ'D.)
7A	0017-00005-0200	LOCK - INDIV. KEYED W/2 KEYS
7B	0017-00103-0079	3/4 HEX NUT
7C	0017-00101-0125	#10 X 1/4 SLOT. PAN HD. SCREW
8	A090-00096-0000	ANTI-SLAM SWITCH & BRKT. ASSY.
8A	0090-00185-00XF	DOOR TILT SWITCH BRKT.
8B	A090-00095-0000	DOOR ANTI-SLAM SWITCH
8C	0090-00126-01XF	SWITCH BACK-UP PLATE
8D	0017-00101-0155	#4-40 X 9/16 PHIL. PAN HD. (2 REQ'D.)
9	0017-00005-0238	DOOR CAM
10	0090-00903-9500	25¢ WINDOW (2 REQ'D.)
11	0090-00143-0000	COIN PLEX RETAINER
12	0017-00003-0219	12 VOLT LAMP - G.E. #194 (2 REQ'D.)
13	0017-00031-0048	WEDGE SOCKET W/BRKT. (2 REQ'D.)
14	A090-00100-0000	CABLE & KEY HOOK BRKT. ASSY.
14A	0090-00179-0000	CABLE & SWITCH MTG. BRKT.
14B	0017-00007-0019	KEY HOOK
14C	0017-00101-0123	#8 X 1/4 UNSLOT. HD. SCR. (2 REQ'D.)

**FRONT DOOR ASSEMBLY - U.S.A. 254 - PARTS LIST, CONT.  
PART NO. A982-00014-0000**

ORDER BY PART NUMBER ONLY

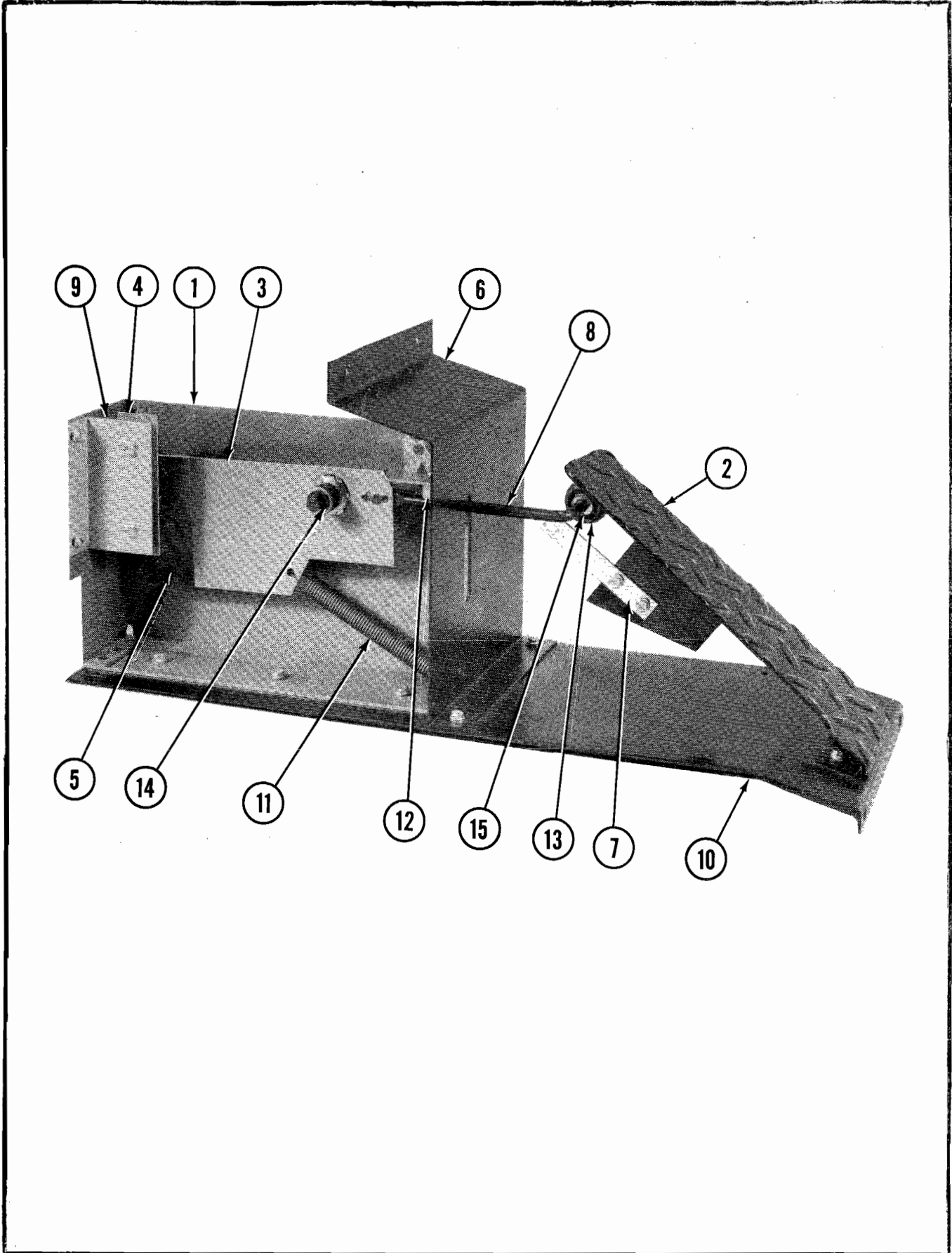
ITEM	PART NO.	DESCRIPTION
15	0017-00103-0084	#6-32 HEX NUT W/SEMS (4 REQ'D.)
16	A090-00089-0000	COIN METER W/DIODE
17	0017-00101-0124	#6 X 1/4 UNSLOT HEX HD. SCR. (4 REQ'D.)
18	0090-00911-0000	INSULATOR (2 REQ'D.)
19	A090-00087-0000	COIN CHUTE & TOP ASSY. (2 REQ'D.)
	A090-00081-00XF	COIN CHUTE & BRKT. ASSY.
	0090-00172-00XF	COIN CHUTE TOP
	0017-00101-0140	#4-40 X 5/16 PHIL. PAN HD. (3 REQ'D.)
	0017-00007-0162	COTTER PIN (4 REQ'D.)
20	0010-00134-0000	SPRING
21	0010-00181-0100	SPRING
22	A090-00115-0000	COIN ACCEPTOR FRAME SUB-ASSY. (2 REQ'D.)
22A	A090-00118-0000	COIN ACCEPTOR & BUSH. ASSY.
22B	A090-00116-0000	REJECT LEVER ASSY. (2 REQ'D.)
22BA	0090-00182-00XF	REJECT LEVER
22BB	0090-00129-00XF	PIVOT POST
22BC	0090-00167-00XF	PIVOT LEVER
22BD	0017-00100-0012	E-RING
22C	0017-00007-0083	1/8 X 1-5/8 ROLL PIN
22D	0093-00145-01XF	LATCH - LEFT
22E	0093-00145-00XF	LATCH - RIGHT
	0017-00072-0036	120 X .218 X 7/32 RIVET (2 REQ'D.)
	0090-00910-00XF	REJECT BUTTON

**FRONT DOOR ASSEMBLY - U.S.A 25¢ - PARTS LIST, CONT.  
PART NO. A982-00014-0000**

ORDER BY PART NUMBER ONLY

ITEM	PART NO.	DESCRIPTION
	0090-00183-0000	BUTTON STOP
	0017-00101-0140	#4-40 X 5/16 PHIL. PAN HD.
23	0017-00005-0003	COIN ACCEPTOR W/STRING CUTTER (2 REQ'D.) (OR)
23	0017-00005-0214	COIN ACCEPTOR W/STRING CUTTER (2 REQ'D.)
24	A090-00064-0100	ANTI-PENNY DEVICE
25	0017-00101-0099	#6 X 1/4 SLT. HEX HD. M.S. (2 REQ'D.)
26	A090-00077-0000	COIN GUIDE & SWITCH ASSY.
26A	0090-00162-00XF	COIN SWITCH MTG. BRKT.
26B	0017-00005-0203	COIN SWITCH CHUTE
26C	A090-00059-0400	COIN SWITCH & WIRE ASSY.
26CA	0017-00005-0195	COIN SWITCH
26CB	0010-00599-0000	COIN SWITCH WIRE
26CC	0017-00007-0015	PUSH-ON RING
26D	0017-00101-0147	#4-40 X 3/4 PHIL. PAN. HD. (4 REQ'D.)
		<b>ADDITIONAL PARTS LIST</b>
	0090-00184-0000	COIN SWITCH COVER (2 REQ'D.)

ACCELERATOR PEDAL ASSEMBLY  
PART NO. AC75-00014-0000



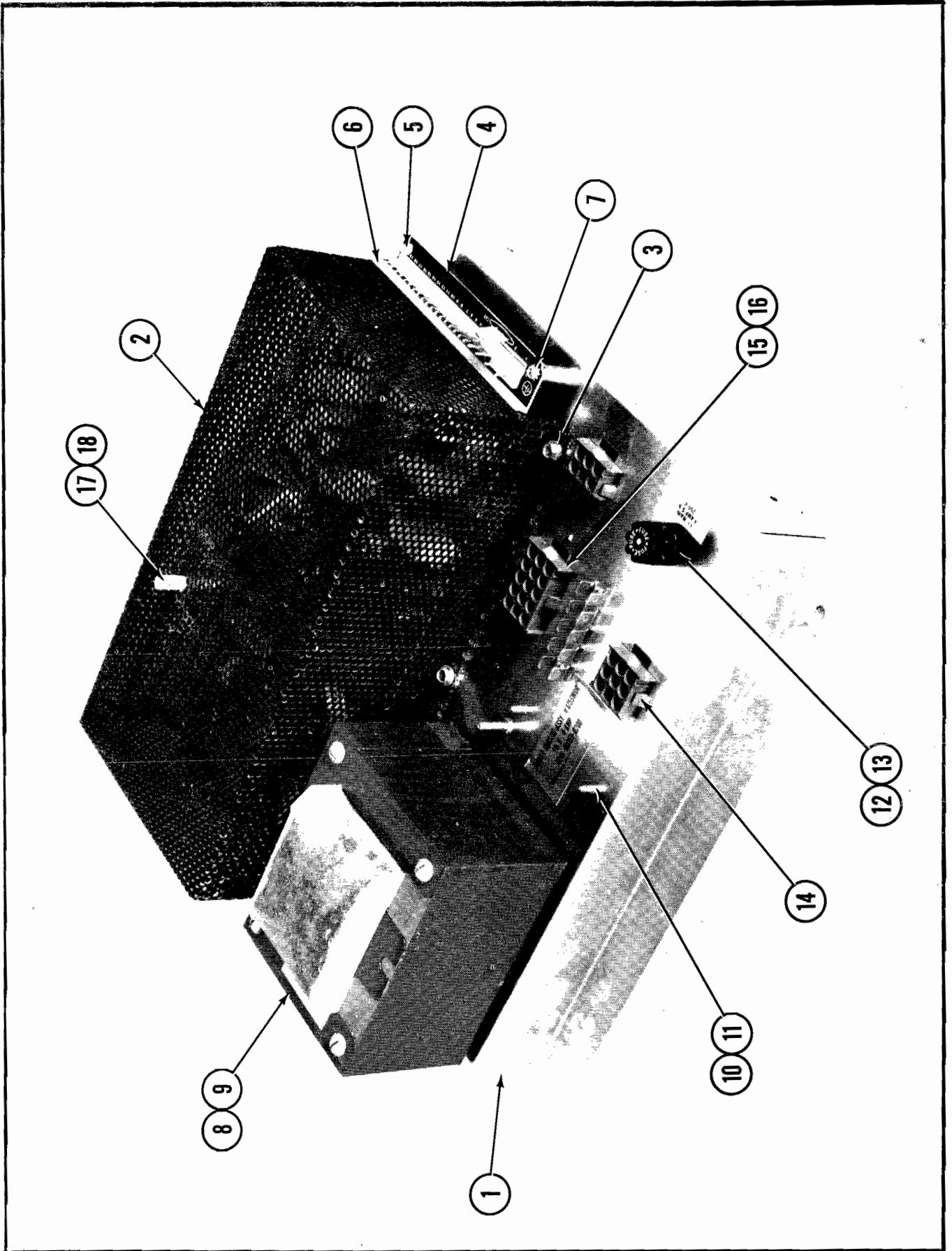


**ACCELERATOR PEDAL ASSEMBLY - PARTS LIST**  
**PART NO. AC75-00014-0000**

ORDER BY PART NUMBER ONLY

ITEM	PART NO.	DESCRIPTION
1	AC75-00015-0000	STUD & STOP BRKT. ASSY.
2	AC75-00016-0000	STOP BRACKET, HINGE & ACCELERATOR PEDAL
3	AC75-00030-0000	PIVOT PLATE & LEVER ASSY.
4	B084-91853-A000	REFLECTIVE SENSOR BD. ASSY.
5	M051-00C75-A009	GRAY-SCALE CARD: ADHESIVE BACKED
6	0A27-00104-00XF	COVER: ACCELERATOR BOX
7	0A27-00107-00XF	PLATE: ACCELERATOR LEVER STOP
8	0A27-00700-00XF	LEVER: ACCELERATOR
9	0C75-00103-0000	BRKT: P.C. BOARD MOUNTING
10	0C75-00106-00XF	BASE: ACCELERATOR
11	0010-00280-0000	SPRING: ACCELERATOR PEDAL
12	0653-00734-0000	STOP: STOP LIMIT (HEX NUT) (NOT SHOWN)
13	0921-00700-0000	ACTUATOR: MOLDED PLASTIC
14	0017-00100-0031	E-RING - 5/16" (NOT SHOWN)
15	0017-00100-0122	RING - RBR - 1/4" (NOT SHOWN)

POWER CHASSIS: 130VA (SWITCHING)  
PART NO. A945-00059-0200



**POWER CHASSIS: 130VA (SWITCHING) PARTS LIST  
PART NO. A945-00059-0200**

ORDER BY PART NUMBER ONLY

ITEM	PART NO.	DESCRIPTION
1	A945-00057-01XF	CHASSIS SUB-ASSEMBLY
2	0945-00117-01XF	POWER SUPPLY COVER
3	0017-00101-0123	8 X 4 UNSLOT HEX HD. SCREW (8 REQ'D.)
4	0017-00003-0543	SWITCHING POWER SUPPLY - 125VA
5	0017-00042-0663	LOCKING P.C. BRD. SPACER (4 REQ'D)
6	0540-00138-2100	CABLE PROTECTOR - 5"
7	0017-00101-0134	6-32 X 4 PHIL. ROUND HD. SCREW
8	MT00-00136-A000	ISOLATION TRANSFORMER W/O SHIELD ASSY.-115V., 50/60 HZ.
9	0017-00103-0061	8-32 HEX NUT W/SEMS (4 REQ'D) (NOT SHOWN)
10	0017-00003-0114	LINE FILTER - 5 AMP, 115VAC (NOT SHOWN)
11	0017-00101-0067	6 X 6 PHL. PAN HD. (2 REQ'D)
12	0017-00003-0433	FUSE HOLDER
13	0017-00003-0263	FUSE MDA, 3AG, 4 AMP, 115 VAC
14	A945-00030-0600	CONNECTOR & CABLE ASSEMBLY
15	0017-00021-0370	TERMINAL STRIP
16	0017-00101-0140	4-40 X 5 PHL. PAN HD. SCREW (2 REQ'D)
17	0017-00009-0580	CAPACITOR ALIGNMENT TOOL
18	0945-00912-0000	ADJ. TOOL HANDLE
		<b>ADDITIONAL PARTS LIST</b>
	115E-00001-0004	VARISTOR-METAL OXIDE (UNDER CHASSIS)
	0017-00021-1110	2 POSITION TERMINAL BARRIER STRIP (UNDER CHASSIS)
	0017-00101-0780	6 X 8 PHIL. PAN HD. SCREW (UNDER CHASSIS)
	0017-00103-0084	6-32 HEX NUT W/SEMS (UNDER CHASSIS)

A945-00059-0200  
D. Herrick 6-17-85

SECTION 3  
COMPONENT LAYOUTS,  
SCHEMATICS & WIRING DIAGRAM

# 19" COLOR MONITOR SCHEMATIC DIAGRAM

## MODELS 19K4901, 19K4906, 19K4951, 19K4956

Power Supply Voltage and Symbols

Symbol	Voltage	Operating Circuit
	15V	Vert. Osc. Sync Blanking CRT Cut-Off
	130V	Horiz. Osc. Horz. Drive Horz. Output Vert. Output
	175V	Video Output

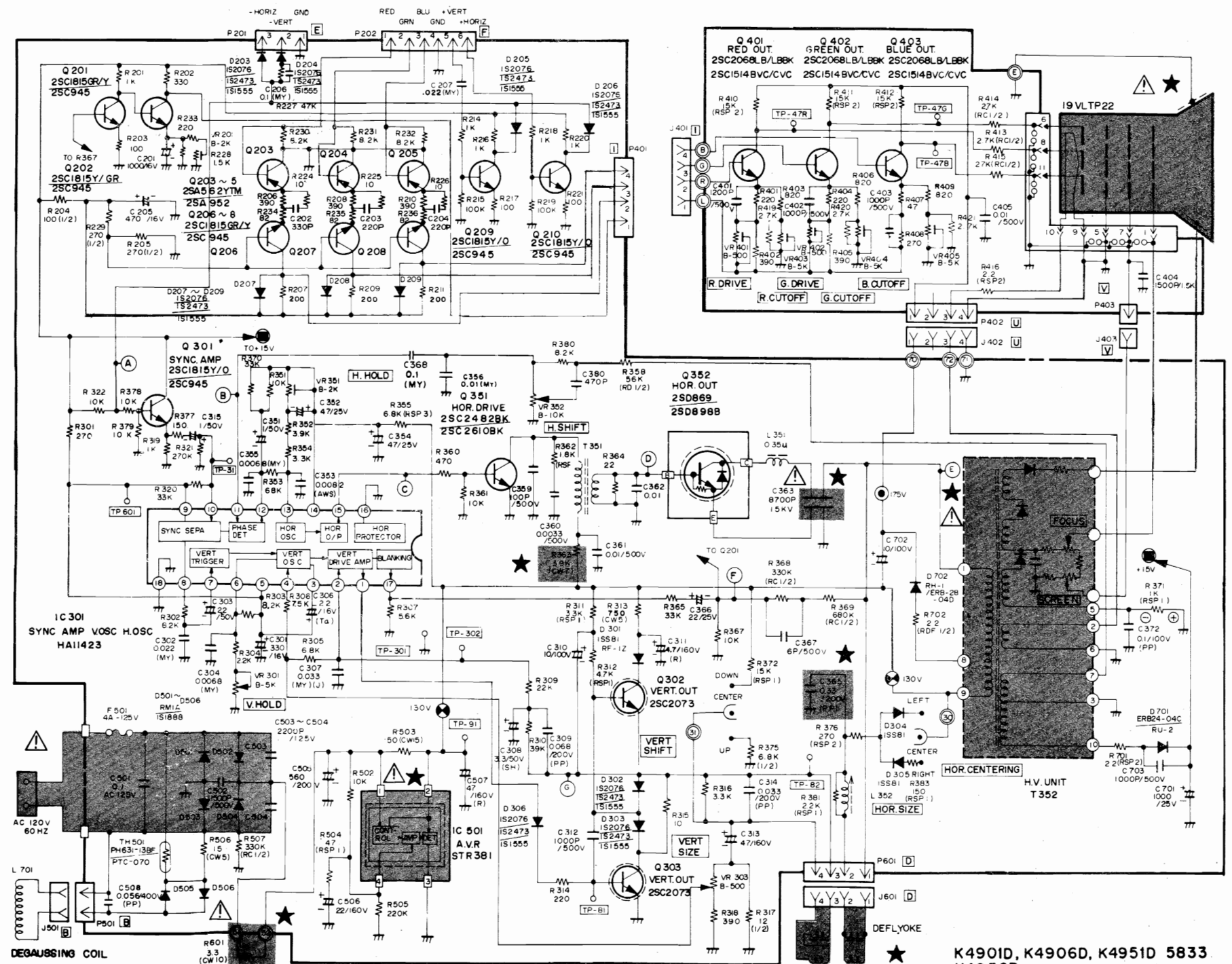
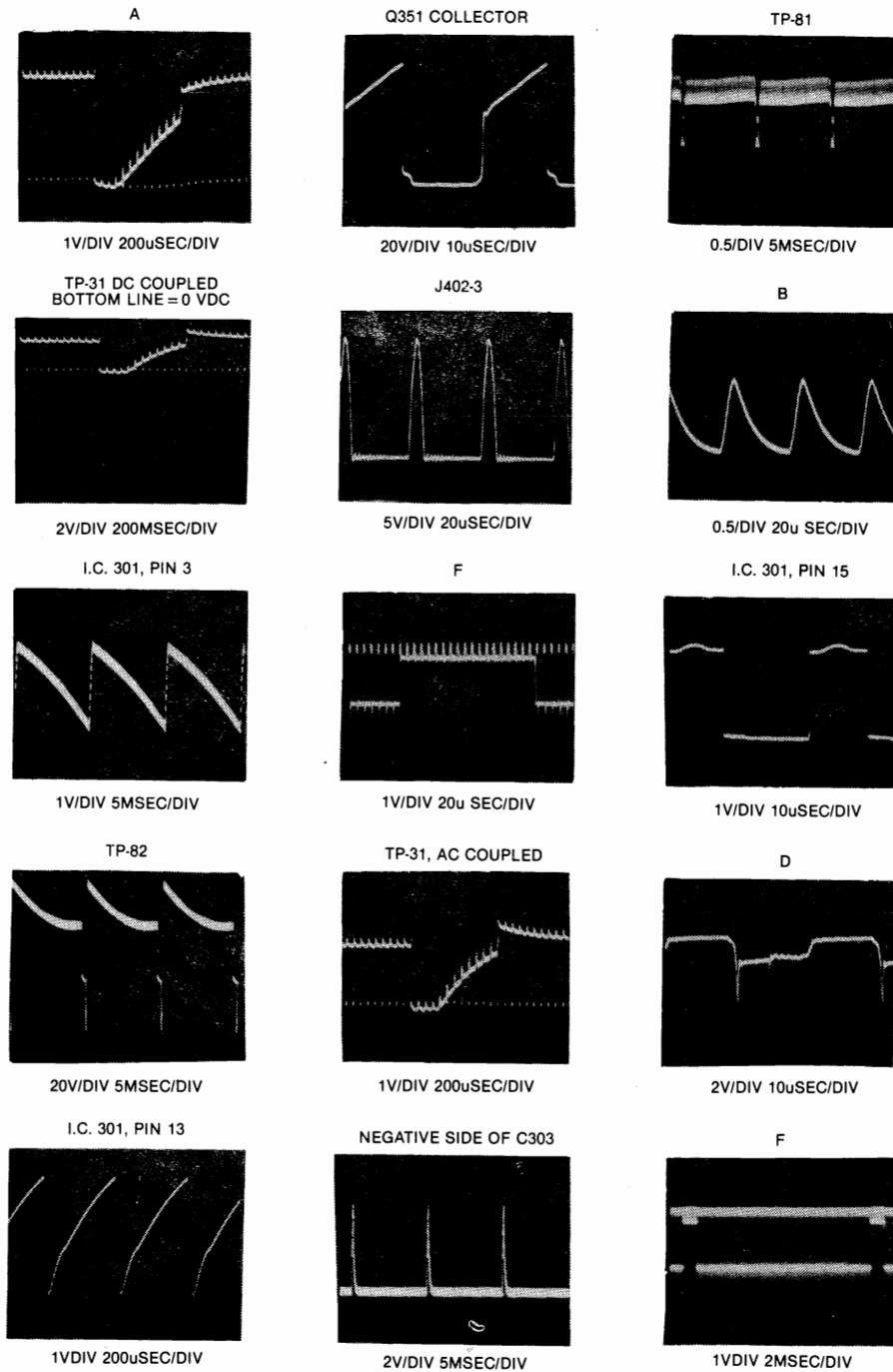
**SERVICE TECHNICIAN WARNING**  
**X-RAY RADIATION PRECAUTION:**  
 THIS PRODUCT CONTAINS CRITICAL ELECTRICAL AND MECHANICAL PARTS ESSENTIAL FOR X-RAY RADIATION PROTECTION.  
 FOR REPLACEMENT PURPOSES, USE ONLY TYPE PARTS SHOWN IN THE PARTS LIST.

**CAUTION: FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.**  
**AVERTISSEMENT: POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.**

### OSCILLOSCOPE WAVEFORM PATTERN

The waveforms shown are as observed on the wide band oscilloscope with the monitor turned to a reasonably strong signal and a normal picture. The voltages shown on each waveform are the approximate peak amplitudes.

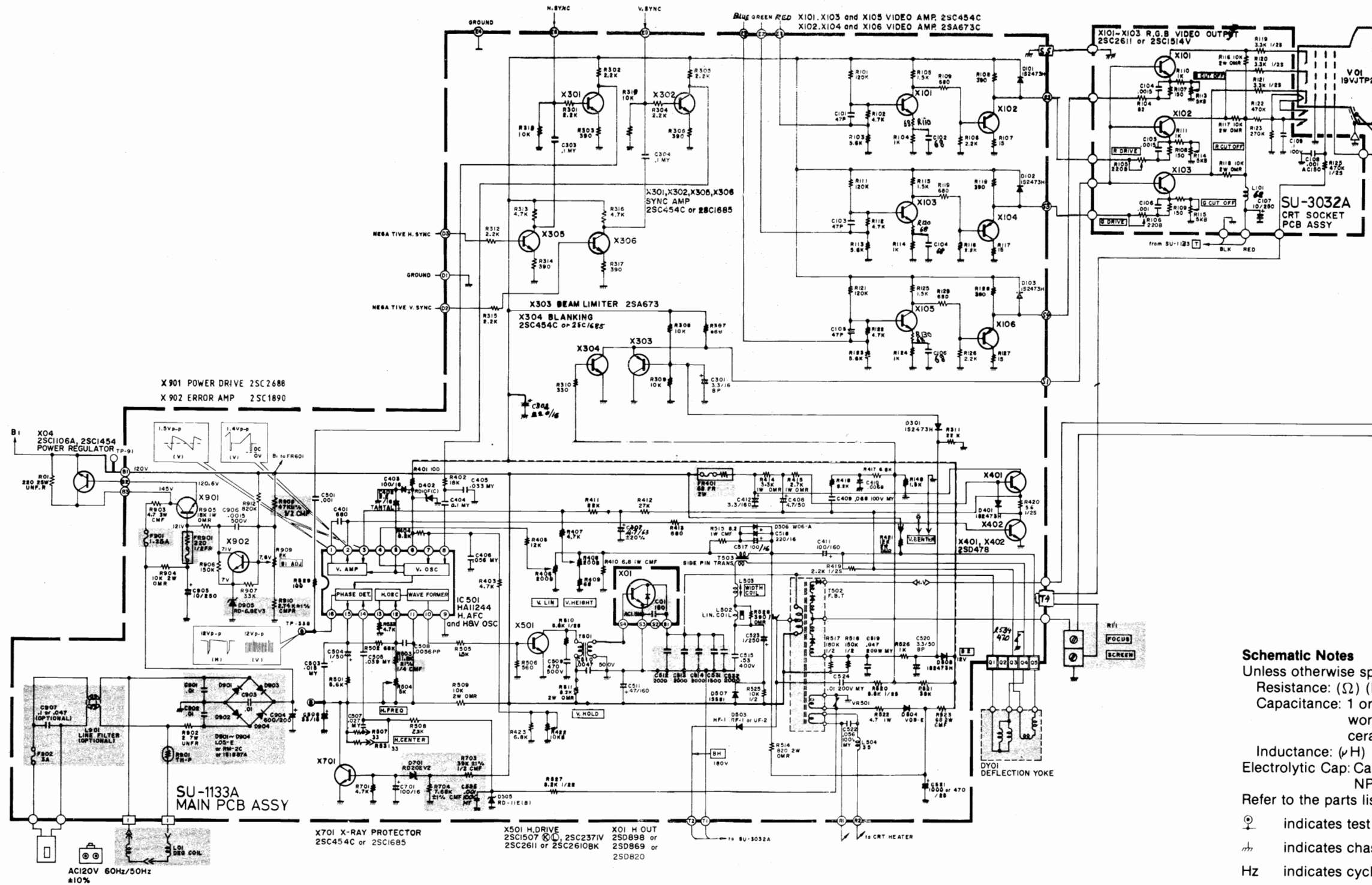
If the waveforms are observed on the oscilloscope with a poor high frequency response, the corner of the pulses will tend to be more rounded than those shown and the amplitude of any high frequency pulse will tend to be less.



