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--MARK--

MONSTER BASH

TM

SEGA®

Owner's Manual
Manual Part No. 420-0807



Owner's Manual

Manufactured By

SEGA®

TLX 910-335-1621

MONSTER BASH™ OWNER'S MANUAL
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TABLE OF CONTENTS

INTRODUCTION	1
GAME CONCEPT	2
SCORING.	4
GAME SET-UP AND INSPECTION	5
SPECIFICATIONS AND IMPORTANT NOTES	6
OPTION SELECTION	8
TROUBLESHOOTING PROCEDURES	10
THEORY OF OPERATION.	12
G-80 BLOCK DIAGRAM	19
G-80 BUS DETAIL.	20
SELF-TEST	21
PARTS CATALOG.	25
CABINET WIRING DIAGRAM	144
SCHEMATICS	145

INTRODUCTION

MONSTER BASH™ is an electronics game that makes extensive use of digital integrated circuitry and television monitor concepts. This manual is intended for the use of the maintenance technician who possesses a general working knowledge of solid state circuitry, microprocessor and digital integrated circuitry, and video monitor concepts. Any individual NOT knowledgeable in these areas SHOULD NOT attempt repair of the electronic portions of the game, referring rather, to a competent technician.

SEGA's G-80 system will make troubleshooting easy. Each board has a separate function and most problems can immediately be isolated to a single board. The individual boards contain less circuitry than if they were combined on one or two boards. This results in faster and easier servicing. The new G-80 card cage system provides for a self-test feature (located on the CPU board) in addition to giving SEGA more flexibility in designing new games compatible with the revolutionary CONVERT-A-GAME™. Increased ROM capability and the addition of a quality synthesis (in some games) means that new SEGA games will be more exciting and certainly more profitable. Comments or questions about our games are welcome, and should be directed to:

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GAME CONCEPT

MONSTER BASH™ is a one or two player game that pits a wiley red-headed boy against one of three creatures intent on the player's destruction. In successive rounds appear a Dracula, a Frankenstein and a Chameleon Man. The fields of play are set within a haunted house, a castle and a graveyard respectively.

As the game begins, you find yourself in a five-story haunted house, surrounded by menacing bats. These bats can bite the player, and must be shot as they approach. The second and fourth floors of the haunted house have candle rooms, and passing through a room lights the candle and sets a magic sword flashing. Once the sword is flashing, touching the sword gives the player Superzap power to defeat Dracula. However, in this, as in the two succeeding scenes, Superzap power only lasts as long as the moon is clear. When the cloud covers the moon, Superzap power is lost and must be required by relighting one of the candles. Remember, bats can be zapped, but the monster must be Superzapped! If you manage to light all five candles, you are awarded 1000 bonus points. Additionally, in the lower right corner of the screen appears a bonus number of points. This bonus decreases by 100 as each candle dims and goes out, and is added to the player's score when and if Dracula is Superzapped. Within Dracula's house are four doors, located in all four corners which hide secret passages behind them. Entering any of these instantly transports the player OR Dracula to the corner diagonally opposite it. The scene shifts to Frankenstein's castle when DRACULA is vanquished.

In the second scene, the red-headed boy enters the creepy, six-story castle. Pursuing Frankenstein, taking care all the while to avoid the fierce Wolfmen who guard him. The Wolfmen can be zapped, but be careful -- they can duck down to avoid being hit! To make this sequence even more challenging, there are fewer candles available to be lit, and the secret passages may only be used when they are flashing. However, a new feature is added here to aid the player in moving about quickly in the castle. Special "Jump Down Zones" at either end of the castle allow the red-headed boy to jump down several levels at once, eliminating any Wolfmen in the way as he descends. Frankenstein can also use the "Jump Down Zones" to pursue you, though not as rapidly. As with Dracula, Frankenstein can be defeated by use of the Superzap, so watch the moving cloud,

its your Superzap timer.

After conquering Dracula and Frankenstein, it's on to the greatest challenge yet--to dispatch the tricky Chameleon Man and his horde of spiders. Entering the spooky graveyard, the player finds that only one candle is available to be lit, and it is in a crypt guarded by giant spiders. These spiders are tricky, but Chameleon Man is even more so, as he can change color to match the background, effectively disappearing (EXCEPT for his eyes!). To make Chameleon Man visible, the player can pass over one of three colored dots that change the background color and rearrange the graveyard tombstones. An added danger is Chameleon Man's l-o-n-g tongue, with which he can reach out and eliminate the player or block a Superzap. As before, the player must light the candle to energize the magic sword, then touch the sword to obtain Superzap power. Destroying Chameleon Man with a well placed Superzap ends the round. Each succeeding round of play presents the three scenes with faster, more aggressive and more numerous adversaries.

MONSTER BASH™ feature's a "Play-Continuation" mode, by which the player may begin a new game at the same level of difficulty as when the last game ended. This is done by simultaneously pressing the Player Start Button and Zap button after inserting another coin. Game play ends with the loss of the last player.

SCORING

BATS.	100 PTS
WOLF MEN	100 PTS
SPIDERS	100 PTS
-POINT VALUES INCREASE BY 100 PTS EVERY ROUND	
DRACULA	1000 PTS
FRANKENSTEIN.	1000 PTS
CHAMELEON MAN	1000 PTS
- PLUS THE TIME BONUS INDICATED IN THE LOWER-LEFT CORNER OF THE DISPLAY	
EVERY LIT CANDLE.	100 PTS
CANDLE BONUS (ALL FIVE CANDLES LIT IN THE VAMPIRE SCENE)	1000 PTS

3. Game Specifications (Cont)

Power	110 VAC, 60 Hz (nominal), 150 watts maximum
	220 VAC, 60 Hz (nominal), 150 watts maximum
Dimensions	25-1/2 inches wide X 30-1/4 inches depth (64.8 cm wide X 76.8 cm depth)
	72-1/2 inches height (184.2 cm height)

4. Important Notes

a) The following note is included in compliance with FCC rules:

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. As temporarily permitted by regulations, it has not been tested for compliance with the limits for Class A computing devices pursuant to Subpart J of Part 15 FCC Rules, which are designed to provide reasonable protection against interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

b) Miscellaneous

NEVER remove circuit board connections while power is on.

NEVER replace any components with anything other than exact replacement parts.

DO NOT replace fuses with anything other than proper value. A blown fuse indicates an overload condition within the game. Replacing the fuse with a higher value can cause damage to internal components, if an overload occurs.

5. Control Panel Removal

With the door to the game electronics compartment open, reach under the control panel and flip the fasteners on both sides of the control panel. The

control panel will now swing outwards. Disconnect the control panel harness, slide the spring-loaded pins on both sides and remove the control panel.

6. Front Plexiglass, Interior Graphics and Graphics Frame Removal

The front plexiglass, which secures the interior graphics, is held in place by the control panel. Release the fasteners on the control panel and swing it down. Directly under the front plexiglass, you will notice a small frame support piece. Grab it by the hand slot in the middle and pull it from the game. The front plexiglass can now be removed easily by lifting it on the bottom slightly and pulling it outward. The interior graphics can now be removed. You will also see the graphics frame, which is located directly behind the interior graphics. It must be removed when taking out the monitor. To remove the graphics frame, simply grip two sides and carefully lift out.

7. Card Cage Removal

If it is necessary to remove the card cage for servicing, first disconnect all the connectors. Then remove the three mounting screws, located on the front bracket. The card cage can now be slipped from under the rear bracket and removed from the game.

8. Logo Panel Removal

Underneath the logo panel are four mounting screws. Remove these and the logo panel can be lifted from its slot. With the logo panel removed, easy access is gained to the speaker and fluorescent lamp assemblies for servicing.

9. Monitor Removal

To remove the monitor for servicing or replacement, first open the rear panel on the cabinet and disconnect the power cable and video cable to the monitor. Then, remove the front plexiglass, interior graphics and graphics frame as explained earlier. Remove the four bolts in each corner of the monitor board. Now grasp the board by the hand holds provided at top and bottom and pull the monitor from the front of the cabinet.

OPTION SELECTION

OPTION	SWITCH #1							
	1	2	3	4	5	6	7	8
UPRIGHT	X	X	X	X	X	0	X	X
COCKTAIL	X	X	X	X	X	C	X	X
NORMAL GAME	0	X	X	X	X	X	X	X
ENDLESS GAME	C	X	X	X	X	X	X	X
6 MEN	X	X	X	X	X	X	0	0
5 MEN	X	X	X	X	X	X	C	0
4 MEN	X	X	X	X	X	X	0	C
3 MEN	X	X	X	X	X	X	C	C
GAME DIFFICULTY:	HARDEST	X	X	X	0	0	X	X
	HARD	X	X	X	C	0	X	X
	MEDIUM	X	X	X	0	C	X	X
	EASY	X	X	X	C	C	X	X
BONUS POINTS:10,000 POINTS	X	0	C	X	X	X	X	X
20,000 POINTS	X	C	0	X	X	X	X	X
40,000 POINTS	X	0	0	X	X	X	X	X
NO BONUS POINTS	X	C	C	X	X	X	X	X
OPTION	SWITCH #2							
	1	2	3	4	5	6	7	8
4 COIN/1 CREDIT	C	C	C	C	C	C	C	C
3 COIN/1 CREDIT	C	C	C	0	C	C	C	0
2 COIN/1 CREDIT	C	C	0	C	C	C	0	C
1 COIN/1 CREDIT	C	C	0	0	C	C	0	0
1 COIN/2 CREDIT	C	0	C	C	C	0	C	C
1 COIN/3 CREDIT	C	0	C	0	C	0	C	0
1 COIN/4 CREDIT	C	0	0	C	C	0	0	C
1 COIN/5 CREDIT	C	0	0	0	C	0	0	0

OPTION SWITCH SETTINGS-(cont't.)

<u>OPTION</u>	<u>SWITCH #2</u>							
	1	2	3	4	5	6	7	8
1 COIN/2 CREDIT	0	0	0	0	0	0	0	0
2 COIN/4 CREDIT								
3 COIN/6 CREDIT								
4 COIN/9 CREDIT								
X = NOT USED	0 = OPEN				C = CLOSED			

MONSTER BASH TROUBLESHOOTING PROCEDURES

MONSTER BASH is a "state-of-the-art" electronic microprocessor based, video game. The result of hundreds of hours of work, design, research, experiment and more work. However, as with any electronic device, component failure or other problems can result in a game that doesn't function properly, or doesn't function at all. In either case, your game is "down", and so critically, are your profits.

Your objective is to fix it as quickly as possible, and logic troubleshooting goes a long way toward that repair. Although many troubleshooting methods may be familiar to you, procedural logic is common among them, and might be stated in this order: visual inspection, symptom recognition, symptom isolation, function isolation, component isolation and repair. Familiarity with the equipment in question will allow you to bypass one or more of these steps, as any particular problem may be obvious to you, or may have happened before. In general though, these 6 steps form a good premise upon which to approach your "down" game.

An extremely important item in our procedure is the first mentioned, giving the gear the "once over". A large percentage of failures found in electronics, show themselves visually and often a great deal of time can be saved by inspecting for burnt or blown components, loose or disconnected wiring or connectors, or PCB traces burnt or pulled up. Thorough visual inspections become increasingly important the closer you get to the faulty item, and should be repeated each time another portion of the game is eliminated. Symptom recognition (as with all electronic troubleshooting) in your game depends first, on knowing what a proper display is, and second, knowing how your display differs from a normal one. Symptom isolation follows naturally; (i.e., "I have no picture", "I have no sound", "I have no control over the car", "the picture is scrambled"), ergo, a video, audio, input or logic problem. Function isolation, such as a sync problem with the video, requires that you consider "on-the-board" problem? A monitor input check to verify the signal will tell you. Does the board have the voltage (from the power supply) that it needs? Yes? We must have a board failure, as we've just isolated down to function.

Taking our sync problem further, before we begin our search for an individual component, let's reapply that first item in our "Logical Troubleshooting Procedure". Look at the board. Open resistors, diodes, and capacitors often give themselves away.

Noticing a trace literally burned open can save you serious "down time". The board looks OK, so on we go. Specific component isolation relates to the specific nature of the failure, component commonality, proper inputting (both signal and power) and proper outputting (as in the case of an output held high, low, or floating by input port failure in the succeeding state). More general problems (such as a total loss of video sync) requires the more involved procedure of systematic elimination of possibilities. This operation can be expedited however, by dividing the circuit in half, establishing a "go-no/go" at that point, and again dividing the suspect circuit portion in half. The largest possible areas can be eliminated in this manner, dividing and subdividing until the individual component failure is found.

As we've outlined previously, any electronic repair procedure consists of a series of efforts to isolate a problem down to a "managable" level; restating our Logical Troubleshooting Procedure in 6 steps, 1. Visual Inspection, 2. Symptom Recognition, 3. Symptom Isolation, 4. Function Isolation, 5. Component Isolation, and 6. Repair.

G-80 THEORY OF OPERATION

1. G-80 Boards

The G-80 system consists of several boards that plug into a mother board in a card cage system. This system simplifies repairs and cuts down on interference from outside communications systems. The mother board is crosswired to allow for the boards to be plugged-in to any order. Listed below are the bus bpin assignments on the mother board:

1	Ground	A	Ground
2	A15	B	A7
3	A14	C	A6
4	A13	D	A5
5	A12	E	A4
6	A11	F	A3
7	A10	H	A2
8	A9	J	A1
9	A8	K	A0
10	D7	L	D3
11	D6	M	D2
12	D5	N	D1
13	D4	P	D0
14	WAIT	R	RESET
15	INT	S	EDGINT
16	NMI	T	EXT
17	EXT SEL	U	OUT
18	MEMR	V	MEMW
19	INPUT	W	OUTPUT
20	RFSH	X	MREQ
21	INTACK	Y	AC
22	+5V	Z	+5V
23	+5V	a	+5V

24	-5V	b	-5V
25	+12V	c	+12V
26	-12V	d	-12V
27		e	
28	HALT	f	MI
29	/2	h	*
30	*	j	*
31	SRC	k	*
32		l	
33		m	
34		n	
35		p	
36		r	
37		s	
38		t	
39		u	
40		v	
41		w	
42		x	
43		y	
44	Ground	z	Ground

* For Development Purposes

a) CPU Board

The CPU is completely timed with the video board. But, for testing purposes it contains its own clock circuit, powered by an 8.000 MHZ crystal. Pin 17 is the external clock select and is grounded when the video board is plugged-in. When the external clock pulse comes in through pin T, it goes directly to the CPU and the entire CPU clock circuit is disabled. The WAIT signal, entering in at pin 14 is used to synchronize slower memory accessed by the CPU.

The NMI circuit, entering in at pin 16, contains a switch for activating the built-in-self-test. The self-test system will be explained more fully later.

When the edge interrupt circuit, entering at pin 5, goes L0, it triggers an interrupt in the CPU. The CPU stops whatever it is working on, completes the activity required by the interrupt, and then returns to the function it was performing prior to the interrupt. It is a negatively triggered interrupt, which can be disabled by the CPU at any time.

The AC signal, entering in at pin Y, combines with RESET at pin R and the input from the reset switch located on the operator panel to reset the CPU. Disregard PANEL RESET at pin 30. This circuit is used only for system development.

The CPU is a Z80A. A Z80A must always be used as the Z80 is not fast enough to run the G-80 system. U21 is an address bus controller. Eight of the sixteen address lines pass through U21 before addressing the RAMs and Eprom at U25. U25 contains the data for the self-test and contains features common to all games, such as coin acceptance, credit/coin handling, power-up sequence, player 1 or 2 recognition and CPU initialization. U3 is an output port for the CPU and U4 is an input port. Connector P1, pins 24 through 40, shown on sheet 6 is not used. U15, located below U4 on the schematic, decodes memory select on the CPU board. Sheet 7 contains the coin inputs, player inputs and inputs from the operator panel. The coin circuitry contains ICs U6, U39 and U16. U9 is the input for the coin switches and service switch. Player inputs enter through connector P1, pin 15 through 22.

b) SOUND BOARDS

A G-80 Sound Board contains the circuits needed to generate all game sounds other than the speech. The Sound Board Circuits are triggered through 8-bit latches, which are connected to the data bus.

The appropriate 8-bit code on the data bus is then latched to activate the corresponding sound circuit. All Sound Board signals are mixed by an IC op-amp, the output of which is amplified by the power amplifier. In games containing a Speech Board, the Sound Board output is mixed with the speech output on the Speech Board. The result of the mixed signals is then amplified by the power amplifier to drive the speaker.

c) VIDEO BOARD

The video board contains a 15.468 MHz crystal that generates the timing signals for video generation. Because the video board contains twice as many RAMs, it has more extensive graphics capability. Color capability is greatly expanded because of a color RAM, U9, which allows the program to create a wider variety of color schemes. There are 8 shades of red, 8 shades of green and 4 shades of blue. The video board also contains circuitry (U34, U35, U36, U38, U49 and U50) to make the picture "flip" for cocktail table models.

On the G-80 Video 1 Board is located the VIC Replacement Board. This board is, in part, the equivalent circuit of the VIC chip. It is a simple circuit consisting of a number of counters and multiplexers for generating video timing and addressing video RAM.

d) EPROM BOARD

The EPROM board contains a relatively simple memory system. It can hold up to 23 2716 EPROMS totalling 46K bytes of memory. U24 and U30 decode all the EPROMS; U25 is the buffer IC to the data bus. In operation, any one of the 23 EPROMS is selected by 5 CPU address lines.

e) POWER SUPPLY

The G-80 power supply incorporates all of the voltages and audio power amplification necessary to power any G-80 based video game. The major

differences between this and other Gremlin power supplies is that the transformer (560-0055) is mounted separately from the PCB/heatsink/chassis combination. This transformer is noticeably larger than previous units, mainly because it has isolation windings for driving X-Y color monitor as well as windings for a raster scan color monitor. There are multiple primary taps available for using 100, 115, or 230 VAC as the input voltage.

Table 1 lists the rating of the regulated DC voltages (a standard test load) as well as the ratings of the transformer's windings used to drive the X-Y or raster scan monitor.

TABLE 1

Regulated DC Voltages

+5V @ 6A

-5V @ 1A

+12V @ 1A

-12V @ 1A

AC (monitor) Voltages

X-Y: 92 VCT (voltage center tap) @ 2A

Raster: 100 or 115 VAC @ 0.65A

Voltage Regulator Circuit Description

The +5 volt supply mainly consists of U1 and the TIP141. U1 is a 723 voltage regulator IC which contains a voltage reference, error amplifier, series pass darlington transistor pair and a current limit transistor. Potentiometer R31 (+5 ADJ) divides the 7.15 (NOM) reference to 5.0 volts as the input to pin 5, the noninverting input of the 723's error amp. Pin 4, the inverting input, senses the output voltage. The internal error amp maintains a voltage as U1 pin 10 which is higher than the 5.0V output by an equal amount to the two VBE drops of the TIP141 (a high current

darlington) which acts as a current amplifier, and IR drop across R25. Any change in the output voltage is sensed at pin 4 which causes the error amp to drive pin 10 higher or lower in order to keep the output at a steady 5.0V.

A "foldback" current limiter circuit is composed of R25, R26, R32, Q7 and the internal current limit transistor of U1. This circuit allows the regulator to operate normally until the load current increases to the point where the voltage across the R32 reaches the value which starts turning on the internal current limit transistor. This transistor reduces the output current of the regulator to a fraction of the "knee" current when the output is shorted to ground. This feature greatly reduces the power dissipated in the TIP141 when the output is accidentally short circuited.

Capacitors C20 and C21 frequently compensate the regulator so it won't oscillate and C17 filters high frequencies at the output. Q7 temperature compensates the current limit circuit. Temperature variations of its emitter-base voltage closely match and cancel the base emitter voltage of the internal current limit transistor so the knee current of this regulator would now remain constant over wide temperature variations.

Audio Amplifier Circuit Description.

The G-80 power supply has provisions for two power amplifiers. Only one is used at present and the foreseeable future. The input signal from the volume control is coupled to differential pair Q2 and Q3 via C5. Resistor R5 sets the input impedance 22K ohms. Resistor R6 sets a current of approximately 2 ma for Q2 and Q3 to divide equally. The voltage gain of Q2 is determined by its emitter current, R7, and the impedance looking into Q1, the second stage of voltage gain. Resistor R8 provides local negative feedback in the emitter of Q1 for increased

open loop linearity while C9 and Q1's voltage gain provide a dominate pole open loop roll-off to ensure stability of the amplifier. Diodes D4 and D5 provide a small amount of turn on bias for the TIP120 and TIP125 darlington current amplifiers. Resistor R22 is bootstrapped by C10 to make R22 look like a current source. This technique allows maximum negative voltage swing for a symmetrical output waveform at full power. Local feedback in the output stage is provided by R14 and R15. The overall voltage gain of the amplifier is set by the ratio of R9 and R10. The actual value is:

$$\frac{R9}{R10} + 1 + \frac{22K}{1K} + 1 + 23 \text{ or } 27\text{db}$$

Capacitor C7 adds additional high frequency compensation and the C8-R10 combination determines the low frequency roll-off point of -3db event that a speaker is not connected. The manimun output is approximately 25 watts into 4 homs and 15 watts into 8 ohms.

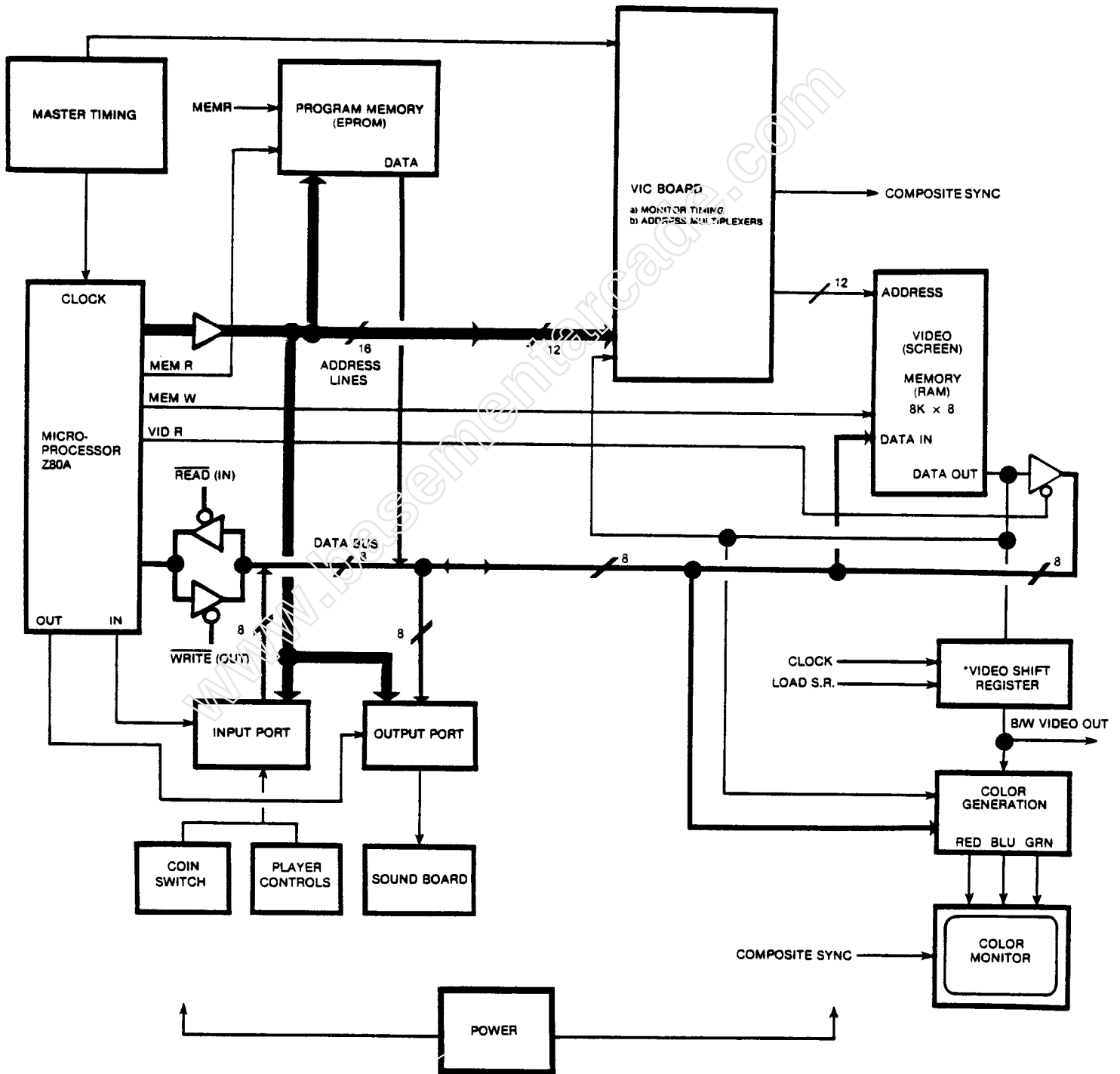
Adjustments

1. Adjust R31 for 5.0V at the load. This compensates for wiring losses.
2. There are no other adjustments. The tolerances are as follows:

$$\begin{aligned} -5V & \pm 0.2V \\ +12V & \pm 0.5V \\ -12V & \pm 0.5V \end{aligned}$$

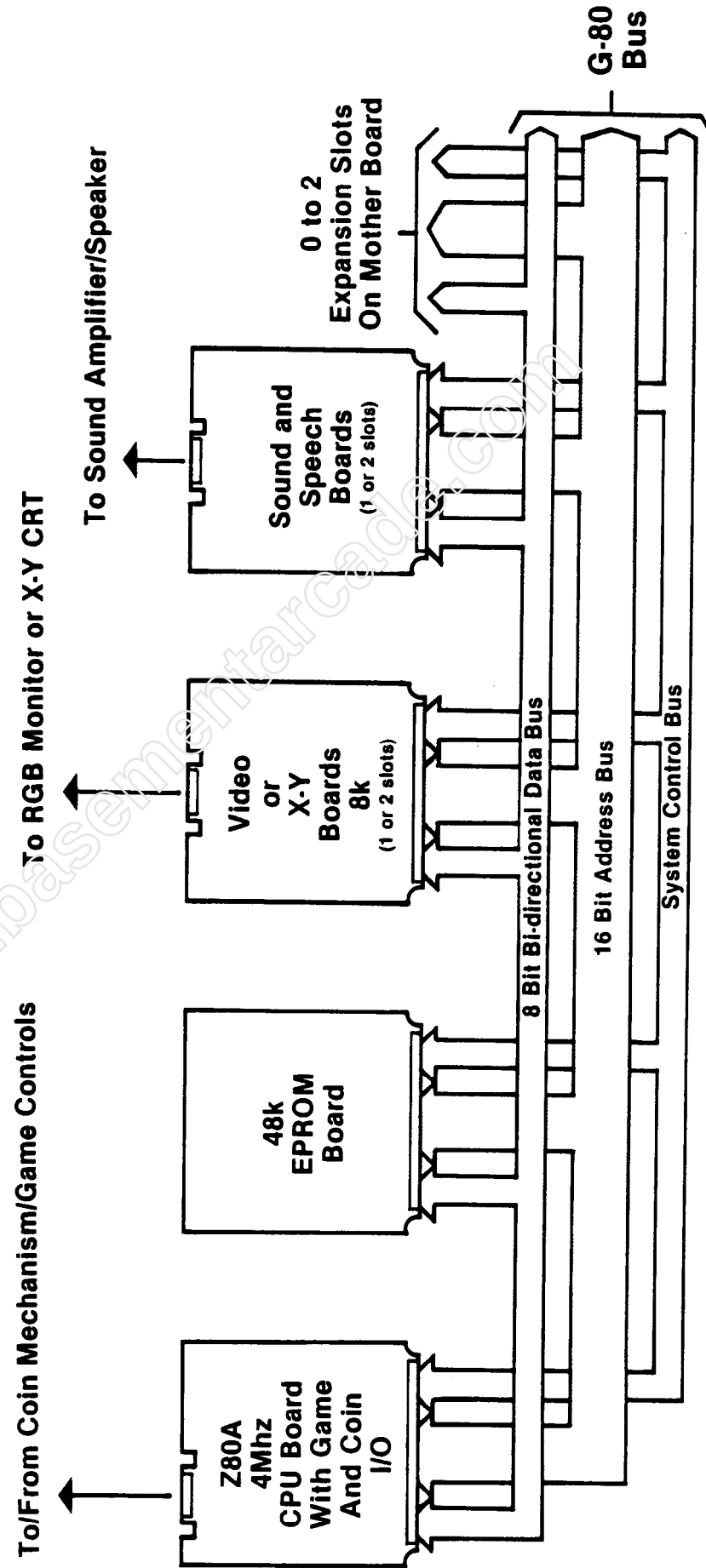
G-80 BLOCK DIAGRAM

RASTER-SCAN GAME



* DENOTES CIRCUITRY CONTAINED IN VIC BOARD

G-80 Bus Detail



SELF-TEST

The G-80 system contains a built-in self-test system, activated by depressing the red self-test switch located on the CPU Board. If the cover to the G-80 card cage is in place, the switch can be activated by putting a pen or pencil through the hole provided on the cover.