K4901D, K4906D, K4951D 5833  
K4956B







**Schematic Notes**

- Unless otherwise specified
- Resistance: ( $\Omega$ ) (K $\rightarrow$ K $\Omega$ , M $\rightarrow$ M $\Omega$ ), 1/4 (W) carbon resistor
- Capacitance: 1 or higher  $\rightarrow$  (pF), less than 1  $\rightarrow$  ( $\mu$ F)
- working voltage  $\rightarrow$  50 (V)
- ceramic capacitor
- Inductance: ( $\mu$ H)
- Electrolytic Cap: Capacitance Value ( $\mu$ F)/working voltage (V), NP  $\rightarrow$  non-polar (or bipolar) electrolytic cap.
- Refer to the parts list for additional component information.
- $\oplus$  indicates test point connection
- $\perp$  indicates chassis ground unless otherwise specified
- Hz indicates cycles per second
- For **safety** purposes (and continuing reliability)
- $\triangle$  replace all components marked with safety symbol with identical type.
- NOTE: FR  $\rightarrow$  fusible resistor

00-4147-04  
G07-CB0

Parts identification on circuit boards:  
e.g. SU1126A (R107 = R1107)  
SU3030A (R113 = R3113)

## REPLACEMENT PARTS LIST—ELECTROHOME 19" MONITOR

Components identified by the  $\Delta$  symbol in the PARTS LIST and on the Schematic have special characteristics important to safety.

DO NOT degrade the safety of the set through improper servicing.

### Abbreviations for Resistors and Capacitors

Resistor		Capacitor	
C R	: Carbon Resistor	C Cap.	: Ceramic Capacitor
Comp. R	: Composition Resistor	M Cap.	: Mylar Capacitor
OM R	: Oxide Metal Film Resistor	E Cap.	: Electrolytic Capacitor
V R	: Variable Resistor	BP E Cap.	: Bi-Polar (or Non-Polar) Electrolytic Capacitor
MF R	: Metal Film Resistor	MM Cap.	: Metalized Mylar Capacitor
CMF R	: Coating Metal Film Resistor	PP Cap.	: Polypropylene Capacitor
UNF R	: Nonflammable Resistor	MPP Cap.	: Metalized PP Capacitor
F R	: Fusible Resistor	PS Cap.	: Polystyrol Capacitor
		Tan. Cap.	: Tantal Capacitor

NOTE: When ordering replacement parts please specify the part number as shown in this list including part name, and model number. Complete information will help expedite the order.

Use of substitute replacement parts which do not have the same safety characteristics as specified, may create shock, fire or other hazards. For maximum reliability and performance, all parts should be replaced by those having identical specifications.

### SERVICE REPLACEMENT PARTS LIST

Symbol	Description	Part Number
	Main P.C.B. Ass'y	SU-1133A
	CRT Socket P.C.B. Ass'y	SU-3032A
	Purity Shield Ass'y	07-220083-03
<b>Outside of the P.C.B. Ass'y</b>		
Symbol	Description	Part Number
$\Delta$	$\Delta$ Deflection Yoke	A29779-D=21-141-01
	PC Magnet	A75034-B=29-32-01
$\Delta$	$\Delta$ Flyback Transf.	A29951-B
$\Delta$	$\Delta$ HVR	A46600-A
R05	UNF Resistor 220 $\Omega$ , 25W K	QRF258K-221
C04	C Capacitor 150pF, AC1.5KV	QCZ0101-005
X01	Si. Transistor	2SD870
X02	Si. Transistor	2SC1106A
SC	Screw #8- $\frac{3}{4}$	31-610818-06
SC	Screw $\frac{1}{4}$ x $\frac{3}{8}$ Pix Tube Mtg. (4)	31-601418-12
WA	Pyramidal Lock Washer (4)	33-255-01
	Nut Retainer, Pix Tube Mtg. (4)	33-494-01
	Clip—P.C.B. Support	33-629-02
	Standoff	33-670-010R-02
	Wire Terminal (Gnd. Strap)	34-228-03
	Terminal Lug (Gnd.)	34-33-04
	Groundstrap Assy.	34-574-02
	Grounding Spring	35-212-03
	Wire Hook (Gnd. Strap)	35-3053-02
	Purity Shield Holddown Clamp	35-2348-01
	Support Brkt. RH	35-3890-01
	Support Brkt. LH	35-3890-02
	Chassis Base	38-449-02
	Yoke Wedge (3)	39-1233-01

### Purity Shield Ass'y. Parts List

Symbol	Description	Part Number
	Degaussing Coil	21-1007-30
D911,	Rectifier 1 Amp 600V (2)	28-22-27
D912	Pin Terminal (2)	34-708-01
	Pin Terminal Housing	34-709-01
	Purity Shield (2 pcs.)	35-3847-01
	Purity Shield (2 pcs.)	35-3847-02
C911	Capacitor 100nF 10% 400V	48-171544-62
R921	Resistor, Wirewound 33 $\Omega$ , 4W	42-113301-03
	Fire Retardant Term. Strip 4 Lug	34-492-09

### CRT Socket P.C.B. Ass'y (SU-3032A) Parts List

Resistors		Capacitors	
Symbol	Description	Part Number	Description
R3105	V R 200	QVZ3234-022	E Cap. 10uF 250V A
R3106	V R 200	QVZ3234-022	C Cap. 1000pF DC1400V P
R3113	V R 5K	QVZ3234-053	
R3114	V R 5K	QVZ3234-053	
R3115	V R 5K	QVZ3234-053	
R3116	OM R 10K $\Omega$ 2W J	QRG029J-103	
R3117	OM R 10K $\Omega$ 2W J	QRG029J-103	
R3118	OM R 10K $\Omega$ 2W J	QRG029J-103	
R3119	Comp. R 3.3K $\Omega$ $\frac{1}{2}$ W K	QRZ0039-332	
R3120	Comp. R 3.3K $\Omega$ $\frac{1}{2}$ W K	QRZ0039-332	
R3121	Comp. R 3.3K $\Omega$ $\frac{1}{2}$ W K	QRZ0039-332	
Symbol	Description	Part Number	Description
C3107	E Cap. 10uF 250V A	QEW53EA-106	
C3108	C Cap. 1000pF DC1400V P	QCZ9001-102M	

### CRT Socket P.C.B. Ass'y (SU-3032A) Parts List (Cont.)

Coils	Description	Part Number
Symbol		
L3101	Peaking Coil	QQL043K-101
Semi-conductors	Description	Part Number
Symbol		
X3101	Si. Transistor	2SC1514VC
X3102	Si. Transistor	2SC1514VC
X3103	Si. Transistor	2SC1514VC
Miscellaneous	Description	Part Number
Symbol		
$\Delta$	$\Delta$ CRT Socket	A76068

### Main PCB Ass'y (SU-1133A) Parts List

Resistors	Description	Part Number
Symbol		
R1406	V R 200 $\Omega$	QVZ3230-002
R1408	V R 200 $\Omega$	QVZ3230-002
R1410	CMF R 6.8 $\Omega$ 1W J	QRX019J-6R8
R1414	OM R 3.3K $\Omega$ 1W J	QRG019J-332
R1415	OM R 2.7K $\Omega$ 1W J	QRG019J-272
R1421	OM R 12K $\Omega$ 2W J	QRG026J-123Z
R1422	V R 10K $\Omega$	QVZ3230-014
$\Delta$ FR1401	$\Delta$ F R 68 $\Omega$ 2W K	QRH024K-680M
$\Delta$ R1503	$\Delta$ CMF R 11.8K $\Omega$ $\frac{1}{2}$ W+1%	QVZ3230-053
R1504	V R 5K $\Omega$	QVZ3230-053
R1509	OM R 10K $\Omega$ 2W J	QRG026J-103Z
R1512	OM R 8.2K $\Omega$ 2W J	QRG026J-822Z
R1514	OM R 820 $\Omega$ 2W J	QRG026J-821Z
R1515	CMF R 8.2 $\Omega$ 1W J	QRX019J-8R2
R1522	CMF R 4.7 $\Omega$ 1W J	QRX019J-4R7
R1523	OM R 68 $\Omega$ 2W J	QRG026J-680Z
R1528	OM R 390 $\Omega$ 1W J	QRG019J-391
R1534	ZN R	ERZ-C05ZK471
VR1501	ZN R	ERZ-C05ZK271
$\Delta$ R1703	$\Delta$ CMF R 39 $\Omega$ $\frac{1}{2}$ W+1%	QVZ3230-053
$\Delta$ R1704	$\Delta$ CMF R 7.68K $\Omega$ $\frac{1}{2}$ W+1%	QVZ3230-053
$\Delta$ R1901	$\Delta$ Posistor	A75414
R1902	UNF R 2 $\Omega$ 7W K	QRF076K-2R0
R1903	CMF R 4.7 $\Omega$ 3W J	QRX039J-4R7
R1904	OM R 10K $\Omega$ 2W J	QRG026J-103Z
R1905	OM R 18K $\Omega$ 1W J	QRG019J-183
$\Delta$ Q1908	$\Delta$ CMF R 47 $\Omega$ $\frac{1}{2}$ W+1%	QVZ3230-053
$\Delta$ R1909	V R 2K $\Omega$	QVZ3230-053
R1910	$\Delta$ CMF R 2.74K $\Omega$ $\frac{1}{2}$ W+1%	QVZ3230-053
$\Delta$ FR1901	$\Delta$ F R 220 $\Omega$ $\frac{1}{2}$ W K	QRH124K-221M

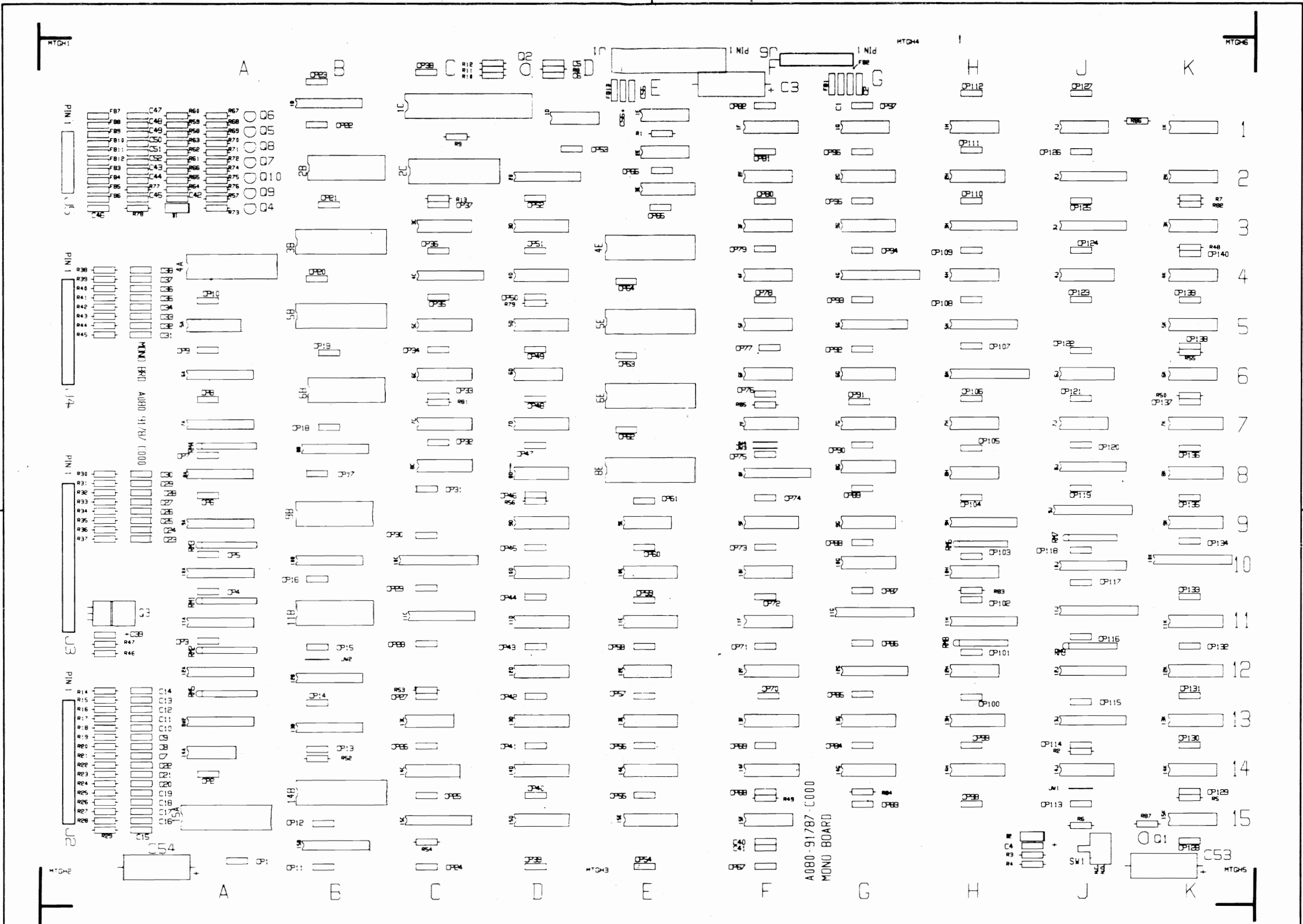
### Capacitors

Symbol	Description	Part Number
C1301	BPE Cap. 3.3uF 50V A	QEN61HA-335Z
C1402	Tan Cap. 2.2uF 16V K	QEE51CK-225B
C1407	E Cap. 4.7uF 6.3V A	QEW51JA-475
C1411	E Cap. 100uF 160V A	QEW52CA-107
C1412	E Cap. 3.3uF 160V A	QEW52CA-335
C1508	PP Cap. 5600uF 50V J	QFP31HJ-562
$\Delta$ C1512	$\Delta$ PP Cap. 2000pF DC1500V J	QFZ0082-202
$\Delta$ C1513	$\Delta$ PP Cap. 2000pF DC1500V J	QFZ0082-202
$\Delta$ C1514	$\Delta$ PP Cap. 2000pF DC1500V J	QFZ0082-202
C1515	PP Cap. 0.53uF DC1200V J	QFZ0067-534
C1520	BPE Cap. 3.3uF 50V A	QEN61HA-335Z
C1523	E Cap. 1uF 160V A	QEW62CA-105Z
C1524	M Cap. 0.1uF 200V K	QFM720K-104M
$\Delta$ C1531	$\Delta$ PP Cap. 2000pF DC1500V J	QFZ0082-202
$\Delta$ C1532	$\Delta$ PP Cap. 1500pF DC1500V J	QFZ0082-152
C1904	E Cap.	QEY0034-001
C1905	E Cap. 10uF 250V A	QEW52EA-106

### Main PCB Ass'y (SU-1133A) Parts List (Cont.)

Coils	Description	Part Number
Symbol		
L1502	Linary Coil	A39835
L1503	Width Coil	C30380-A
L1504	Heater Choke	C30445-A
Transformers	Description	Part Number
Symbol		
T1501	Hor. Drive Transf.	A46022-BM
T1503	Side Pin Transf.	C39050-A
Semi-conductors	Description	Part Number
Symbol		
IC1501	IC	HA11244
X1101	Si. Transistor	2SC1685(R)
X1102	Si. Transistor	2SA673(C)
X1103	Si. Transistor	2SC1685(R)
X1104	Si. Transistor	2SA673(C)
X1105	Si. Transistor	2SC1685(R)
X1106	Si. Transistor	2SA673(C)
X1301	Si. Transistor	2SC1685(R)
X1302	Si. Transistor	2SC1685(R)
X1303	Si. Transistor	2SA673(C)
X1304	Si. Transistor	2SC1685(R)
X1305	Si. Transistor	2SC1685(R)
X1401	Si. Transistor	2SD478
X1402	Si. Transistor	2SD478
X1501	Si. Transistor	2SC2610BK
X1901	Si. Transistor	2SC2688 (K.L.M.)
X1902	Si. Transistor	2SC1890A (E.F.)
D1101	Si. Diode	W06A
D1102	Si. Diode	W06A
D1103	Si. Diode	W06A
D1301	Si. Diode	1S2473H
D1401	Si. Diode	1S2473H
D1402	Zener Diode	RD10F(C)
D1503	Si. Diode	HF-1
D1504	Si. Diode	V09E
D1505	Zener Diode	RD11E(B)
D1506	Si. Diode	W06A
D1507	Si. Diode	1SS81
D1508	Si. Diode	1S2473H
$\Delta$ D1701	$\Delta$ Zener Diode	RD20EV2
$\Delta$ D1901	$\Delta$ Si. Diode	1S1887A
$\Delta$ D1902	$\Delta$ Si. Diode	1S1887A
$\Delta$ D1903	$\Delta$ Si. Diode	1S1887A
$\Delta$ D1904	$\Delta$ Si. Diode	1S1887A
$\Delta$ D1905	$\Delta$ Zener Diode	RD6.8EV3
Miscellaneous	Description	Part Number
Symbol		
$\Delta$ F1901	$\Delta$ Fuse 1.25A	QMF53U1-1R25S
$\Delta$ F1902	$\Delta$ UL Fuse 3A	QMF66U1-3R0S





DIM. TOLERANCES UNLESS OTHERWISE SPEC		FIRST USED ON		DATE		SCALE	
CONCENTRICITY T I R .002		DRN		03/03/86			
FRACTIONAL ± 1/64		MECH CHK		MATT			
DECIMAL ± .005		ELEC CHK		FINISH			
HOLE DIA + .002 - .000							
ANGLE ± 1/2°							
DO NOT SCALE DWG							

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**MIDWAY MFG. CO.**  
FRANKLIN PK., IL. 60131 A BALLY CO

ASS'Y DRAWING  
MONO BD.  
A080-91787-C000

REVISIONS	
PART NO	M051-0-0-1-4-C-1-2-8

DESIGNATION LIST: Page 1 of 4 (Rev. 04 Sep 85)

DESIGNATION LIST: Page 2 of 4 (Rev. 04 Sep 85)

DESIGNATION LIST: Page 3 of 4 (Rev. 04 Sep 85)

DESIGNATION LIST: Page 4 of 4 (Rev. 04 Sep 85)

DESCRIPTION	DESIGNATION NO.
CP1-CP140	.01 UF AX. CER.
C1,C2	390 PF AX. CER.
C3	470 UF 16V AX. ELEC.
C4	10 UF 25V AX. TANT.
C5	33 PF AX. CER.
C6-C38	.1 UF AX. CER.
C39	10 UF 25V AX. TANT.
C40	NOT USED (LEAVE OPEN)
C41,C42	390 PF AX. CER.
C43-C46	820 PF AX. CER.
C47-C52	47 PF AX. CER.
C53,C54	470 UF 16V AX. ELEC.
C55	390 PF AX. CER.
C56	10 UF 25V AX. TANT.
R1,R2	4.7K OHM 1/4W 5% CRBN.
R3,R4	10K OHM 1/4W 5% CRBN.
R5-R7	4.7K OHM 1/4W 5% CRBN.
R8	82K OHM 1/4W 5% CRBN.
R9	22 OHM 1/4W 5% CRBN.
R10-R13	4.7K OHM 1/4W 5% CRBN.
R14-R45	220 OHM 1/4W 5% CRBN.
R46,R47	2.7K OHM 1/4W 5% CRBN.
R48-R50,R52-R56	4.7K OHM 1/4W 5% CRBN.
R57	560 OHM 1/4W 5% CRBN.
R58,R59	10 OHM 1/4W 5% CRBN.
R60	470 OHM 1/4W 5% CRBN.
R61,R62	10 OHM 1/4W 5% CRBN.
R63	470 OHM 1/4W 5% CRBN.
R64,R65	10 OHM 1/4W 5% CRBN.
R66	470 OHM 1/4W 5% CRBN.
R67	2K OHM 1/4W 5% CRBN.
R68	1K OHM 1/4W 5% CRBN.
R69	510 OHM 1/4W 5% CRBN.
R70	2K OHM 1/4W 5% CRBN.
R71	1K OHM 1/4W 5% CRBN.
R72	510 OHM 1/4W 5% CRBN.
R73	1K OHM 1/4W 5% CRBN.
R74	2K OHM 1/4W 5% CRBN.
R75	1K OHM 1/4W 5% CRBN.
R76	510 OHM 1/4W 5% CRBN.
R77,R78	560 OHM 1/4W 5% CRBN.
R79,R81-R84	4.7K OHM 1/4W 5% CRBN.
R85	1K OHM 1/4W 5% CRBN.
R86	1K OHM 1/4W 5% CRBN.
R87	4.7K OHM 1/4W 5% CRBN.
RM1-RM4	2.7K OHM 10 PIN SIP
RM5	4.7K OHM 10 PIN SIP
RM6-RM9	1K OHM 9 PIN SIP
D1,D2	1N4148 DIODE
Q1	2N4123 XSTR.
Q2	2N4403 XSTR.
Q3	TIP110 XSTR.

DESCRIPTION	DESIGNATION NO.
Q4	2N4123 XSTR.
Q5-Q10	MPSA70 XSTR.
IC 4A	93419 64x9 RAM
IC 5A	74LS157
IC 6A,7A	74LS273
IC 8A-12A	74LS244
IC 14A	74LS00
IC 15A	BG0 64K ROM/EPROM
IC 1B	74LS245
IC 3B,5B	PROG0,PROG1 256K ROM/EPROM
IC 6B	6116 2Kx8 RAM 150 NS.
IC 8B	74LS245
IC 9B	6116 2Kx8 RAM 150 NS.
IC 10B	74LS245
IC 11B	6116 2Kx8 RAM 120 NS.
IC 12B,13B	74LS377
IC 14B	BG1 64K ROM/EPROM
IC 15B	74LS273
IC 1C	Z80B CPU
IC 2C	Z80B CTC
IC 3C	74LS157
IC 4C	74LS244
IC 5C,6C	74F157
IC 7C	74LS157
IC 8C	74F157
IC 10C	2018 2Kx8 RAM 55NS
IC 11C	74LS244
IC 13C	74LS86
IC 14C	74LS153
IC 15C	74LS273
IC 1D	74S04
IC 2D	74LS244
IC 3D-5D	74LS163
IC 6D	74ALS20
IC 7D	74LS157
IC 8D	74LS174
IC 9D	74LS158
IC 10D	74LS174
IC 11D	74LS157
IC 12D	74LS174
IC 13D	74LS194
IC 14D	74LS158
IC 15D	74LS153
IC 1E	20 MHZ COSC.
IC 2E	74F74
IC 3E	74LS368
IC 4E-6E,8E	FG3,FG2,FG1,FG0 256K ROM/EPROM
IC 9E	74F10
IC 10E	74LS138
IC 11E	74LS194
IC 12E	74LS74
IC 13E,14E	74LS194

DESCRIPTION	DESIGNATION NO.
IC 15E	74LS298
IC 1F	74LS367
IC 2F,3F	74LS20
IC 4F	74S04
IC 5F	74LS32
IC 6F	74LS00
IC 7F	74LS378
IC 8F	74LS377
IC 9F	74LS378
IC 10F	74F86
IC 11F	74F00
IC 12F-14F	74LS194
IC 15F	74LS74
IC 1G	74LS08
IC 2G	74LS138
IC 3G	74LS157
IC 4G	MMC01A HAL
IC 5G	MMC03B HAL
IC 6G	74F157
IC 7G	74LS283
IC 8G	74LS173
IC 9G,10G	74LS169
IC 11G	2018 2Kx8 RAM 45NS
IC 12G	74LS374
IC 13G	74LS258
IC 14G	74LS194
IC 1H	74LS32
IC 2H	74F174
IC 3H	74LS273
IC 4H	74LS08
IC 5H	MMC06 HAL
IC 6H	MMC02B HAL
IC 7H	74F86
IC 8H	74LS86
IC 9H	74LS374
IC 10H	74F74
IC 11H	74LS374
IC 12H	74LS20
IC 13H	74LS258
IC 14H	74LS174
IC 1J	74LS55
IC 2J	PACNS REV 1.0 PLA
IC 3J	PACOUT REV 1.0 PLA
IC 4J	74LS175
IC 6J	74LS283
IC 7J	74LS02
IC 8J	74LS374
IC 9J	2018 2Kx8 RAM 45NS
IC 10J	74LS374
IC 11J	2018 2Kx8 RAM 45NS
IC 12J	74LS374
IC 13J	ROMCNTRL REV 1.0 PLA

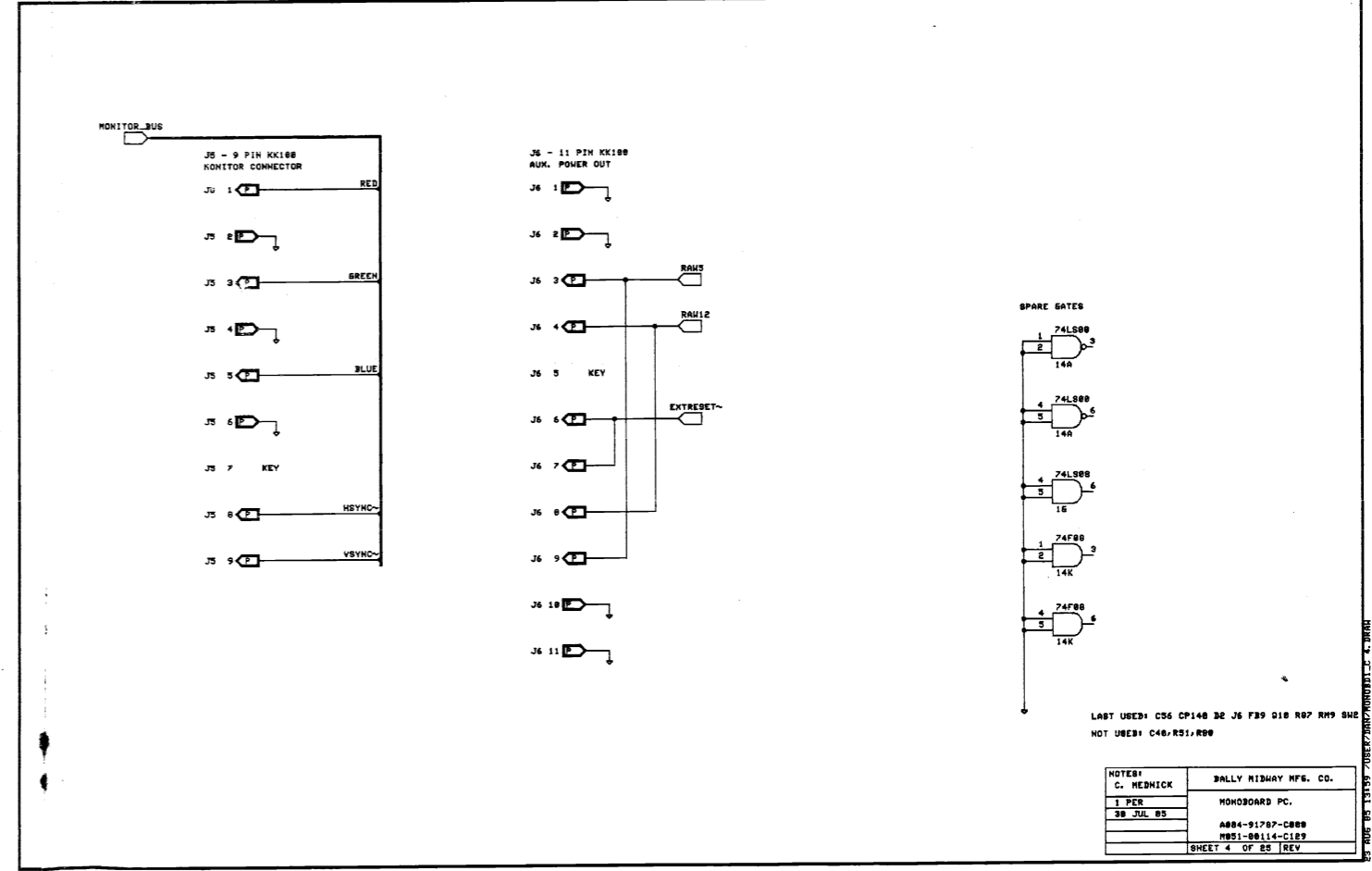
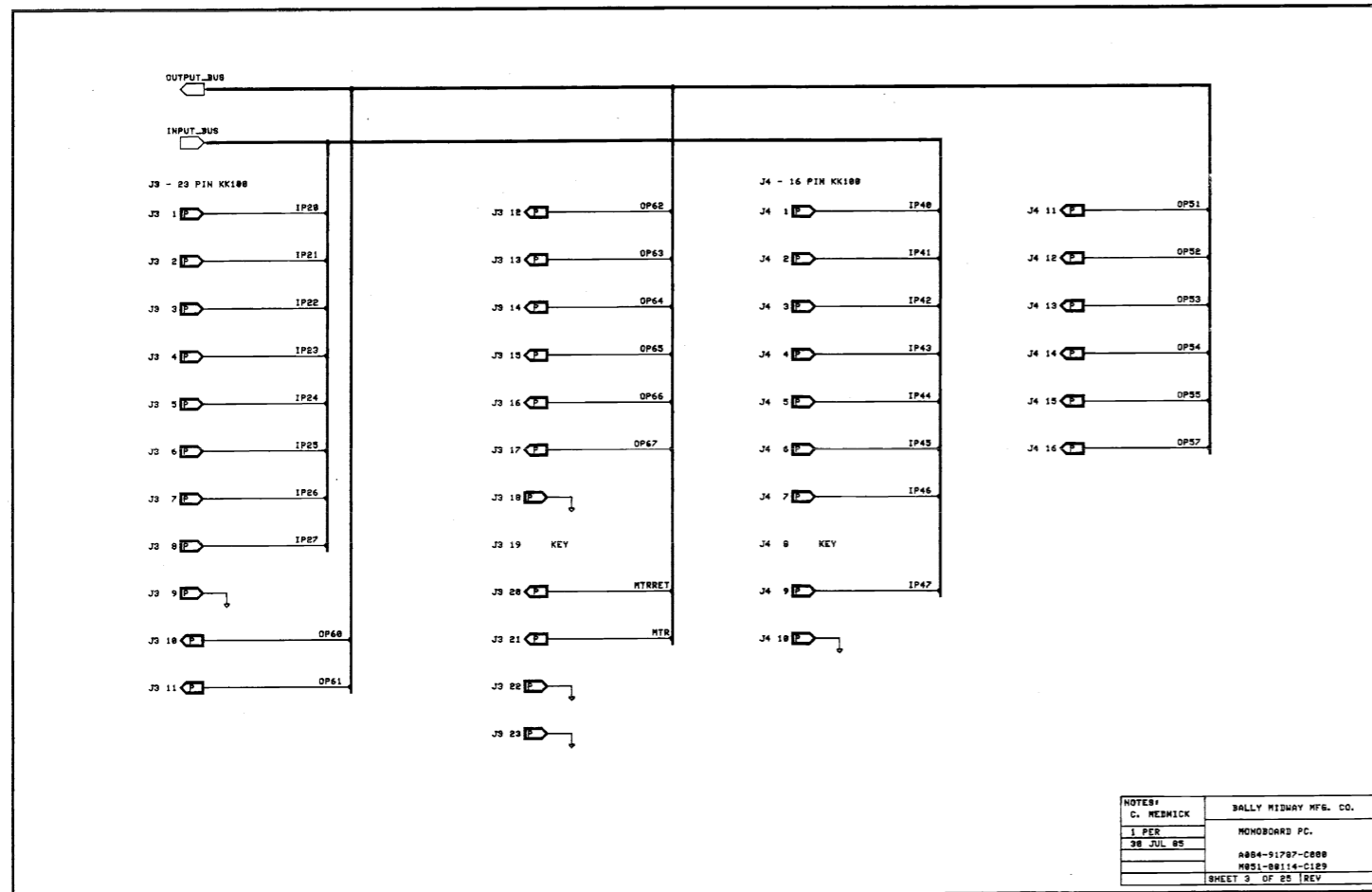
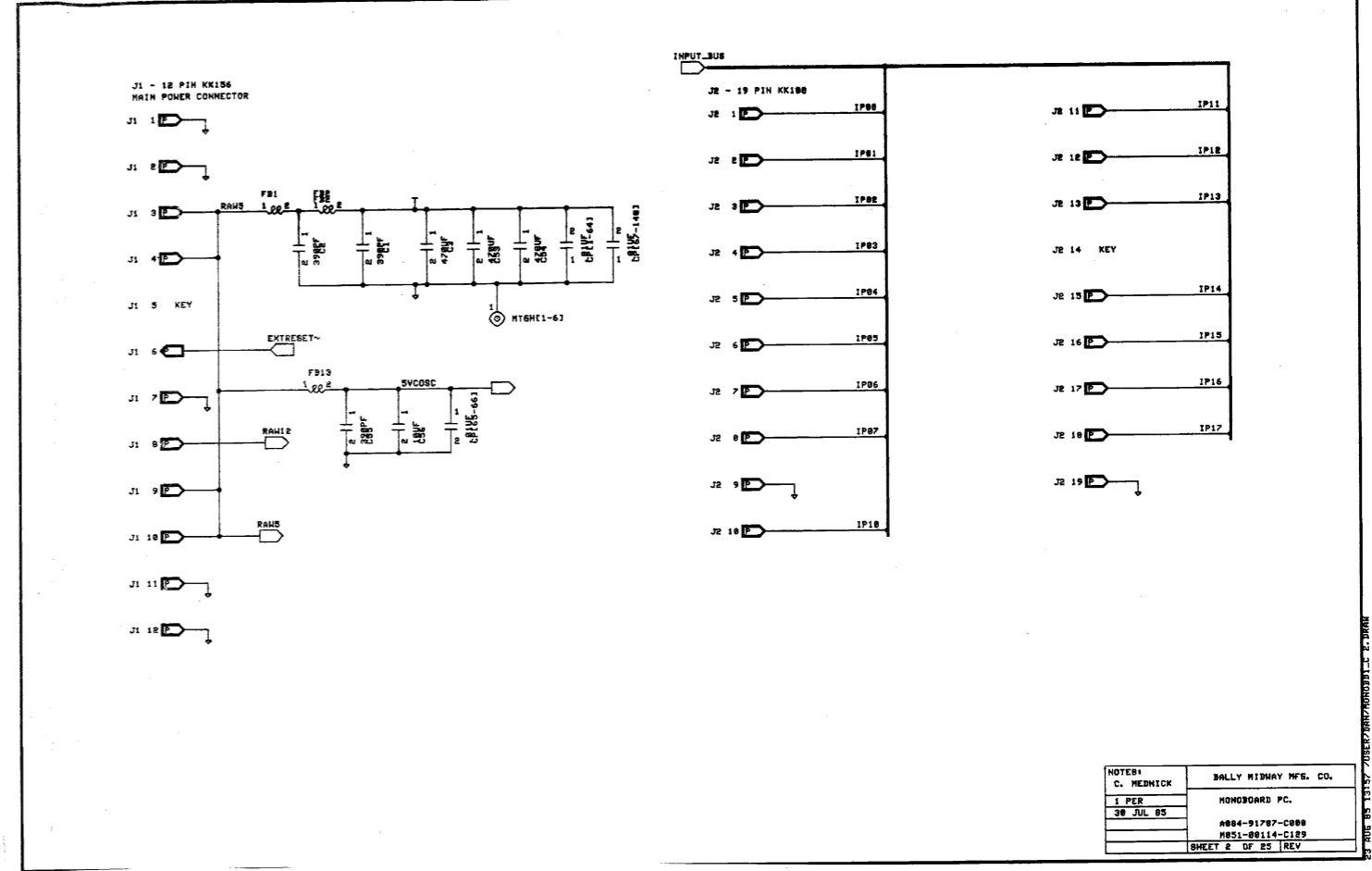
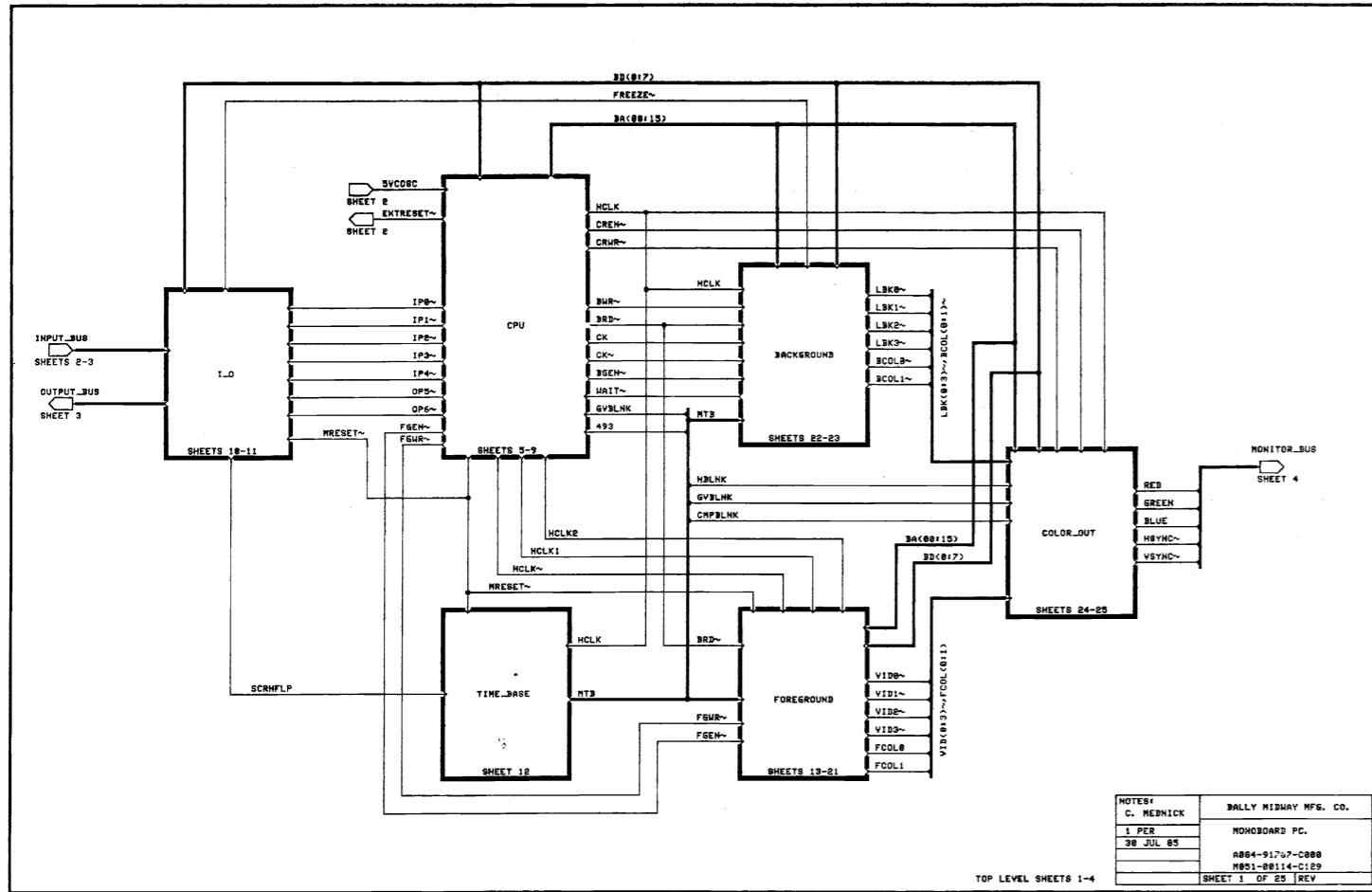
DESCRIPTION	DESIGNATION NO.
IC 14J	74LS161
IC 1K	74LS04
IC 2K	7406
IC 3K	74LS74
IC 4K	74LS32
IC 5K,6K	74LS74
IC 7K	74LS169
IC 8K	74LS173
IC 9K	74LS169
IC 10K	2018 2Kx8 RAM 45NS
IC 11K	74LS173
IC 12K	74LS298
IC 13K	74LS174
IC 14K	74F08
IC 15K	74LS74
ICS 4A,15A,3B,5B	28 PIN IC SOCKET (.600)
ICS 6B,9B,11B	24 PIN IC SOCKET (.600)
ICS 14B	28 PIN IC SOCKET (.600)
ICS 1C	40 PIN IC SOCKET (.600)
ICS 2C	28 PIN IC SOCKET (.600)
ICS 10C	24 PIN IC SOCKET (.300)
ICS 3E	16 PIN IC SOCKET (.300)
ICS 4E-6E,8E	28 PIN IC SOCKET (.600)
ICS 4G	24 PIN IC SOCKET (.300)
ICS 5G	20 PIN IC SOCKET (.300)
ICS 11G	24 PIN IC SOCKET (.300)
ICS 5H	20 PIN IC SOCKET (.300)
ICS 6H	24 PIN IC SOCKET (.300)
ICS 2J,3J	20 PIN IC SOCKET (.300)
ICS 9J,11J	24 PIN IC SOCKET (.300)
ICS 13J	20 PIN IC SOCKET (.300)
ICS 10K	24 PIN IC SOCKET (.300)
FB1-FB13	FERRITE BEAD
SW1	SWITCH PC. MTG.
SW2	10 POS. DIP SWITCH
JW1-JW4	JUMPER
J1	AUTO INSERT PINS TIN .045
J2-J6	AUTO INSERT PINS TIN .025
MHQ3	SNAP
PC BOARD	A080-91787-C000

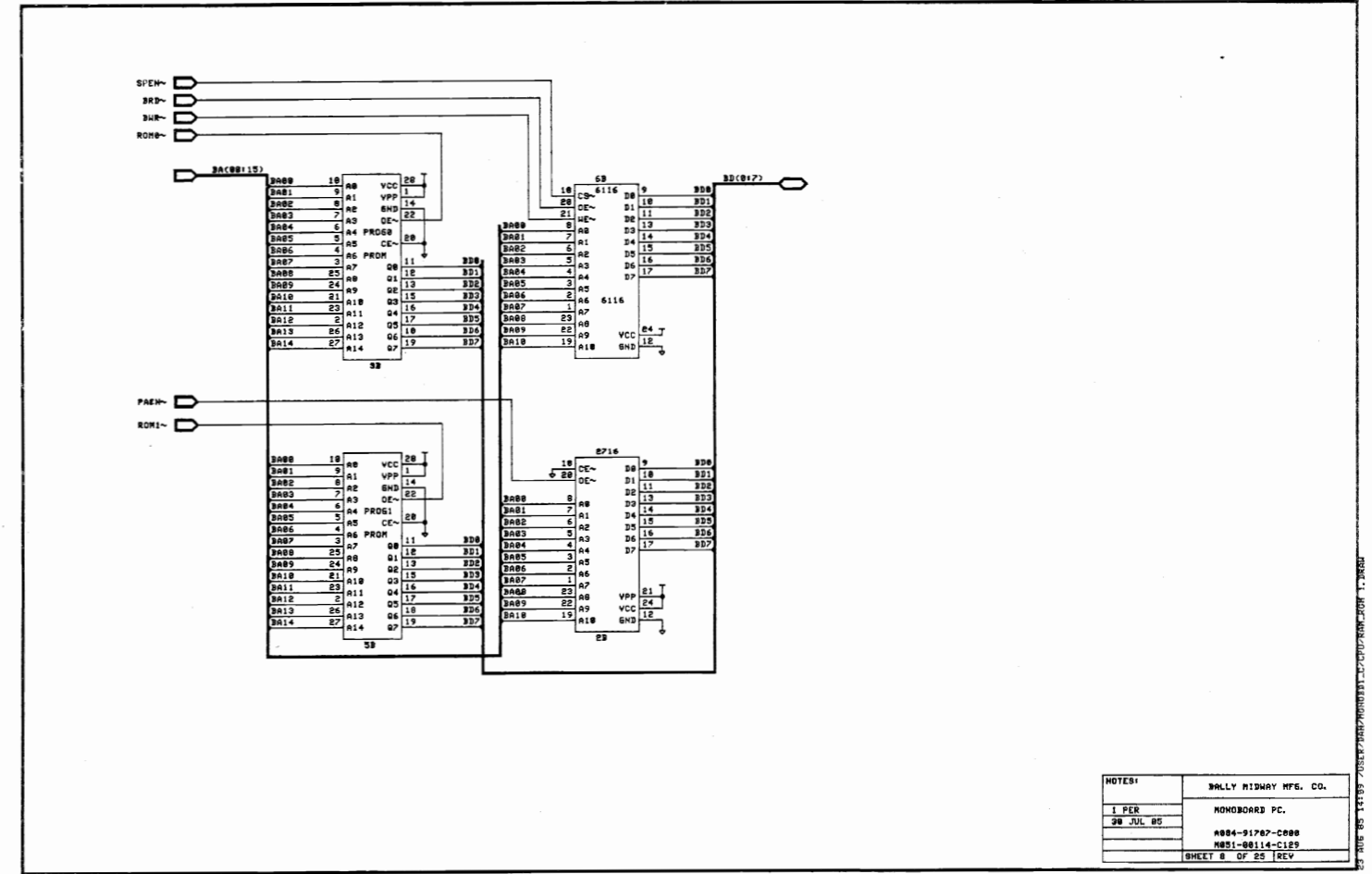
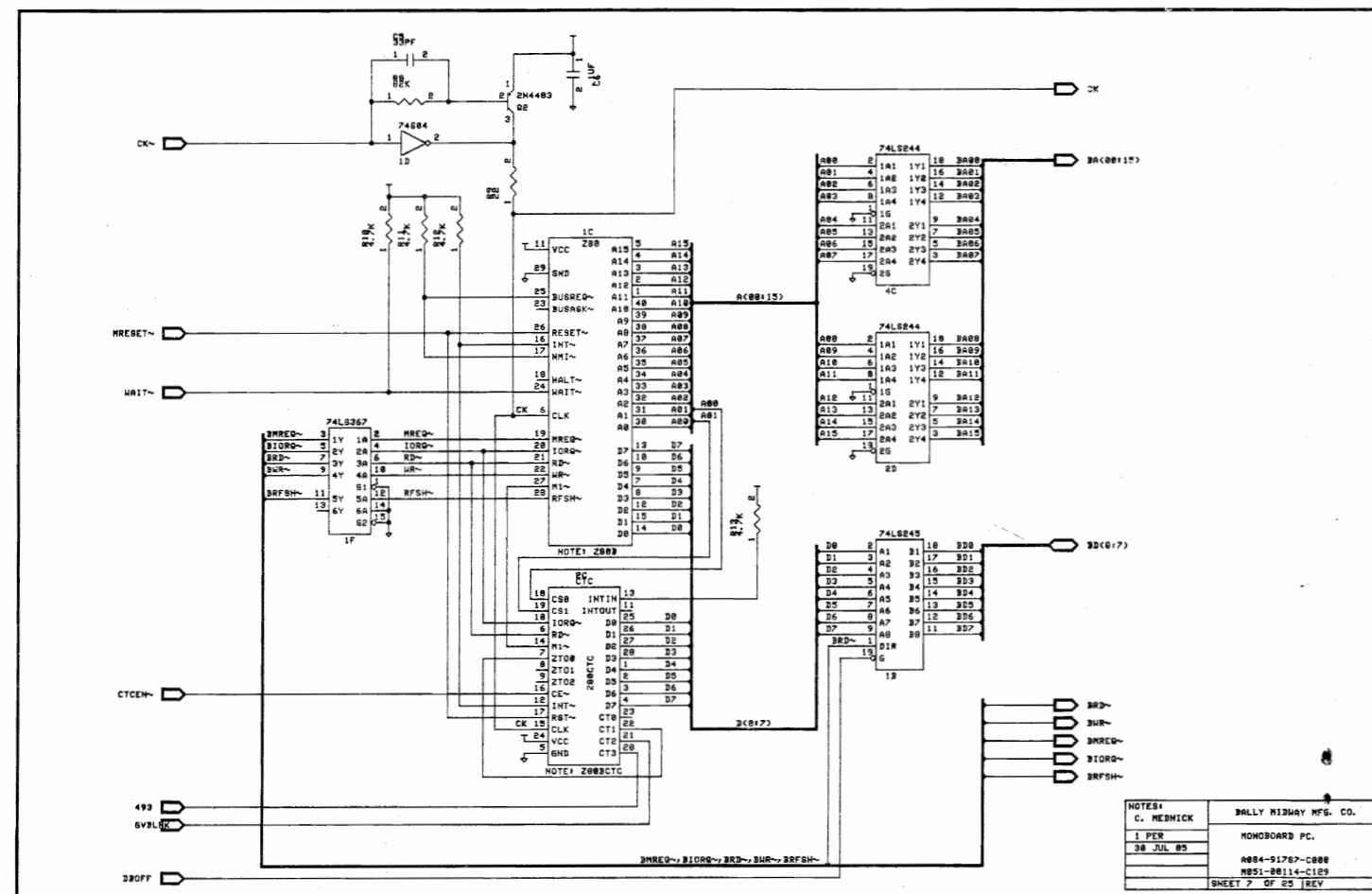
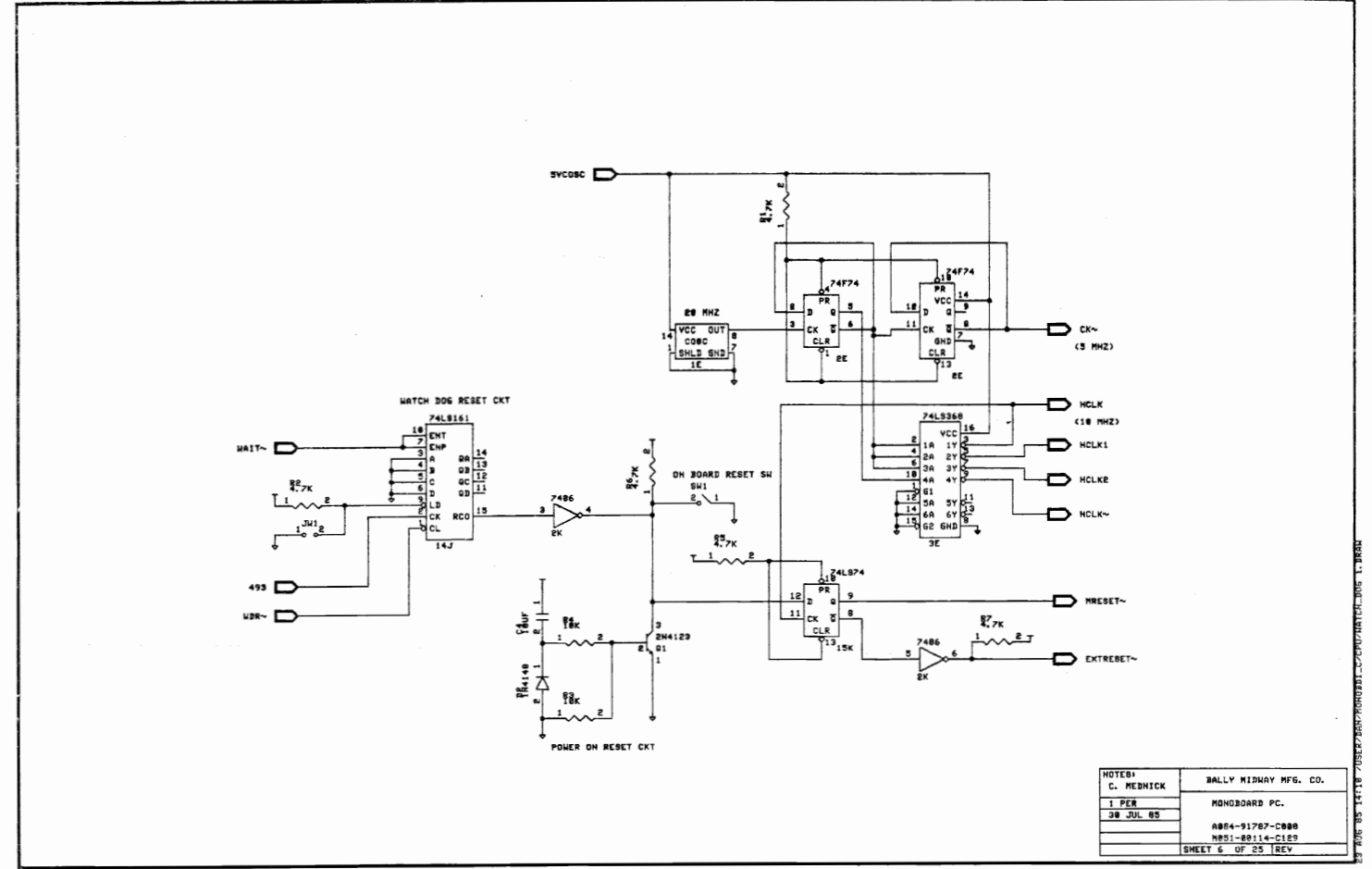
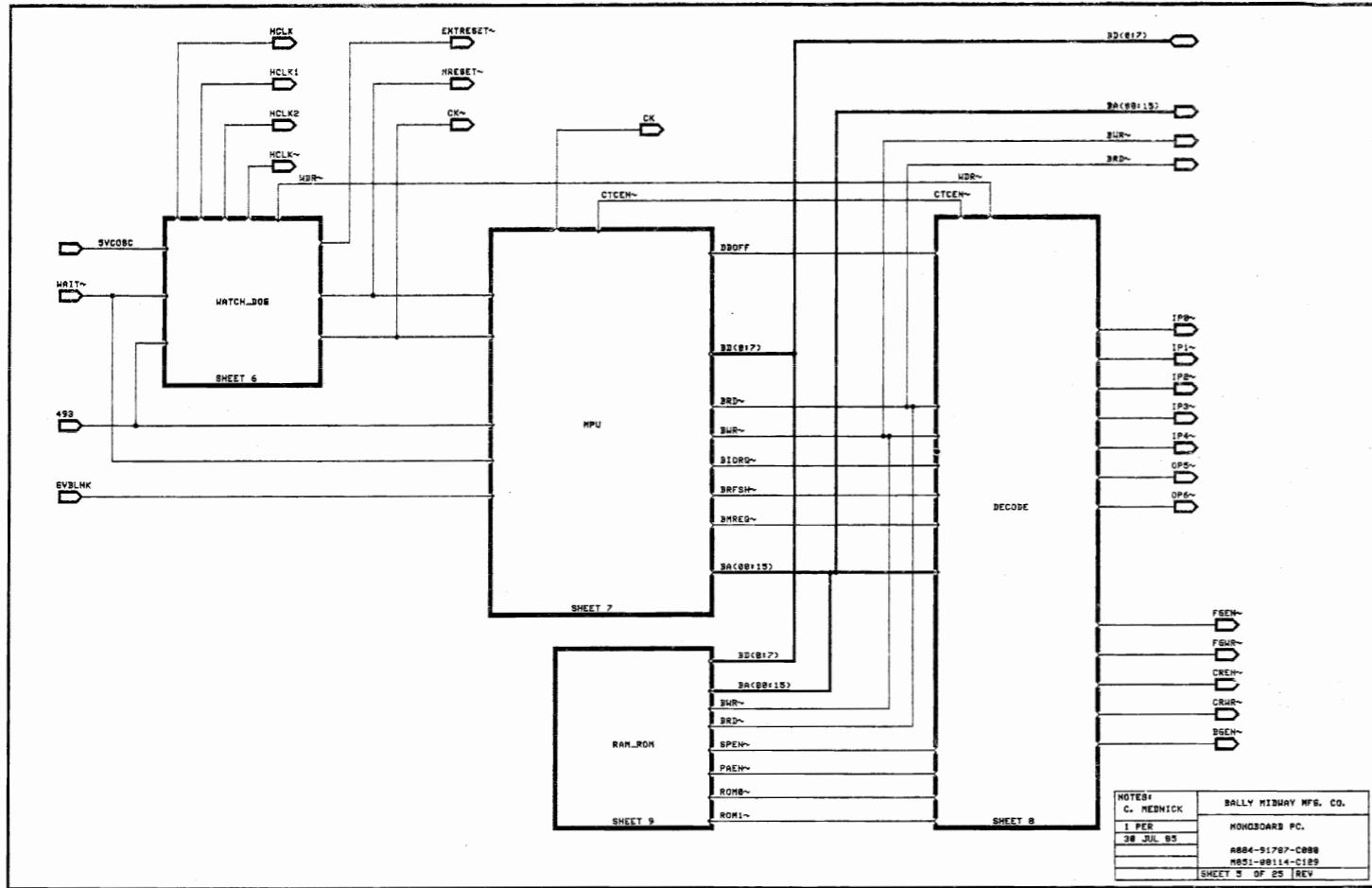
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Changed 22 Aug 85 - added ICS 3E CMM  
Changed 04 Sep 85 - Corrected J2-J6 to .025  
Sq. Pin CMM