Basic diagnostics test sequence:

1. CPU RAM
2. Maskable interrupts
3. First 1K of game ROMs
4. Video RAM and Hardware multiplier
5. Player start buttons
6. Display screen (visual)
7. All game ROMs
8. System inputs
9. Game controls
10. Sounds/Voice

Individualized diagnostics descriptions and procedures:

1. CPU RAM - tests all RAM on CPU card before proceeding, system needs to use this RAM for stack and variables during other tests so if any locations are bad processor will halt (halt light will come on).

2. Maskable interrupts - video interrupt is enabled through output port bit and all maskable interrupts are enabled inside processor, CPU then executes several HALT instructions to insure that at least one edge triggered interrupt has occurred. If no interrupts occur during this test the halt light will remain on constantly. This is the same result as a bad CPU RAM. This ambiguity can be eliminated by checking the vertical interrupt another way. The system reset/power-up logic will also halt if the video interrupt is not functioning, to try this press the RESET switch.

3. First 1K of game ROMs - the first 1K of the first game ROM will be checked for validity. If this portion of the first ROM is bad the system will not be able to proceed because vital information defining parameters of the game are stored in this first 1K. If an error occurs during this validity check, the CPU will lock up and repeatedly flash the halt light.

4. Video RAM and Hardware multiplier - the video RAM is tested first and in the event that it tests good then the hardware multiplier is checked. If the video RAM is good, the message "ALL VIDEO RAM GOOD, MULTIPLIER GOOD" appears. If a bad video RAM chip is found, then the message "BAD VIDEO RAM, CHIP U##" appears on the screen along with that chip's location. Due to the fact that sometimes a bad video chip causes the display to be erratic, the system also flashes out the bad chip's location on the halt light, over and over again separating the U's with a one second on pulse.

The hardware multiplier is used in the game to multiply two 8 bit numbers together to form one 16 bit product. This test performs a select group of multiplications, over 2,000 multiplications in actuality, designed to thoroughly exercise the process of multiplication between the software and the hardware multiplier. The messages "GOOD" or "BAD" are the only indication of functionality with respect to this test.

5. Player start buttons - one of the two "game start" push buttons on the front of the cabinet is very special. The "one player start" button was designated by the system as a way to terminate the test that is currently being run. The reason that these two buttons were tested relatively early in the sequence, was so that the remaining tests could use the "one player start"

button for a termination signal. To be sure that these two buttons are functioning properly, see that when untouched the status indicated is "0" (for open switch contact) and that when pushed or depressed momentarily the indicated status is "C" (for closed switch contact) during the time the button is down. This notation for switches being in the open or closed state, "0" or "C", will be used throughout the diagnostic sequence whenever the status of a switch is being displayed on the screen.

6. Screen - this test is supplied by the game logic, external to the CPU ROM, to provide a visual indication of how well the display screen is functioning. It tests beam deflection and colors to check that all electron guns are functioning. In the display, you should see some sort of test showing the colors white, red, green and blue.

7. All game ROMs - the intent of this test was to insure the integrity of all of the data in all of the game ROMs. At the time the ROMs for a game were originally generated there was an algorithm performed on each 1K block of data. Each of these calculations, a form of CRC (cyclic redundancy check, similar to a checksum), produced one 16-bit word. These words are stored, along with a Gremlin part number, in the first ROM. When this test is run, all of these 16-bit CRC words are regenerated and are compared to the known values stored in the table in the first ROM. If one of these newly calculated values does not match its corresponding stored value, then the system kicks out an error which amounts to the message "BAD ROM" followed by one or more bad part numbers of that ROM that was found in mis-match. If all ROMs are good the screen displays: "ALL ROMS GOOD". Then the system quickly proceeds on to the next test.

8. System inputs - these inputs are referred to as 'system inputs', simply because they control system functions, such as credit accumulation, coinage options, game configuration, etc. The diagnostic user may check to see that the coin switches, service switch, and option dip switches are functioning properly. The open and closed switch notation applies here as described earlier.

9. Game controls - the names of the controls that the game player would use to control the action on the screen is what this test was designed to check. Make sure that when hands are off of the controls all of

MONSTER BASH UPR TOP ASSEMBLY

MONSTER BASH UPR TOP ASSEMBLY

DRAWING NUMBER 700

MONSTER BASH UPR TOP ASSEMBLY

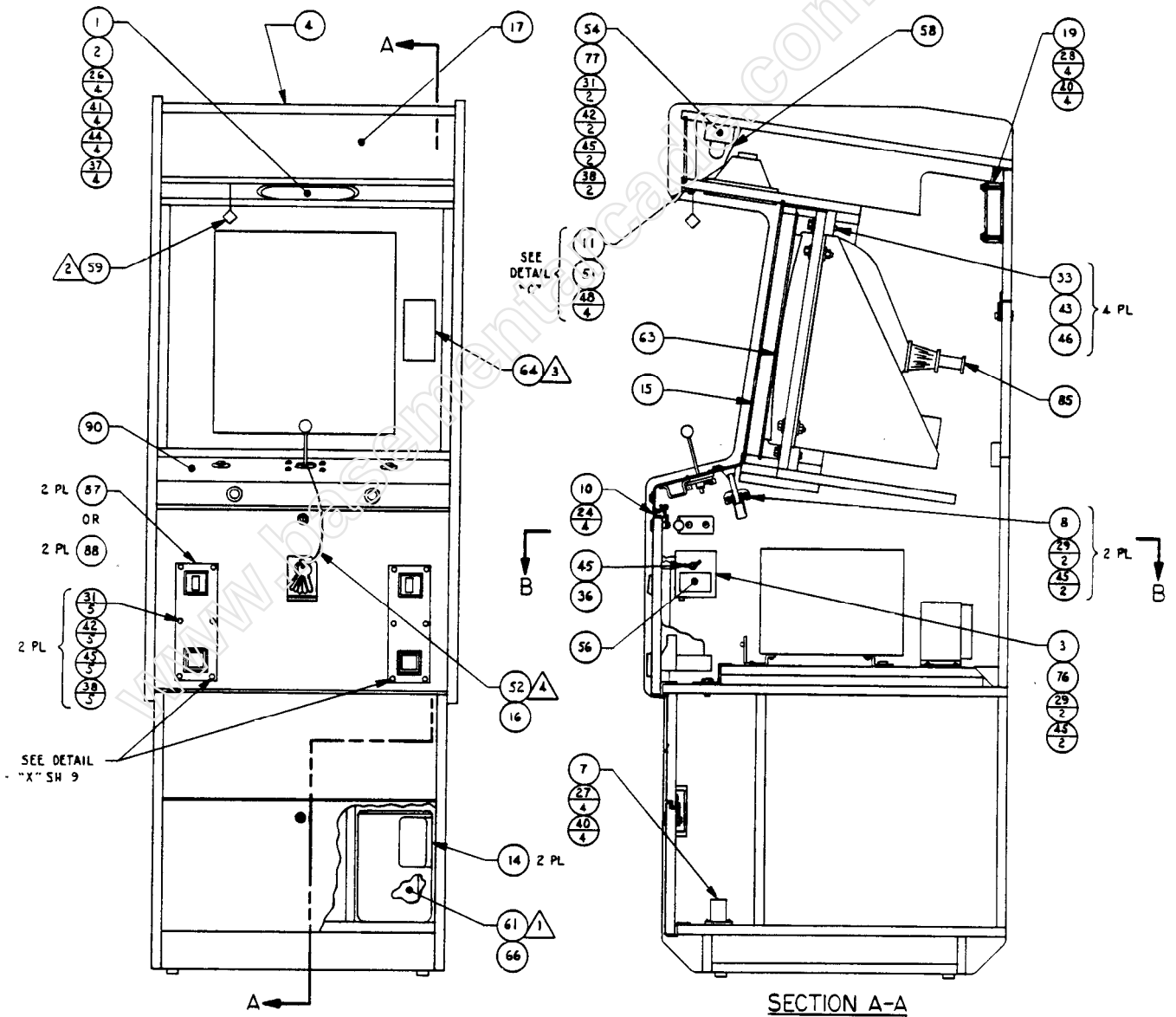
MONSTER BASH UPR TOP ASSEMBLY

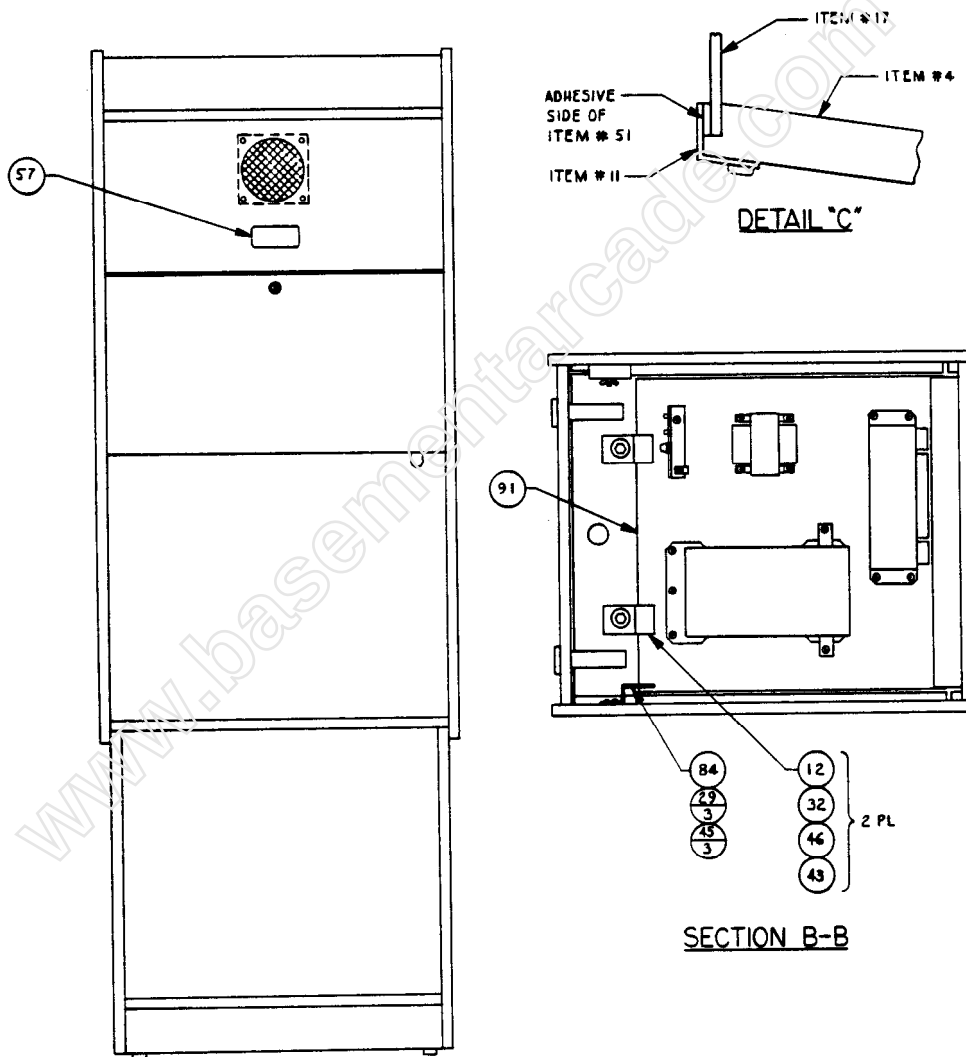
MONSTER BASH UPR TOP ASSEMBLY

MONSTER BASH UPR TOP ASSEMBLY

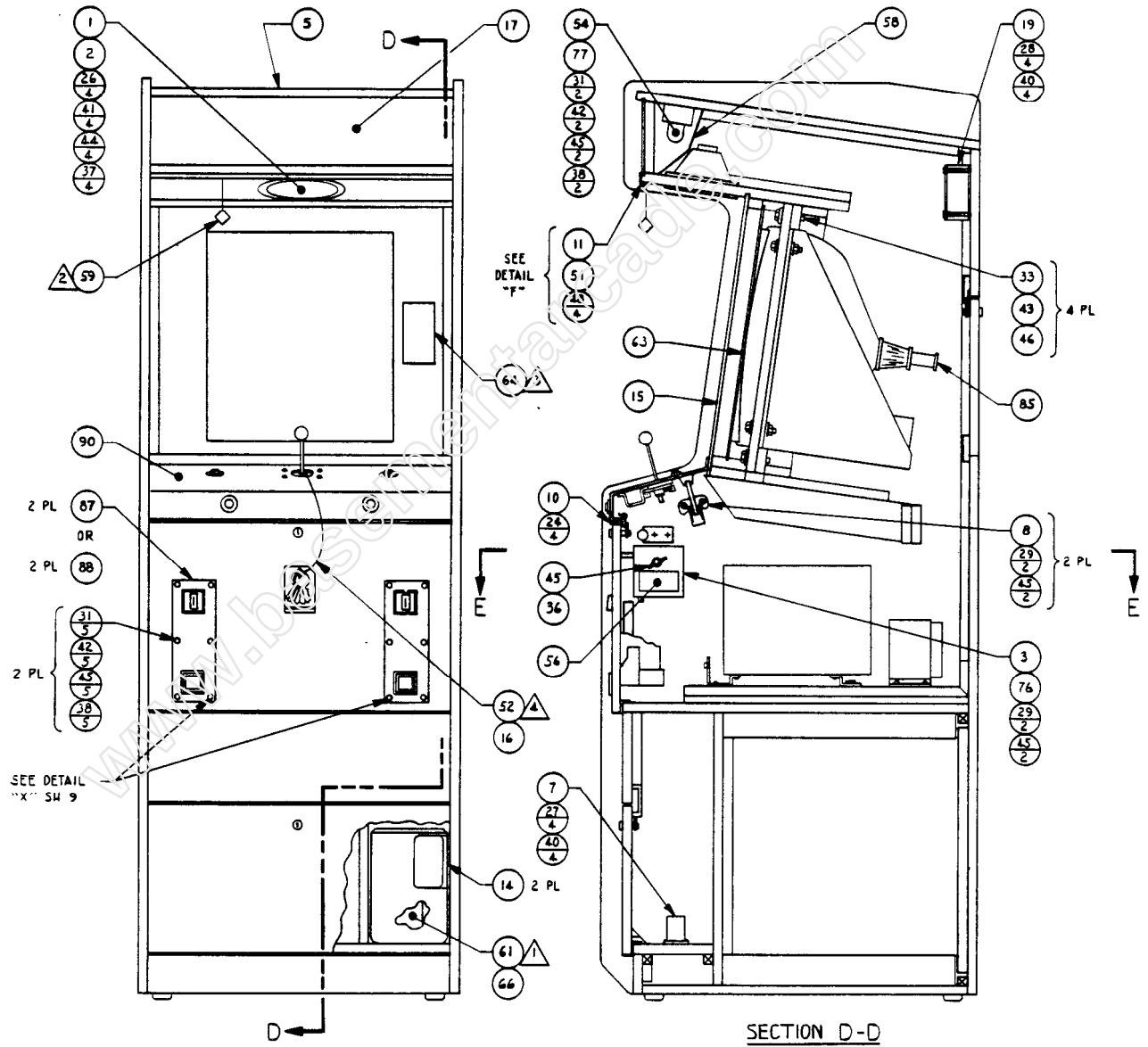
DRAWING NUMBER 700-0103-01

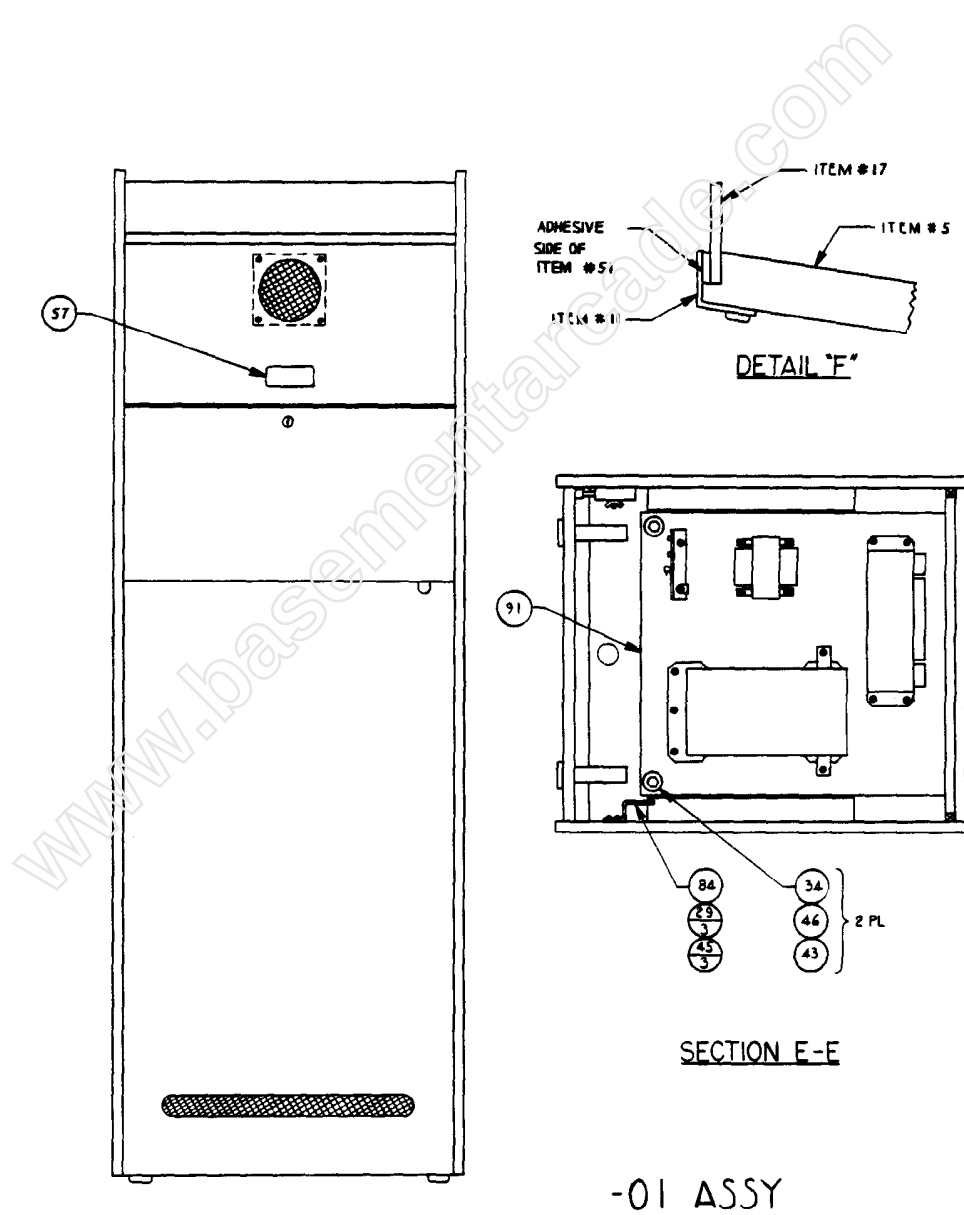
<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>
72			
73			
74			
75			
76	800-0145	1	Assy AC J-Box
77	800-0147	1	Fluorescent Lamp Assy 2 UL
78	800-0232	1	Assy Harness GND
79	800-0284	1	Assy Harness GND Coin Mech
80	800-0290	1	Assy GND Strap Control Panel
81	800-0322	1	Assy Cord Fan
82	800-0329	1	Assy Harness Monitor
83	800-0330	1	Assy Harness GND Monitor, Raster, Universal
84	800-0333	1	Assy Connector Bracket
85	800-0405	1	Assy Monitor Color
86	800-0396	1	Harness, Coin Mech
87	800-0398	2	Coin Mech Assy
88	800-0398	2	Coin Mech Assy
89	800-0403	1	Assy Speaker Harness
90	800-3274	1	Control Panel Assy. Monster Bash Upright
91	800-3276	1	Component Shelf Assy. Monster Bash Upright



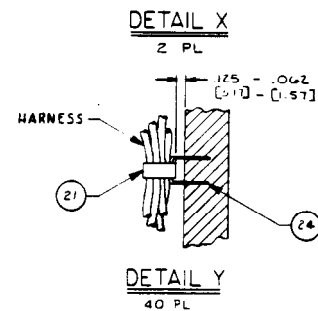
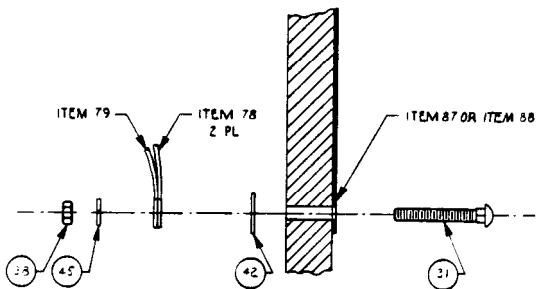
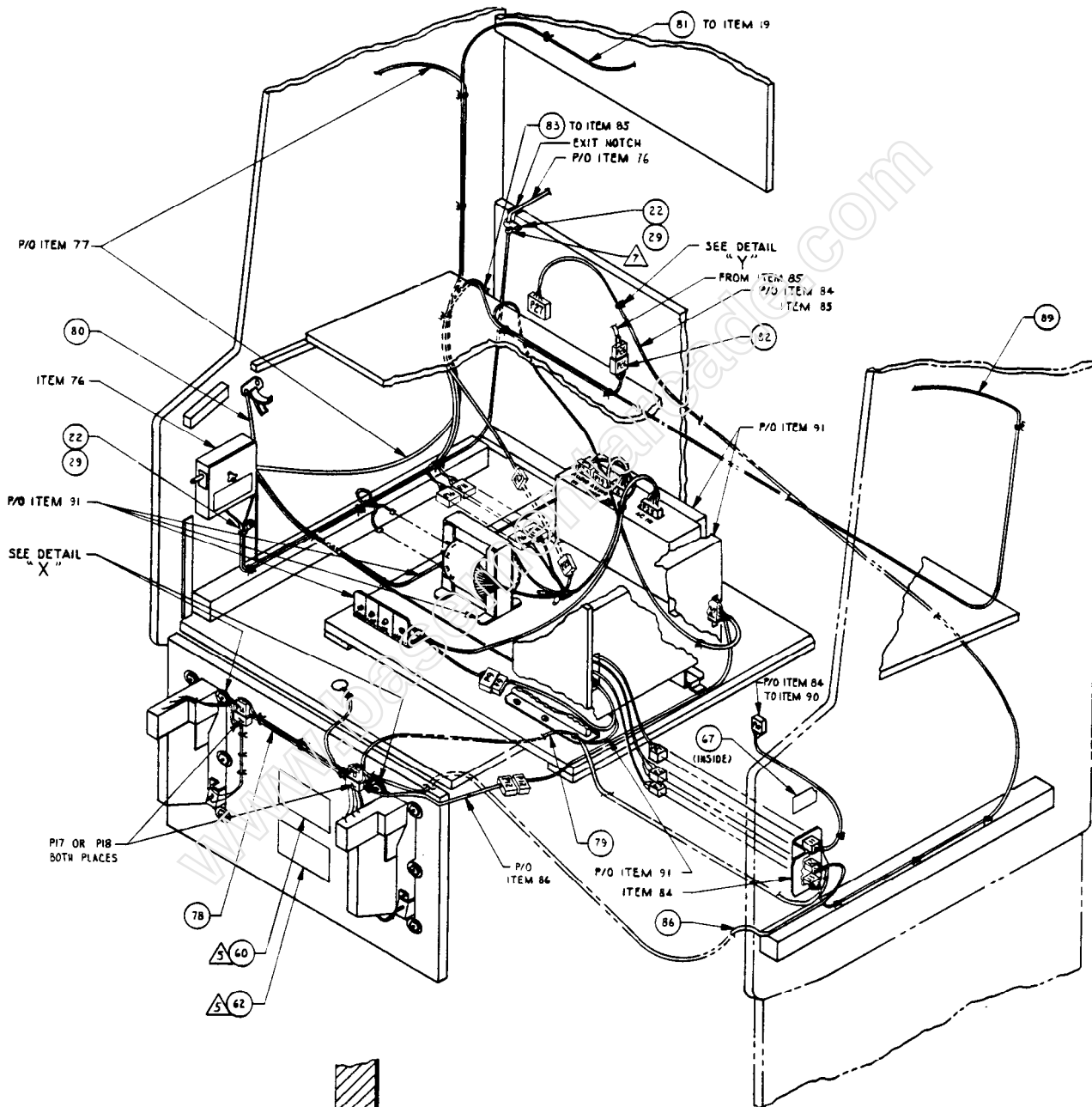