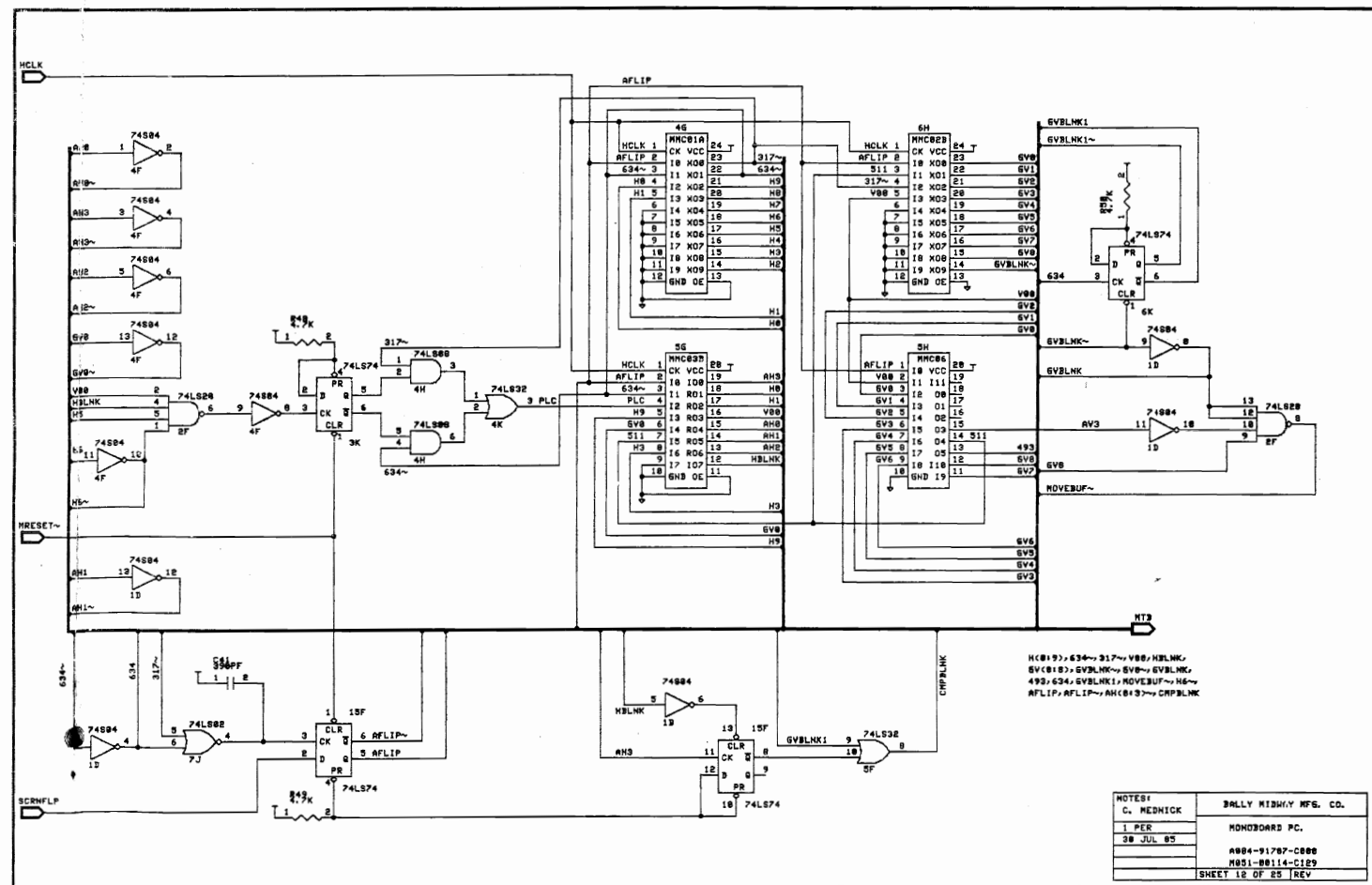
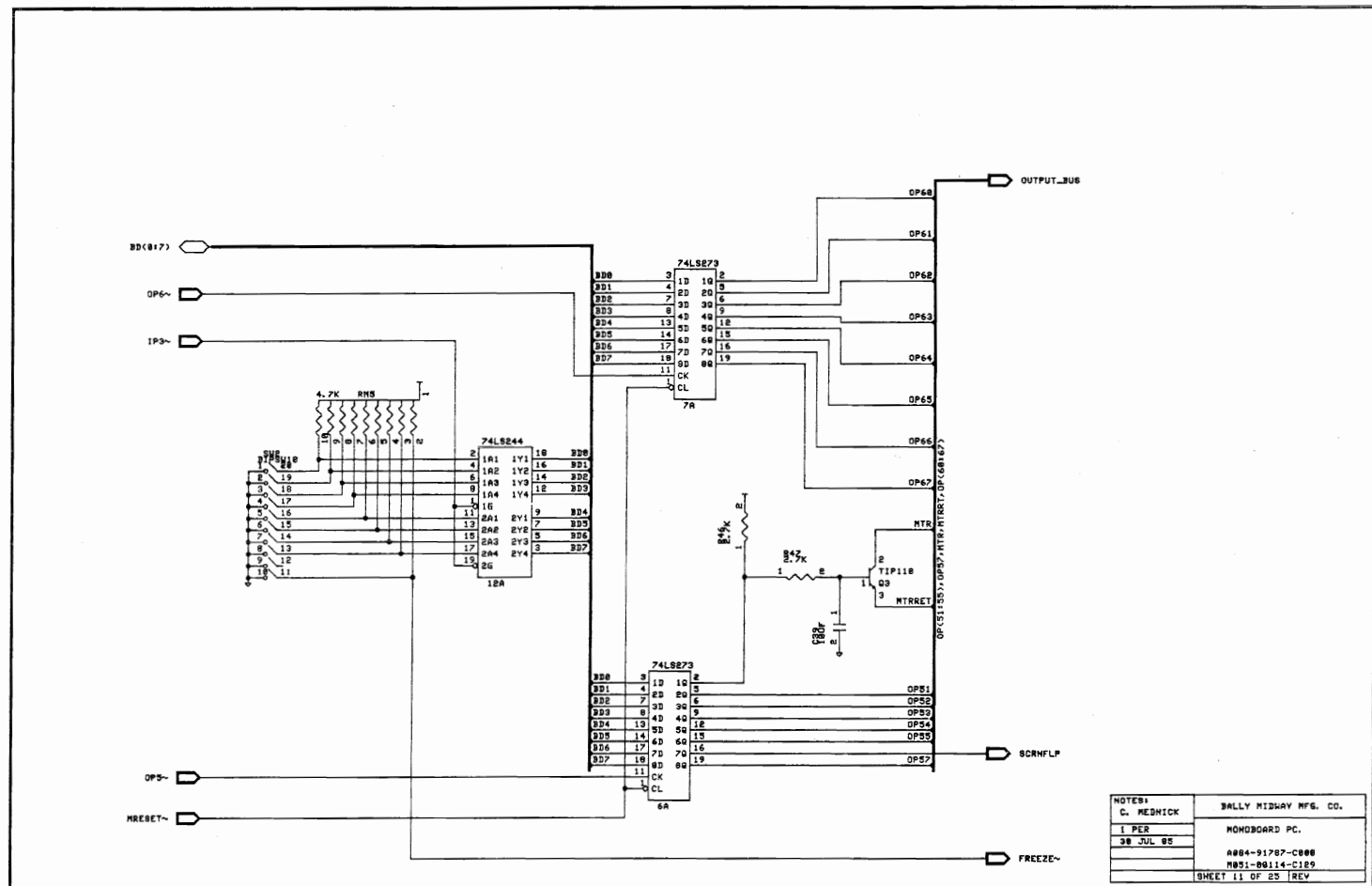
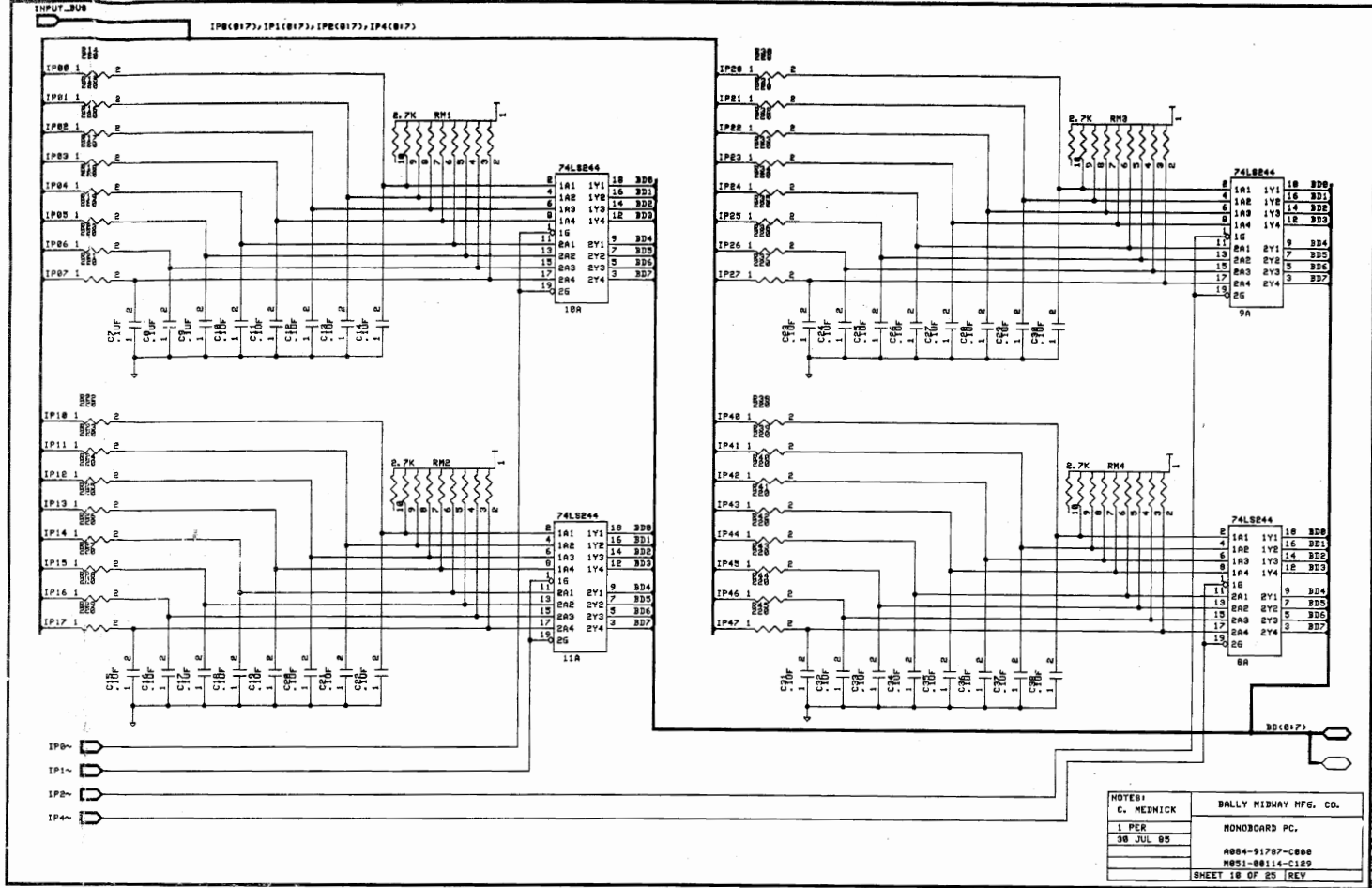
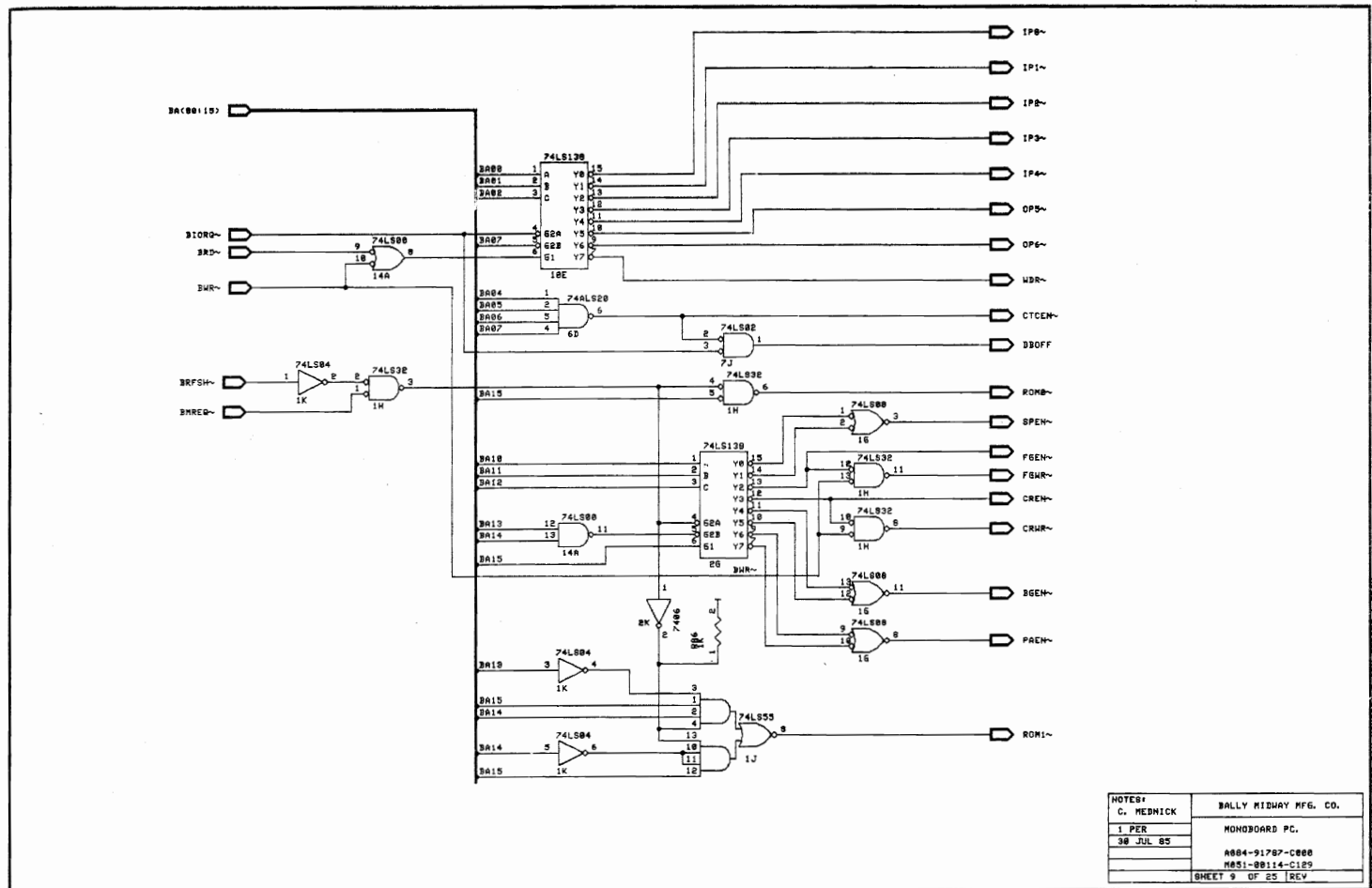
DESCRIPTION	QTY	DESIGNATION NO.	PART NO.
33 PF AX. CER.	1	C5	0986-00800-0300
47 PF AX. CER.	6	C47-C52	0986-00800-2800
390 PF AX. CER.	5	C1,C2,C41,C42,C55	0986-00800-3000
820 PF AX. CER.	4	C43-C46	0945-00816-0400
.01 UF AX. CER.	140	CP1-CP140	0986-00800-2000
.1 UF AX. CER.	33	C6-C38	0986-00800-1100
10 UF 25V AX. TANT.	3	C4,C39,C56	0986-00800-0700
470 UF 16V AX. ELEC.	3	C3,C53,C54	0986-00800-2700
10 OHM 1/4W 5% CRBN.	6	R58,R59,R61,R62,R64, R65	100E-00005-0011
22 OHM 1/4W 5% CRBN.	1	R9	100E-00005-0016
220 OHM 1/4W 5% CRBN.	32	R14-R45	100E-00005-0041
470 OHM 1/4W 5% CRBN.	3	R60,R63,R66	100E-00005-0051
510 OHM 1/4W 5% CRBN.	3	R69,R72,R76	100E-00005-0053
560 OHM 1/4W 5% CRBN.	3	R57,R77,R78	100E-00005-0054
1K OHM 1/4W 5% CRBN.	6	R68,R71,R73,R75,R85, R86	100E-00005-0061
2K OHM 1/4W 5% CRBN.	3	R67,R70,R74	100E-00005-0068
2.7K OHM 1/4W 5% CRBN.	2	R46,R47	100E-00005-0071
4.7K OHM 1/4W 5% CRBN.	23	R1,R2,R5-R7,R10-R13, R48-R50,R52-R56,R79, R81-84,R87	100E-00005-0079
10K OHM 1/4W 5% CRBN.	2	R3,R4	100E-00005-0088
82K OHM 1/4W 5% CRBN.	1	R8	100E-00005-0112
1K OHM 9 PIN SIP	4	RM6-RM9	102E-00004-0011
2.7K OHM 10 PIN SIP	4	RM1-RM4	102E-00004-0020
4.7K OHM 10 PIN SIP	1	RM5	102E-00004-0026
1N4148 DIODE	2	D1,D2	103E-00002-0005
2N4123 NPN XSTR.	2	Q1,Q4	104E-00001-0007
2N4403 PNP XSTR.	1	Q2	104E-00002-0006
MPSA70 PNP XSTR	6	Q5-Q10	104E-00002-0012
TIP110 NPN XSTR.	1	Q3	104E-00009-0001
20 MHZ COSC.	1	IC 1E	0304-00804-0007
7406	1	IC 2K	0986-00803-7600
74ALS20	1	IC 6D	0A59-00803-0015
74F00	1	IC 11F	0A59-00803-0001
74F08	1	IC 14K	0A59-00803-0030
74F10	1	IC 9E	0A59-00803-0002
74F74	2	IC 2E,10H	0A59-00803-0003
74F86	2	IC 10F,7H	0A59-00803-0031
74F157	4	IC 5C,6C,8C,6G	0A59-00803-0004
74F174	1	IC 2H	0A59-00803-0005
74LS00	2	IC 14A,6F	0304-00803-0010
74LS02	1	IC 7J	0986-00803-7400

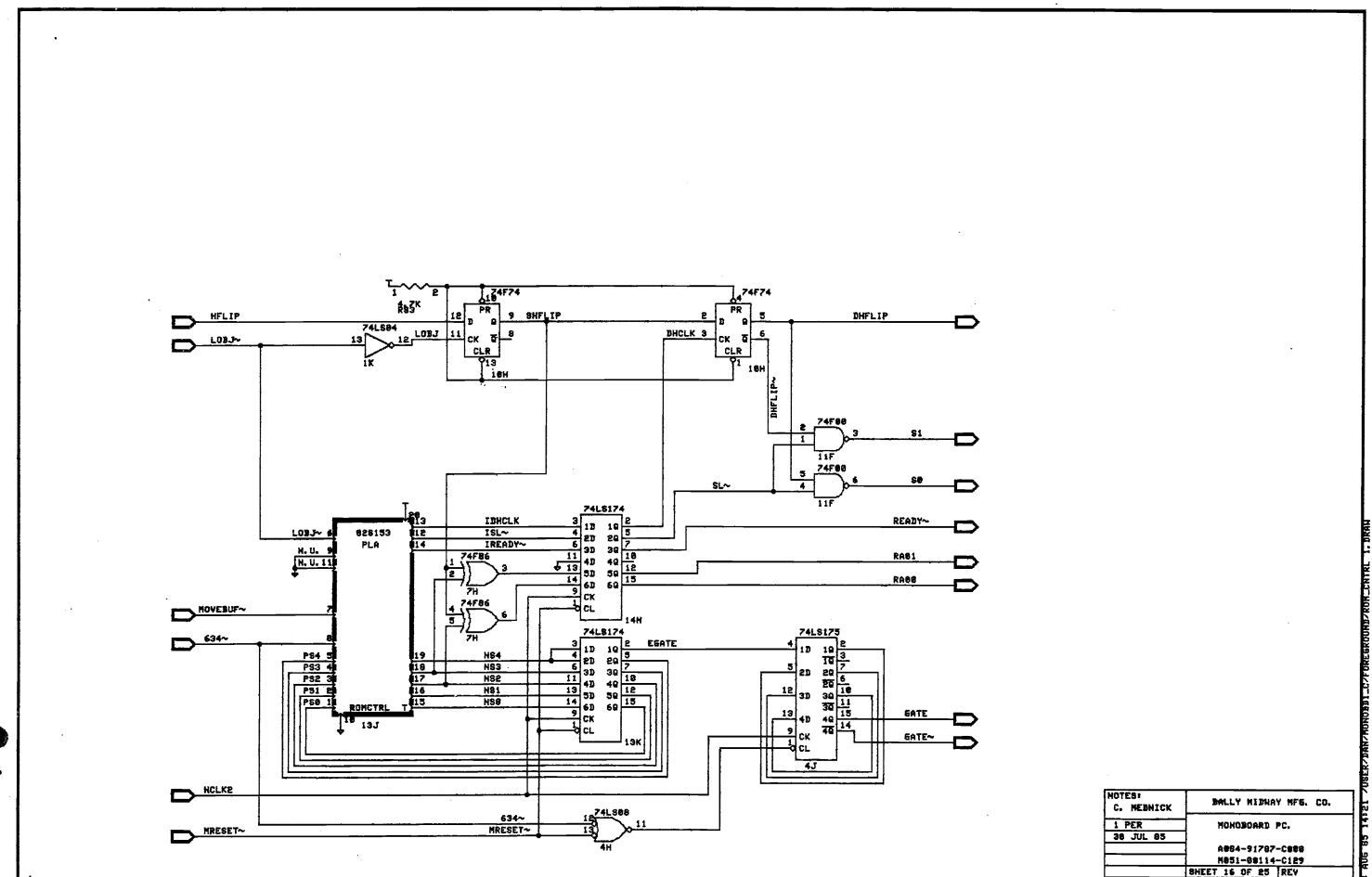
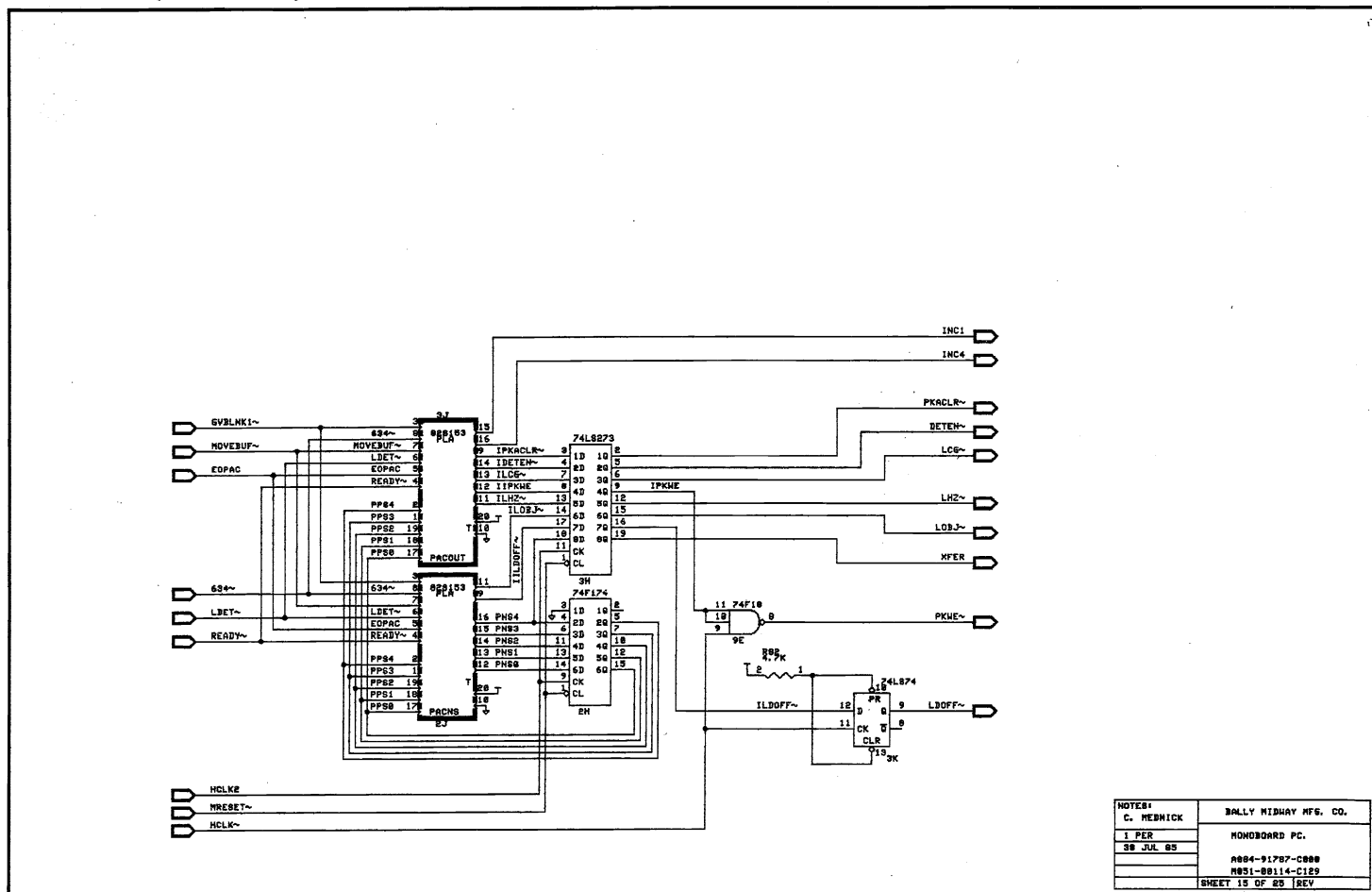
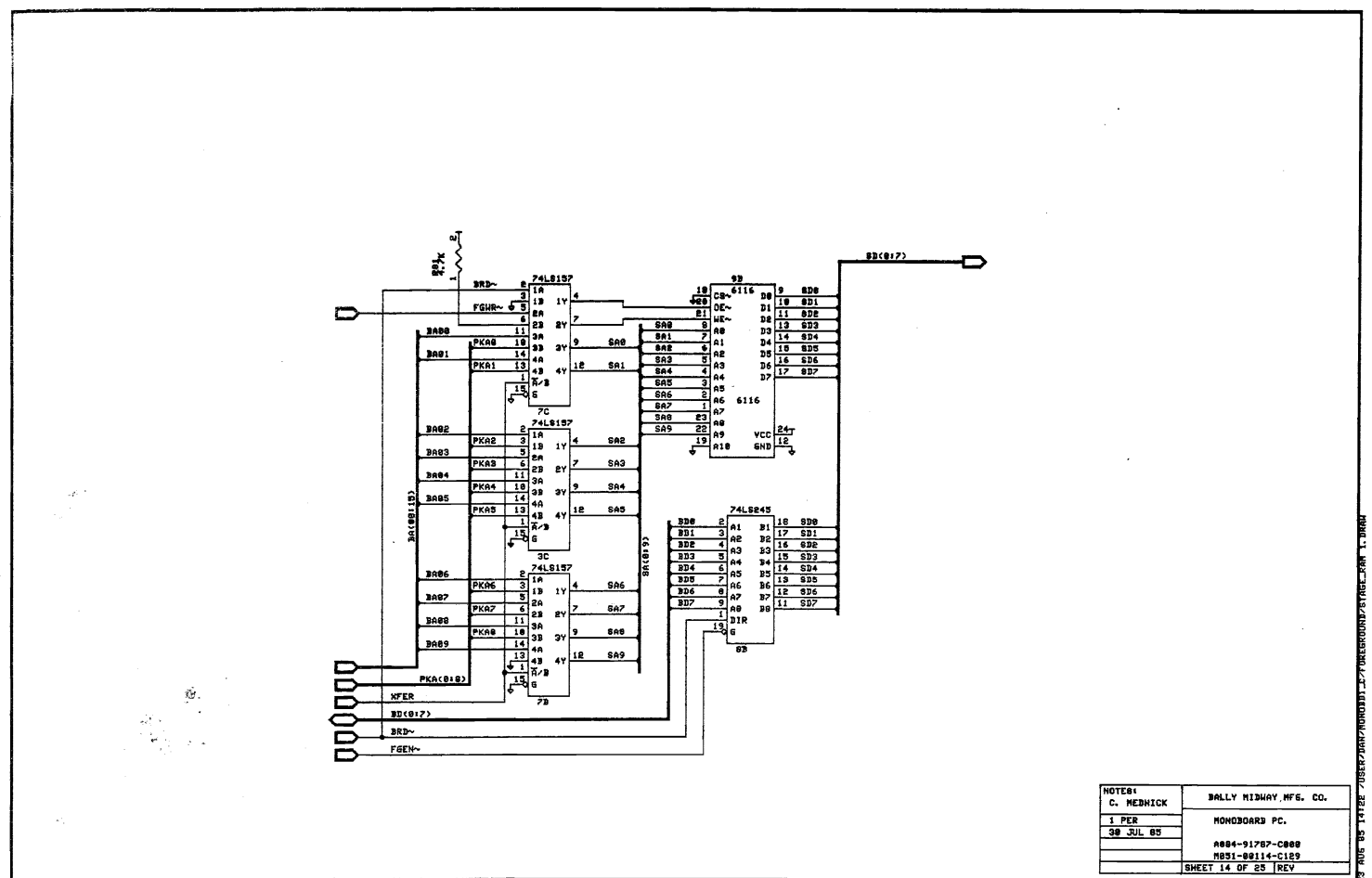
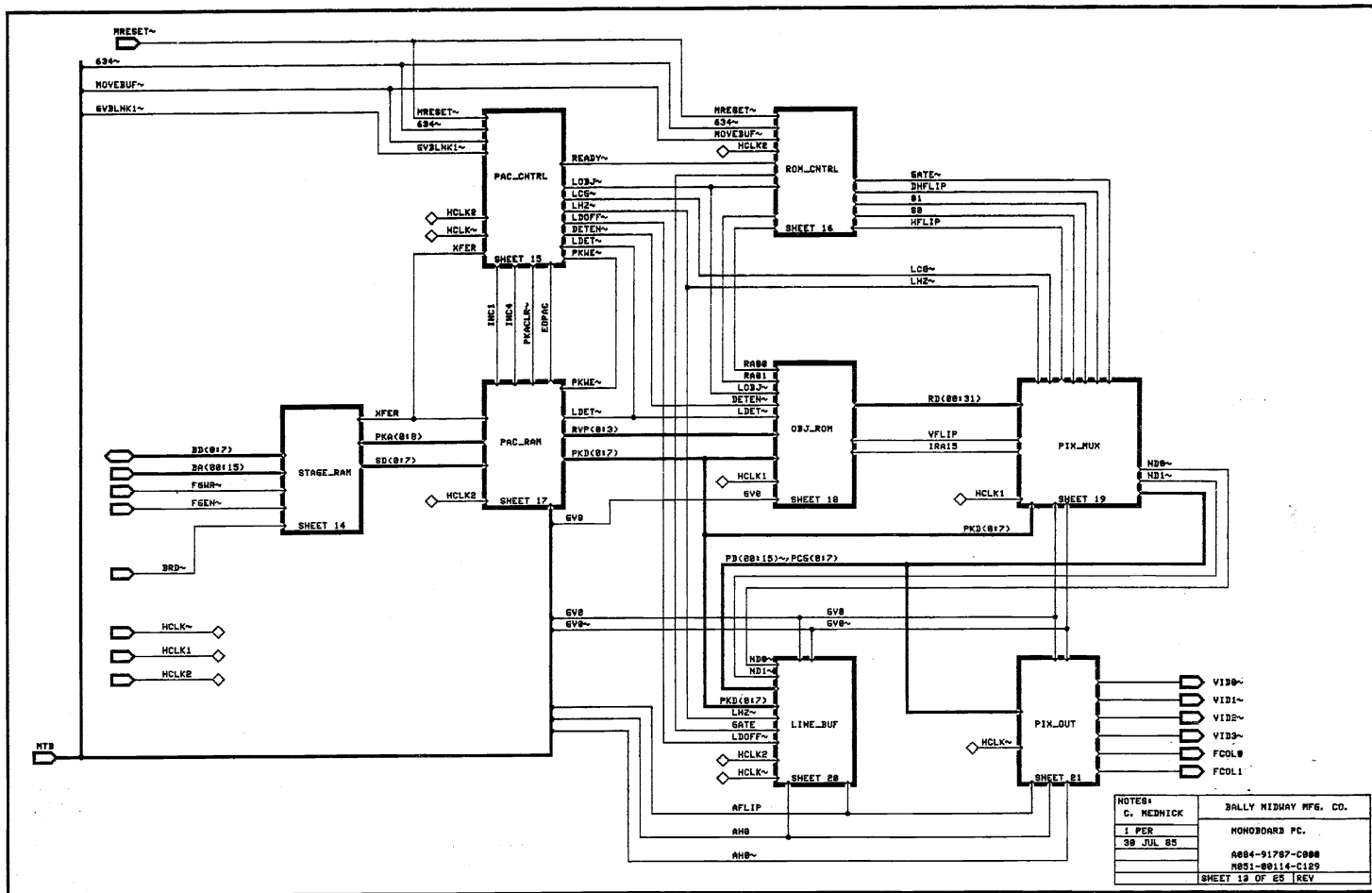
DESCRIPTION	QTY	DESIGNATION NO.	PART NO.
74LS04	1	IC 1K	0986-00803-6900
74LS08	2	IC 1G,4H	0986-00803-7300
74LS20	3	IC 2F,3F,12H	0986-00803-1004
74LS32	3	IC 5F,1H,4K	0986-00803-6100
74LS55	1	IC 1J	0A59-00803-0026
74LS74	6	IC 12E,15F,3K,5K,6K, 15K	0986-00803-1005
74LS86	2	IC 13C,8H	0986-00803-9900
74LS138	2	IC 10E,2G	0986-00803-6500
74LS153	2	IC 14C,15D	0A59-00803-0006
74LS157	6	IC 5A,3C,7C,7D,11D,3G	0304-00803-0021
74LS158	2	IC 9D,14D	0A59-00803-0007
74LS161	1	IC 14J	0986-00803-1003
74LS163	3	IC 3D-5D	0A59-00803-0008
74LS169	4	IC 9G,1CG,7K,9K	0304-00803-0023
74LS173	3	IC 8G,8K,11K	0A59-00803-0009
74LS174	5	IC 8D,10D,12D,14H,13K	0304-00803-0024
74LS175	1	IC 4J	0304-00803-0025
74LS194	8	IC 13D,11E,13E,14E, 12F-14F,14G	0304-00803-0026
74LS244	8	IC 8A-12A,4C,11C,2D	0986-00803-4800
74LS245	3	IC 1B,8B,10B	0986-00803-6400
74LS258	2	IC 13G,13H	0304-00803-0028
74LS273	5	IC 6A,7A,15B,15C,3H	0986-00803-4700
74LS283	2	IC 7G,6J	0304-00803-0030
74LS298	2	IC 15E,12K	0A59-00803-0010
74LS367	1	IC 1F	0986-00803-7000
74LS368	1	IC 3E	0A59-00803-0011
74LS374	6	IC 12G,9H,11H,8J,10J, 12J	0986-00803-4600
74LS377	3	IC 8F,12B,13B	0A59-00803-0012
74LS378	2	IC 7F,9F	0A59-00803-0013
74S04	2	IC 1D,4F	0986-00803-6600
MMCO1A HAL	1	IC 4G	0986-00803-8900
MMCO2B HAL	1	IC 6H	0986-00803-9000
MMCO3B HAL	1	IC 5G	0986-00803-9100
MMCO6 HAL	1	IC 5H	0986-00803-9200
PACNS REV 1.0 PLA	1	IC 2J	A59A-26AAJ-BXHD
PACOUT REV 1.0 PLA	1	IC 3J	A59A-26AAJ-AXHD
ROMCTRL REV 1.0 PLA	1	IC 13J	A59A-26AAJ-CXHD
2018 2Kx8 RAM 45NS	4	IC 11G,10K,9J,11J	0A59-00803-0028
2018 2Kx8 RAM 55NS	1	IC 10C	0A59-00803-0029
6116 2Kx8 RAM 120NS	1	IC 11B	0A59-00803-0027
6116 2Kx8 RAM 150NS	2	IC 6B,9B	0A59-00803-0014
93419 64x9 RAM	1	IC 4A	0986-00803-9600
Z80B	1	IC 1C	0304-00803-0041
Z80B CTC	1	IC 2C	0304-00803-0040
BGO 64K ROM/EPROM	1	IC 15A	ROM/EPROM CHART

DESCRIPTION	QTY	DESIGNATION NO.	PART NO.
BG1 64K ROM/EPROM	1	IC 14B	ROM/EPROM CHART
FG0 256K ROM/EPROM	1	IC 8E	ROM/EPROM CHART
FG1 256K ROM/EPROM	1	IC 6E	ROM/EPROM CHART
FG2 256K ROM/EPROM	1	IC 5E	ROM/EPROM CHART
FG3 256K ROM/EPROM	1	IC 4E	ROM/EPROM CHART
PROG0 256K ROM/EPROM	1	IC 3B	ROM/EPROM CHART
PROG1 256K ROM/EPROM	1	IC 5B	ROM/EPROM CHART
16 PIN IC SOCKET(.300)	1	ICS 3E	110E-00001-0003
20 PIN IC SOCKET(.300)	5	ICS 5G,5H,2J,3J,13J	110E-00001-0005
24 PIN IC SOCKET(.300)	7	ICS 10C,4G,11G,6H,9J 11J,10K	110E-00001-0009
24 PIN IC SOCKET(.600)	3	ICS 6B,9B,11B	110E-00001-0007
28 PIN IC SOCKET(.600)	10	ICS 4A,15A,3B,5B,14B, 2C,4E-6E,8E	110E-00001-0010
40 PIN IC SOCKET(.600)	1	ICS 1C	110E-00001-0011
AUTO INSERT PIN TIN .025 SQ	18	J2	0304-00804-0009
AUTO INSERT PIN TIN .025 SQ	22	J3	0304-00804-0009
AUTO INSERT PIN TIN .025 SQ	15	J4	0304-00804-0009
AUTO INSERT PIN TIN .025 SQ	8	J5	0304-00804-0009
AUTO INSERT PIN TIN .025 SQ	10	J6	0304-00804-0009
AUTO INSERT PIN TIN .045 SQ	11	J1	0304-00804-0010
FERRITE BEAD	13	FB1-FB13	0316-00804-0002
JUMPER	4	JW1-JW4	117E-00001-0003
SWITCH PC. MTG.	1	SW1	0986-00804-3100
10 POS. DIP SWITCH	1	SW2	113E-00001-0004
SNAP	1	MHQ3	0017-00007-0134
PC BOARD	1		A080-91787-C000
Released 6 Aug 85 CMM			
Changed 22 Aug 85 - Added ICS 3E CMM			

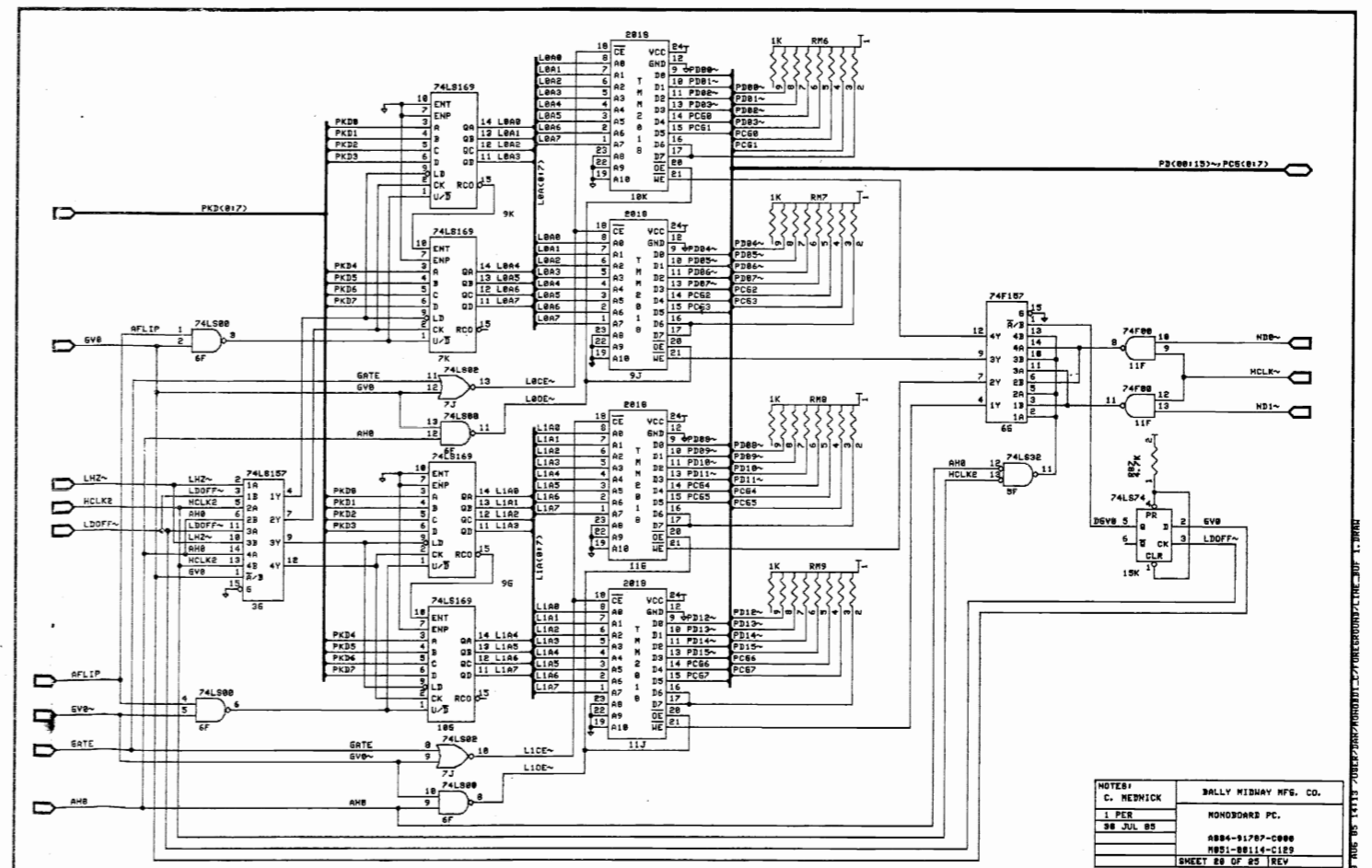
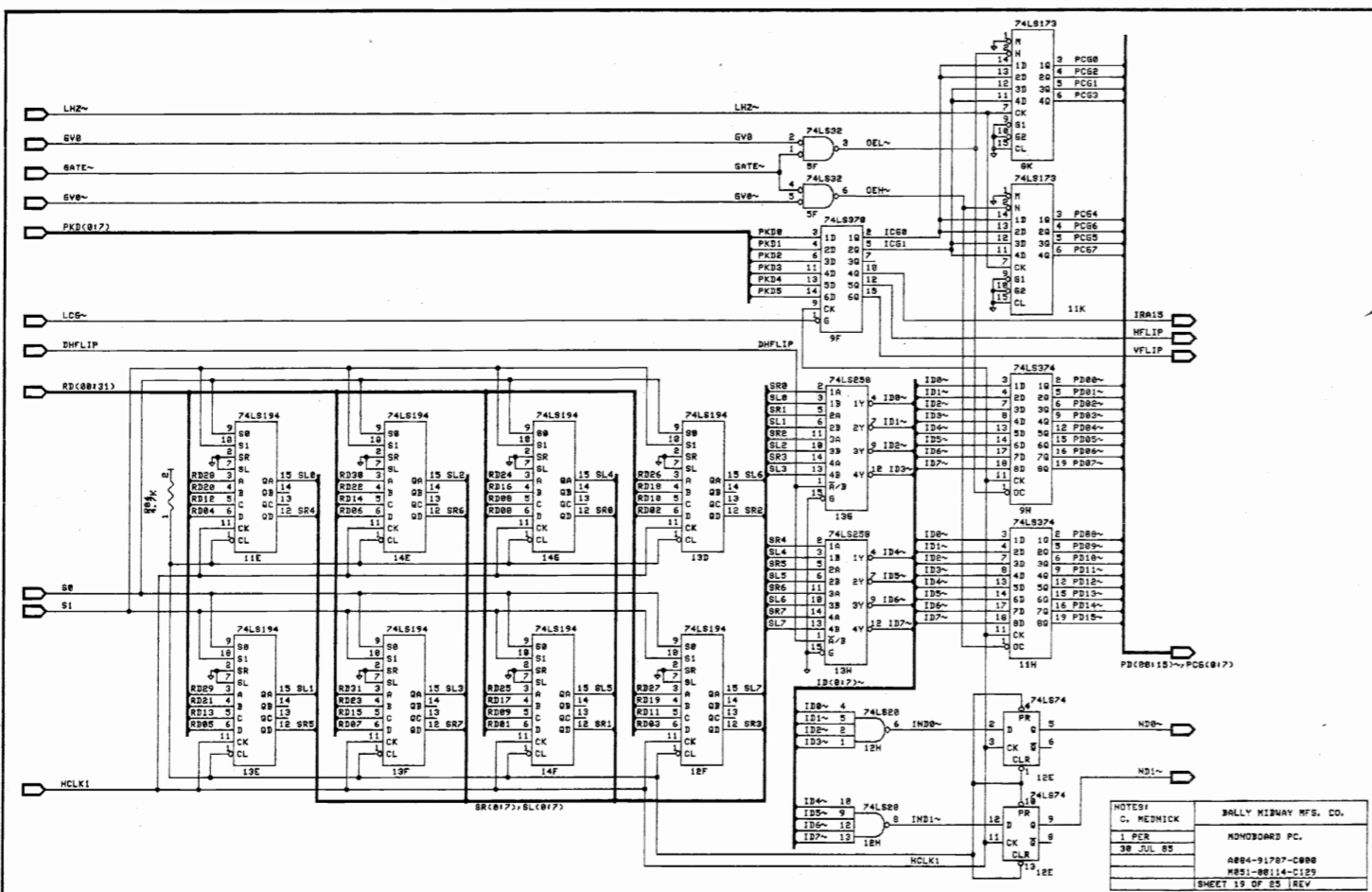
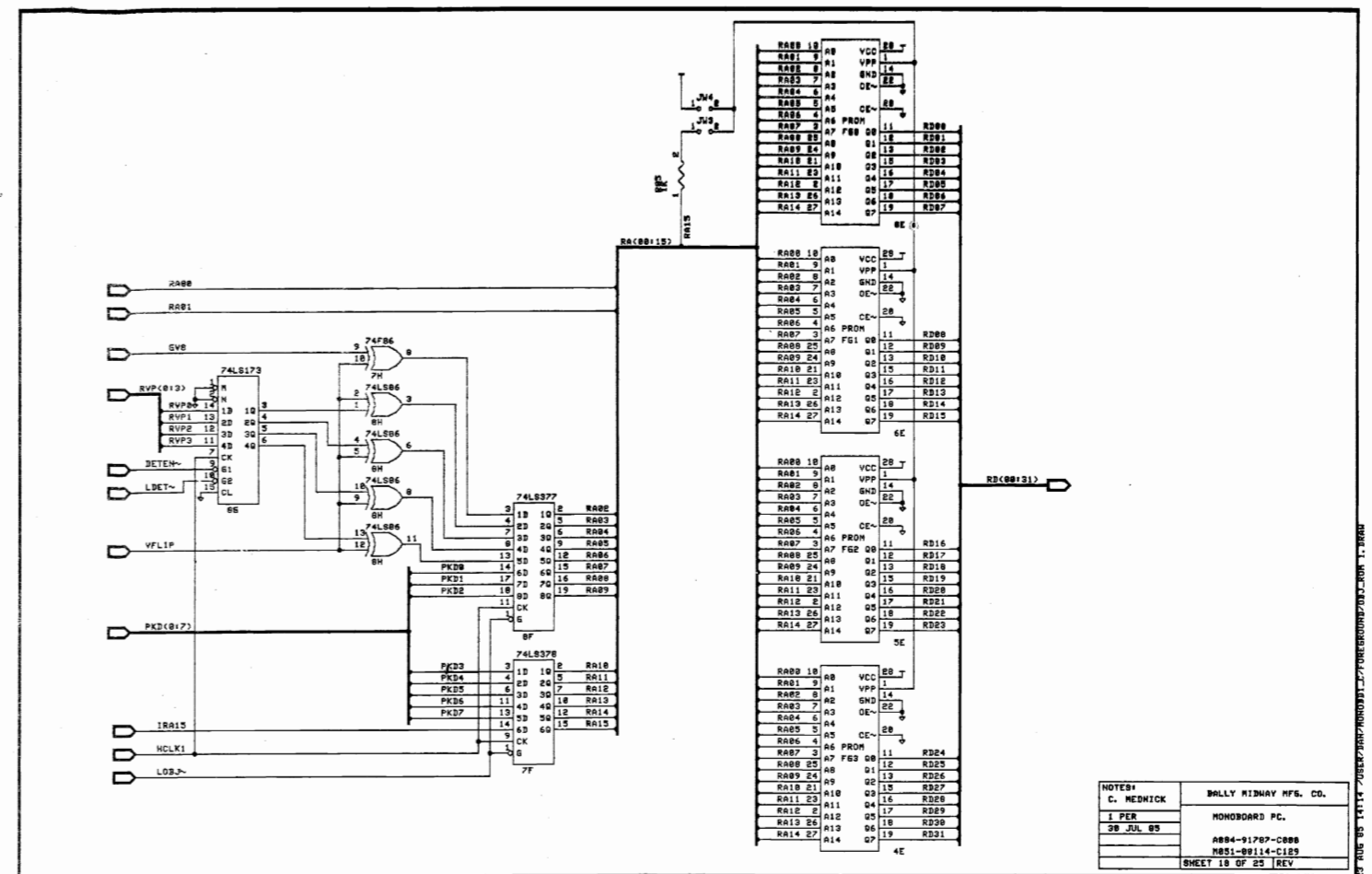
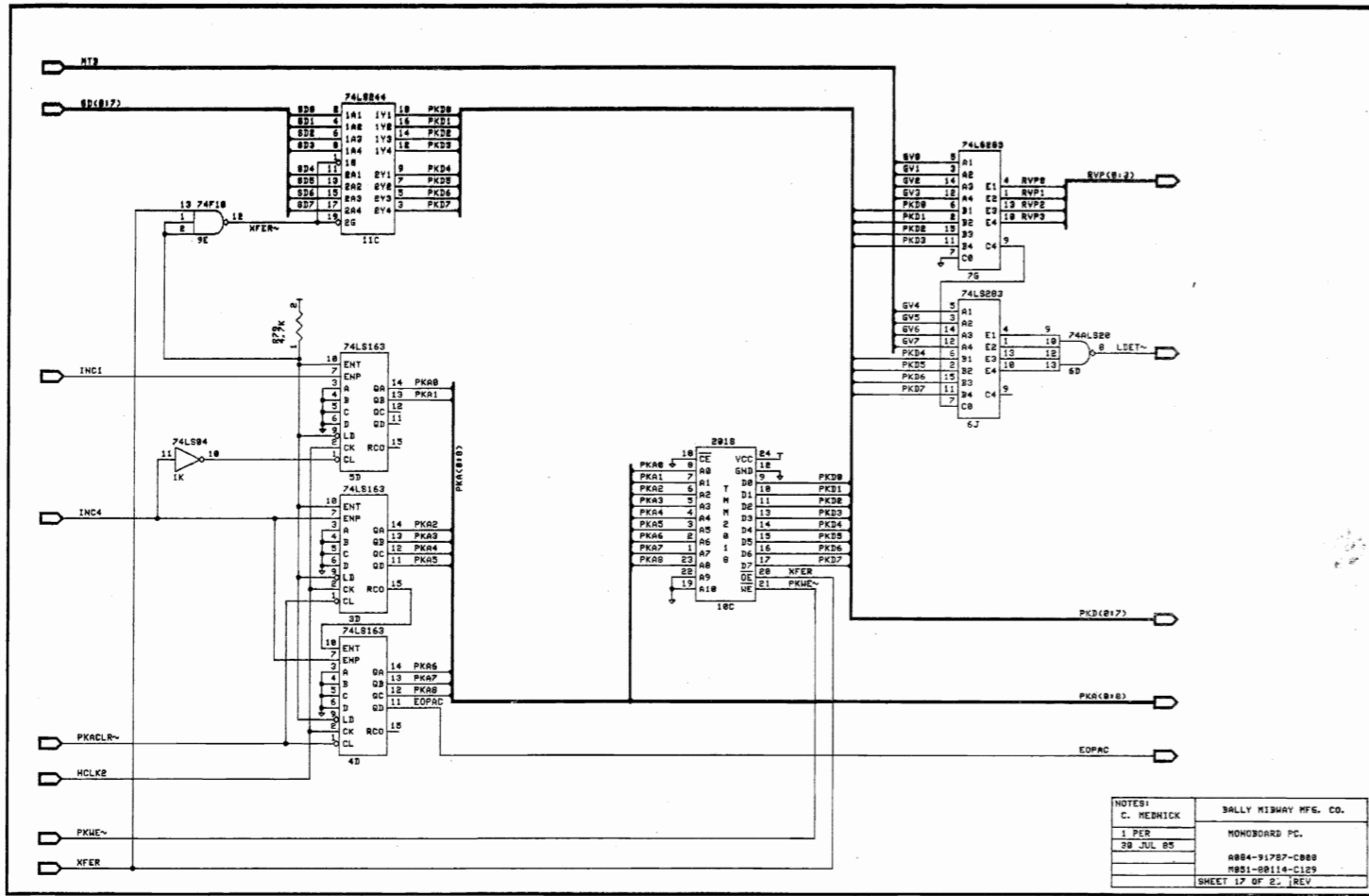