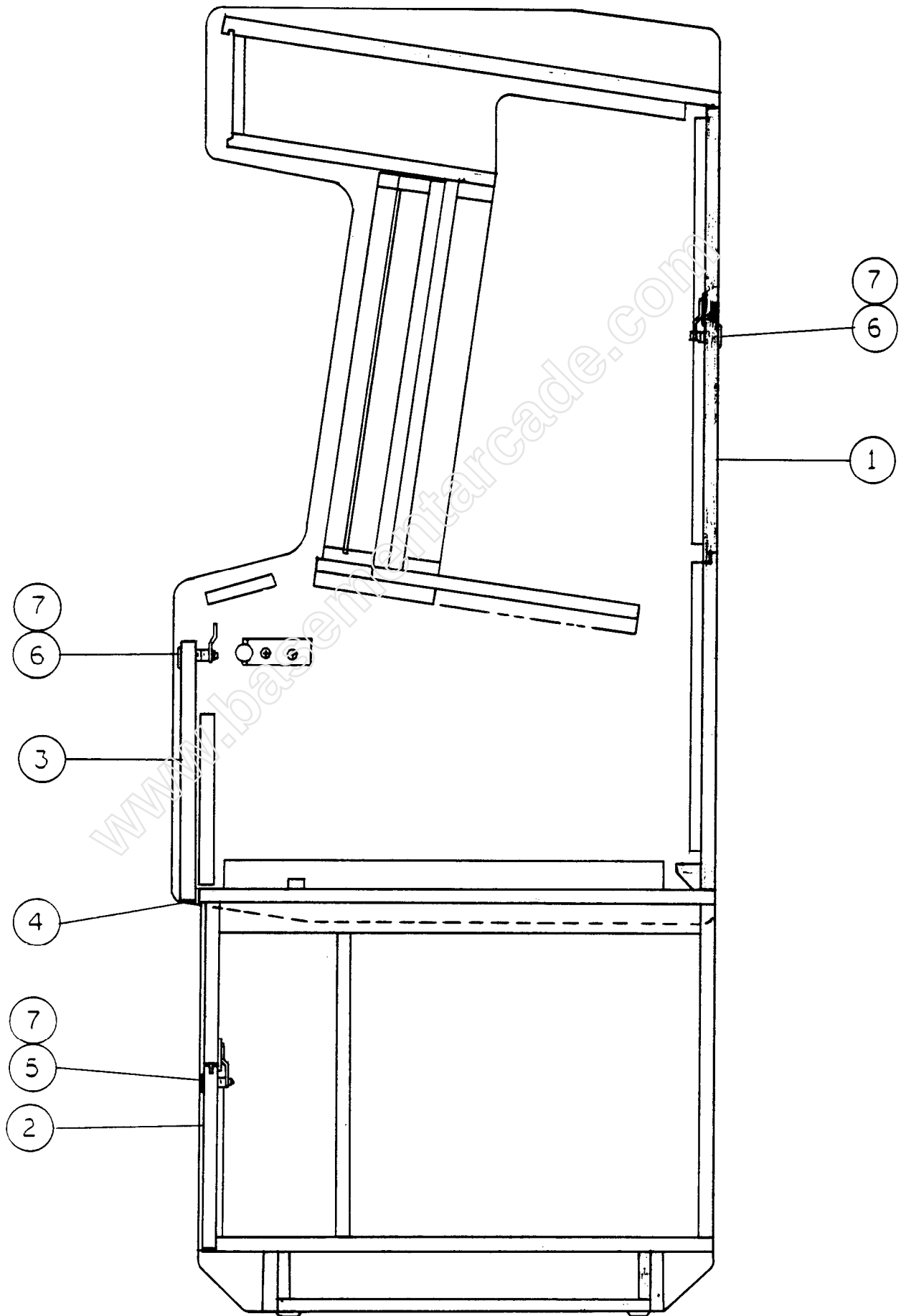
-00 ASSY

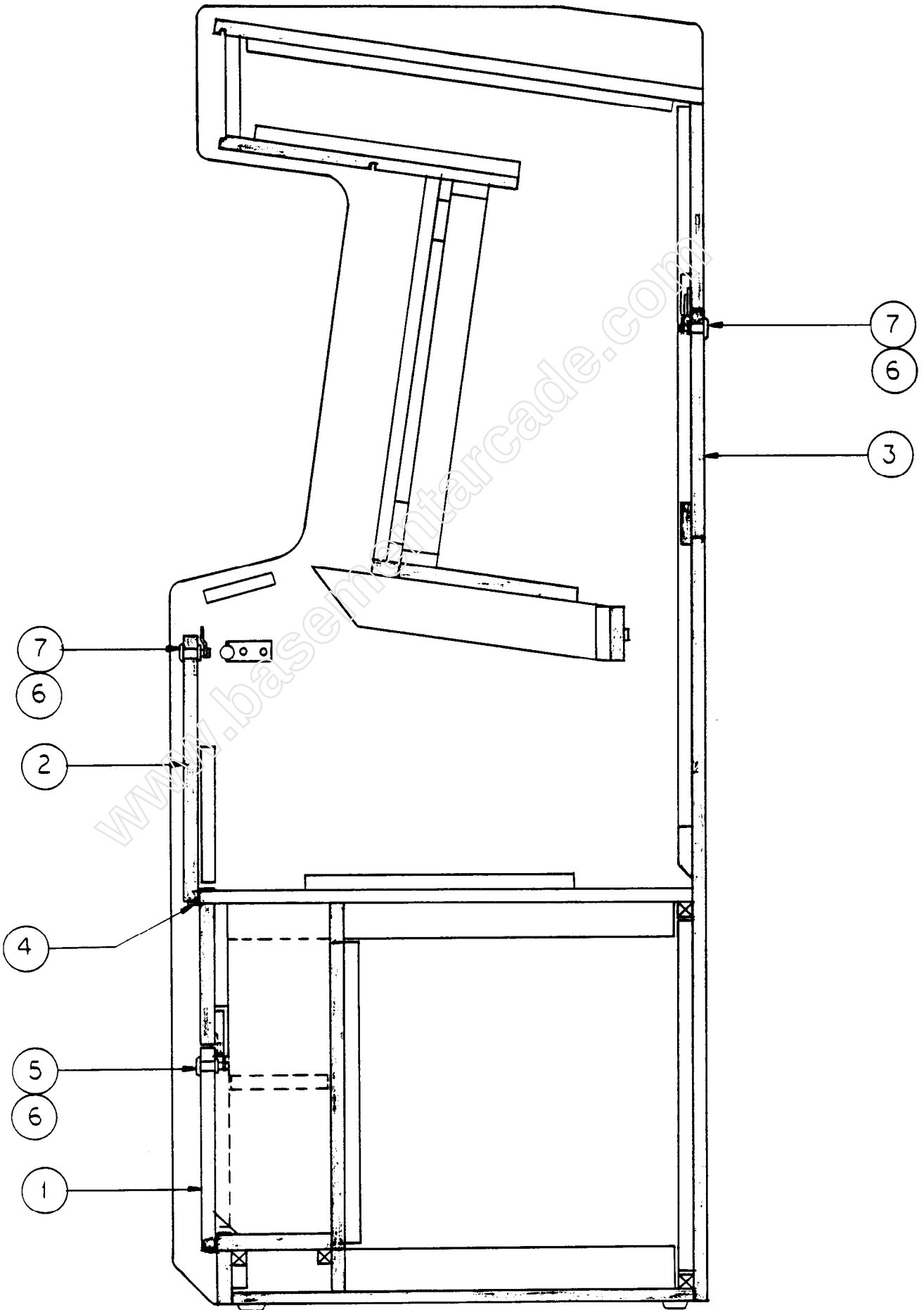




-01 ASSY



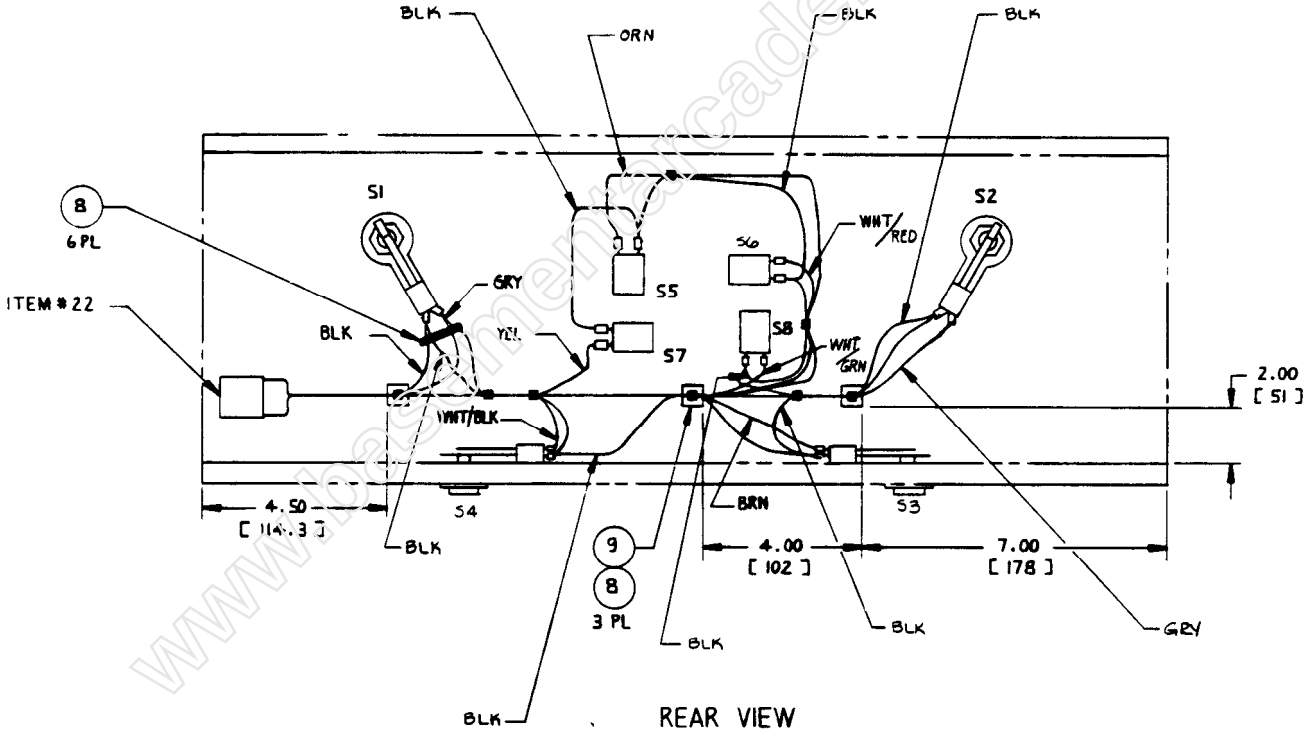




CONTROL PANEL ASSEMBLY

DRAWING NUMBER 800-3274-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>
1	240-0009	4	Button PLR Yellow
2			
3			
4			
5	250-0551	1	Subpanel Metal
6	253-0275	1	Graphic Control Panel
7			
8	280-0005	9	Cable Tie
9	280-0327	3	Base Tie Wrap
10	280-0329	4	1/2" - 13 Hex Pal Nut
11			
12	282-0005	4	Bolt #10-24 X .750 CRG Mach
13	283-0072	4	Nut Hex Mach #10-24
14	283-0060	4	Washer Flt, Stl. #10
15	283-0061	4	Washer Lock Split #10
16			
17	510-0059	1	Joystick 4 Way Long Shaft S5-S8
18	510-0064	4	Switch Pushbutton Metal Panel S1-S4
19			
20			
21			
22	800-3259	1	Control Panel Harn Assy

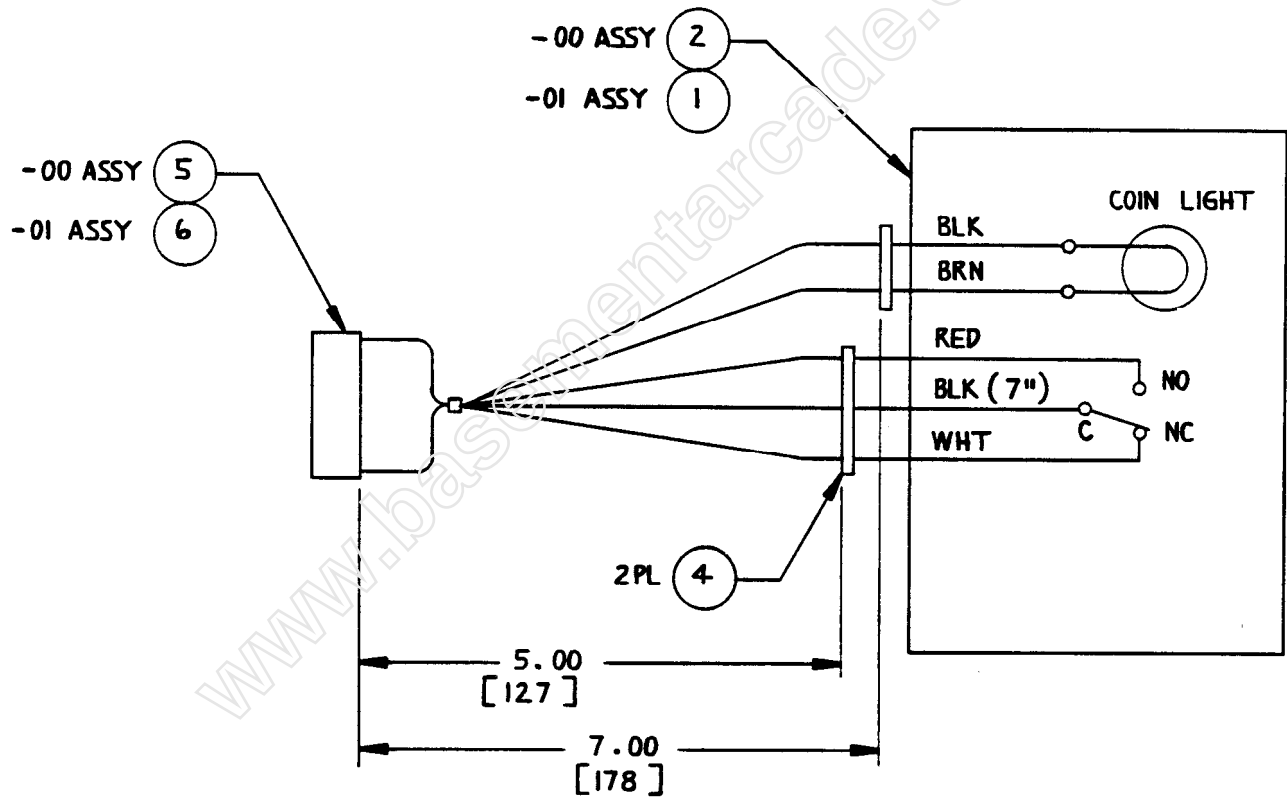


<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	220-0194		Coin Mech W/Lamp	
2	220-0195	1	Coin Mech W/Lamp	
3				
4	280-0005	2	Cable Tie	
5	800-0397	1	Harness, Coin Mech	
6	800-0397		Harness, Coin Mech	

COIN MECH ASSEMBLY

DRAWING NUMBER 800-0398-01

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF DESG.</u>
1	220-0194	1	Coin Mech W/Lamp	
2	220-0195		Coin Mech W/Lamp	
3				
4,	280-0005	2	Cable Tie	
5	800-0397		Harness, Coin Mech	
6	800-0397	1	Harness, Coin Mech	



OUTSIDE OF THE PCB ASSY

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
200-0667	Picture tube 19"	
200-0068	Deflection yoke	
113-0009	PC magnet	
560-0096	Flyback trans.	
	HVR	
	UNF resistor 220 Ohm, 25W K	R05
	C capacitor 150pf, AC1.5KV	C04
482-0198	Si. transistor, 2SD870	X01
482-0143	Si. transistor, 2SC1106A	X02
	Screw #8 3/8	
	Screw 1/4 x 3/4 pix tube mtg (4)	
	Pyramidal lock washer (4)	
	Nut retainer, pix tube mtg (4)	
	Clip--PCB support	
	Standoff	
	Wire terminal (gnd strap)	
	Terminal lug (gnd)	
	Groundstrap assy	
	Grounding spring	
	Wire hook (gnd strap)	
	Purity shield holddown clamp	
	Support brkt RH	
	Support brkt LH	

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	Chassis base	
	Yoke wedge (3)	
	PURITY SHIELD ASSY	
180-0022	Degaussing coil	D911,D912
481-0225	Rectifier 1 amp 600 V (2)	
	Pin terminal (2)	
	Pin terminal housing	
	Purity shield (2 pcs)	
	Purity shield (2 pcs)	
	Capacitor 100nf 10% 400V	C911
	Resistor, wirewound 33 Ohm, 4W	R921
	Fire retardent term strip 4 lug	
	CRT SOCKET PCB ASSY	
	V R 200	R105
	V R 200	R106
	V R 5K	R113
	V R 5K	R114
	V R 5K	R115
	OM R 10K Ohm 2W J	R116
	OM R 10K Ohm 2W J	R117
	OM R 10K Ohm 2W J	R118
	Comp R 3.3K Ohm 1/2W K	R119
	Comp R 3.3K Ohm 1/2W K	R120
	Comp R 3.3K Ohm 1/2W K	R121

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
Capacitors		
	E Cap 10uf 250V A	C107
	C Cap 1000pf DC1400V P	C108
Coils		
180-0023	Peaking coil	L101
Semiconductors		
482-0290	Si transistor, 2SC1514VC	X101
482-0290	Si transistor, 2SC1514VC	X102
482-0290	Si transistor, 2SC1514VC	X103
Miscellaneous		
213-0022	CRT socket	
	MAIN PCB ASSY	
Resistors		
	V R 200 Ohm	R406
	V R 200 Ohm	R408
	CMF R 6.8 Ohm 1W J	R410
	OM R 3.3K Ohm 1W J	R414
	OM R 2.7K Ohm 1W J	R415
	OM R 12K Ohm 2W J	R421
	V R 10K Ohm	R422
	F R 68 Ohm 2W K	FR401
	CMF R 11.8K Ohm 1/4W +1%	R503
	V R 5K Ohm	R504
	OM R 10K Ohm 2W J	R509
	OM R 8.2K Ohm 2W J	R512

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	OM R 820 Ohm 2W J	R514
	CMF R 8.2 Ohm 1W J	R515
	CMF R 4.7 Ohm 1W J	R522
	OM R 68 Ohm 2W J	R523
	OM R 390 Ohm 1W J	R528
	ZN R 470 Ohm	R534
	ZN R	VR501
	CMF R 39 Ohm 1/2W + 1%	R703
	CMF R 7.68K Ohm 1/4W + 1%	R704
	Posistor	R901
	UNF R 2 Ohm 7W K	R902
	CMF R 4.7 Ohm 3W J	R903
	OM R 10K Ohm 2W J	R904
	OM R 18K Ohm 1W J	R905
	CMF R 47 Ohm 1/2W + 1%	Q908
	V R 2K Ohm	R909
	CMF R 2.74K Ohm 1/4W + 1%	R910
	F R 220 Ohm 1/2W K	FR901
Capacitors		
	BPE Cap 3.3uf 50V A	C301
	Tan cap 2.2uf 16V K	C402
	E cap 4.7uf 6.3V A	C407
	E cap 100uf 160V A	C411
	E cap 3.3uf 160V A	C412

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	PP cap 5600uf 50V J	C508
	PP cap 2000pf DC1500V J	C512
	PP cap 2000pf DC1500V J	C513
	PP cap 2000pf DC1500V J	C514
	PP cap 0.53uf DC1200V J	C515
	BPE cap 3.3uf 50V A	C520
	E cap 1uf 160V A	C523
	M cap 0.1uf 200V K	C524
	PP cap 2000pf DC1500V J	C531
	PP cap 1500pf DC1500V J	C532
	E cap	C904
	E cap 10uf 250V A	C905
Coils		
180-0024	Linarity coil	L502
181-0031	Width coil	L503
180-0025	Heater choke	L504
Transformers		
560-0061	Hor drive transf	T501
560-0097	Side pin transf	T503
Semiconductors		
316-0807	IC HA11244	IC501
482-0177	Si transistor, 2SC1685(R)	X101
482-0111	Si transistor, 2SA673(C)	X102
482-0177	Si transistor, 2SC1685(R)	X103

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
482-0111	Si transistor, 2SA673(C)	X104
482-0177	Si transistor, 2SC1685(R)	X105
482-0111	Si transistor, 2SA673(C)	X106
482-0177	Si transistor, 2SC1685(R)	X301
482-0177	Si transistor, 2SC1685(R)	X302
482-0111	Si transistor, 2SA673(C)	X303
482-0177	Si transistor, 2SC1685(R)	X304
482-0177	Si transistor, 2SC1685(R)	X305
482-0196	Si transistor, 2SD478	X401
482-0196	Si transistor, 2SD478	X402
482-0291	Si transistor, 2SC2610BK	X501
482-0257	Si transistor, 2SC2688 (KLM)	X901
482-0258	Si transistor, 2SC1890A (EF)	X902
481-0226	Si diode, W06A	D101
481-0226	Si diode, W06A	D102
481-0226	Si diode, W06A	D103
481-0149	Si diode, 1SZ473H	D301
481-0149	Si diode, 1SZ473H	D401
481-0227	Zener diode, RD10F(C)	D402
481-0171	Si diode, HF-1	D503
481-0228	Si diode, V09E	D504
481-0229	Zener diode, RD11E(B)	D505
481-0226	Si diode, W06A	D506
481-0230	Si diode, 1SS81	D507

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
481-0149	Si diode, 1SZ473H	D508
481-0231	Zener diode, RD20EV2	D701
481-0160	Si diode, 1S1887A	D901
481-0160	Si diode, 1S1887A	D902
481-0160	Si diode, 1S1887A	D903
481-0160	Si diode, 1S1887A	D904
481-0198	Zener diode, RD6.8EV3	D905
Miscellaneous		
	Fuse 1.25A	F901
	US fuse 3A	F902

P.C. BOARD LAYOUT

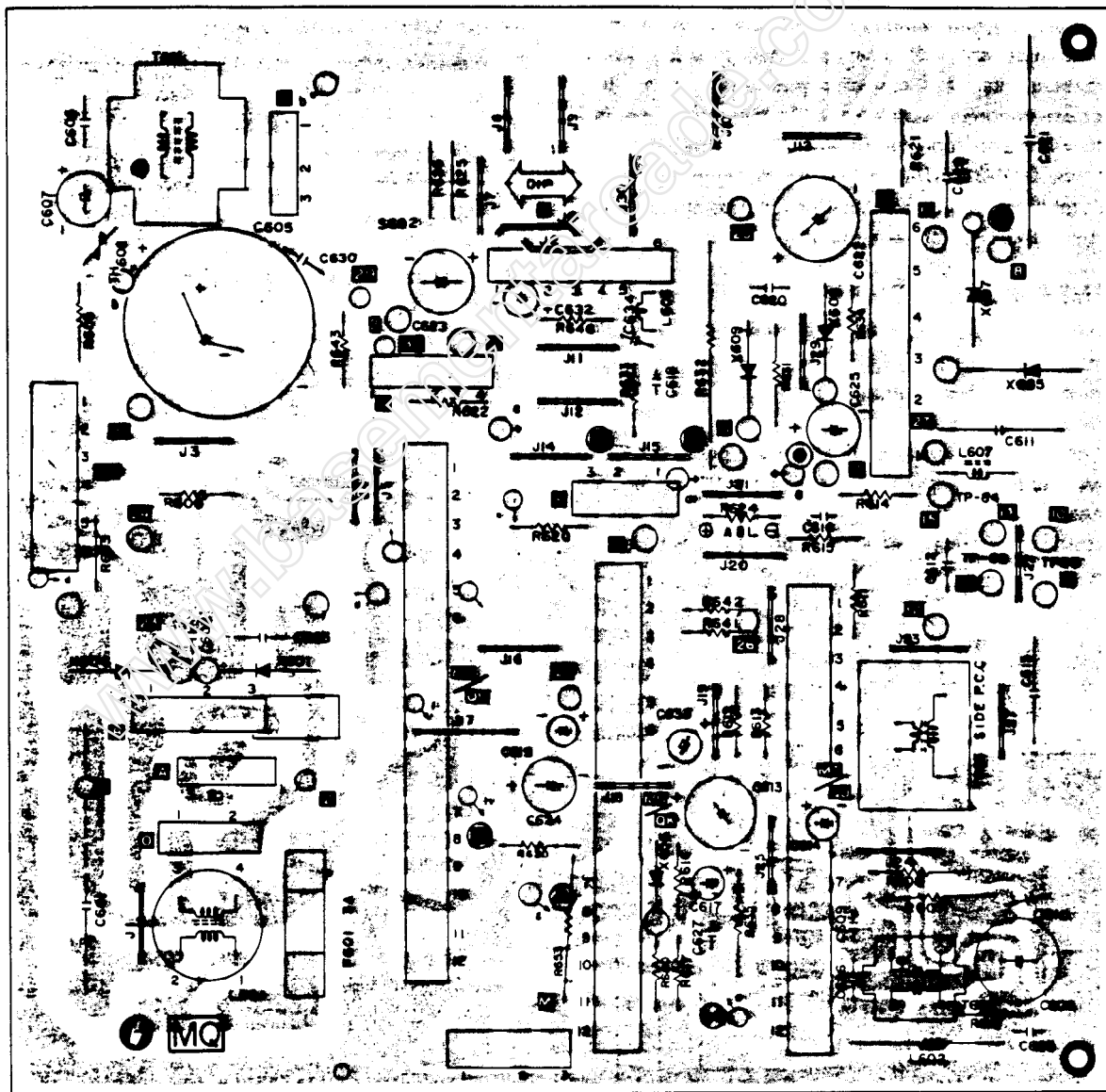


FIGURE 13. NECK P.C. BOARD

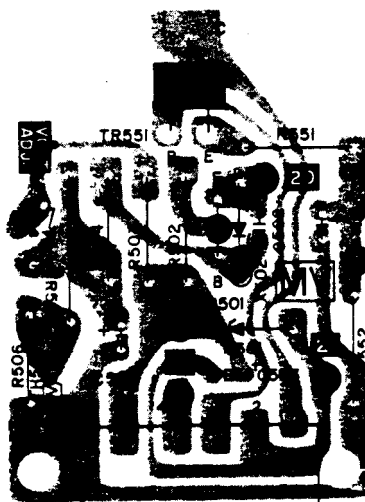


FIGURE 14. POWER P.C. BOARD

[illegible]

FIGURE 15. HORIZ/VERT P.C. BOARD

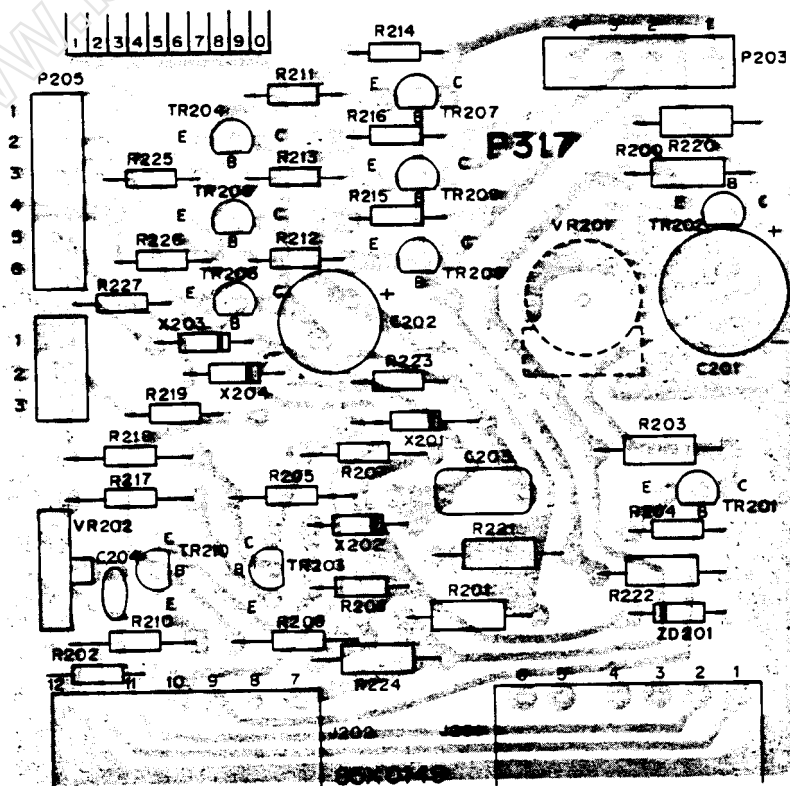


FIGURE 16. INTERFACE BOARD (P317 AND P318)

MAIN BOARD

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
Resistors		
	33k Ohm, $\pm 10\%$, 1/2W carbon	R603
	470 Ohm, $\pm 10\%$, 5W WW	R606
	2.7k Ohm, $\pm 10\%$, 5W WW	R607
	1.2k Ohm, $\pm 5\%$, 1W MO	R608
	22 Ohm, $\pm 5\%$, 1/8W carbon	R610
	1k Ohm, $\pm 5\%$, 1/2W carbon	R611
	470 Ohm, $\pm 10\%$, 1/2W carbon	R612
	1.2k Ohm, $\pm 5\%$, 1W MO	R613
	680k Ohm, $\pm 5\%$, 1/2W comp	R614
	270k Ohm, $\pm 5\%$, 1/2W comp	R615
	2.7 Ohm, $\pm 5\%$, 1/8W carbon	R616
	68k Ohm, $\pm 5\%$, 1/8W carbon	R617
	1k Ohm, $\pm 5\%$, 1/2W carbon	R624
	2.2 Ohm, $\pm 10\%$, 5W MO	R631
	120 Ohm, $\pm 5\%$, 5W carbon	R632
	2.2 Ohm, $\pm 5\%$, 1/8W carbon	R634
	6.8 Ohm, $\pm 5\%$, 1/2W carbon	R635
	33k Ohm, $\pm 5\%$, 1/8W carbon	R641
	15k Ohm, $\pm 5\%$, 1/8W carbon	R642
	15 Ohm, $\pm 10\%$, 2W carbon	R647
	1.8k Ohm, $\pm 10\%$, 1/2W carbon	R649
	270 Ohm, 10%, 1/2W carbon	R650

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	240 Ohm, $\pm 10\%$, 2W carbon	R651
	6/8k Ohm, $\pm 10\%$, 1/2W carbon	
Semiconductors		
482-0262	Transistor, 2SC1893	TR601
481-0214	Rectifier, (SI) RM-2AV 600V	X601
481-0214	Rectifier, (SI) RM-2AV 600V	X602
481-0214	Rectifier, (SI) RM-2AV 600V	X603
481-0214	Rectifier, (SI) RM-2AV 600V	X604
481-0215	Diode (HS) SB-20GL 1200V min	X605
481-0149	Diode (SI) IS2473-772	X606
481-0216	Diode (HS) RC-2V 0.8 US	X607
481-0217	Diode (HS) RU-2V	X608
481-0217	Diode (HS) RU-2V	X609
481-0218	Rectifier, power (SI) 500V PIV	X610
481-0218	Rectifier, power (SI) 500V PIV	X611
481-0218	Rectifier, power (SI) 500V PIV	X612
Transformers & Coils		
180-0020	Coil, line filter R-3	L601
180-0014	Coil, filter, 10uh	L602
560-0094	Transformer, hor drive	T602
560-0095	Transformer, side PC	T603
180-0015	Width coil	L702

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
Capacitors		
	0.1 uf, 125V, $\pm 20\%$ MM	C601
	2200 pf, Z5F, $\pm 10\%$ ceramic	C602
	2200 pf, 125V ceramic	C603
	2200 pf, Z5F, $\pm 10\%$ ceramic	C604
	330 uf, 200V electrolytic	C605
	47 uf, 160V electrolytic	C608
	.0033 uf, 500V $\pm 10\%$ ceramic	C609
	.01 uf, 500V, $\pm 10\%$ ceramic	C610
	100 pf, 3KV, $\pm 10\%$ ceramic	C611
	.022 uf, 200v, $\pm 10\%$ PP	C612
	220 uf, 25V electrolytic	C613
	33 uf, 25V electrolytic	C614
	0.39 uf, 200V, $\pm 10\%$ PP	C615
	47 pf, 500V ceramic	C616
	1 uf, 50v electrolytic	C617
	1 uf, 50V electrolytic	C619
	0.1 uf, 100V, $\pm 10\%$ mylar	C620
	0.1 uf, 1.5KV, $\pm 20\%$ paper	C621
	1000 uf, 35V electrolytic	C622
	470 uf, 25V electrolytic	C623
	100 uf, 25V electrolytic	C624
	10 uf, 160V electrolytic	C625
	100 pf, 500V, $\pm 10\%$ ceramic	C626

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	39 pf, 500V, $\pm 10\%$ ceramic	C627
	2200 pf, 500V, $\pm 10\%$ ceramic	C628
	6900 pf, 1.5KV, $\pm 5\%$ PP	C629
	2.2 uf, 50V electrolytic	C633
	3 pf, 2kV, ± 0.5 pf ceramic	C637
	.056 uf, 10% mylar	C638
Miscellaneous		
	Fuse (UL/CSA) 3A-125	F601
	Socket, 6 pin	J607
	Plug, 3 pin (GT)	P602
	Plug, 4 pin (NM)	P604
	Plug, 6 pin (GT)	P607
	Plug, 3 pin (NM)	P608
	Plug, 2 pin (NM)	P611
	Thermistor	TH601
	Plug, 6 pin	P201
	Plug, 6 pin	P202
	VERT/HOR BOARD	
Resistors		
	820 Ohm, $\pm 5\%$, 1/8W carbon	R301
	12k Ohm, $\pm 5\%$, 1/8W carbon	R302
	15k Ohm, $\pm 5\%$, 1/8W carbon	R303
	10k Ohm, $\pm 5\%$, 1/8W carbon	R304
	330k Ohm, $\pm 5\%$, 1/8W carbon	R305

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	1k Ohm, $\pm 5\%$, 1/8W carbon	R306
	1.5k Ohm, $\pm 5\%$, 1/8W carbon	R307
	2.2k Ohm, $\pm 5\%$, 1/8W carbon	R309
	470k Ohm, $\pm 5\%$, 1/8W	R310
	56k Ohm, $\pm 5\%$, 1/8W carbon	R311
	100k Ohm, $\pm 5\%$, 1/8W carbon	R312
	10k Ohm, $\pm 5\%$, 1/8W carbon	R313
	47k Ohm, 5%, 1/8W carbon	R314
	820 Ohm, $\pm 5\%$, 1/8W carbon	R315
	120 Ohm, $\pm 5\%$, 1/8W carbon	R316
	2.2 Ohm, $\pm 5\%$, 1/2W carbon	R317
	33k Ohm, $\pm 5\%$, 1/4W carbon	R318
	10 Ohm, $\pm 5\%$, 1/8W carbon	R319
	15k Ohm, $\pm 5\%$, 1/8W carbon	R320
	560 Ohm, $\pm 5\%$, 1/2 W carbon	R321
	22 Ohm, $\pm 5\%$, 2W MO	R322
	1.5 Ohm, $\pm 5\%$, 1/8W carbon	R323
	27k Ohm, $\pm 5\%$, 1/8W carbon	R324
	47 Ohm, $\pm 5\%$, 1/8W carbon	R325
	820 Ohm, $\pm 5\%$, 1/8W carbon	R328
	10k Ohm, $\pm 5\%$, 1/8W carbon	R330
	220k Ohm, $\pm 5\%$, 1/8W carbon	R331
	2.2k Ohm, $\pm 5\%$, 1/8W carbon	R351
	15k Ohm, $\pm 5\%$, 1/8W carbon	R352

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	18k Ohm, $\pm 5\%$, 1/8W carbon	R353
	3.9k Ohm, $\pm 5\%$, 1/8W carbon	R354
	12k Ohm, $\pm 5\%$, 1/8W carbon	R355
	470 Ohm, $\pm 5\%$, 1/8W carbon	R356
	2.2k Ohm, $\pm 5\%$, 1/8W carbon	R357
	1.2k Ohm, $\pm 5\%$, 1/8W carbon	R358
	68k Ohm, $\pm 5\%$, 1/8W carbon	R359
	27 Ohm, $\pm 5\%$, 1/4W carbon	R360
	1.2k Ohm, $\pm 5\%$, 1/8W carbon	R361
	1.2k Ohm, $\pm 5\%$, 1/8W carbon	R363
	47k Ohm, $\pm 5\%$, 1W MO	R364
	56k Ohm, $\pm 5\%$, 1/2W carbon	R365
	3.3k Ohm, $\pm 5\%$, 1/8W carbon	R366
	2.2k Ohm, $\pm 5\%$, 1/2W carbon	R367
	3.9k Ohm, $\pm 5\%$, 1/8W carbon	R368
	3.3k Ohm, $\pm 5\%$, 1/4W carbon	R369
	1k Ohm, $\pm 5\%$, 1/4W carbon	R370
	2.7k Ohm, $\pm 5\%$, 1/4W carbon	R371
	2.2k Ohm, $\pm 5\%$, 1/4W carbon	R383
	8.2k Ohm, $\pm 5\%$, 1/4W carbon	R384
	Varistor, 250k Ohm, vert hold	VR301
	Varistor, 20k Ohm, vert size	VR302
	Varistor, 50k Ohm, hqr hold	VR351

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
Capacitors		
	0.15 uf, 50V ±10% mylar	C301
	0.022 uf, 50V, ±10% mylar	C302
	0.1 uf, 50V, ±10% mylar	C304
	2.2 uf, 50V, electrolytic	C306
	0.15 uf, 50V, ±10% mylar	C307
	0.1 uf, 50V, ±10% mylar	C309
	22 uf, 16V electrolytic	C310
	1000 uf, 35V electrolytic	C311
	0.0082 uf, 50V, ±10% ceramic	C312
	47 uf, 50V electrolytic	C313
	10 uf, 25V electrolytic	C315
	3300 uf, 50V, ±10% mylar	C316
	100 pf 50V, ±10% ceramic	C317
	1500 pf, 50V, ±10% ceramic	C351
	1000 pf, 50V, ±10% ceramic	C352
	0.022 uf, 50V, ±10% mylar	C353
	0.1 uf, 50V, ±10% mylar	C355
	4.7 uf, 25V electrolytic	C356
	0.015 uf, 200V, ±10% PP	C357
	0.018 uf, 200V, ±10% PP	C358
	4.7 uf, 160V electrolytic	C359
	0.01 uf, 50V, ±10% ceramic	C360
	0.015 uf, 50V, ±10% mylar	C361

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	10 uf, 50V electrolytic	C362
	0.01 uf, 630V, $\pm 10\%$ PP	C363
	0.01 uf, 50V, $\pm 10\%$ ceramic	C364
Semiconductors		
482-0282	Transistor, 2SA826Q	TR301
482-0261	Transistor, 2SC1740Q	TR302
482-0283	Transistor, 2SA1740Q	TR303
482-0261	Transistor, 2SC1740Q	TR304
452-0284	Transistor, 2SA490YLBGLI	TR305
482-0285	Transistor, 2SC1625YLBGLI	TR306
482-0261	Transistor, 2SC1740R	TR307
482-0261	Transistor, 2SC1740Q	TR308
482-0117	Transistor, 2SA854Q	TR351
482-0286	Transistor, 2SC1722BKS	TR352
482-0261	Transistor, 2SC1740Q	TR353
482-0282	Transistor, 2SA826Q	TR354
481-0149	Diode (SI) IS 2473-T72	X301
481-0149	Diode (SI) IS2473-T72	X302
481-0099	Diode (GE), IN60TVGL	X303
481-0219	Diode (SI) ISS81	X304
481-0219	Diode (SI) ISS81	X305
481-0219	Diode (SI) 1SS81	X306
481-0220	Diode (SI) MA26W	X307
481-0149	Diode (SI) IS2473	X308

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
481-0149	Diode (SI) IS2473-T72	X351
481-0149	Diode (SI) IS2473-T72	X352
481-0149	Diode (SI) IS2473-T72	X53
481-0149	Diode (SI) IS2473-T72	X54
481-0221	Diode (Zener) RD10EBI	X355
481-0222	Diode (HS) RU-1 0.3 US	X366
Miscellaneous		
204X9300-958	Socket, 6 pin	J301
204X9300-958	Socket, 6 pin	J302
204X9601-195	Plug, 6 pin	P301
204X9601-195	Plug, 6 pin	P302
201X0000-534	Thermistor	TH301
Transformers & Coils		
101-0030	Coil, horiz osc	L351
POWER BOARD		
Resistors		
	180 Ohm, $\pm 10\%$, 15W WW	R501
	100 Ohm, $\pm 5\%$, 1/8W carbon	R502
	1k Ohm, $\pm 5\%$, 1/8W carbon	R503
	560 Ohm, $\pm 5\%$, 1/8W carbon	R504
	39k Ohm, $\pm 5\%$, 1W MO	R505
	6.8k Ohm, $\pm 5\%$, 1/8W carbon	R506
	Varistor volt adj	VR501

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
Capacitors		
	10uf, 160V electrolytic	C501
	1500 pf, 50V, $\pm 10\%$ ceramic	C502
	22 uf, 16V electrolytic	
Semiconductors		
482-0261	Transistor, 2SC1740Q	TR501
482-0288	Transistor, 2SC1454	TR502
481-0135	Diode (SI) zener EQB01-06V	X501
481-0149	Diode (SI) IS2473-172	X502
Miscellaneous		
	Socket, 6 pin	J501
	Plug, 6 pin	P501
	Thermistor	TH501
NECK BOARD		
Resistors		
	1.8k Ohm, $\pm 5\%$, 1/8W carbon	R401
	1.8k Ohm, $\pm 5\%$, 1/8W carbon	R402
	1.8k Ohm, $\pm 5\%$, 1/8W carbon	R403
	150 Ohm, $\pm 5\%$, 1/8W carbon	R404
	220 Ohm, $\pm 5\%$, 1/8W carbon	R405
	150 Ohm, $\pm 5\%$, 1/8W carbon	R406
	390 Ohm, $\pm 5\%$, 1/4W carbon	R407
	390 Ohm, $\pm 5\%$, 1/4W carbon	R408
	4.7k Ohm, $\pm 5\%$, 1/8W carbon	R409

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	4.7k Ohm, $\pm 5\%$, 1/8W carbon	R410
	4.7k Ohm, $\pm 5\%$, 1/8W carbon	R411
	12k Ohm, $\pm 5\%$, 2.0W metal oxide	R412
	12k Ohm, $\pm 5\%$, 2.0W metal oxide	R413
	12k Ohm, $\pm 5\%$, 2.0W metal oxide	R414
	2.7k Ohm, $\pm 10\%$, 1/2W comp	R415
	2.7k Ohm, $\pm 10\%$, 1/2W comp	R416
	2.7k Ohm, $\pm 10\%$, 1/2W comp	R417
	470k Ohm, $\pm 10\%$, 1/2W comp	R418
	330k Ohm, $\pm 10\%$, 1/2W comp	R419
	1.0 Ohm, $\pm 10\%$, 2W metal oxide	R422
	270 Ohm, $\pm 5\%$, 1/4W carbon	R423
	500 Ohm varistor R drive	VR401
	500 Ohm varistor B drive	VR402
	5k Ohm varistor R cutoff	VR403
	5k Ohm varistor G cutoff	VR404
	5k Ohm varistor B cutoff	VR405
	1M Ohm varistor screen	VR406
Capacitors		
	1000 pf, 50V, 10% ceramic	C401
	1000 pf, 50V, 10% ceramic	C402
	1000 pf, 50V, 10% ceramic	C403
	1500 pf, 2kV $\pm 10\%$ ceramic	C404
	100 pf, 12kv, $\pm 10\%$ ceramic	C405

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	.01 uf, 500V, $\pm 10\%$ ceramic	C406
	1500 pf, 2kV, $\pm 10\%$ ceramic	C407
	68 pf, 50V, $\pm 10\%$ ceramic	C408
	68 pf, 50V, $\pm 10\%$ ceramic	C409
	68 pf, 50V, $\pm 10\%$ ceramic	C410
Semiconductors		
482-0155	Transistor, 2SC1514 (R output)	TR401
482-0155	Transistor, 2SC1514 (G output)	TR402
482-0155	Transistor, 2SC1514 (B output)	TR403
481-0223	Diode, 1S2367 (protector)	X404
481-0223	Diode, 1S2367 (protector)	X405
481-0223	Diode, 1S2367 (protector)	X406
Miscellaneous		
	Socket, 5 pin	J401
	Socket, 3 pin	J402
	Plug, 5 pin	P401
	Plug, 3 pin	P402
800-3253 High Voltage Assembly (T701)		
	6.8 Ohm, $\pm 10\%$ 15W WW resistor	R701
220-0223	Focus control	VR702
	Diode (SI HV))	X701
	Diode (SI HV))	X702
	Diode (SI HV))	X703
	Part of T701	

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
Final Assembly Parts		
200-0020	19VJTP22 pix tube	
800-3254	Assy purity shld/degaussing	
800-3255	Lateral/purity assembly	
200-0066	Yoke, deflection	
213-0021	CRT socket	
800-3253	HV unit (T701)	
	Plug, line cord (K4625, K4675, K4677)	
	Plug, line cord (K4626, K4676)	
180-0021	Degaussing coil (L701)	
	INTERFACE FACE BOARD (P317)	
Resistors		
	91 Ohm $\pm 5\%$, 12/W carbon	R201
	22k Ohm, $\pm 10\%$, 1/4W carbon	R202
	1k Ohm, $\pm 5\%$, 1/2W carbon	R203
	100 Ohm, $\pm 5\%$, 1/4W carbon	R204
	100k Ohm, $\pm 5\%$, 1/4W carbon	R205
	330 Ohm, $\pm 10\%$, 1/2W carbon	R206
	2.2k Ohm, $\pm 5\%$, 1/4W carbon	R207
	2.2k Ohm, $\pm 5\%$, 1/4W carbon	R208
	100k Ohm, $\pm 5\%$, 1/4W carbon	R209
	100 Ohm, $\pm 5\%$, 1/4W carbon	R210
	220 Ohm, $\pm 5\%$, 1/4W carbon	R211
	220 Ohm, $\pm 5\%$, 1/4W carbon	R212

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	220 Ohm, $\pm 5\%$, 1/4W carbon	R213
	150 Ohm, $\pm 5\%$, 1/4W carbon	R214
	150 Ohm, $\pm 5\%$, 1/4W carbon	R215
	150 Ohm, $\pm 5\%$, 1/4W carbon	R216
	100 Ohm, $\pm 5\%$, 1/4W carbon	R217
	1k Ohm, $\pm 5\%$, 1/2W carbon	R218
	1k Ohm, $\pm 5\%$, 1/2W carbon	R219
	680 Ohm, $\pm 5\%$, 1/2W carbon	R220
	270 Ohm, $\pm 5\%$, 1/2W carbon	R221
	270 Ohm, $\pm 5\%$, 1/2W carbon	R222
	100k Ohm, 5%, 1/4W carbon	R223
	1k Ohm, 5%, 1/2W carbon	R224
	8.2k Ohm, 5%, 1/4W carbon	R225
	8.2k Ohm, 5%, 1/4W carbon	R226
	8.2k Ohm, 5%, 1/4W carbon	R227
	390 Ohm, 5%, 1/2W carbon	R228
	1.5k Ohm black level control	VR201
	10k Ohm horizontal centering	VR202

Capacitors

1000 uf, 16V electrolytic	C201
470 uf, 16V lytic	C202
.022 uf, 10% 100V	C203
680 pf, 10%, Z5F	C204
.01 uf, 10%, 100V	C205

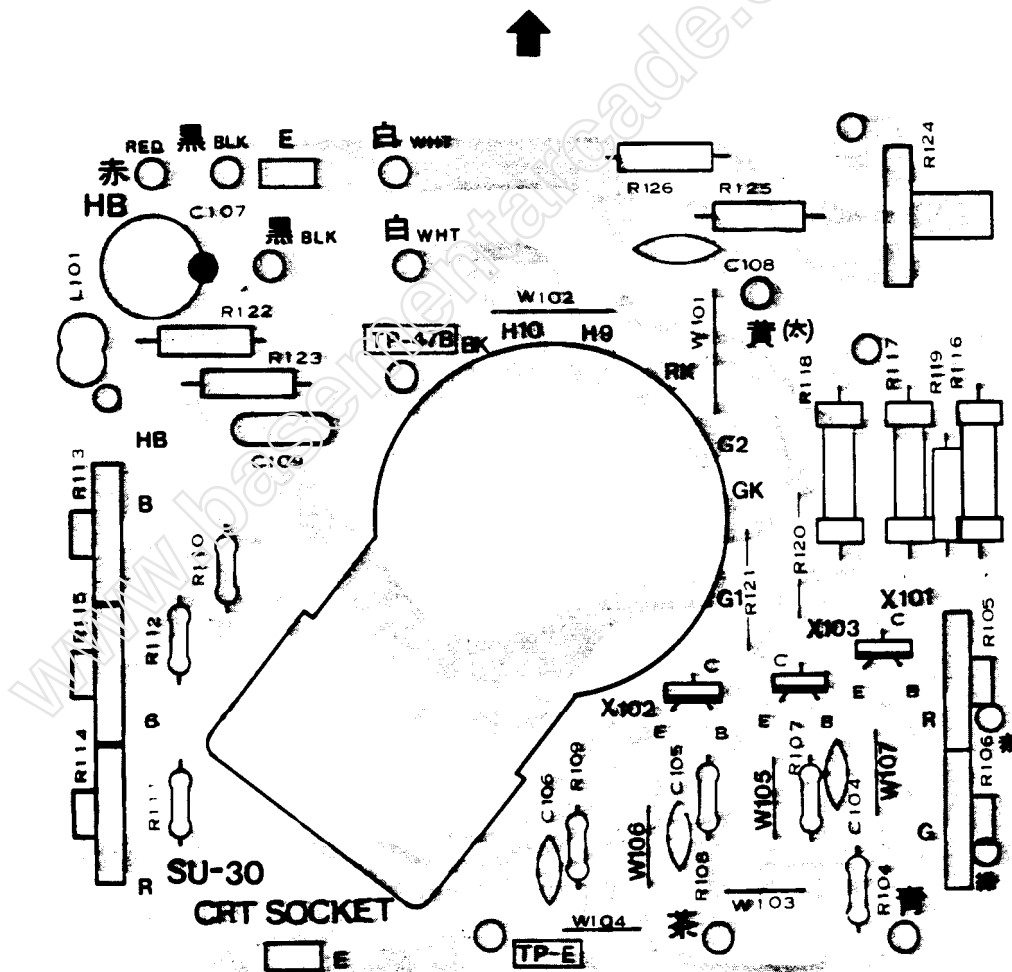
<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
Semiconductors		
482-0030	Transistor (NPN) 2N3904	TR201
482-0030	Transistor (NPN) 2N3904	TR202
482-0030	Transistor (NPN) 2N3904	TR203
482-0289	Transistor (PNP) MPS-A70	TR204
482-0289	Transistor (PNP) MPS-A70	TR205
482-0289	Transistor (PNP) MPS-A70	TR206
482-0030	Transistor (NPN) 2N3904	TR207
482-0030	Transistor (NPN) 2N3904	TR208
482-0030	Transistor (NPN) 2N3904	TR209
482-0030	Transistor (NPN) 2N3904	TR210
481-0224	Diode silicon FDH-444	X201
481-0224	Diode silicon FDH-444	X202
481-0224	Diode silicon FDH-444	X203
481-0224	Diode silicon FDH-444	X204
481-0014	Diode, zener 3.9V, 5%, 0.5W IN5228B	ZD201
Miscellaneous		
	Socket, 6 pin	J201
	Socket, 6 pin	J202
	Plug, 4 pin	P203
	Plug, 3 pin	P204
	Plug, 6 pin	P205