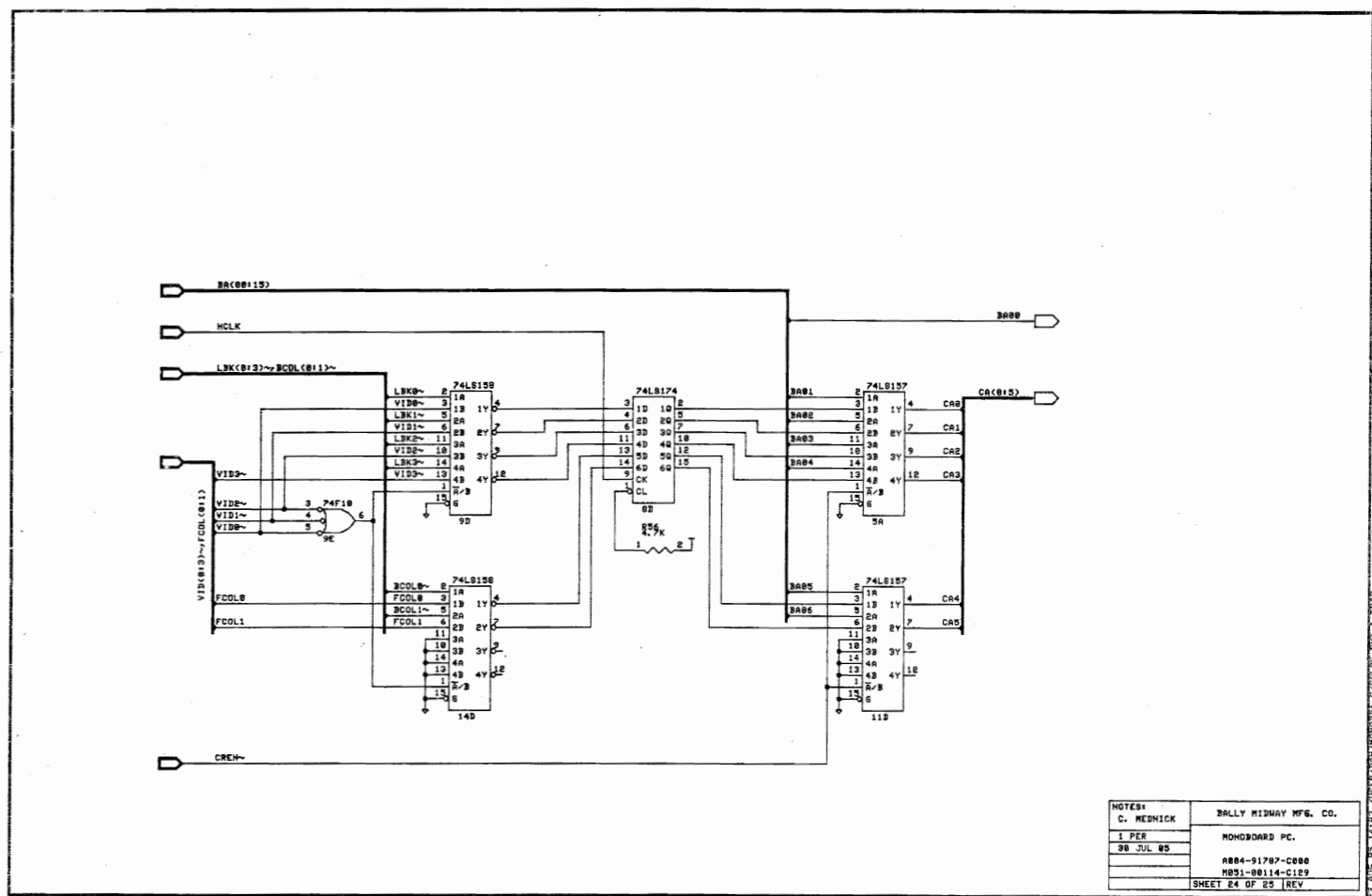
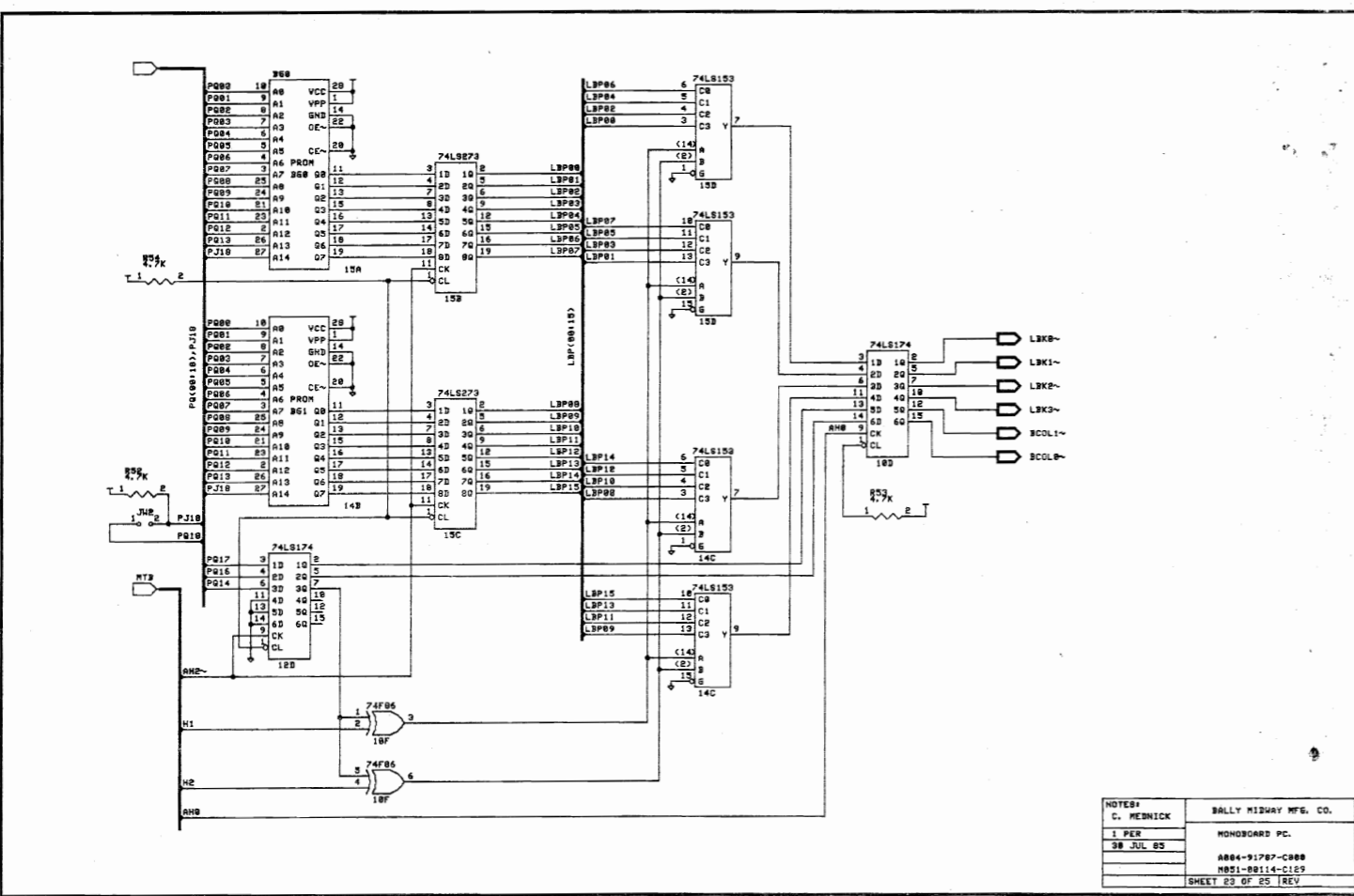
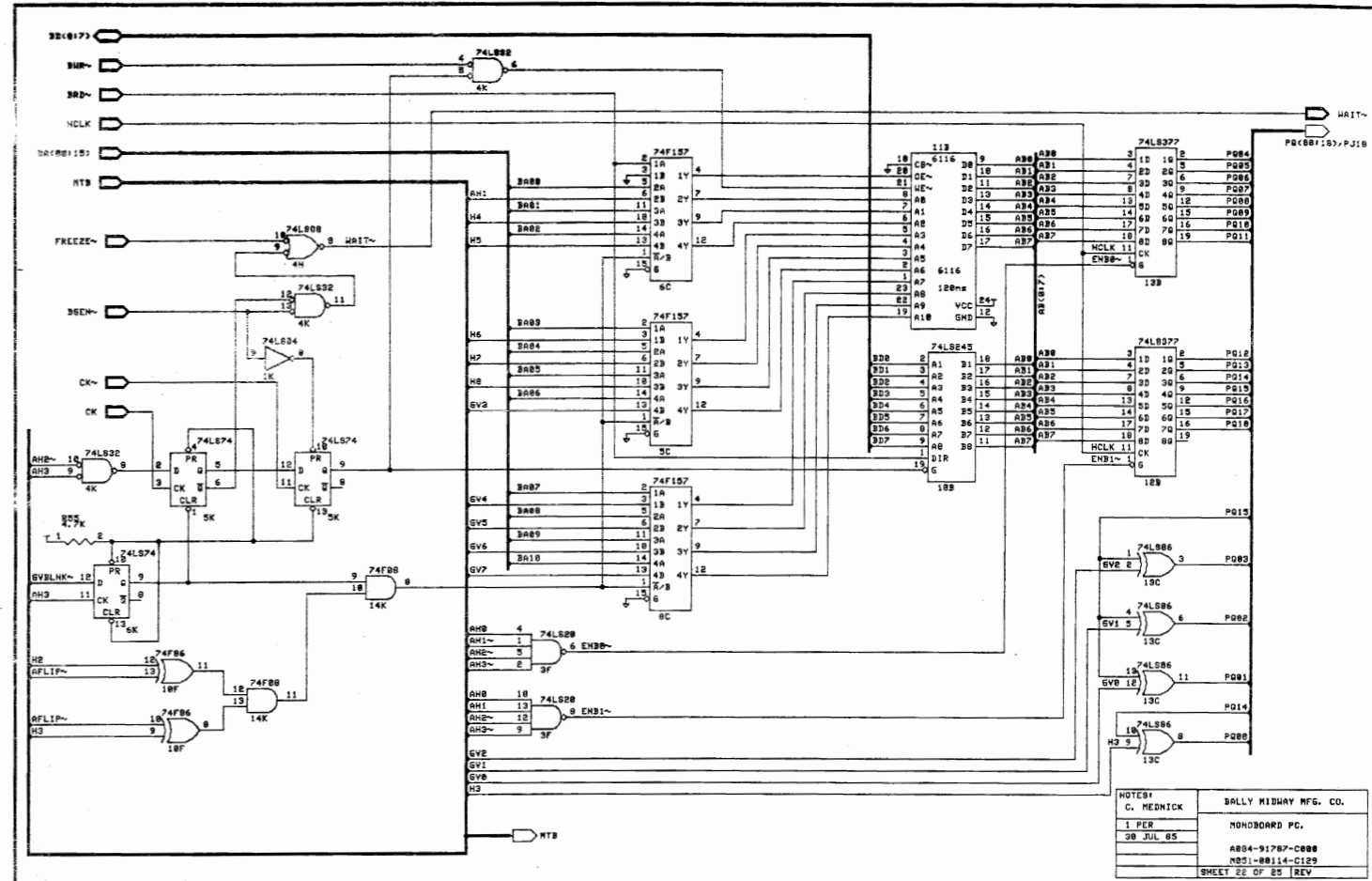
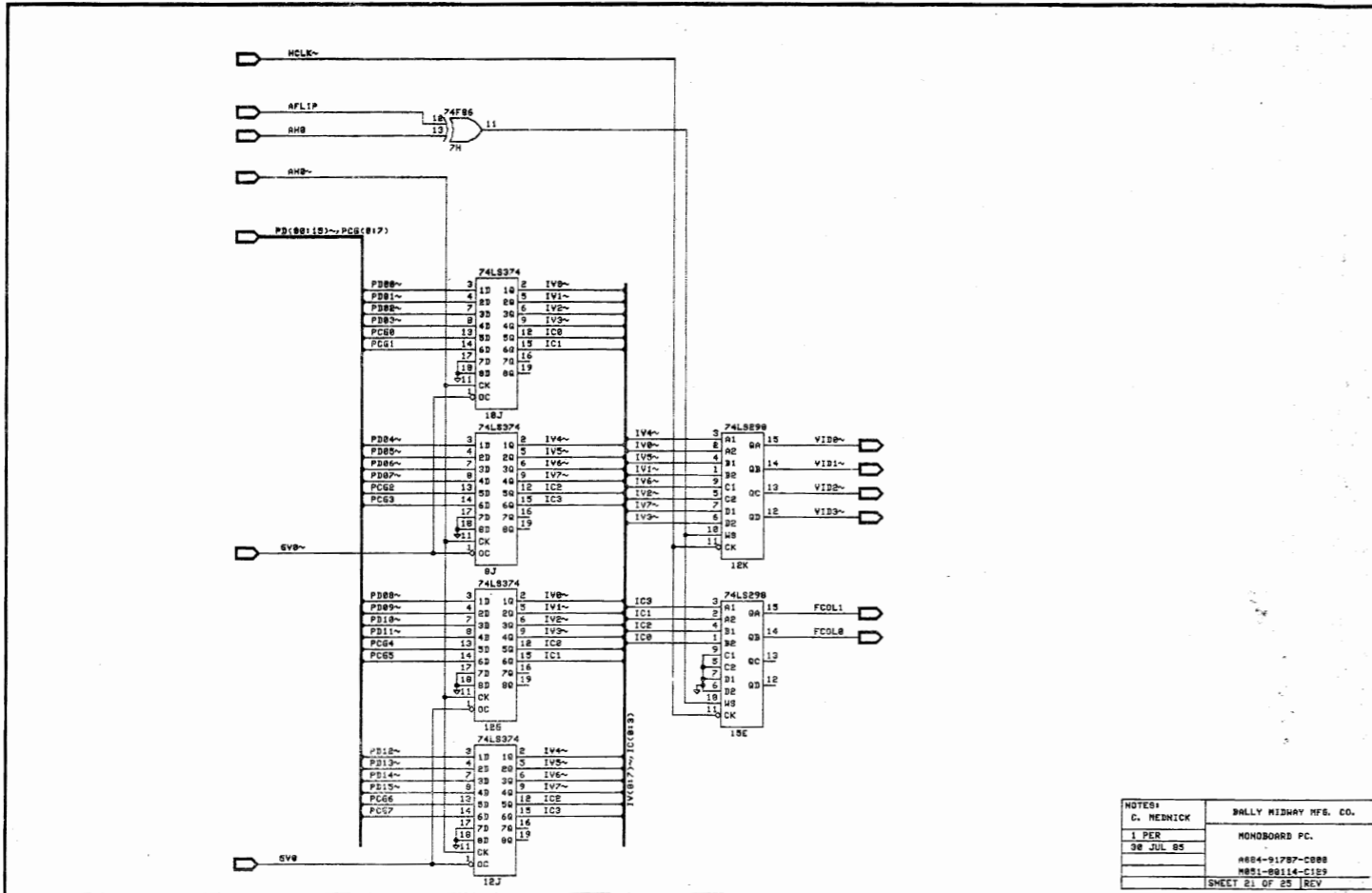


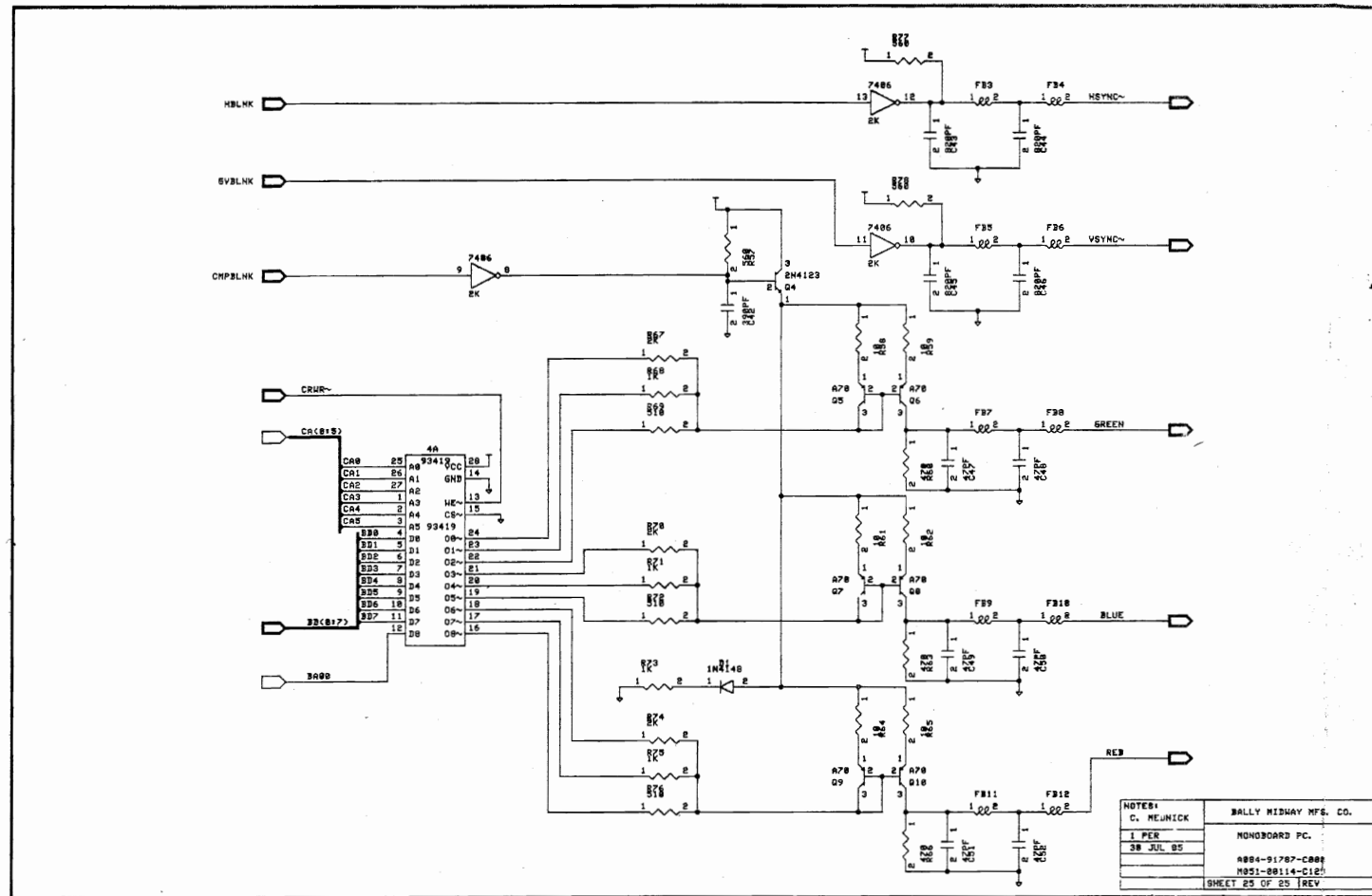








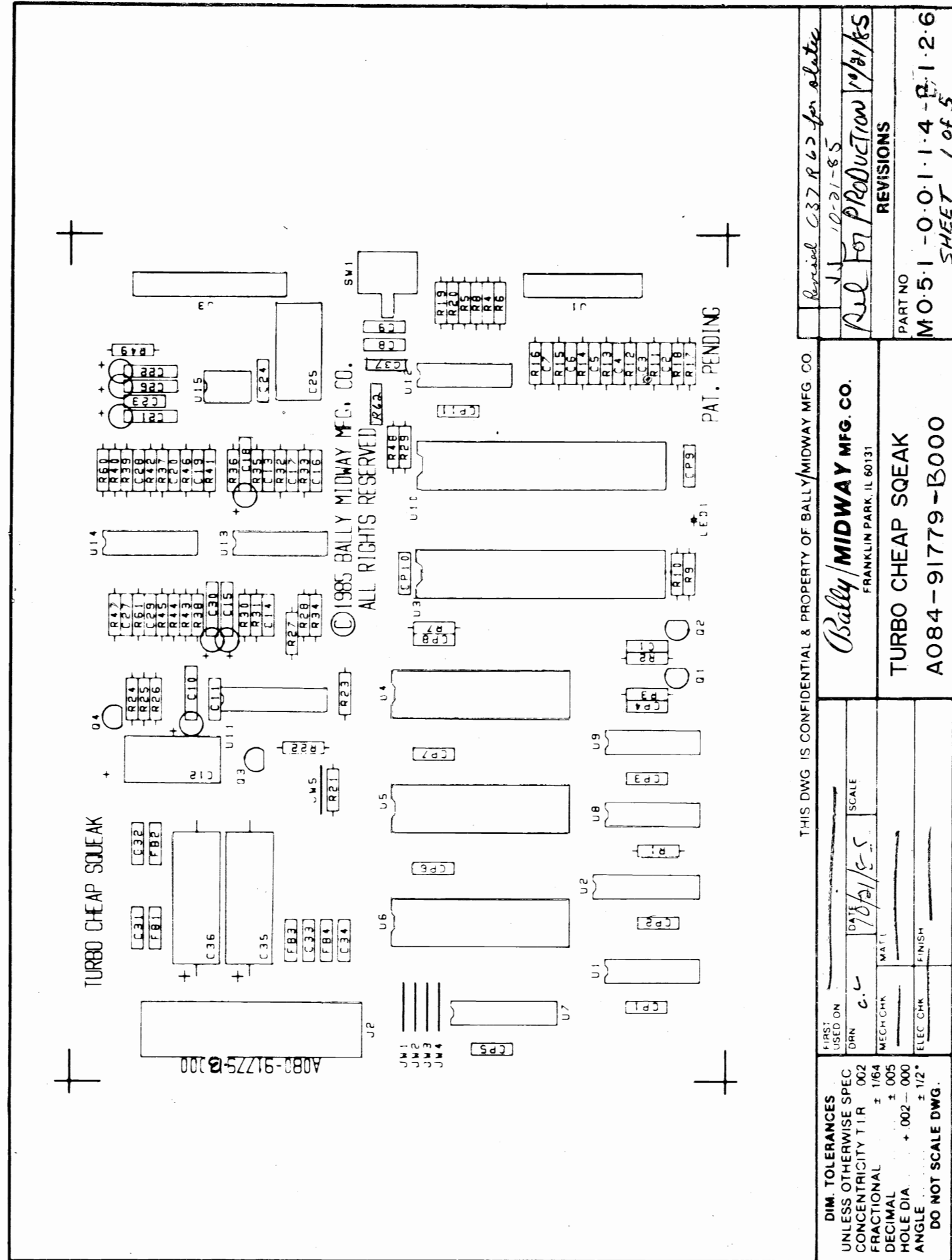




M051-00114-B126  
 TURBO CHEAP SQUEAK  
 A084-91779-B000

**DESIGNATION LIST**

DESIGNATION	DESCRIPTION	DESIGNATION	DESCRIPTION
CP1-CP11	.01MF AX. CR.	R32	33K OHM 1/4W 5%
C1	18PF AX. CR.	R33	18K OHM 1/4W 5%
C2-C3	820PF AX. CR.	R34	110K OHM 1/4W 5%
C4-C9, C37	100PF AX. CR.	R35	33K OHM 1/4W 5%
C10	10MF RD TANT	R36	150K OHM 1/4W 5%
C11	.01MF AX. CR.	R37	82K OHM 1/4W 5%
C12	47MF AX. ELECT.	R38	510K OHM 1/4W 5%
C13	.01MF AX. CR.	R39	150K OHM 1/4W 5%
C14	270PF AX. CR.	R40	24K OHM 1/4W 5%
C15	1MF RD TANT	R41	3.3K OHM 1/4W 5%
C16	.0056MF AX. CR.	R42	24K OHM 1/4W 5%
C17	270PF AX. CR.	R43	330K OHM 1/4W 5%
C18	1MF RD TANT	R44	160K OHM 1/4W 5%
C19	470PF AX. CR.	R45	100 OHM 1/4W 5%
C20	150PF AX. CR.	R46	560K OHM 1/4W 5%
C21-C22	1MF RD TANT	R47	24K OHM 1/4W 5%
C23	680PF AX. CR.	R48	4.7K OHM 1/4W 5%
C24	.01MF AX. CR.	R49	2.7K OHM 1/4W 5%
C25	47MF AX. ELECT.	R60	1K OHM 1/4W 5%
C26	1MF RD TANT	R61	1K OHM 1/4W 5%
C27	68PF AX. CR.	01	MPS3646
C28-C29	.01MF AX. CR.	02-04	2N5305
C30	10MF RD TANT	U1	C1K OSC
C31-C34	390PF AX. CR.	U2	74LS76
C35-C36	470MF AX. ELECT.	U3	68B09E
R1	4.7K OHM 1/4W 5%	U4	EPROM/ROM
R2	3.3K OHM 1/4W 5%	U5	EPROM/ROM
R3	150 OHM 1/4W 5%	U6	2K X 8 RAM
R4-R8	4.7K OHM 1/4W 5%	U7	74LS139
R9	100 OHM 1/4W 5%	U8	74LS02
R10	47K OHM 1/4W 5%	U9	74LS00
R11-R12	100 OHM 1/4W 5%	U10	68B21
R13-R16, R62	10K OHM 1/4W 5%	U11	AD7533
R17	100K OHM 1/4W 5%	U12	40106
R18	10K OHM 1/4W 5%	U13	LM359
R19	100K OHM 1/4W 5%	U14	LM359
R20	10K OHM 1/4W 5%	U15	3340
R21	4.7K OHM 1/4W 5%	ICS U3	40 PIN IC SOCKET
R22	47K OHM 1/4W 5%	ICS U4-U6	28 PIN IC SOCKET
R23	360 OHM 1/4W 5%	ICS U10	40 PIN IC SOCKET
R24	2.7K OHM 1/4W 5%	ICS U11	16 PIN IC SOCKET
R25	180 OHM 1/4W 5%	FB1-FB4	FERRITE BEAD
R26	360 OHM 1/4W 5%	JW1-JW5	JUMPER WIRE
R27	120K OHM 1/4W 5%	SW1	PCB SWITCH
R28	330K OHM 1/4W 5%		
R29	4.7K OHM 1/4W 5%		
R30	510K OHM 1/4W 5%		
R31	120K OHM 1/4W 5%		



M051-00114-B126  
TURBO CHEAP SQUEAK  
A084-91779-B000

DESIGNATION LIST

<u>DESIGNATION</u>	<u>DESCRIPTION</u>
LED 1	GREEN LED
U1	CLOCK OSCILLATOR 8MHZ
J1	9 PIN KK100 R/A
J2	12 PIN KK156 R/A
J3	12 PIN KK100 R/A
MTHW 1-4	SPACERS
PCB	TURBO CHEAP SQUEAK

M051-00114-B126  
TURBO CHEAP SQUEAK  
A084-91779-B000

11/1/85 - A  
J.J.

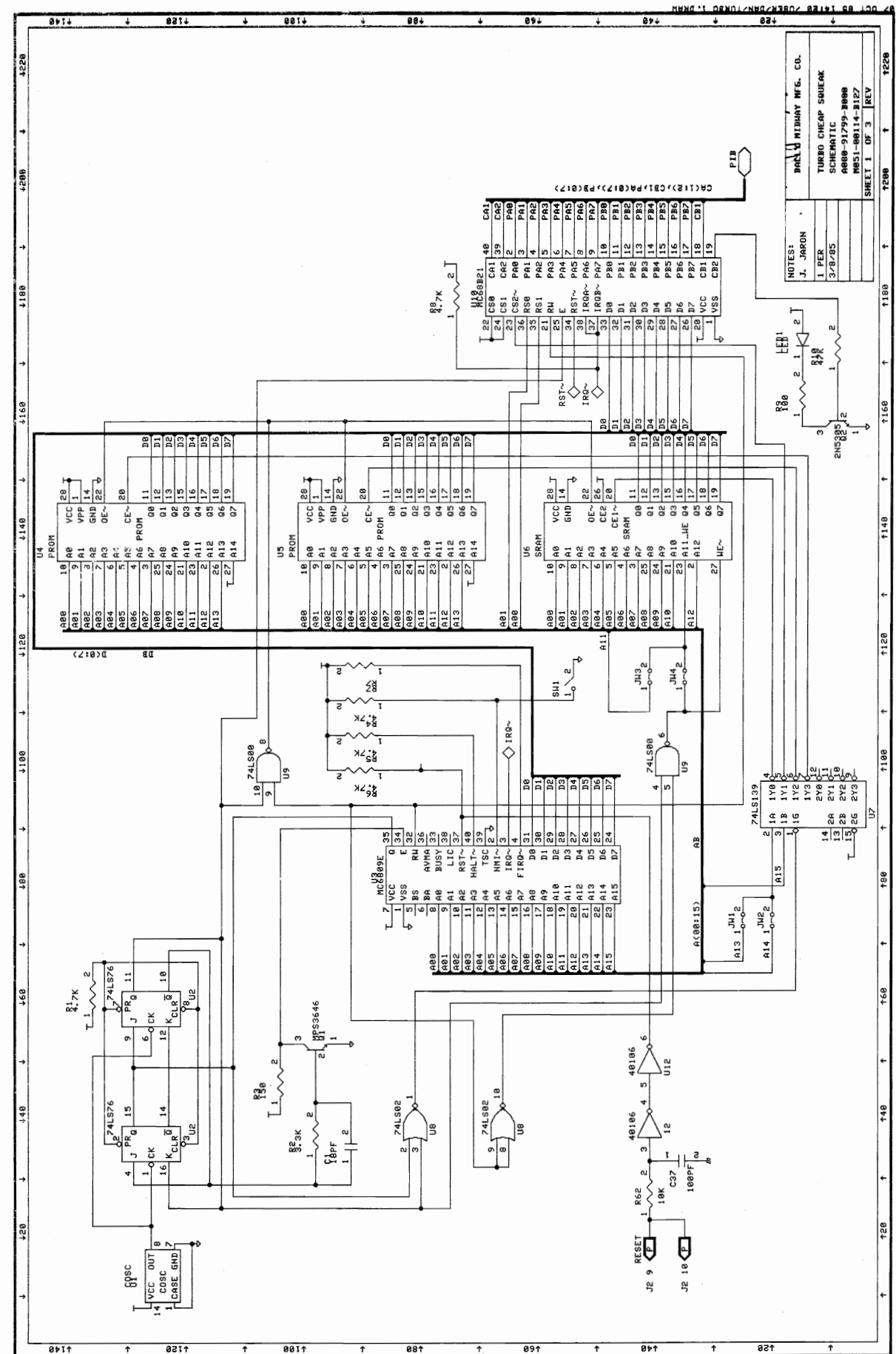
CROSS REFERENCE

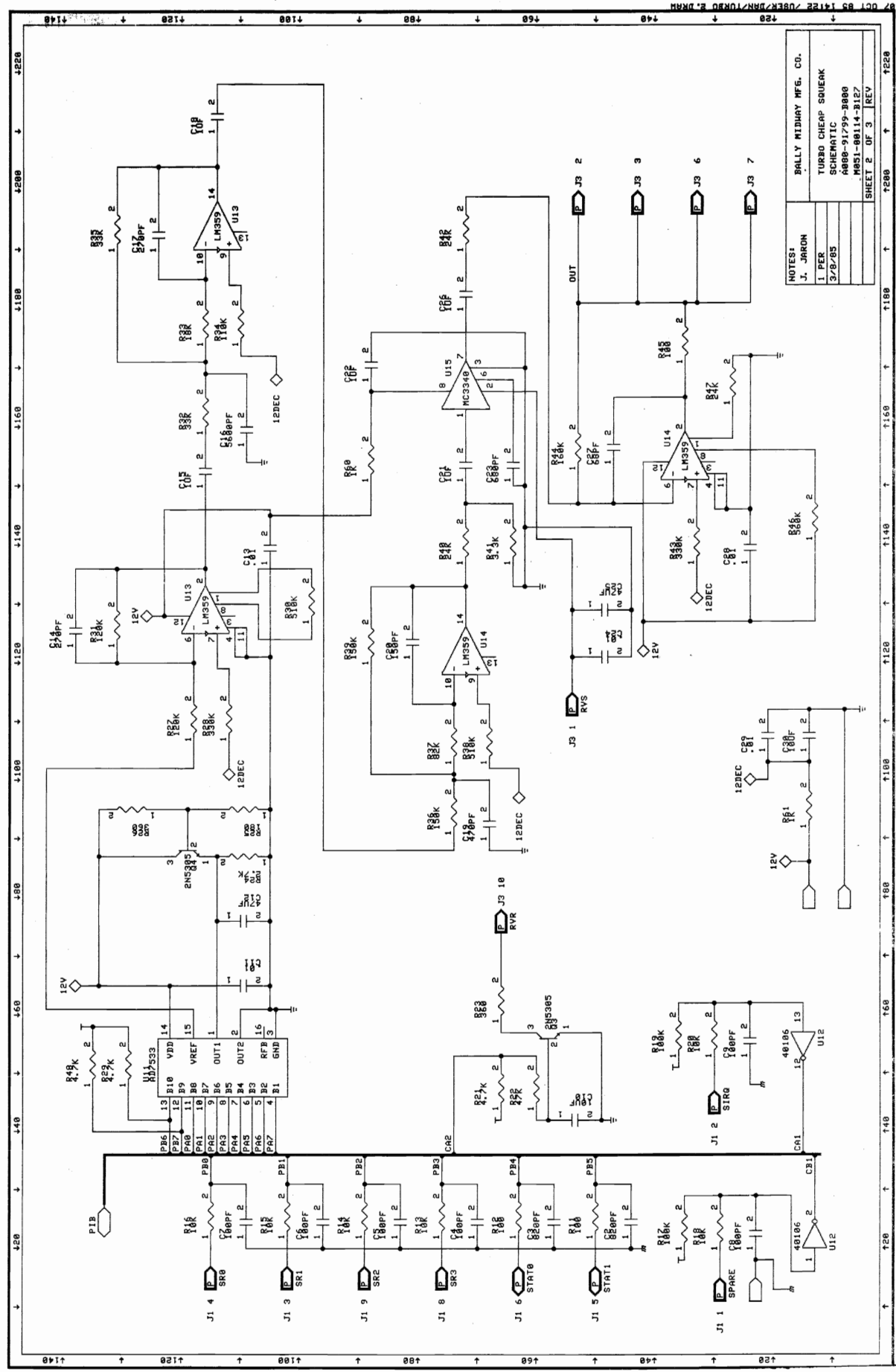
<u>DESCRIPTION</u>	<u>QTY</u>	<u>DESIGNATION NO.</u>	<u>PART NUMBER</u>
18PF AX. CR.	1	C1	0C48-00800-0001
68PF AX. CR.	1	C27	0307-00800-0011
100PF AX. CR.	7	C4,C5,C6,C7,C8,C9,C37	0304-00800-0001
150PF AX. CR.	1	C20	0307-00800-0010
270PF AX. CR.	2	C14,C17	0307-00800-0009
390PF AX. CR.	4	C31,C32,C33,C34	0986-00800-3000
470PF AX. CR.	1	C19	0307-00800-0008
580PF AX. CR.	1	C23	0358-00800-0002
820PF AX. CR.	2	C2,C3	0304-00800-0002
.0056MF AX. CR.	1	C16	0307-00800-0007
A .01MF AX. CR.	15	CP1-CP11,C13,C24, C28,C29	0986-00800-2200
1MF RAD TANT	5	C15,C18,C21,C22,C26	0307-00800-0004
10MF RAD TANT	2	C10,C30,	0307-00800-0005
47MF AX. ELECT	2	C12,C25	0307-00800-0003
470MF AX. ELECT	2	C35,C36	0A15-00800-0005
100 OHM 1/4WATT 5%	4	R9,R11,R12,R45	100E-00005-0033
150 OHM 1/4WATT 5%	1	R3	100E-00005-0037
180 OHM 1/4WATT 5%	1	R25	100E-00005-0039
360 OHM 1/4WATT 5%	2	R23,R26	100E-00005-0048
1K OHM 1/4WATT 5%	2	R60,R61	100E-00005-0061
2.7K OHM 1/4WATT 5%	2	R24,R49	100E-00005-0071
3.3K OHM 1/4WATT 5%	2	R2,R41	100E-00005-0074
4.7K OHM 1/4WATT 5%	9	R1,R4,R5,R6,R7,R8 R21,R29,R48	100E-00005-0079
A 10K OHM 1/4WATT 5%	7	R13,R14,R15,R16,R18 R20,R62	100E-00005-0088
18K OHM 1/4WATT 5%	1	R33	100E-00005-0093
24K OHM 1/4WATT 5%	3	R40,R42,R47	100E-00005-0097
33K OHM 1/4WATT 5%	2	R32,R35	100E-00005-0100
47K OHM 1/4WATT 5%	2	R10,R22	100E-00005-0104
82K OHM 1/4WATT 5%	1	R37	100E-00005-0112
100K OHM 1/4WATT 5%	2	R17,R19	100E-00005-0115
110K OHM 1/4WATT 5%	1	R34	100E-00005-0117
120K OHM 1/4WATT 5%	2	R27,R31	100E-00005-0118
150K OHM 1/4WATT 5%	2	R36,R39	100E-00005-0120
160K OHM 1/4WATT 5%	1	R44	100E-00005-0121
330K OHM 1/4WATT 5%	2	R28,R43	100E-00005-0128
510K OHM 1/4WATT 5%	2	R30,R38	100E-00005-0133
560K OHM 1/4WATT 5%	1	R46	100E-00005-0134
MPS3646	1	01	104E-00001-0019
2N5305	3	02-04	104E-00007-0003
IC 40106	1	IC U12	0304-00803-0056
IC 74LS00	1	IC U9	0A15-00803-0046
IC 74LS02	1	IC U8	0986-00803-7400
IC 74LS76	1	IC U2	0A15-00803-0072
IC 74LS139	1	IC U7	0A15-00803-0051

**M051-00114-B126**  
**TURBO CHEAP SQUEAK**  
**A084-91779-B000**

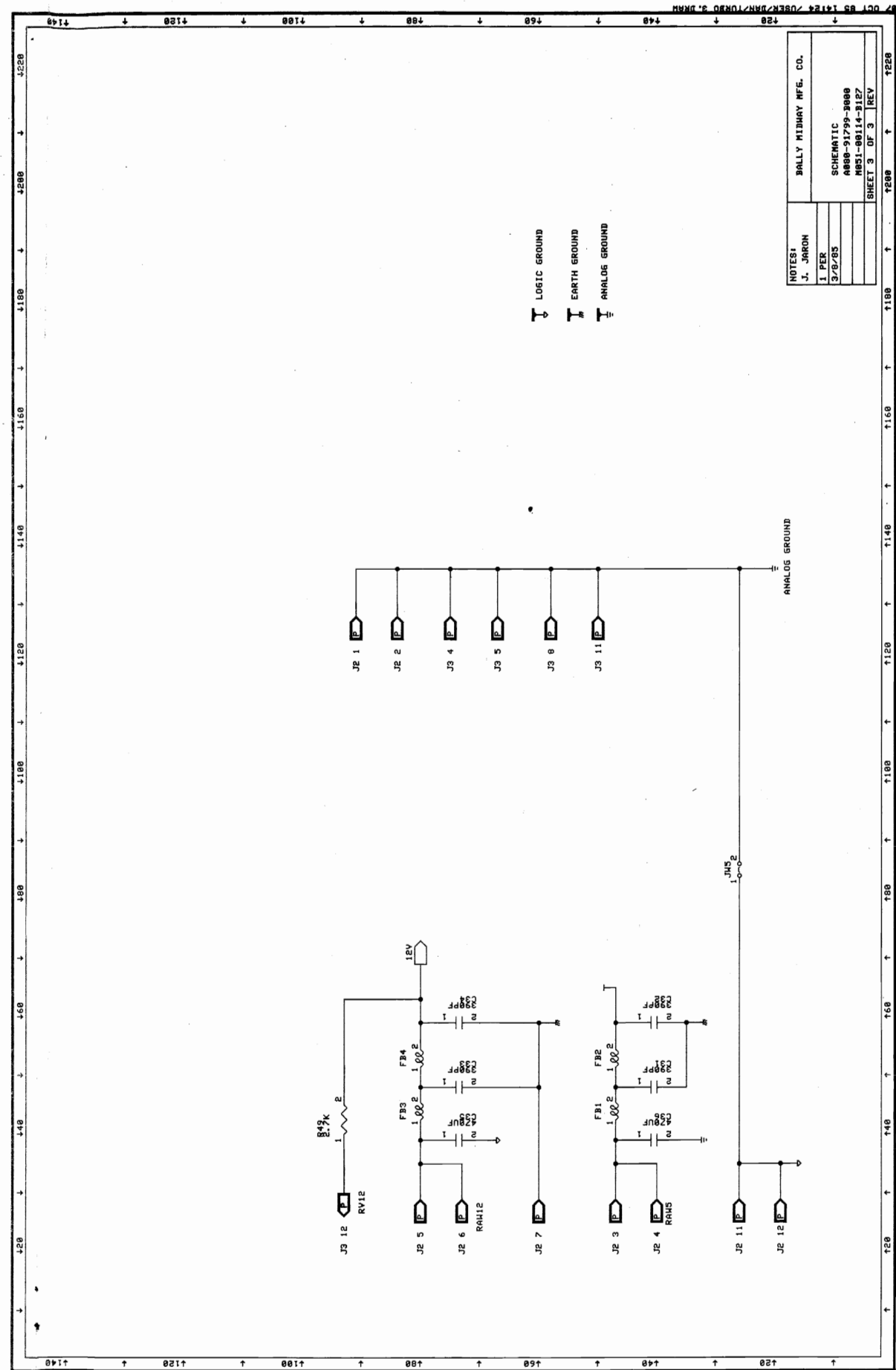
**CROSS REFERENCE**

DESCRIPTION	QTY	DESIGNATION NO.	PART NUMBER
IC AD7533	1	IC U11	0304-00803-0055
IC LM359	2	IC U13-U14	0304-00803-0053
IC 3340	1	IC U15	0358-00803-0002
IC 68B09E	1	IC U3	0C48-00803-0001
IC 68B21	1	IC U10	0A15-00803-0074
IC 2K X 8 RAM	1	IC U6	0304-00803-0057
IC EPROM/ROM	2	IC U4-U5	SEE EPROM/ROM CHART
16 PIN IC SOCKET	1	ICS U11	110E-00001-0003
28 PIN IC SOCKET	3	ICS U4-U6	110E-00001-0010
40 PIN IC SOCKET	2	ICS U3,U10	110E-00001-0011
FERRITE BEAD	4	FB1,FB2,FB3,FB4	0316-00804-0002
JUMPER WIRE	5	JW1,JW2,JW3,JW4,JW5	117E-00001-0003
PCB SWITCH	1	SW1	0986-00804-3100
LED GREEN	1	LED 1	119E-00001-0001
CLOCK OSCILLATOR 8MHZ	1	U1	109E-00002-0009
9 PIN KK100 RT ANGLE	1	J1	0017-00021-1269
12 PIN KK156 RT ANGLE	1	J2	0017-00021-1286
12 PIN KK100 RT ANGLE	1	J3	0017-00021-1288
SPACERS	4	MTHW 1-4	0017-00042-0328
TURBO CHEAP SQUEAK	1	PCB	A080-91779-A000

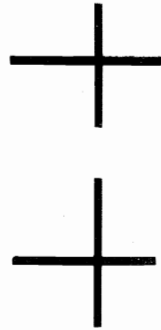
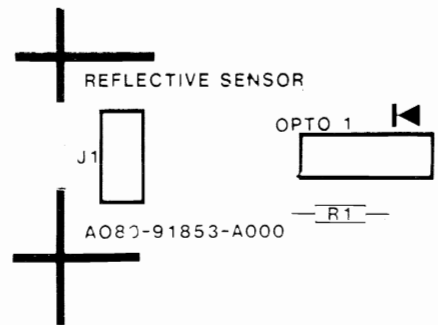




NOTES:  
 1. PER J. JARON 3/2/85  
 TURBO CHEAP SQUAWK SCHEMATIC  
 888-9179-8888  
 MS1-88114-3127  
 SHEET 2 OF 3 REV



NOTES:  
 1. PER J. JARON 3/2/85  
 SCHEMATIC  
 888-9179-8888  
 MS1-88114-3127  
 SHEET 3 OF 3 REV



M051-00114-A140  
REFLECTIVE SENSOR BOARD  
A084-91853-A000

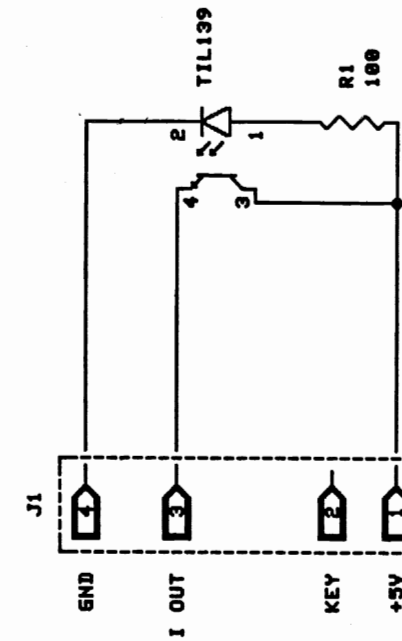
Page 2 of 2

DESIGNATION NO.

DESCRIPTION

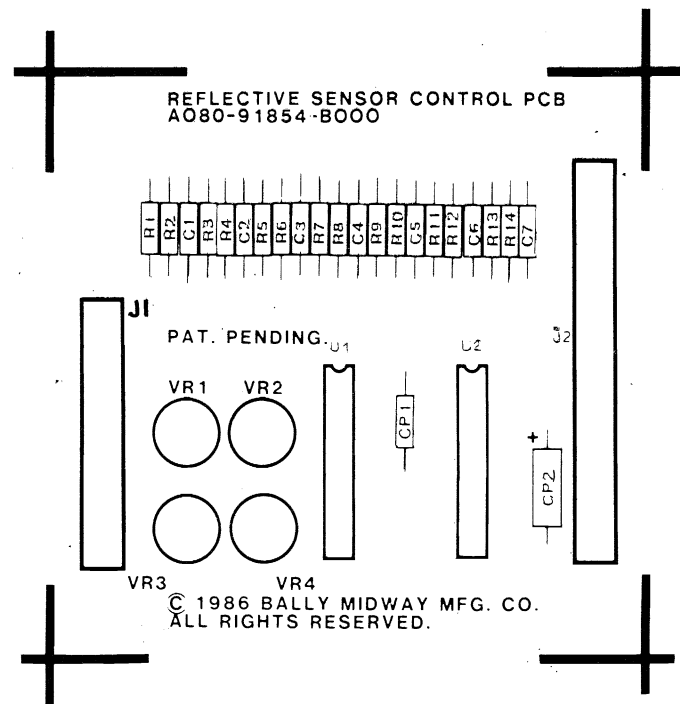
PART NUMBER

R1	100 OHM	100E-00005-0033
OPT 1	T1L139	120E-00001-0012
J1	4 PIN HDR. 100 CTR.	0017-00021-1635
PCB	A080-91853-A000	



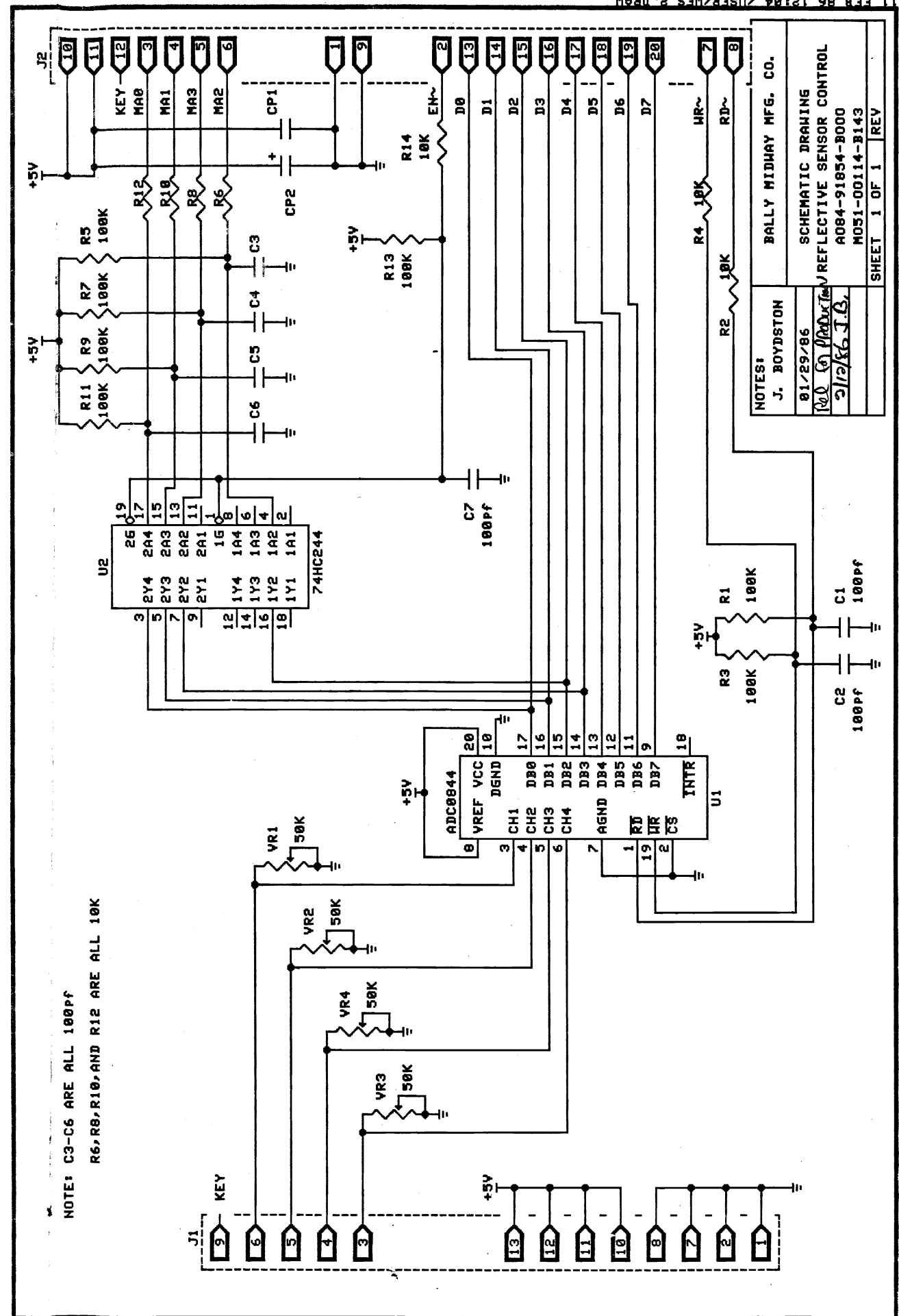
NOTES:	BALLY MIDWAY MFG. CO.
J. BOYDSTON	SCHEMATIC DRAWING
01/29/86	REFLECTIVE SENSOR
	A084-91853-A000
	M051-00114-A141
	SHEET 1 OF 1 REV