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
Resistors		
	91 Ohm, $\pm 5\%$, 1/2W carbon	R201
	22k Ohm, $\pm 10\%$, 1/4W carbon	R202
	1k Ohm, $\pm 5\%$, 1/2W carbon	R203
	100 Ohm, $\pm 5\%$, 1/4W carbon	R204
	100k Ohm, $\pm 5\%$, 1/4W carbon	R205
	330 Ohm, $\pm 10\%$, 1/2W carbon	R206
	2.2k Ohm, $\pm 5\%$, 1/4W carbon	R207
	2.2k Ohm, $\pm 5\%$, 1/4W carbon	R208
	100k Ohm, $\pm 5\%$, 1/4W carbon	R209
	100 Ohm, $\pm 5\%$, 1/4W carbon	R210
	200 Ohm, $\pm 5\%$, 1/4W carbon	R211
	200 Ohm, $\pm 5\%$, 1/4W carbon	R212
	200 Ohm, $\pm 5\%$, 1/4W carbon	R213
	200 Ohm, $\pm 5\%$, 1/4W carbon	R214
	200 Ohm, $\pm 5\%$, 1/4W carbon	R215
	200 Ohm, $\pm 5\%$, 1/4W carbon	R216
	100 Ohm, $\pm 5\%$, 1/4W carbon	R217
	1k Ohm, $\pm 5\%$, 1/2W carbon	R218
	1k Ohm, $\pm 5\%$, 1/2W carbon	R219
	1k Ohm, 5%, 1/2W carbon	R220
	200 Ohm, 5%, 1/2W carbon	R221
	200 Ohm, 5%, 1/2W carbon	R222
	100k Ohm, 5%, 1/4W carbon	R223

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
	680k Ohm, 5%, 1/2W carbon	R224
	8.2k Ohm, 5%, 1/4W carbon	R225
	8.2k Ohm, 5%, 1/4W carbon	R226
	8.2k Ohm, 5%, 1/4W carbon	R227
	390 Ohm, 5%, 1/2W carbon	R228
	1.5k Ohm black level control	VR201
	10k Ohm horizontal centering	VR202
Capacitors		
	1000 uf, 16V electrolytic	C201
	470 uf, 16V lytic	C202
	.022 uf, 10% 100V	C203
	680 pf, 10%, Z5F	C204
	.01 uf, 10%, 100V	C205
Semiconductors		
482-0030	Transistor (NPN) 2N3904	TR201
482-0030	Transistor (NPN) 2N3904	TR202
482-0030	Transistor (NPN) 2N3904	TR203
482-0289	Transistor (PNP) MPS-A70	TR204
482-0289	Transistor (PNP) MPS-A70	TR205
482-0289	Transistor (PNP) MPS-A70	TR206
482-0030	Transistor (NPN) 2N3904	TR207
482-0030	Transistor (NPN) 2N3904	TR208
	482-0030 Transistor (NPN) 2N3904	TR209
482-0030	Transistor (NPN) 2N3904	TR210

<u>Part No.</u>	<u>Description</u>	<u>Ref. Des.</u>
481-0224	Diode silicon FDH-444	X201
481-0224	Diode silicon FDH-444	X202
481-0224	Diode silicon FDH-444	X203
481-0224	Diode silicon FDH-444	Xw04
481-0014	Diode, zener 3.9V, 5%, 0.5W IN5228B	ZD201
Miscellaneous		
	Socket, 6 pin	J201
	Socket, 6 pin	J202
	Plug, 4 pin	P203
	Plug, 3 pin	P204
	Plug, 5 pin	P205

C.R.T. P.C.B. COMPONENT LAYOUT



MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
CAPACITORS			
1		1000 uF, 16V, Electrolytic	C201
2		330 pF, 500V, Ceramic	C202
3		220 pF, 500V, Ceramic	C203
4		220 pF, 500V, Ceramic	C204
5		470 uF, 16V, Electrolytic	C205
6		0.1 uF, 125V Mylar	C206
7		.022 uF, 100V Mylar	C207
8		330 uF, 50V Electrolytic	C301
9		0.033 uF, 50V Mylar	C302
10		3.3 uF, 50V Electrolytic	C303
11		0.068 pF, 50V Mylar	C304
12		2.2 uF, 16V Tantal	C306
13		0.033 uF, 50V Mylar	C307
14		3.3 uF, 50V Electrolytic	C308
15		0.068 uF, 100V PP	C309
16		10 uF, 100V Electrolytic	C310
17		10 uF, 160V Electrolytic	C311
18		1000 pF, 500V Ceramic	C312
19		47 uF, 160V Electrolytic	C313
20		0.033 uF, 200V PP	C314
21		1 uF, 50V Electrolytic	C315
22		1 uF, 50V Electrolytic	C351
23		47 uF, 25V Electrolytic	C352

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
CAPACITORS			
24		0.0082 pF, 50V Mylar-PP	C353
25		47 uF, 25V Electrolytic	C354
26		0.0068 pF, 50V Mylar	C355
27		0.01 uF, 500V Ceramic	C356
28		100 pF, 500V Ceramic	C359
29		0.0033 pF, 500V Ceramic	C360
30		0.01 uF, 500V Ceramic	C361
31		0.01 uF, 50V Ceramic	C362
32		8700 pF, 1.5 KV PP	C363
33		0.33 uF, 200V PP	C365
34	150-0074	22 uF, 25V Electrolytic	C366
35		6 uF, 500V Ceramic	C367
36		0.01 uF, 50V Ceramic	C368
37		0.1 uF, 100V PP	C372
38		470 uF, 500V Ceramic	C380
39		0.1 uF, 125V Mylar	C501
40		1500 pF, 500V Ceramic	C502
41		2200 pF, 125V Ceramic	C503
42		2200 pF, 125V Ceramic	C504
43		560 uF, 200V Electrolytic	C505
44		22 uF, 160V Electrolytic	C506
45		47 uF, 160V Electrolytic	C507
46		1000 uF, 25V Electrolytic	C701

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
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CAPACITORS

47		10 uF, 100V Electrolytic	C702
48		1000 pF, 500V Ceramic	C703

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
RESISTORS			
1		1K Ohm, 5%, 1/4W Carbon	R201
2		30 Ohm, 5%, 1/4W Carbon	R202
3		100 Ohm, 5%, 1/4W Carbon	R203
4		100 Ohm, 5%, 1/2W Carbon	R204
5		270 Ohm, 5%, 1/2W Carbon	R205
6		390 Ohm, 5%, 1/4W Carbon	R206
7		200 Ohm, 5%, 1/4W Carbon	R207
8		390 Ohm, 5%, 1/4W Carbon	R208
9		200 Ohm, 5%, 1/4W Carbon	R209
10		390 Ohm, 5%, 1/4W Carbon	R210
11		200 Ohm, 5%, 1/4W Carbon	R211
12		1K Ohm, 5%, 1/4W Carbon	R214
13		100K Ohm, 5%, 1/4W Carbon	R215
14		1K Ohm, 5%, 1/4W Carbon	R216
15		100 Ohm, 5%, 1/4W Carbon	R217
16		1K Ohm, 5%, 1/4W Carbon	R218
17		100K Ohm, 5%, 1/4W Carbon	R219
18		1K Ohm, 5%, 1/4W Carbon	R220
19		100 Ohm, 5%, 1/4W Carbon	R221
20		3.3 Ohm, 5%, 1/4W Carbon	R222
21		10 Ohm, 5%, 1/4W Carbon	R224
22		10 Ohm, 5%, 1/4W Carbon	R225
23		10 Ohm, 5%, 1/4W Carbon	R226
24		47K Ohm, 5%, 1/4W Carbon	R227

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
RESISTORS			
25		1K Ohm, 5%, 1/4W Carbon	R228
26		270 Ohm, 5%, 1/2W Carbon	R229
27		8.2K Ohm, 5%, 1/2W Comp.	R230
28		8.2K Ohm, 5%, 1/2W Comp.	R231
29		8.2K Ohm, 5%, 1/2W Comp.	R232
30		180 Ohm, 5%, 1/4W Carbon	R233
31		82 Ohm, 5%, 1/4W Carbon	R234
32		82 Ohm, 5%, 1/4W Carbon	R235
33		82 Ohm, 5%, 1/4W Carbon	R236
34		270 Ohm, 5%, 1/4W Carbon	R301
35		8.2K Ohm, 5%, 1/4W Carbon	R302
36		8.2K Ohm, 5%, 1/4W Carbon	R303
37		2.2K Ohm, 5%, 1/4W Carbon	R304
38		6.8K Ohm, 5%, 1/4W Carbon	R305
39		7.5K Ohm, 2%, 1/4W Carbon	R306
40		5.6K Ohm, 5%, 1/4W Carbon	R307
41		22K Ohm, 5%, 1/4W Carbon	R309
42		39K Ohm, 5%, 1/4W Carbon	R310
43		3.3K Ohm, 5%, 1/4W Carbon	R311
44		4.7K Ohm, 5%, 1/4W Carbon	R312
45		1K Ohm, 5%, 5W Carbon	R313
46		220 Ohm, 5%, 1/4W Carbon	R314
47		10 Ohm, 5%, 1/4W Carbon	R315

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
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RESISTORS

48		3.3K Ohm, 5%, 1/4W Carbon	R316
49		12 Ohm, 5%, 1/2W Carbon	R317
50		390 Ohm, 5%, 1/4W Carbon	R318
51		1K Ohm, 5%, 1/4W Carbon	R319
52		33K Ohm, 5%, 1/4W Carbon	R320
53		270K Ohm, 5%, 1/2W Carbon	R321
54		10K Ohm, 5%, 1/4W Carbon	R322
55		10K Ohm, 5%, 1/4W Carbon	R351
56		3.9K Ohm, 5%, 1/4W Carbon	R352
57		68K Ohm, 5%, 1/4W Carbon	R353
58		3.3K Ohm, 5%, 1/4W Carbon	R354
59		6.8K Ohm, 5%, 3W Metal Oxide	R355
60		56K Ohm, 5%, 1/2W Carbon	R358
61		470 Ohm, 5%, 1/4W Carbon	R360
62		10K Ohm, 5%, 1/4W Carbon	R361
63		1.8K Ohm, 5%, 1W Metal Oxide	R362
64		3.9K Ohm, 5%, 7W Metal Oxide	R363
65		22 Ohm, 5%, 1/4W Carbon	R364
66		33K Ohm, 5%, 1/4W Carbon	R365
67		10K Ohm, 5%, 1/4W Carbon	R367
68		330K Ohm, 5%, 1/2W Comp.	R368
69		680K Ohm, 5%, 1/2W Comp.	R369
70		33K Ohm, 5%, 1/4W Carbon	R370

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
RESISTORS			
71		1K Ohm, 5%, 1W Metal Oxide	R371
72		12K Ohm, 5%, 1W Metal Oxide	R372
73		6.8K Ohm, 5%, 1/2W Carbon	R375
74		270 Ohm, 5%, 2W Metal Oxide	R376
75		150 Ohm, 5%, 1/4W Carbon	R377
76		10K Ohm, 5%, 1/4W Carbon	R378
77		10K Ohm, 5%, 1/4W Carbon	R379
78		8.2K Ohm, 5%, 1/4W Carbon	R380
79		2.2K Ohm, 5%, 1W Metal Oxide	R381
80		150 Ohm, 5%, 1W Metal Oxide	R383
81		10K Ohm, 5%, 1/4W Carbon	R502
82		150 Ohm, 5%, 15W Metal Oxide	R503
83		47 Ohm, 5%, 1W Metal Oxide	R504
84		2.2K Ohm, 5%, 1/4W Carbon	R505
85		15 Ohm, 5%, 2W Metal Oxide	R506
86		330K Ohm, 5%, 1/2W Comp.	R507
87		3.3 Ohm, 5%, 10W WW	R601
88		2.2 Ohm, 5%, 2W Metal Oxide	R701
89		2.2 Ohm, 5%, 1/2W Carbon	R702
90		2K Ohm-B Semi-Fixed	VR201
91		5K Ohm-B Semi-Fixed	VR301
92		500 Ohm-B Semi-Fixed	VR303
93		2K Ohm-B Semi-Fixed	VR351
94		2K Ohm-B Semi-Fixed	VR352

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
SEMICONDUCTORS			
1	481-0175	Diode, IS2076-27	D203
2	481-0175	Diode, IS2076-27	D204
3	481-0175	Diode, IS2076-27	D205
4	481-0175	Diode, IS2076-27	D206
5	481-0175	Diode, IS2076-27	D207
6	481-0175	Diode, IS2076-27	D208
7	481-0175	Diode, IS2076-27	D209
8	481-0219	Diode, ISS81	D301
9	481-0175	Diode, IS2076-27	D302
10	481-0175	Diode, IS2076-27	D303
11	418-0244	Diode, RH-IV	D304
12	481-0244	Diode, RH-IV	D305
13	481-0175	Diode, IS2076-27	D306
14	481-0245	Diode, RM-1AV	D501
15	481-0245	Diode, RM-1AV	D502
16	481-0245	Diode, RM-1AV	D503
17	481-0245	Diode, RM-1AV	D504
18	481-0245	Diode, RM-1AV	D505
19	481-0245	Diode, RM-1AV	D506
20	481-0217	Diode, RU-2V	D701
21	481-0244	Diode, RH-IV	D702
22	482-0160	Transistor (NPN) 2SC1815GR	Q201
23	482-0160	Transistor (NPN) 2SC1815GR	Q202

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
SEMICONDUCTORS			
24	482-0301	Transistor (PNP) 2SA562-Y-TM	Q203
25	482-0301	Transistor (PNP) 2SA562-Y-TM	Q204
26	482-0301	Transistor (PNP) 2SA562-Y-TM	Q205
27	482-0160	Transistor (NPN) 2SC1815GR	Q206
28	482-0160	Transistor (NPN) 2SC1815GR	Q207
29	482-0160	Transistor (NPN) 2SC1815GR	Q208
30	482-0302	Transistor (NPN) 2SC1851GR	Q209
31	482-0302	Transistor (NPN) 2SC1851GR	Q210
32	482-0302	Transistor (NPN) 2SC1851GR	Q301
33	482-0161	Transistor (NPN) 2SC2073LBGL2	Q302
34	482-0161	Transistor (NPN) 2SC2073LBGL2	Q303
35	482-0303	Transistor (NPN) 2SC2482BK	Q351
36	482-0202	Transistor (NPN) 2SD898B	Q352
37	313-0132	IC HA11423	IC301
38	313-0129	IC STR381	IC501

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
TRANSFORMERS & COILS			
1	181-0035	Coil, (RF Choke)	L351
2	181-0036	Coil, Horiz., Size	L352
3	181-0037	Coil, Adg.	L701
4	560-0121	Transformer, Hor. Drive	T351
5	560-0122	HV-Unit M-11	T352

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
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MISCELLANEOUS

1		Fuse, 4 Amp. 125V	F501
2		Recap W Wire 3P-M-BG	J402
3		Plug, PWB 3P-J	P201
4		Plug, PWB 6P-Q	P202
5		Plug, PWB 4P-B	P401
6		Plug, PWB 2P-S	P501
7		Plug, PWB 4P-C	P601
8	478-0012	Thermistor	TH501

MAIN BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
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FINAL ASSEMBLY

1	200-0093	19VLTP22 Pix Tube	
2	834-5030	Lateral/Purity Assembly	
3	200-0092	Yoke Deflection	
4	834-5031	CRT Socket	
5	181-0038	Automatic Degaussing Coil Unit	

NECK BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
RESISTORS			
1		220 Ohm, 5%, 1/4W Carbon	R401
2		390 Ohm, 5%, 1/4W Carbon	R402
3		820 Ohm, 5%, 1/4W Carbon	R403
4		220 Ohm, 5%, 1/4W Carbon	R404
5		390 Ohm, 5%, 1/4W Carbon	R405
6		820 Ohm, 5%, 1/4W Carbon	R406
7		470 Ohm, 5%, 1/4W Carbon	R407
8		270 Ohm, 5%, 1/4W Carbon	R408
9		820 Ohm, 5%, 1/4W Carbon	R409
10		15K Ohm, 5%, 2W M.O. Forming	R410
11		15K Ohm, 5%, 2W M.O. Forming	R411
12		15K Ohm, 5%, 2W M.O. Forming	R412
13		2.7K Ohm, 5%, 1/2W Comp.	R413
14		2.7K Ohm, 5%, 1/2W Comp.	R414
15		2.7K Ohm, 5%, 1/2W Comp.	R415
16		2.2 Ohm, 5%, 2W Metal Oxide	R416
17		2.7K Ohm, 5%, 1/4W Carbon	R419
18		2.7K Ohm, 5%, 1/4W Carbon	R420
19		2.7K Ohm, 5%, 1/4W Carbon	R421
20		500 Ohm, -B Semi-Fixed	VR401
21		500 Ohm, -B Semi-Fixed	VR402
22		5K Ohm, -B Semi-Fixed	VR403
23		5K Ohm, -B Semi-Fixed	VR404
24		5K Ohm, -B Semi-Fixed	VR405

NECK BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
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CAPACITORS

1		1200 pF, 500V Ceramic	C401
2		1000 pF, 500V Ceramic	C402
3		1000 pF, 500V Ceramic	C403
4		1500 pF, 1.5KV Ceramic	C404
5		0.01 uF, 500V Ceramic	C405

NECK BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
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SEMICONDUCTORS

1	482-0304	Transistor (NPN) 2SC2068LB	Q401
2	482-0304	Transistor (NPN) 2SC2068LB	Q402
3	482-0304	Transistor (NPN) 2SC2068LB	Q403

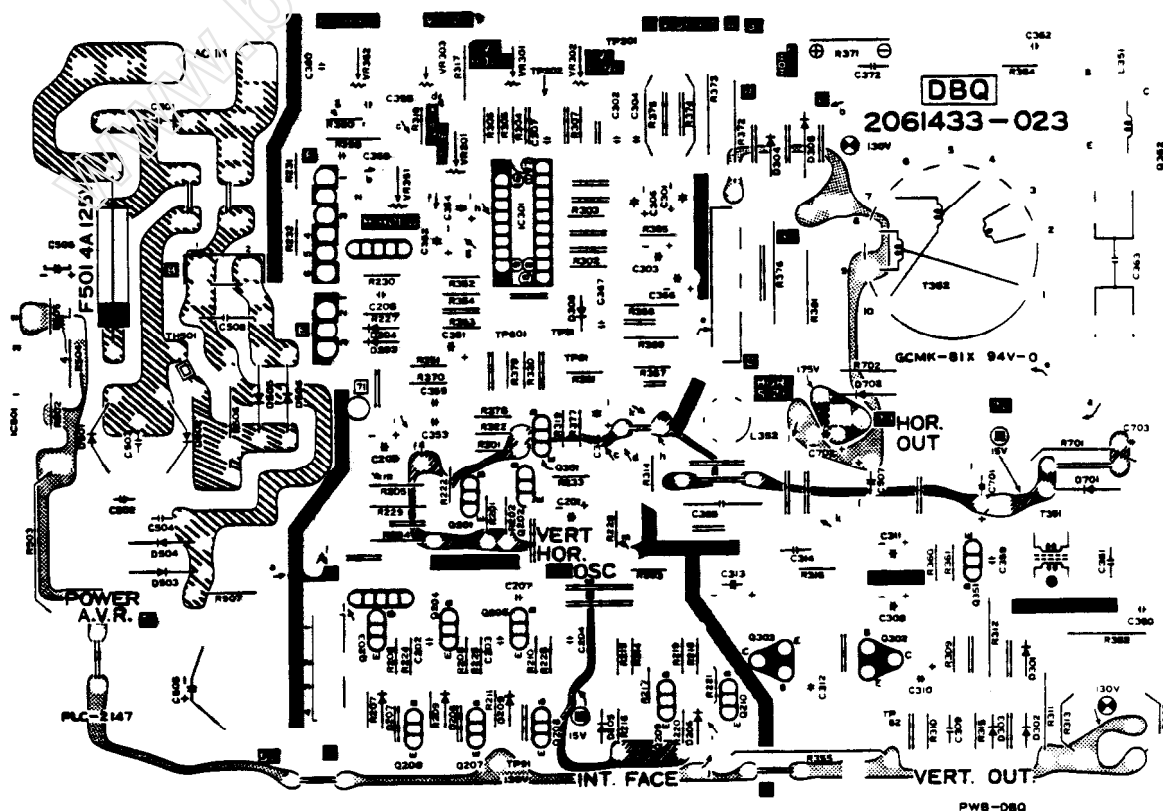
NECK BOARD

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
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MISCELLANEOUS

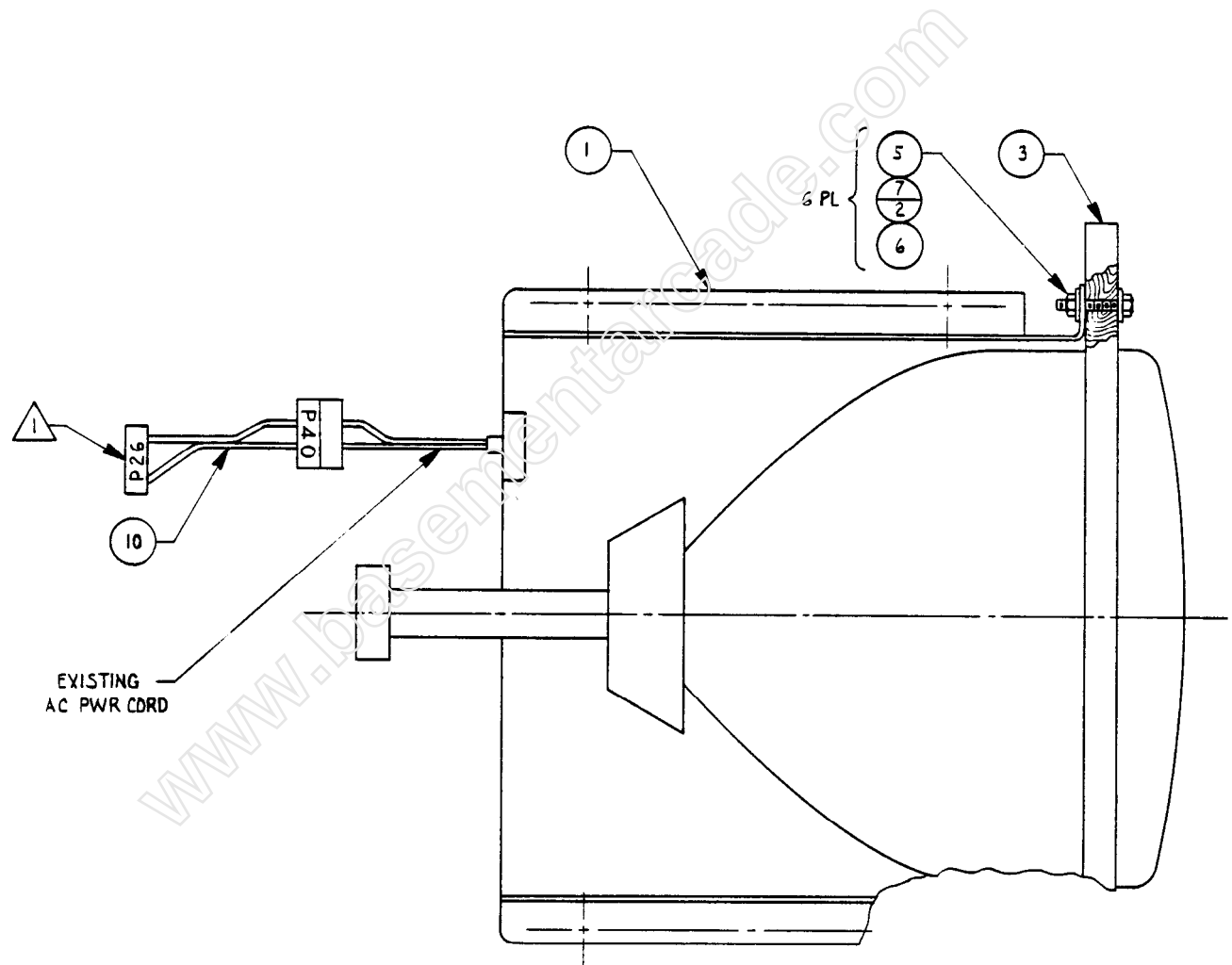
1		RECEP W Wire 4P-E	J401
2		Plug, PWB 3P-A	P402
3		Plug, Pin 1P-D	P403
4		Plug, PWB 4P-E	P701

TOP VIEW



BOTTOM VIEW

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	200-0091	1	W/G Color 19 In Vertical Mt	
	200-0019	1	CRT Color 19 IN Vertical Mt	
	200-0022	1	W/G Color 19 IN Vertical Mt	
3	252-0175	1	Monitor Mounting Board	
4				
5	282-0017	6	Bolt 1/4-20 X 1.50 Lg Hex Hd	
6	283-0007	6	Nut 1/4-20 Hex, Slfkg, Mach Thd	
7	284-0027	12	Washer 1/4 Flat, Large OD, Steel .281 ID X 1.00 OD	
8				
9				
10	800-0159	1	Assy. Harness Monitor Power	



A.C. JUNCTION BOX ASSEMBLY

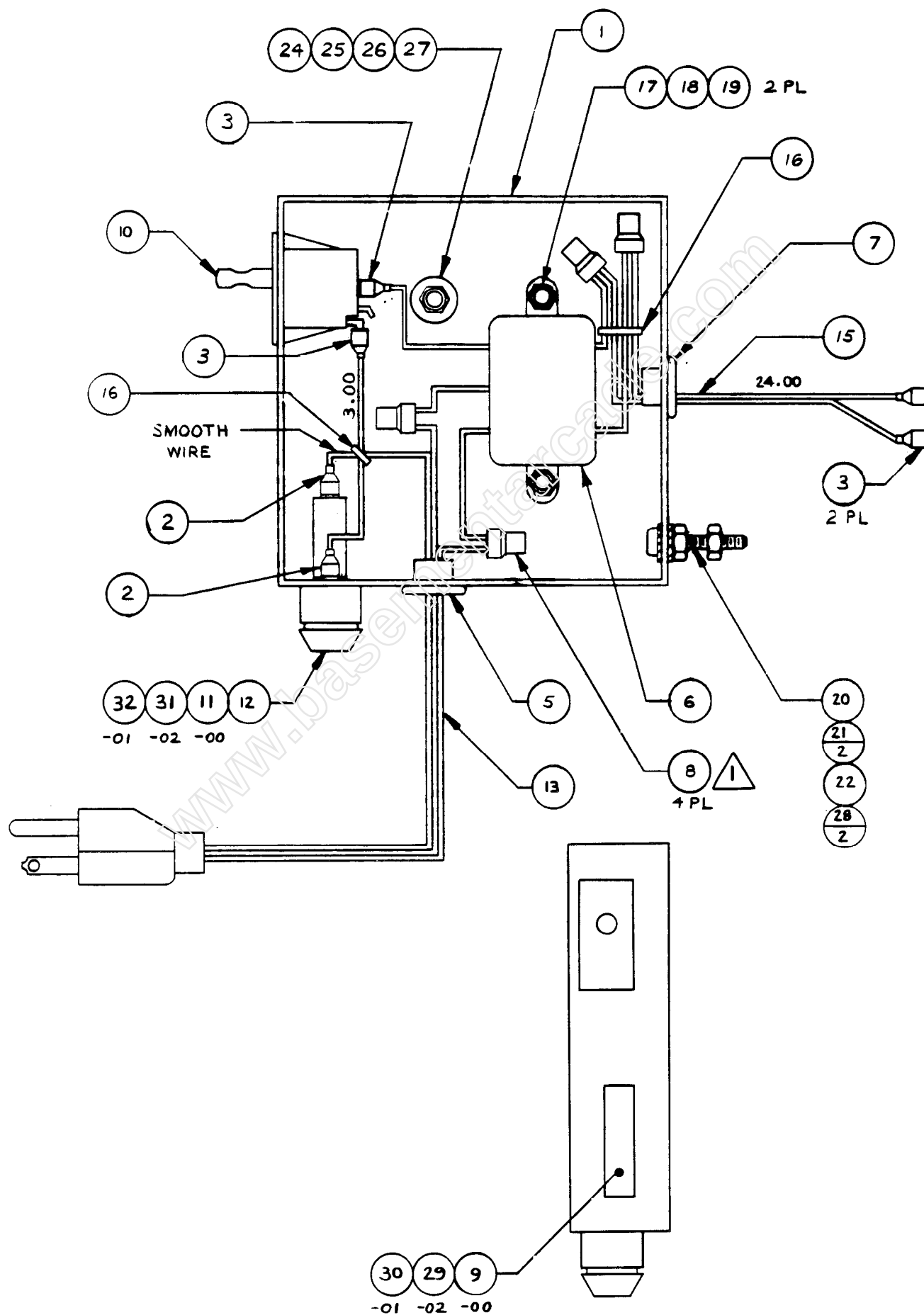
DRAWING NUMBER 800-0145-00

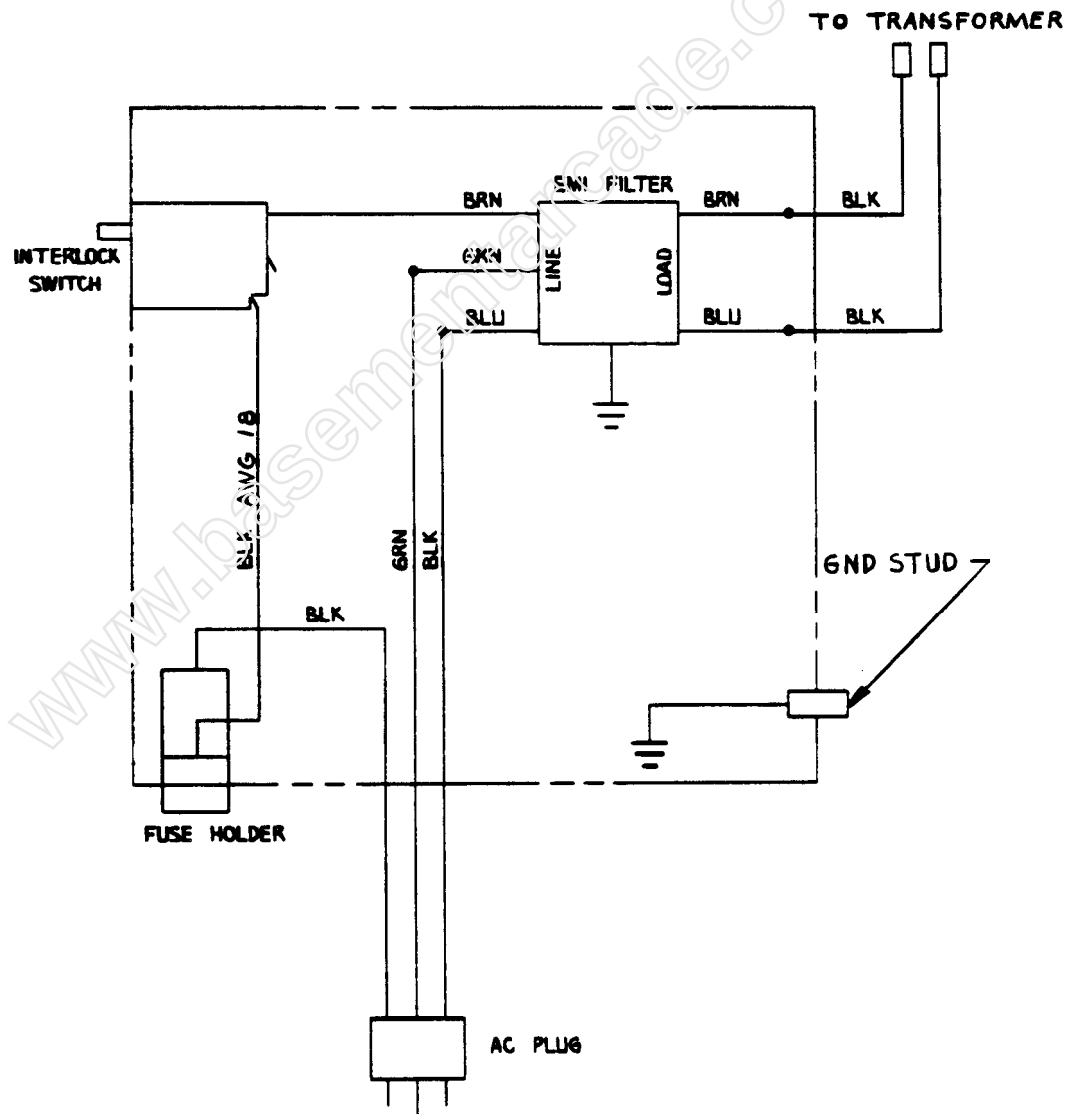
<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>
1	140-0020	1	Junction Box Metal
2	211-0165	2	Conn Quick Fem Fully Ins1. .250 X .032 (AWG 18-22)
3	211-0164	4	Conn Quick Fem Fully Ins1. .187 X .020 (AWG 18-22)
4			
5	280-0361	1	Bushing S/Rel AC Cord
6	270-0001	1	Filter EMI
7	280-0007	1	Bushing S/Rel 1/2
8	280-0362	4	Electric Crimp Sleeve AWG 24-18
9	420-0598	1	Decal 2 Amp Fuse
10	510-0013	1	Switch SPDT Cherry
11	514-0001	1	Fuse 2 AMP 250V S.B.
12	514-0005	1	Holder Fuse
13	600-0001	1	Cord Line 3 Cond.
14			
15	600-0079	2'	Cord Line Zip
16	280-0005	2	Cable Tie
17	281-0002	2	SCR PN HD Phil #6-32 X .625 Mach
18	283-0022	2	Nut Hex HD # 6 - 32 Mach
19	284-0042	2	Washer Lock Int. Tooth #6
20	281-0004	1	SCR PN HD Phil # 8-32 X .750 Mach
21	283-0024	2	Nut Hex HD #8-32 Mach
22	284-0044	1	Washer Lock Int. Tooth #8
23			

A.C. JUNCTION BOX ASSEMBLY

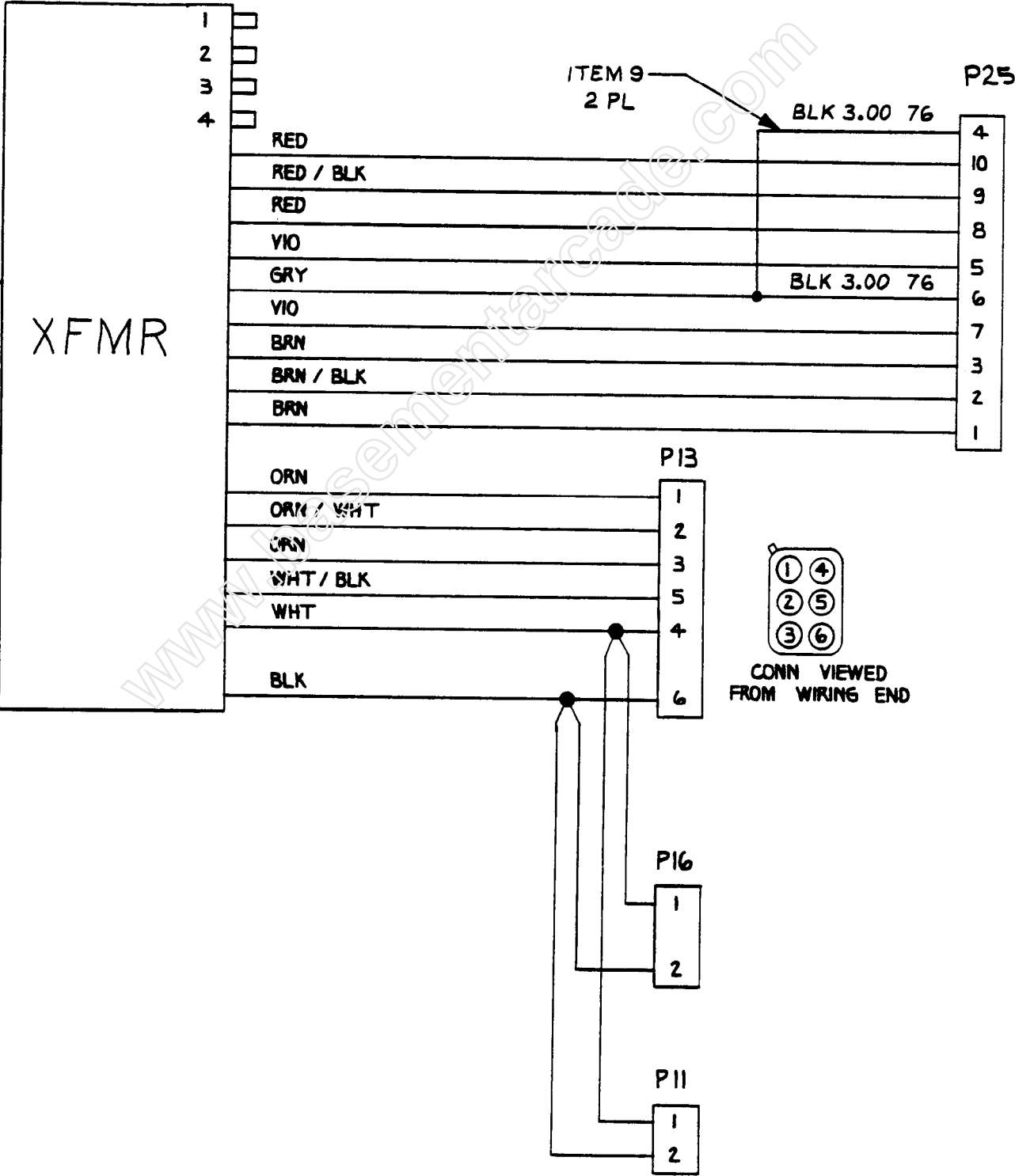
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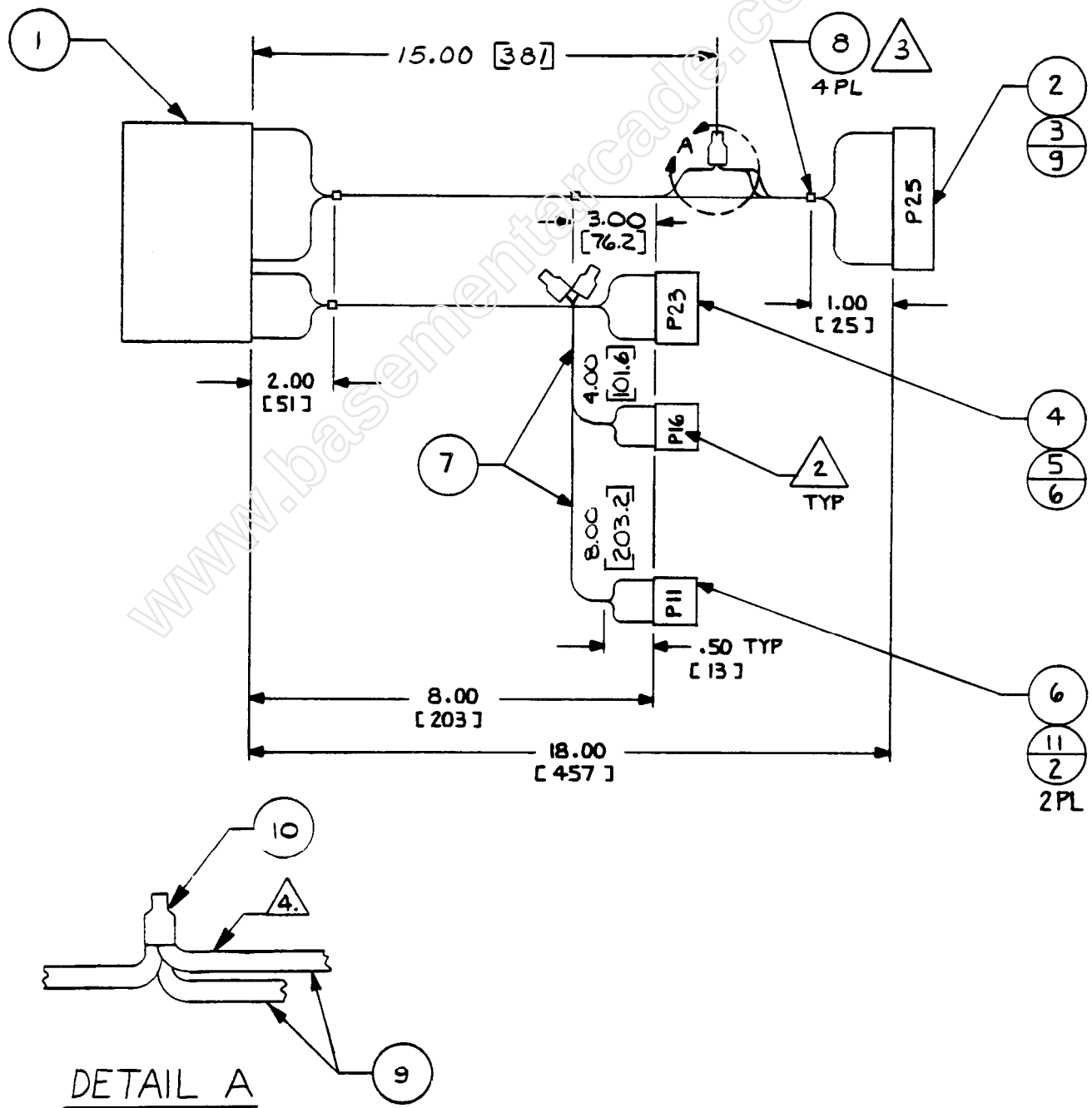
<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>
24	284-0007	1	Washer Flat STD O.D. # 1/4
25	283-0025	1	Nut Hex HD #10 -24 Mach
26	282-0005	1	Bolt Carriage #10-24 X 1.750 Mach
27	310-0016	1	Insul TBG .187 ID
28	284-0004	2	Washer Flat STD O.D. #8





<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	560-0055	1	Transformer G-80 Power Supply	
2	212-0016	1	Conn Fem 10 Pin	
3	211-0005	9	Conn Crimp	
4	211-0045	1	Conn Plug AMP 6 Pin	
5	211-0042	6	Conn Socket	
6	211-0043	2	Conn Plug AMP 2 Pin	
7	600-0079	1'	Zip Cord	
8	280-0005	4	Cable Tie	
9	600-0092	.5'	Wire 18 AWG Blk Electrical Hookup Stranded	
10	280-0359	3	Electric Crimp Sleeve	
11	211-0077	4	Conn Term Socket 20-14 AWG	

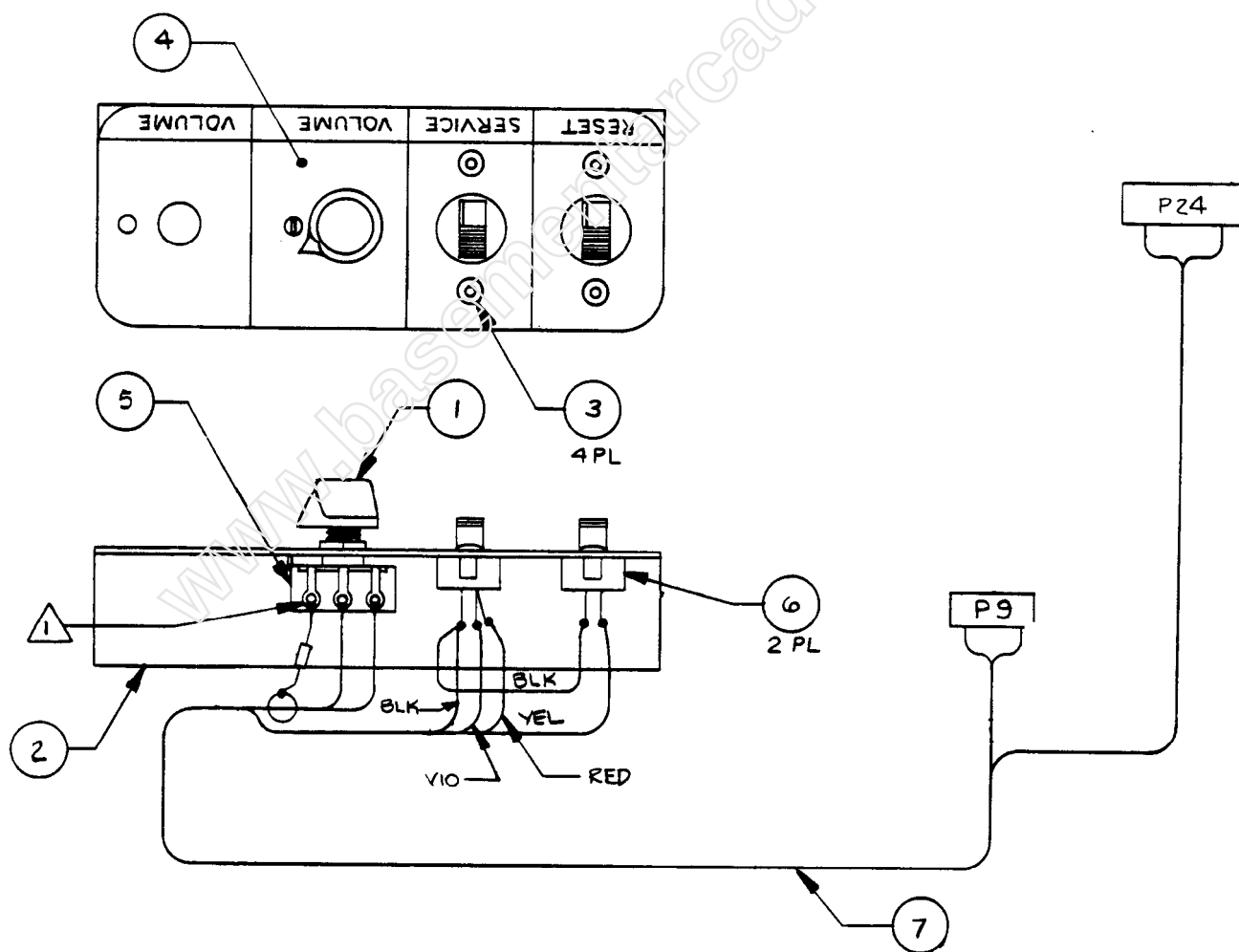




VOLUME CONTROL BLOCK ASSEMBLY

DRAWING NUMBER 800-0277-00

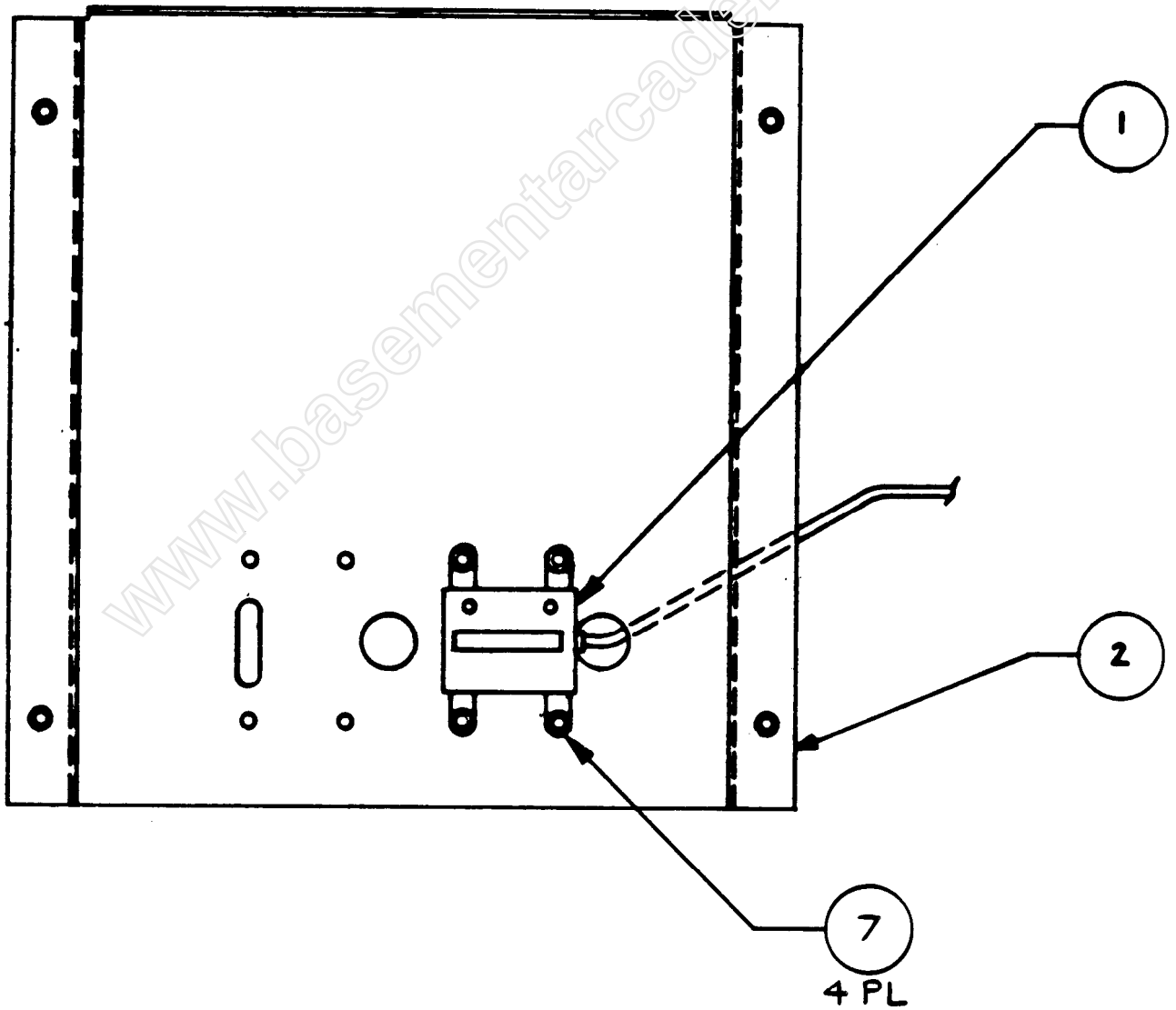
<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	240-0001	1	Knob Volume Control	
2	250-0462	1	Brkt Volume Control	
3	285-0001	4	RVT .125 Dia X .250 Lg Mdrl Pull, Dome Hd, A1	
4	420-0623	1	Decal Oper Cont Blk	
5	475-0007	1	Pot 10K Pnlmnt	
6	510-0051	2	SW Pushbutton Slide	
7	800-0402	1	Harn Vol Control Blk Univ	



COIN COUNTER ASSEMBLY

DRAWING NUMBER 800-0280

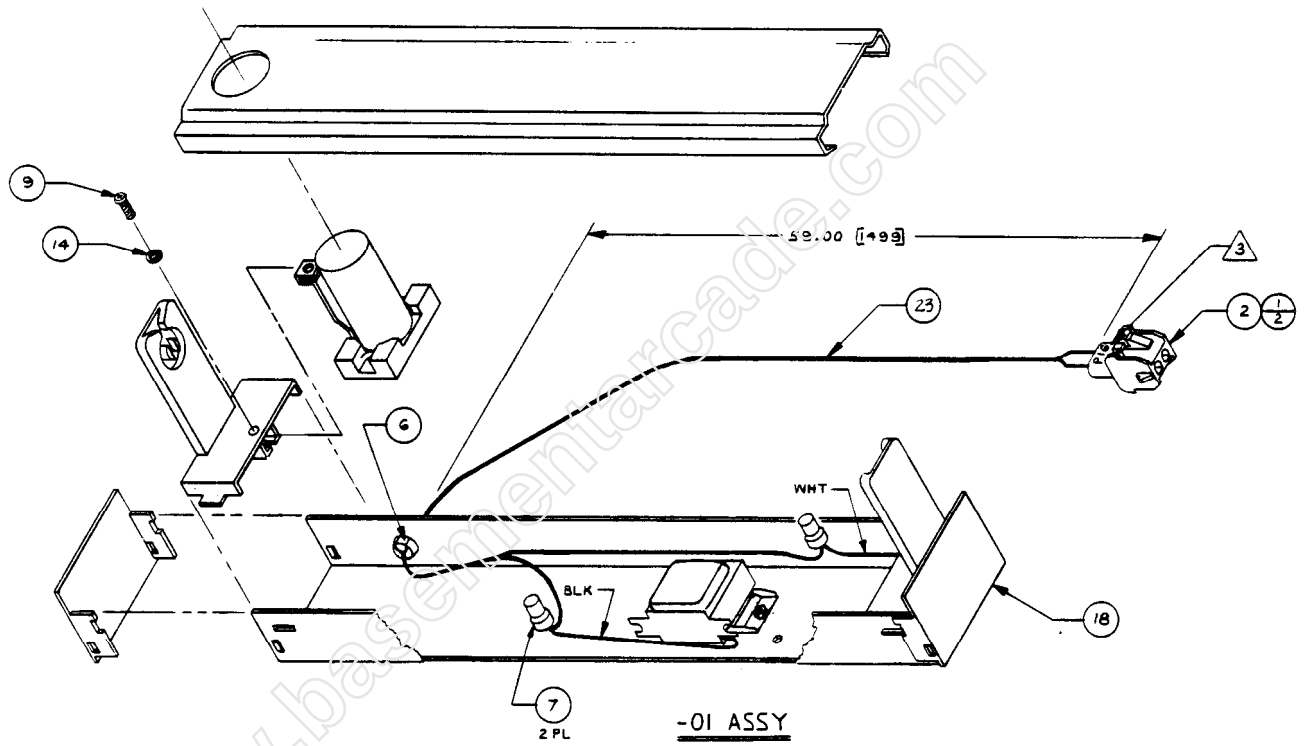
<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY REQD.</u>	<u>DESCRIPTION</u>
1	220-0008	1	Digital Counter, 6 volts
2	250-0496	1	Coin Counter Bracket
3	281-0002-08	4	Pan Head Phillips screw, 6-32 x 1/2" machine
4	284-0002-00	4	Flat Washer, #6
5	284-0032-00	4	Split Lock Washer, #6
6	283-0022-00	4	Hex Nut, #6-32