30 JAN 86 11:00 /\$T1/USER/HES 1.DRAW



M051-00114-B142  
REFLECTIVE SENSOR CONTROL BOARD  
A084-91854-B000

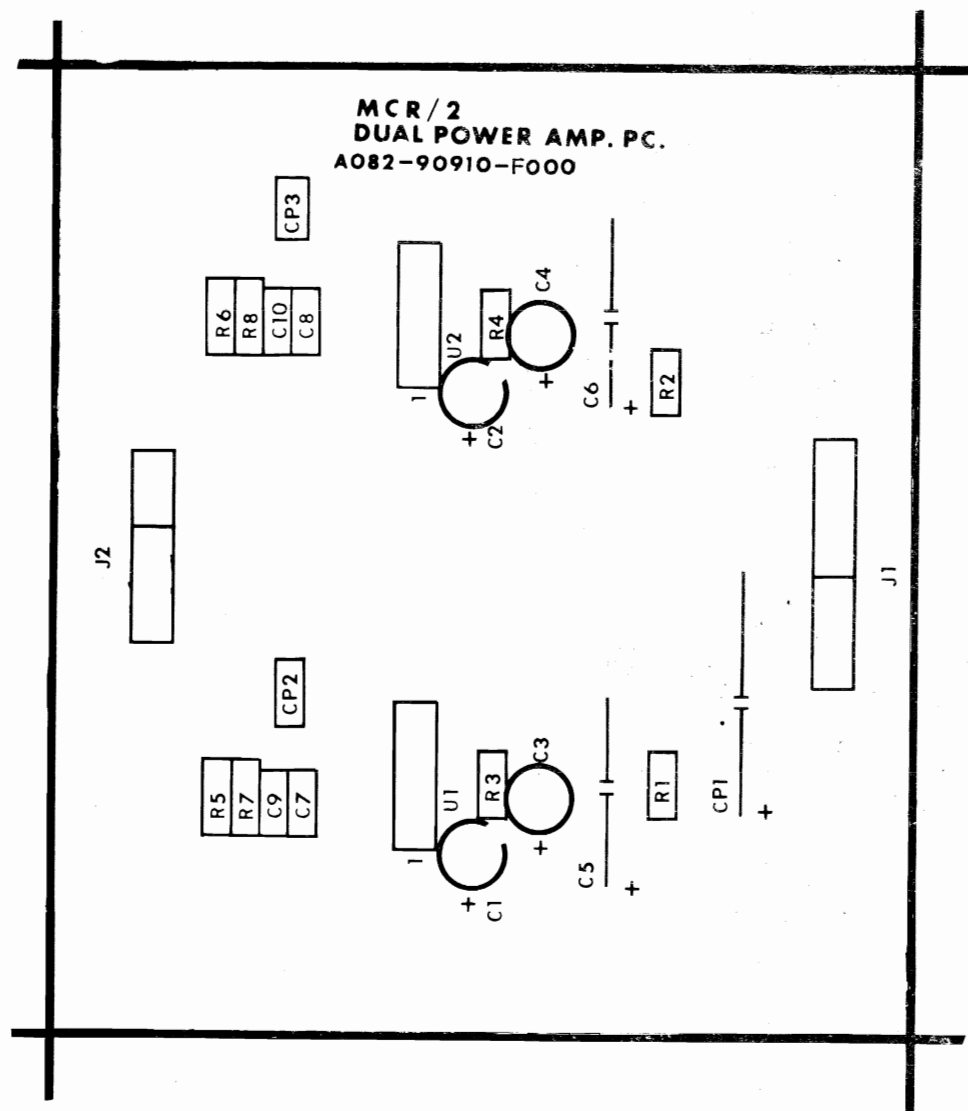
DESIGNATION NO.	DESCRIPTION	PART NUMBER
C1 - C7	100PF AX. CR.	0639-00800-0003
CP1	.01MF AX. CR.	0628-00800-0100
CP2	10MF AX. TANT.	0986-00800-3400
R1,R3,R5,R7,R9,R11,R13	100K OHM	100E-00005-0115
R2,R4,R6,R8,R10,R12,R14	10K OHM	100E-00005-0088
U1	ADC0844	0066-442BX-XXAX
U2	74HC244	0C75-00803-0001
VR1 - VR4	50K POT.	0C75-00804-0001
J1	13 PIN HDR. 100 CTR.	0017-00021-1642
J2	20 PIN HDR. 100 CTR.	0017-00021-1643
PCMH1 - PCMH4	SPACER #8	0017-00042-0320
PCB		A080-91854-B000





**DESIGNATION LIST**

DESIGNATION NO.	DESCRIPTION
C1,C2	4.7 MF 25V RD TANT
C3,C4	22 MF 6V RD TANT
C5,C6	470 MF 6V AX ELEC
C7-C10	.1 MF 50V AX CER
CP1	220 MF 25V AX ELEC
CP2,CP3	.1 MF 50V AX CER
R1,R2	2.7K OHM 1/4W 5% CRBN
R3,R4	27 OHM 1/4W 5% CRBN
R5-R8	1 OHM 1/2W 5% CRBN
U1,U2	MB3730
J1	7 PIN
J2	5 PIN
HSA1,2	HEATSINK ASSY
MH1-MH4	1/4" SPACER



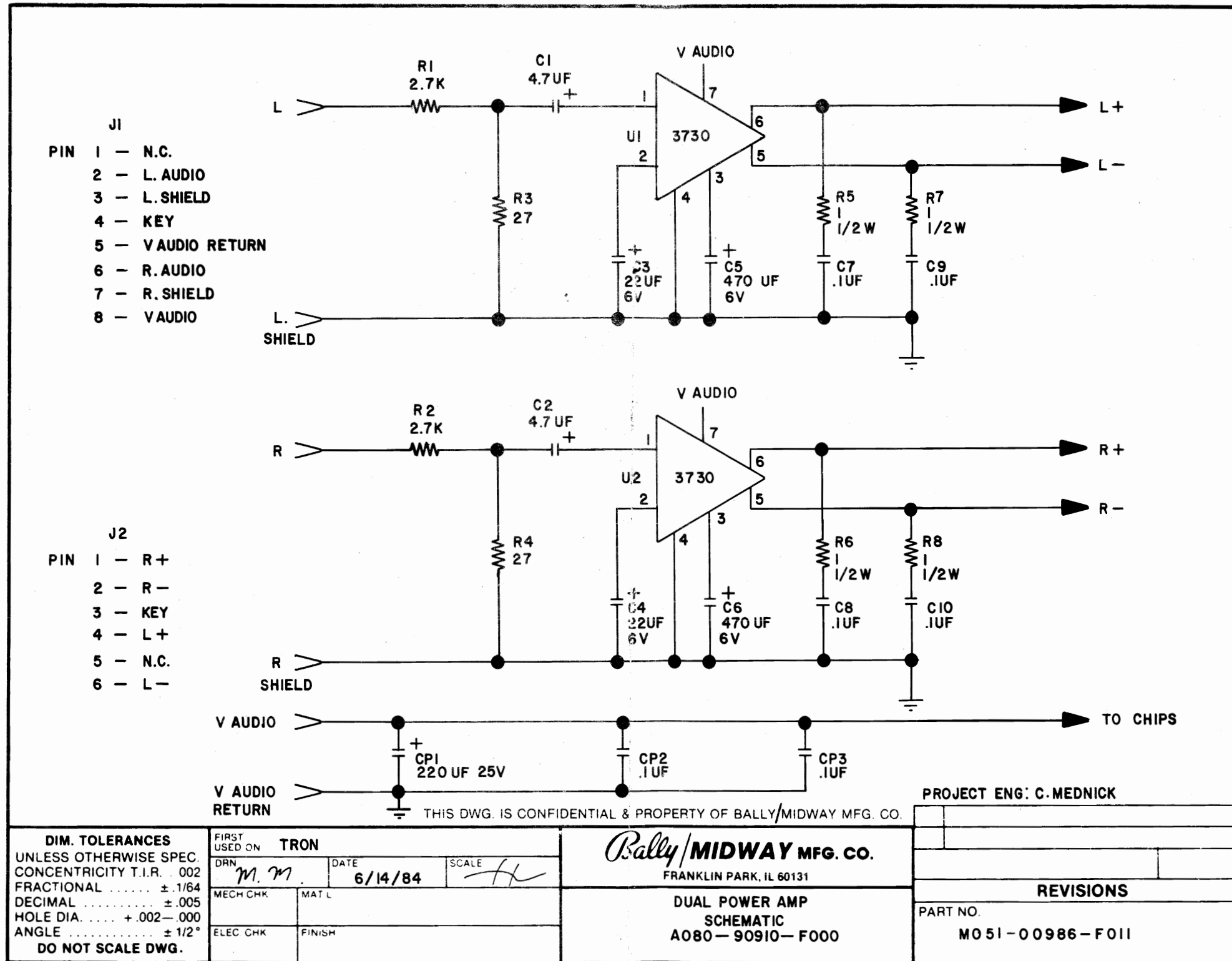
**CROSS REFERENCE LIST**

DESCRIPTION	QTY	DESIGNATION NO.	PART NUMBER
.1 MF 50V AX CER	6	C7-C10, CP2, CP3	0986-00800-1100
4.7 MF 25V RD TANT	2	C1, C2	0986-00800-3100
22 MF 6V RD TANT	2	C3, C4	0986-00800-1600
220 MF 25V AX ELEC	1	CP1	0986-00800-3200
470 MF 6V AX ELEC	2	C5, C6	0986-00800-1700
1 OHM 1/2W 5%	4	R5-R8	0062-02603-1XXX
27 OHM 1/4W 5%	2	R3, R4	0062-06803-1XXX
2.7K OHM 1/4W 5%	2	R1, R2	0062-19903-1XXX
MB3730	2	U1, U2	0066-188XX-XX4X
TIN .045 SQ PINS	12	J1, J2	0017-00033-0480
HEATSINK ASSY	2	HSA1, 2	A986-00010-E000
1/4" SPACER	4	MH1-MH4	0017-00042-0320
PC BOARD	1		A080-90910-F000

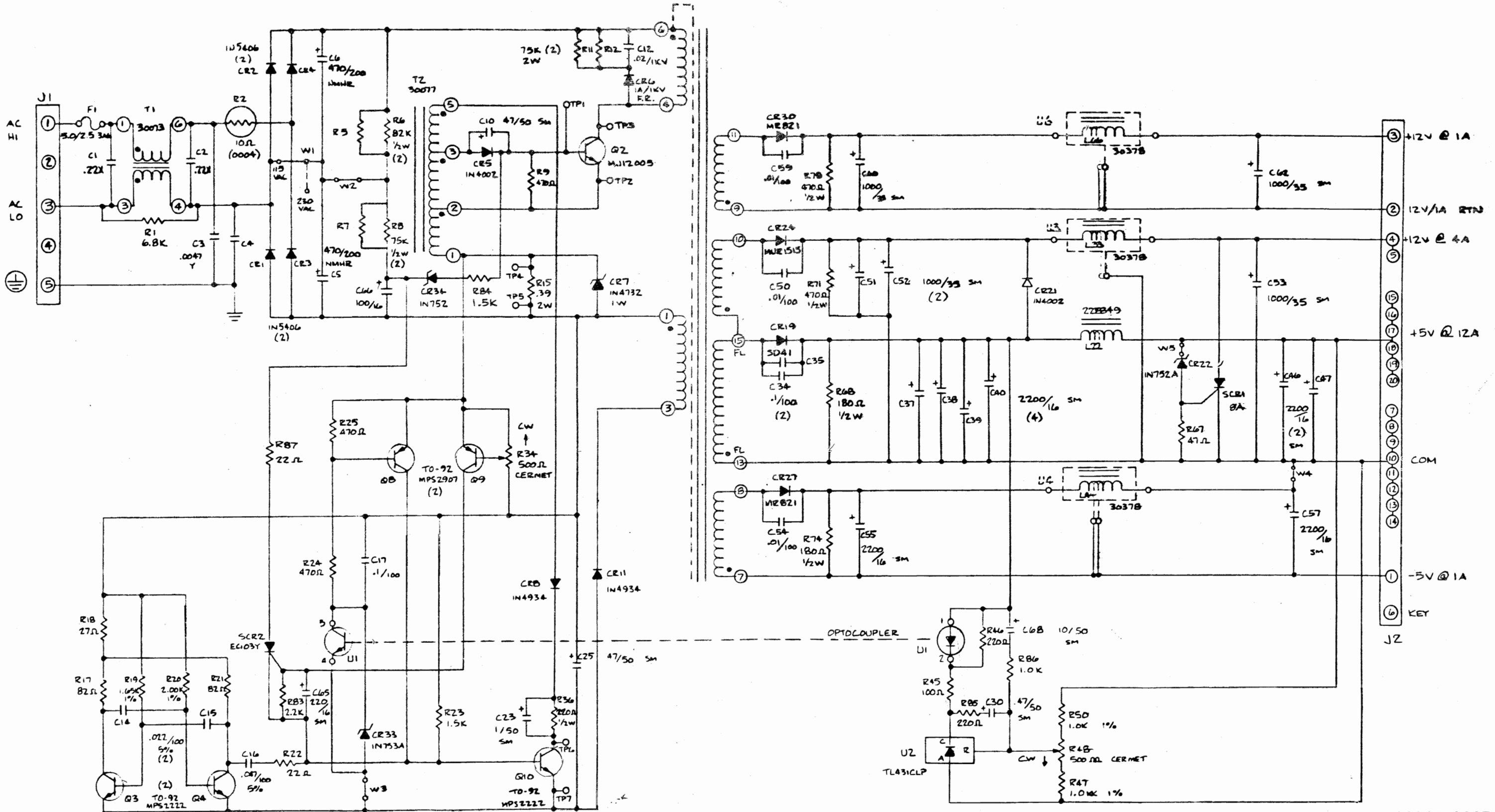
PROJECT ENG. C. MEDNICK

THIS DWG IS CONFIDENTIAL & PROPERTY OF BALLY/MIDWAY MFG. CO.

<b>DIM. TOLERANCES</b> UNLESS OTHERWISE SPEC. CONCENTRICITY T.I.R. .002 FRACTIONAL ± .1/64 DECIMAL ± .005 HOLE DIA. + .002 - .000 ANGLE ± 1/2° <b>DO NOT SCALE DWG.</b>	FIRST USED ON TRON	Bally/MIDWAY MFG. CO. FRANKLIN PARK, IL 60131	<b>REVISIONS</b>  PART NO. M051-00986-F010	
	DRN M M			DATE 6/14/84
	MECH CHK	MAT'L		DUAL PWR AMP ASSEMBLY DRWNG A084-90910-F000
	ELEC CHK	FINISH		



BRUNING-40-107



3-24 CAPACITOR VALUES IN MICROFARAD/VOLTS.  
 1. RESISTOR VALUES ARE IN OHMS 1/2W, 5%, C.F.  
 NOTES: UNLESS OTHERWISE SPECIFIED.

FOR ADDITIONAL ELECTRICAL INFORMATION,  
 REFER TO MECH. DWG. NO. 0017-00003-0543.

0017-00003-0543 M051-00945-A087

QTY	FRAC	PART OR IDENTIFYING NO.	NOMENCLATURE / DESCRIPTION	MATERIAL SPECIFICATION
PARTS LIST				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES III - XXX -		CONTRACT NO.		CAMARILLO, CALIF 93010 (805) 484-2851
MATERIAL		APPROVALS	DATE	SCHEMATIC
FINISH		DRAWN: S. WIMBERS	5-10-84	SP1016
NEXT ASSY		CHECKED		
USED ON		ISSUED		
APPLICATION		D. NOT SCALE DRAWING		REV X
		SIZE: FRAC NO	DWG. NO.	31-SP1016
		SCALE		

CR1  
MF  
M  
MF  
M  
M  
HM  
OH  
K  
5730  
I  
ATS  
" S  
BO

ONF

A945-00059-0000/0100/0200

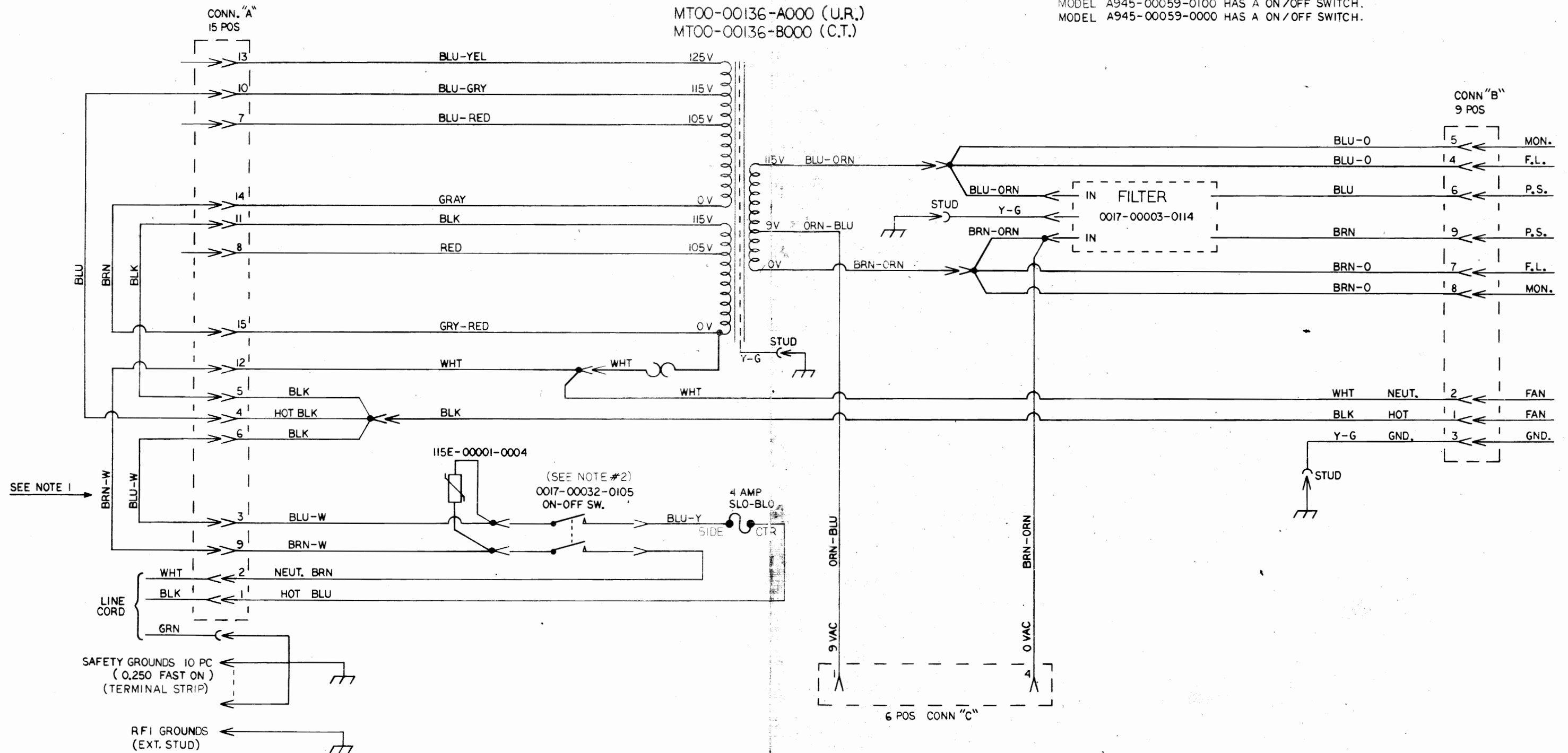
UNI PWR SUPPLY CHASSIS ASS'Y # 125 SWUR + 125 SWCT

	105	115	210	220	230	240
BLK	5-8	5-11	8-14	11-14	11-14	11-14
BRN	14-15	14-15	—	—	—	—
BLU	4-7	4-10	4-7	4-7	4-10	4-13

NOTES: 1. JUMPERS ON CONN "A" 3-6 AND 9-12 CAN BE REPLACED WITH A SAFETY SW. AND/OR AUX. ON OFF SW.

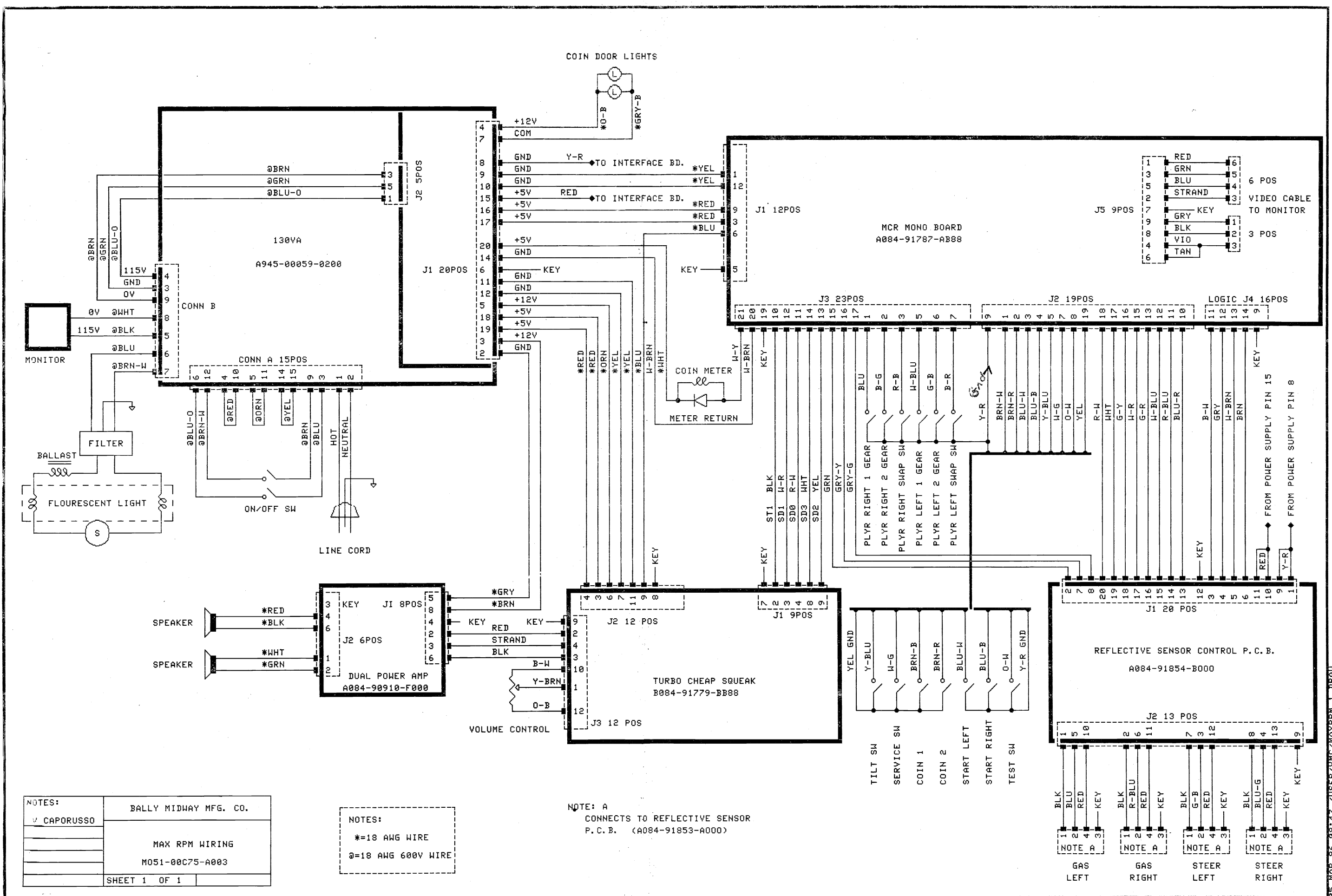
2. MODEL A945-00059-0200 HAS A TERMINAL STRIP.  
 MODEL A945-00059-0100 HAS A ON/OFF SWITCH.  
 MODEL A945-00059-0000 HAS A ON/OFF SWITCH.

TRANSFORMER  
 MT00-00136-A000 (U.R.)  
 MT00-00136-B000 (C.T.)



DRAWING # M051-00945-A081

REL FOR PRODUCTION: 4/26/85



NOTES:	BALLY MIDWAY MFG. CO.
V CAPORUSSO	
	MAX RPM WIRING
	M051-00C75-A003
	SHEET 1 OF 1

NOTES:  
 \* = 18 AWG WIRE  
 @ = 18 AWG 600V WIRE

NOTE: A  
 CONNECTS TO REFLECTIVE SENSOR  
 P.C.B. (A084-91853-A000)

05 MAR 86 08147 7USER/VMC/MAKRP 1. DRAH

**BALLY/MIDWAY'S MAX RPM (2 PLYR)**

**U.R. #0C75**

**ROM/EPROM PART NUMBERS**

**UNPROGRAMMED MONOBOARD A084-91787-C000**

**PROGRAMMED MONOBOARD A084-91787-AC75**

POS.	MIDWAY PART NUMBER
15A	0C75-00803-0008
14B	0C75-00803-0009
8E	0C75-00803-0004
6E	0C75-00803-0005
5E	0C75-00803-0006
4E	0C75-00803-0007
3B	0C75-00803-0002
5B	0C75-00803-0003

JUMPERS	IN	OUT
JW1	**	
JW2	**	
JW3	**	
JW4		**

**UNPROGRAMMED TURBO CHEAP SQUEAK A084-91779-B000**

**PROGRAMMED TURBO CHEAP SQUEAK A084-91779-AC75**

POS.	MIDWAY PART NUMBER
U4	0C75-00803-0010
U5	0C75-00803-0011

JUMPERS	IN	OUT
JW1		**
JW2	**	
JW3		**
JW4	**	
JW5	**	

<b>M051-00C75-A008</b>	<b>REVISIONS</b>
<b>2-28-86</b>	<b>RELEASE FOR PRODUCTION</b>