FLUORESCENT LAMP 2 ASSEMBLY

DRAWING NUMBER 800-0147-01

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>
1	211-0041	2	Conn Pin AMP
2	211-0044	1	Conn Cap AMP 2 Pin
3			
4			
5			
6	280-0361	1	Bshg Str Rlf AC Cord
7	280-0362	2	Elec CRP SL 24-18 AWG
8			
9	281-0002	1	SCR #6-32 X 3/8" PN HD Mach
10			
11			
12			
13			
14	284-0002	1	Washer Flat STD O.D. #6
15			
16			
17			
18	390-0117	1	Flur Lamp FXT 18 IN U.L.
19			
20			
21			
22			
23	600-0079	5.9'	CA 2 Cond Zip Cord



FAN CABINET #2 ASSEMBLY

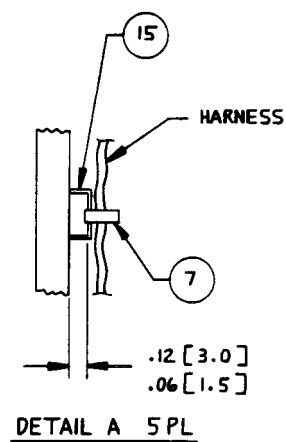
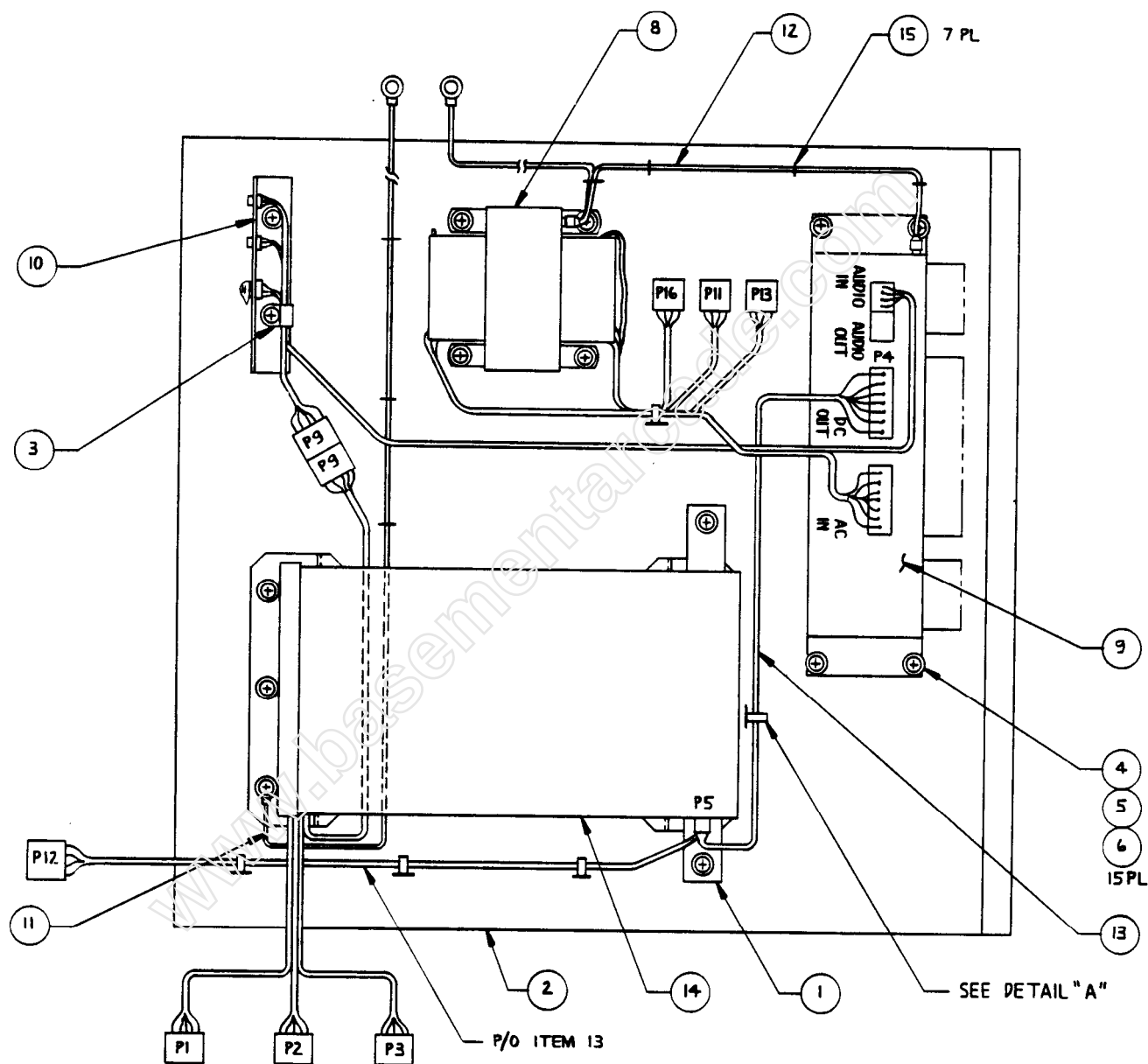
DRAWING NUMBER 800-0297

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY</u> <u>REQD.</u>	<u>DESCRIPTION</u>
1	260-0001	1	Axial Cooling Fan, 110 VAC
2	211-0078	2	Conn Term Pin 20-14 AWG
3	280-0005	7	Cable Tie
4	211-0044	1	Conn Cap Amp 2 Pin

COMPONENT SHELF ASSEMBLY

DRAWING NUMBER 800-3276-00

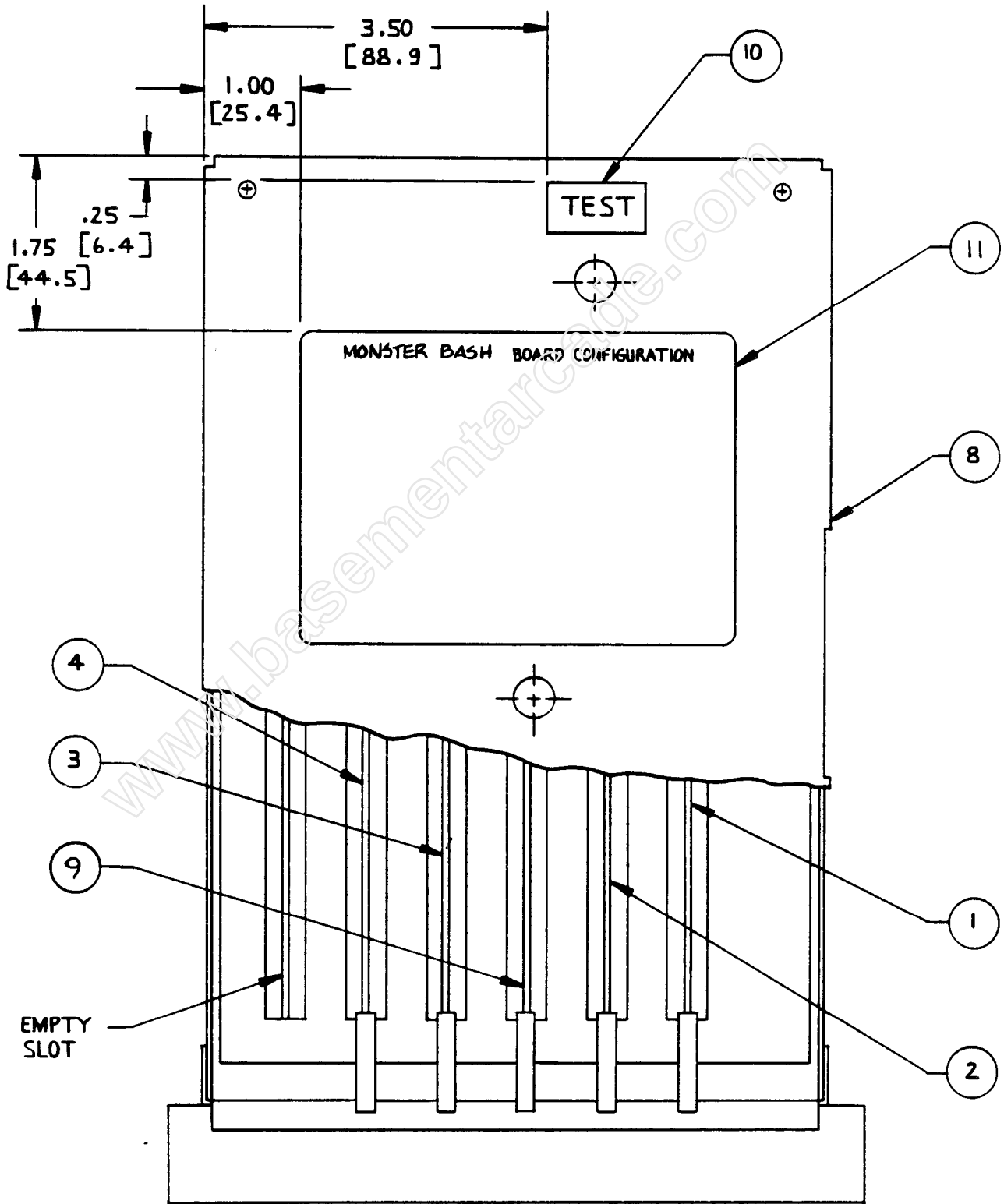
<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>
1	250-0458	1	Saddle G-80 Cage
2	252-0142	1	Component Shelf UP Cab
3	280-0324	1	Cable Clamp Nylon
4	281-0045	15	SCR 10-12 X 3/4" PN HD Type A/AB
5	284-0015	15	Washer Flt #10 .220 ID X .500 OD
6	284-0036	15	Washer Lock Split #10
7	280-0005	5	Cable Tie
8	800-0190	1	Assy. XFMR EM1
9	800-0191	1	Assy. Game Power Supply G-80
10	800-0277	1	Assy. Vol. Control Block
11	800-0285	1	Assy. Harn GND Game Elec.
12	800-0286	1	Assy. Harn GND Power Supply
13	800-0314	1	Assy. Harn Power
14	800-3273	1	Game Electronics Assy.
15	280-0475	5	Staple

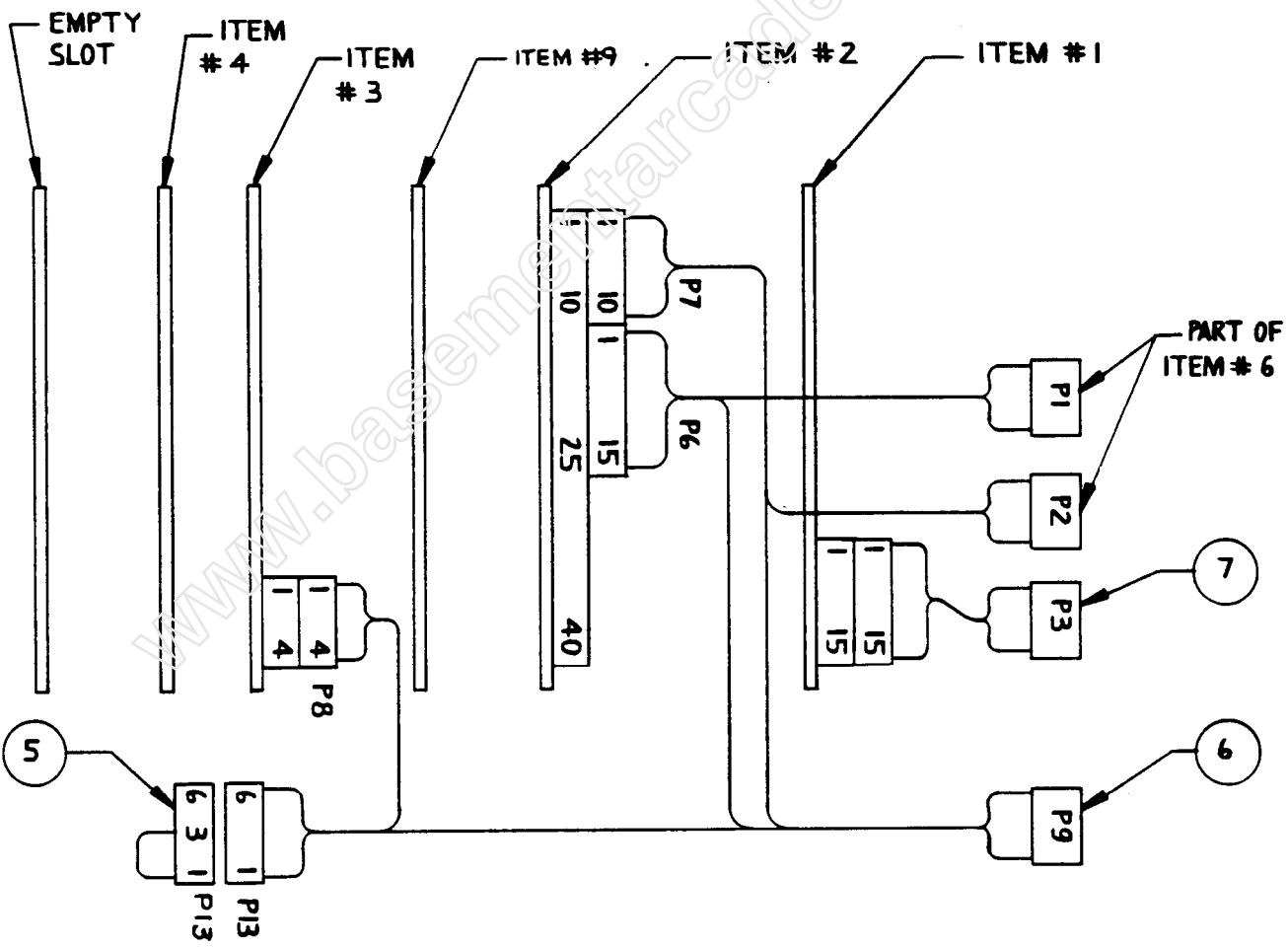


GAME ELECTRONICS ASSEMBLY

DRAWING NUMBER 800-3273-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	800-3290	1	Assy. Video I Board	
2	800-3278	1	Assy. CPU	
3	834-0316	1	Assy. Sound Board	
4	800-3277	1	Assy. 2716 Prom Board	
5	800-0302	1	Assy. Jumper Plug	
6	800-0281	1	Assy. Harn Master Intf.	
7	800-0332	1	Assy. Harn Video Interface	
8	800-0296	1	Assy. G-80 CG. Uni.	
9	834-0293	1	Assy. Background Board	
10	420-0560	1	Decal Test	
11	420-0808	1	Decal Game Electronics	

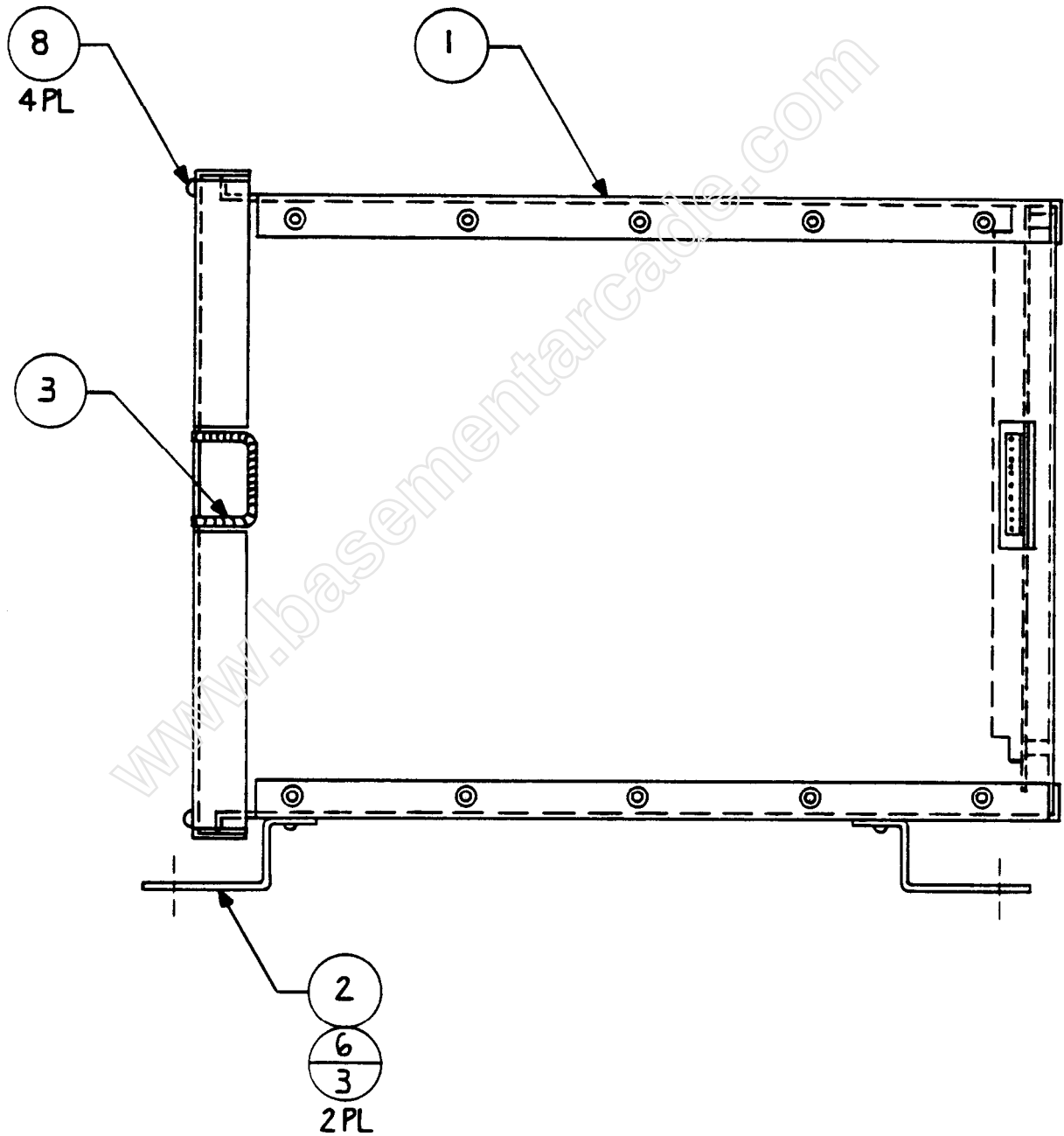


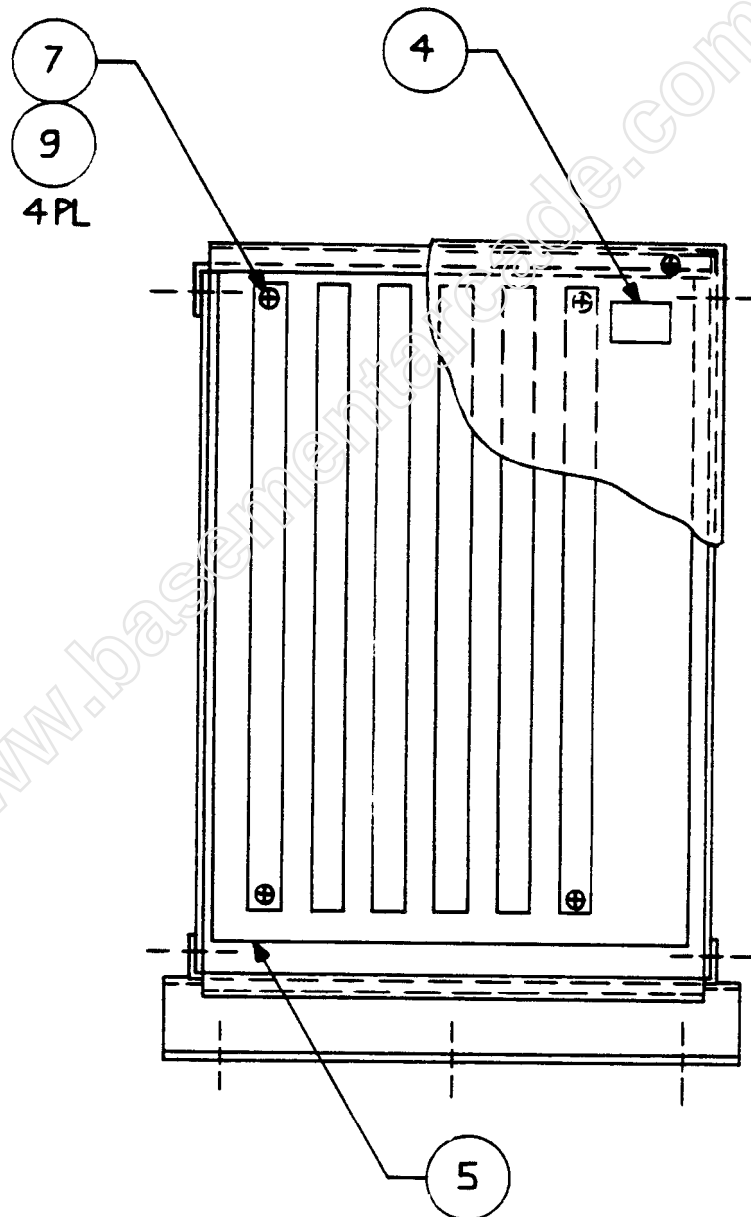


G-80 CAGE UNIVERSAL ASSEMBLY

DRAWING NUMBER 800-0296

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY REQD.</u>	<u>DESCRIPTION</u>
1	250-0456	1	G-80 Cage Assembly
2	250-0499	2	G-80 Cage Bracket
3	280-0343	1	Split Grommet
4	420-0560	1	Test Button Decal
5	800-0105	1	6-Slot Master Board Assembly
6	281-0045-06	6	Pan Head Phillips Screw, Type AB, 10- 12 x .375 Lg
7	281-0001-12	4	Pan Head Phillips Machine Screw, #4-40x3/4
8	281-0001-06	4	Pan Head Phillips Machine Screw, #4-40x3/8
9	284-0001-00	4	Flat Washer, #4



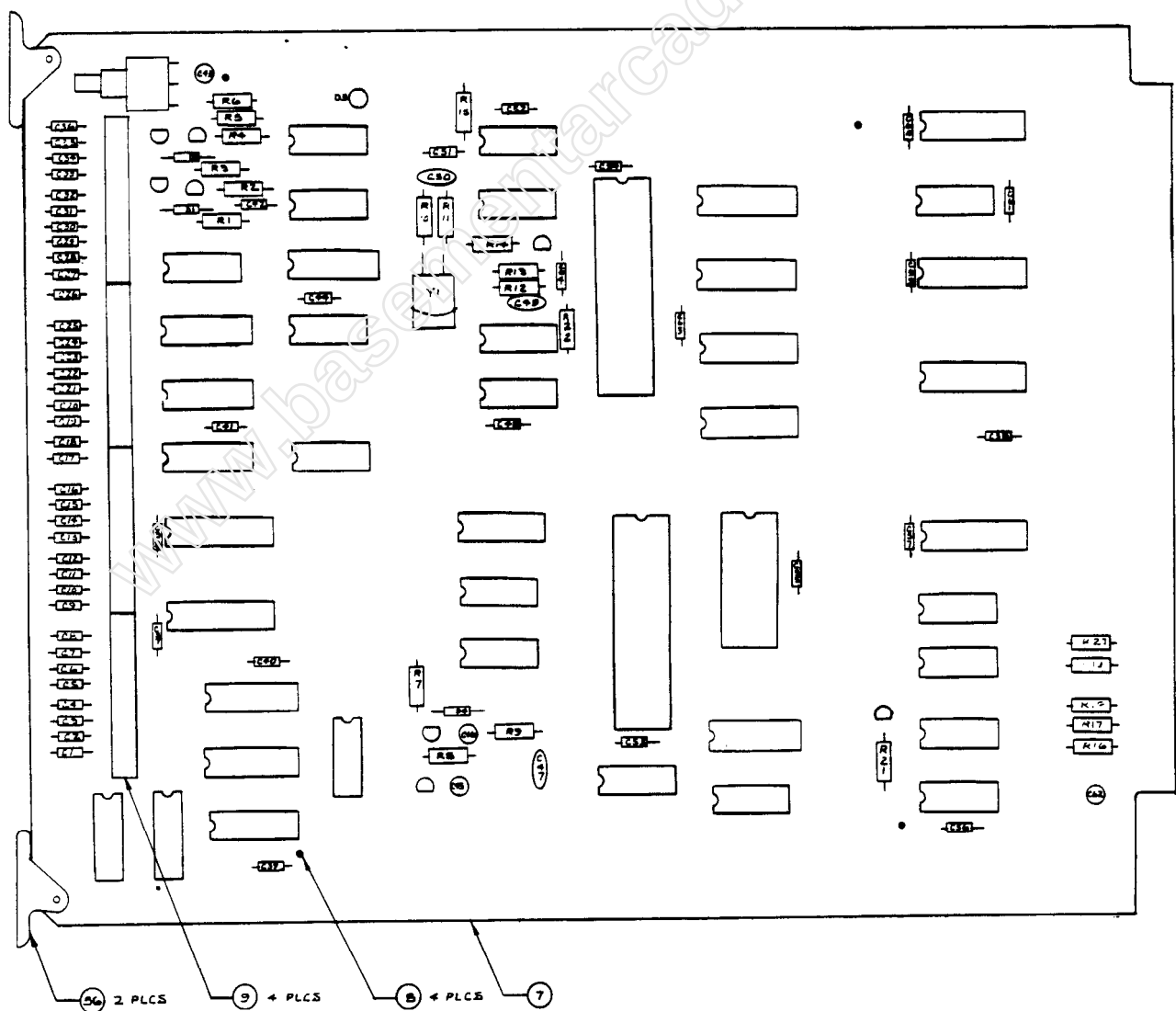


CPU BOARD ASSEMBLY

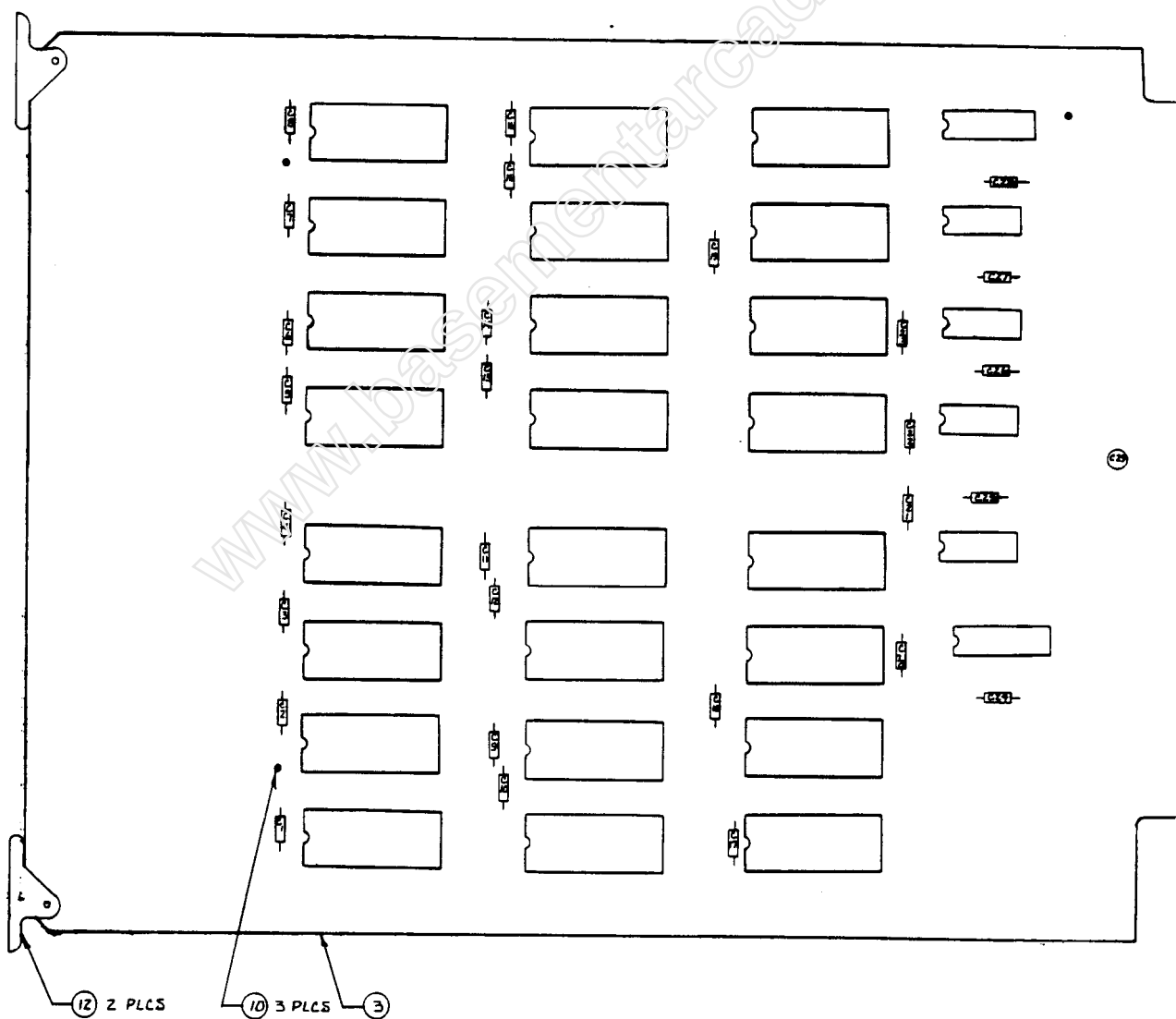
DRAWING NUMBER 800-3278

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY</u> <u>REQD.</u>	<u>DESCRIPTION</u>	<u>REF DES.</u>
1	150-0088	3	Cap E 10 uf 25V	C43, C46, C62
2	151-0005	1	Cap CER 680 pf 50V	C50
3	151-0012	1	Cap CER .1 uf 50V	C47
4	151-0020	1	Cap CER 33 pf 50V	C49
5	151-0060	21	Cap CER .1 uf 16V AX	C37-C42, C44, C48, C51-C61, C63, C64
6	151-0061	36	Cap CER 220 pf 16V AX	C1-C36
7	170-0194	1	PC Board	
8	211-0008	4	Conn Pin Test PT	TP1-TP4
9	212-0098	4	Conn M 10 Pin RTA	
10	230-0013	1	XTAL 8.000 MHZ	Y1
11	314-0001	1	IC NE555	U12
12	314-0015	1	IC 7404	U30
13	314-0018	4	IC 74LS00	U6, U8, U14, U19
14	314-0019	1	IC 74LS04	U18
15	314-0055	3	IC 74LS244	U34, U36, U38
16	314-0058	1	IC 74LS08	U13
17	314-0062	5	IC 74LS74	U10, U11, U17, U20, U39
18	314-0066	1	IC 74LS27	U16
19	314-0067	1	IC 74LS30	U37
20	314-0068	2	IC 74LS32	U32, U33
21	314-0078	1	IC 74LS02	U23
22	314-0083	1	IC 74LS240	U4
23	314-0085	2	IC 74LS14	U7, U31
24	314-0087	1	IC 74LS139	U24
25	314-0093	1	IC 74LS374	U3
26	314-0099	1	IC 74LS245	U35
27	314-0105	4	IC 74LS253	U1, U2, U5, U9
28	315-0041	1	IC Z80A	U22
29	315-0046	4	IC 2114	U26-U29

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY</u> <u>REQD.</u>	<u>DESCRIPTION</u>	<u>REF DES.</u>
30	316-1778	1	IC 2516 (2716)	U25
31	316-0764	1	IC Prom 32x8	U15
32				
33	390-0003	1	Led Red	D3
34	471-0101	1	Res 100 Ohm 1/2W 5%	R5
35	471-0102	2	Res 1K Ohm 1/2W 5%	R1, R3
36	471-0103	1	Res 10K Ohm 1/2W 5%	R6
37	471-0104	3	Res 100K Ohm 1/2W 5%	R7, R8, R22
38	471-0122	1	Res 1.2K Ohm 1/2W 5%	R12
39	471-0220	1	Res 22 Ohm 1/2W 5%	R14
40	471-0221	3	Res 220 Ohm 1/2W 5%	R2, R4, R13
41	471-0331	8	Res 330 Ohm 1/2W 5%	R10, R11, R15-R20
42	477-0002	3	Res Pack 15x2.2K	RP1-RP3
43	481-0001	2	Diode 1N4002	D1, D2
44	481-0006	1	Diode 1N914/IN4148	D4
45	482-0006	1	XSTR 2N4403	Q7
46	482-0010	2	XSTR PE8050	Q1, Q2
47	482-0014	5	XSTR 2N4401	Q3-Q6, Q8
48	510-0052	1	SWITCH PIANO DIP	SW1
49	510-0053	1	SW Pushbutton Side PCM	SW3
50	213-0001	1	SKT 24 Pin Dual INLN	XU25
51	213-0002	4	SKT 18 Pin Dual INLN	XU26-XU29
52	213-0004	1	SKT 16 Pin Dual INLN	XU15
53	213-0005	2	SKT 40 Pin Dual INLN	XU21, XU22
54	510-0049	1	Switch 8 Pos Dip	SW2
55	471-0472	1	Res 4.7K Ohm 1/2W 5%	R21
56	280-0420	2	Card Ejector, Snap On	
57	471-0473	1	Res 47K Ohm 1/2W 5%	R9
58	151-0031	1	Cap CER .22 uf 16V	C45



<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY REQD.</u>	<u>DESCRIPTION</u>	<u>REF DES.</u>
1	151-0058	13	Ceramic Capacitor, .01 uf, 16V AX	C2, C4, C6, C8, C9, C11, C14, C16, C18, C21, C23, C25, C27
2	151-0060	15	Ceramic Capacitor, .1 uf, 16V AX	C1, C3, C5, C7, C10, C12, C13, C15, C17, C19, C20, C22, C24, C26, C28
3	170-0211	1	PC Board	
4	213-0001	23	24-Pin Dual Inline Socket	UX1-UX23
5	314-0055	1	IC 74LS244	U25
6	314-0058	3	IC 74LS08	U26-U28
7	314-0059	1	IC 74LS10	U29
8	314-0104	1	IC 74LS138	U30
9	314-0120	1	IC 74LS154	U24
10	211-0008	3	Test Point Connector Pin	TP1-TP3
11	150-0088	1	Electrolytic Capacitor 10 uf, 25V	C29
12	280-0420	2	Card Ejector, Snap On	
13	316-1779	1	IC 2716	U1
14	316-1780	1	IC 2716	U2
15	316-1781	1	IC 2716	U3
16	316-1782	1	IC 2716	U4
17	316-1783	1	IC 2716	U5
18	316-1784	1	IC 2716	U6
19	316-1785	1	IC 2716	U7
20	316-1786	1	IC 2716	U8
21	316-1787	1	IC 2716	U9
22	316-1788	1	IC 2716	U10
23	316-1789	1	IC 2716	U11
24	316-1790	1	IC 2716	U12
25	316-1791	1	IC 2716	U13
26	316-1792	1	IC 2716	U14
27	316-1793	1	IC 2716	U15
28	316-1794	1	IC 2716	U16
29	316-1795	1	IC 2716	U17
30	316-1796	1	IC 2716	U18
31	316-1797	1	IC 2716	U19
32	316-1798	1	IC 2716	U20
33	316-1799	1	IC 2716	U21
34	316-1800	1	IC 2716	U22
35	316-1801	1	IC 2716	U23



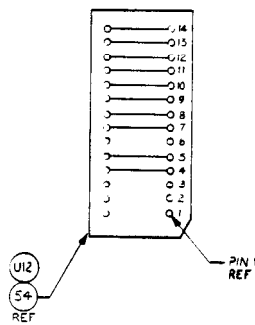
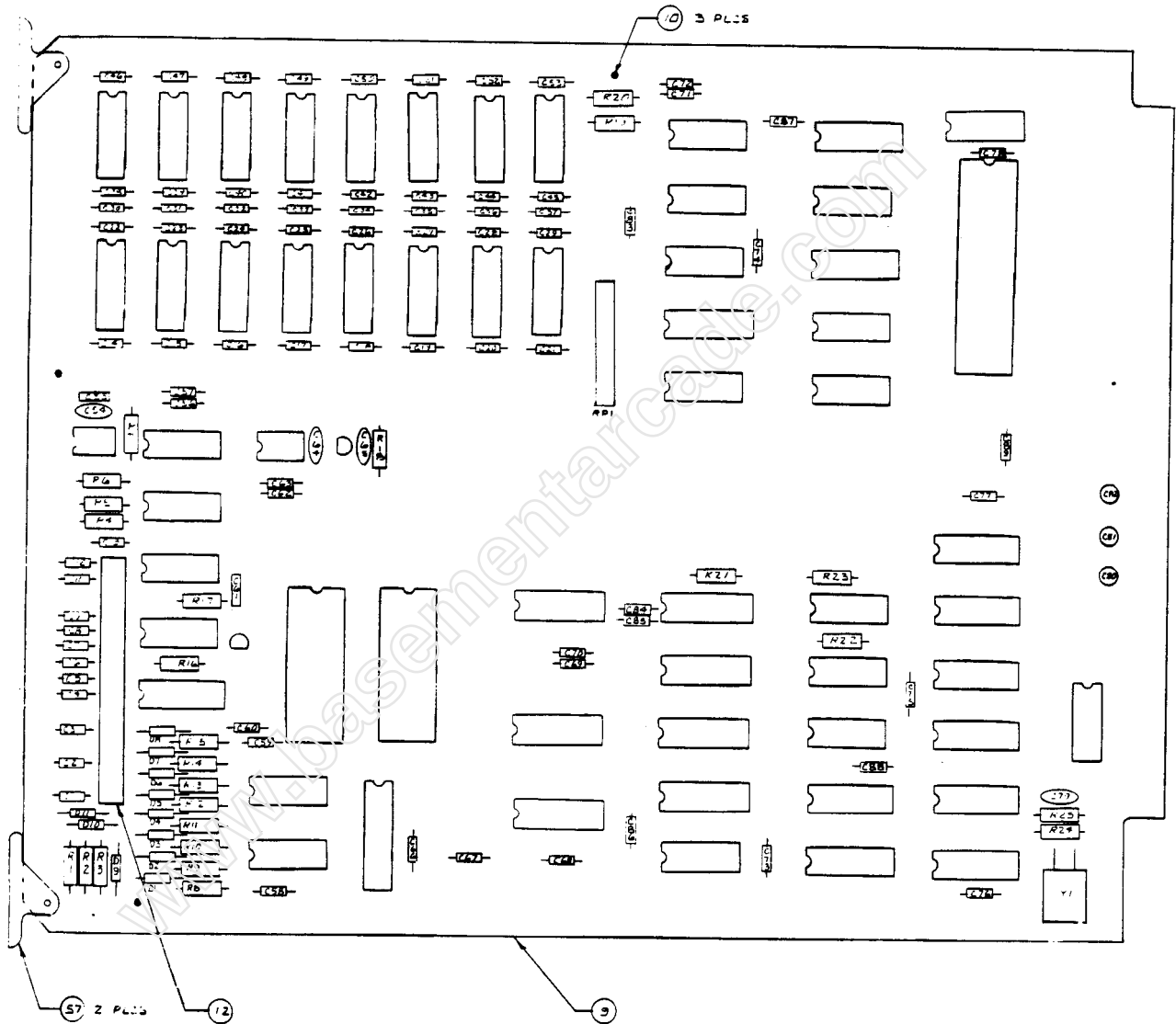
VIDEO 1 BOARD ASSEMBLY

DRAWING NUMBER 800-3290-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	150-0088	3	Cap E 10 UF 25V	C80-C82
2				
3	151-0005	1	Cap Cer 680 PF 50V	C79
4	151-0008	1	Cap Cer .001 UF 50V	C65
5	151-0011	2	Cap Cer .01 UF 50V	C54, C64
6				
7	151-0042	1	Cap Cer 470 PF	C90
8	151-0058	7	Cap Cer .01 UF 16V AX	C57, C60, C63, C70, C71, C84, C87
9	151-0060	29	Cap Cer .1 UF 16V AX	C13, C30-C37, C56, C58, C59, C62, C66-C69, C72-C78, C83, C85, C8 C88, C89
10	151-0061	11	Cap Cer 220 PF 16V AX	C1-C9, C11, C12
11	152-0007	2	Cap Film .001 UF 250V	C55, C61
12				
13	170-0193	1	Video 1 Board	
14				
15	211-0008	3	Conn Pin Test PT	TP1-TP3
16	212-0099	1	Conn Male 15 Pin RTA	
17				
18	213-0003	1	Skt 14 Pin Dual Inln	XU45
19	213-0004	21	Skt 16 Pin Dual Inln	XU16 - XU31, XU38, XU42, XU43, XU52, XU53
20	213-0005	1	Skt 40 Pin Dual Inln	XU58
21	213-0012	2	Skt 28 Pin Dual Inln	XU9, XU12
22				

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
23	230-0009	1	Xtal Clk 15.46848	Y1
24				
25	280-0420	2	Card Ejector Snap-On	
26	280-0354	3	PCB Support Locking 1/2	
27	314-0001	2	IC NE555	U1, U10
28	314-0040	2	IC 74LS125	U32, U50
29	314-0046	1	IC 74LS04	U60
30	314-0053	3	IC 74S175	U42, U43
31	314-0058	2	IC 74LS08	U5, U44
32	314-0059	1	IC 74LS10	U41
33	314-0062	1	IC 74LS74	U6
34	314-0067	1	IC 74LS30	U59
35	314-0068	1	IC 74LS32	U48
36	314-0070	4	IC 74LS86	U3, U4, U39, U40
37	314-0073	3	IC 74LS175	U49, U54, U55
38	314-0076	2	IC 74LS157	U56, U57
39	314-0077	4	IC 74LS166	U33-U36
40	314-0085	2	IC 74LS14	U37, U47
41	314-0087	1	IC 74LS139	U15
42	314-0093	1	IC 74LS374	U11
43	314-0104	1	IC 74LS138	U51
44	314-0123	2	IC 74LS257	U13, U14
45	314-0124	2	IC 74LS33	U7, U8
46	314-0125	1	IC 74LS38	U46
47	314-0138	1	IC 74S283	U38

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
48	314-0139	1	IC 74S163	U53
49	314-0140	1	IC 74S74	U45
50				
51	315-0039	16	IC 4015	U16 - U31
52	315-0065	1	IC 93419	U9
53	315-0067	1	IC Header 28 Pin	U12
54	316-0806	1	IC PRM G-80 Vid X-1	U52
55				
56	471-0102	5	Res 1K Ohm 1/2W 5%	R4-R6, R15, R16
57	471-0103	2	Res 10K Ohm 1/2W 5%	R7, R17
58	471-0122	2	Res 1.2K Ohm 1/2W 5%	R10, R13
59	471-0202	1	Res 2K Ohm 1/2W 5%	R14
60	471-0221	3	Res 220 Ohm 1/2W 5%	R1-R3
61	471-0222	3	Res 2.2K Ohm 1/2W 5%	R21-R23
62	471-0242	2	Res 2.4K Ohm 1/2W 5%	R9, R12
63	471-0330	2	Res 33 Ohm 1/2W 5%	R19, R20
64	471-0331	8	Res 330 Ohm 1/2W 5%	R24-R31
65	471-0472	2	Res 4.7 Ohm 1/2W 5%	R8, R11
66	471-0563	1	Res 56K Ohm 1/2W 5%	R18
67				
68	477-0002	1	Res Pack 15 X 2.2K	RP1
69	481-0006	1	Diode In914/In4148	D1-D11
70	482-0006	1	XSTR 2N4403	Q2
71	482-0014	1	XSTR 2N4401	Q1
72				
73	800-0212	1	Assy Vic Replacement Board	

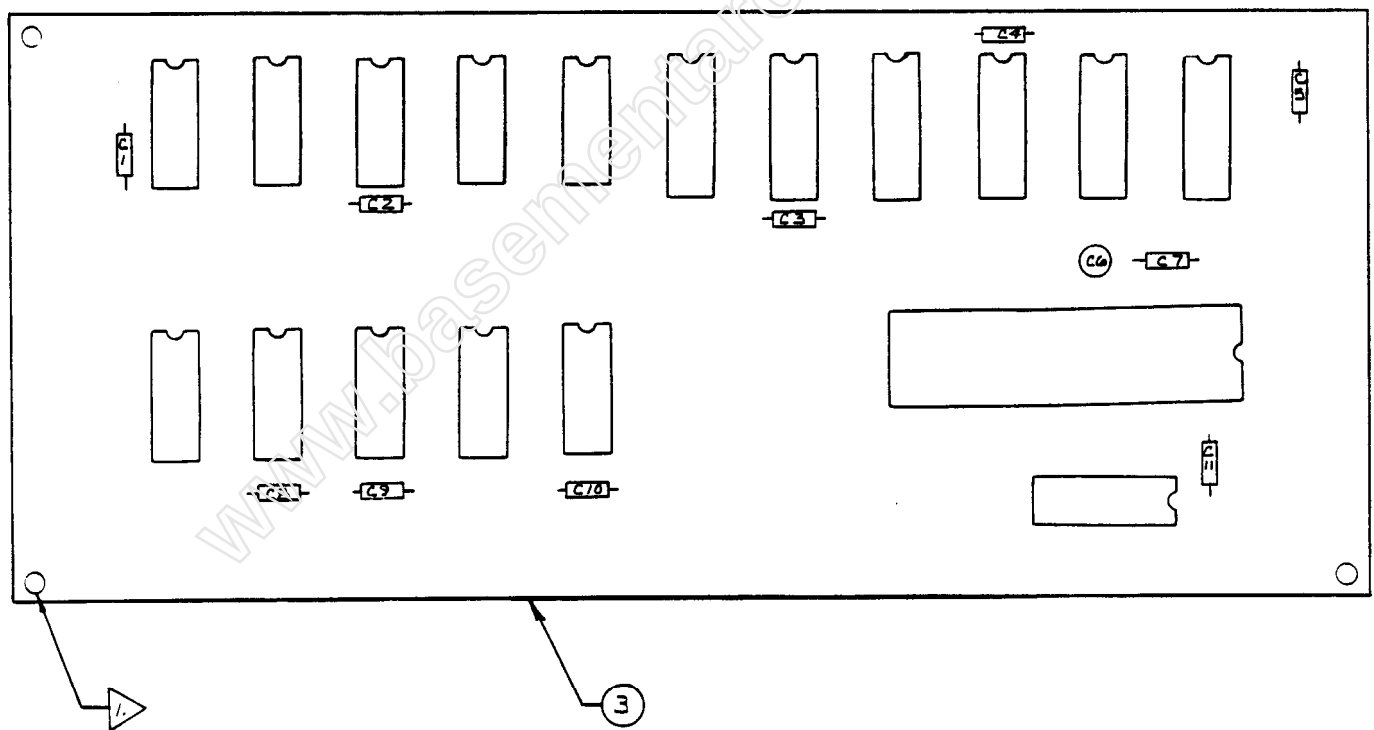


315-0067 HEADER 28 PIN
TO BE WIRED IN THIS CONFIGURATION
(SOLDER AWG 22 BUS WIRE
ACROSS HEADER PINS 10 PLC)

VIC REPLACEMENT BOARD ASSEMBLY

DRAWING NUMBER 800-0212

<u>ITEM NO.</u>	<u>PART NUMBER</u>	<u>QTY. PER ASSY.</u>	<u>DESCRIPTION</u>
1	150-0088	1	CAP E 10UF 25V
2	151-0060	10	CAP CER .1UF 16V AX
3	170-0227A	1	PC BOARD
4	213-0014	1	SKT 40 PIN WIRE WRAP
5	314-0058	1	IC 74LS08
6	314-0059	1	IC 74LS10
7	314-0062	3	IC 74LS74
8	314-0067	1	IC 74LS30
9	314-0070	1	IC 74LS86
10	314-0136	6	IC 74S151
11	314-0072	1	IC 74LS174
12	314-0075	2	IC 74LS393
13	314-0085	1	IC 74LS14
14	280-0354	3	PCB SUPPORT LOCKING



BACKGROUND BOARD ASSEMBLY

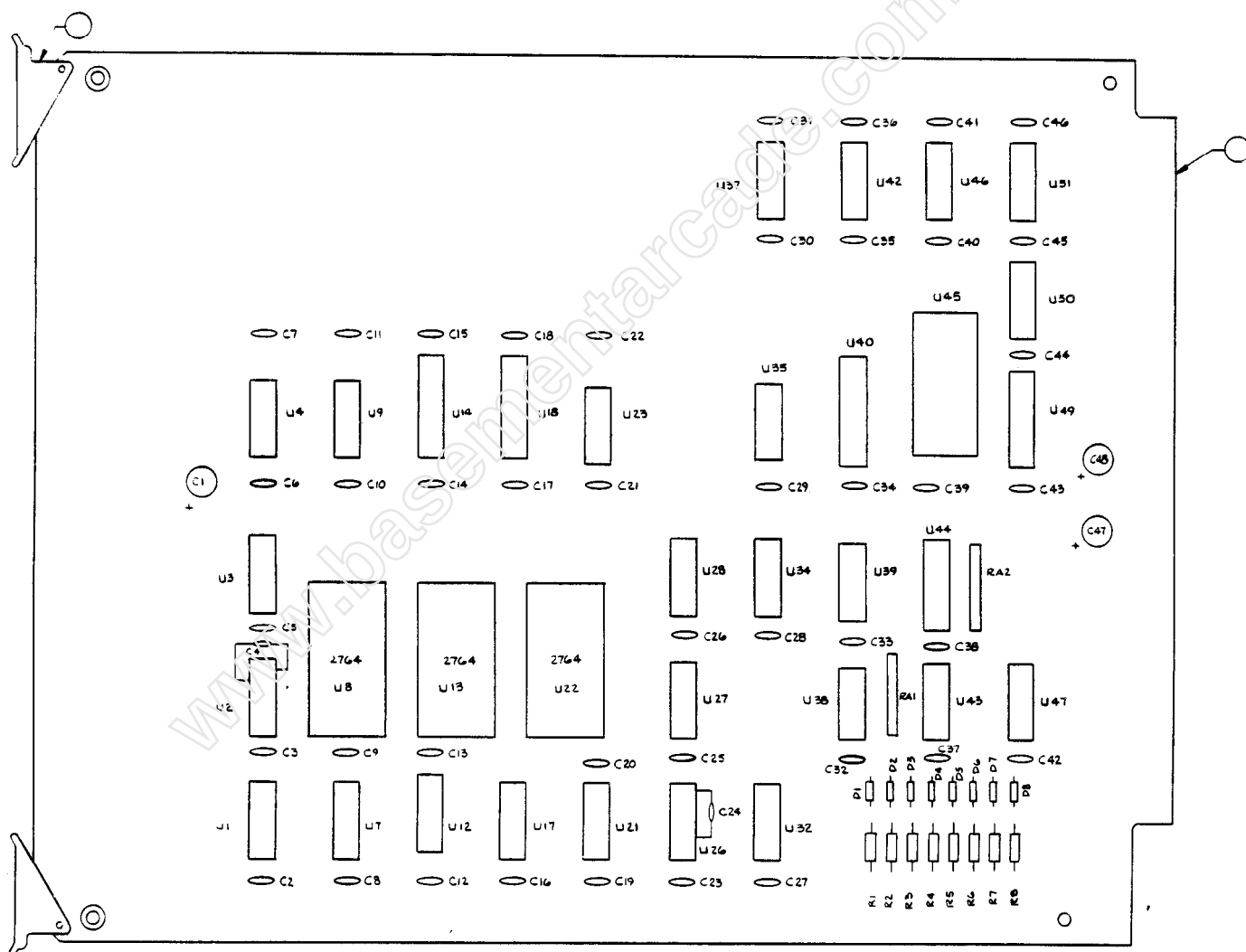
DRAWING NUMBER 834-0293-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	150-0010	3	Elec 100uF 16V	C1, C47-C48
2				
3	151-0101	1	Cer 680 PF 30V	C4
4	151-0118	1	Cer 1000 PF	C24
5				
6				
7	280-0330	2	Card Ejector	
8				
9				
10	314-0018	1	IC 74LS00	U9
11	314-0019	2	IC 74LS04	U2, U46
12	314-0055	1	IC 74LS244	U49
13	314-0060	1	IC 74LS20	U37
14	314-0066	1	IC 74LS27	U42
15	314-0067	2	IC 74LS30	U40, U51
16	314-0070	4	IC 74LS86	U4, U7, U17, U21
17	314-0072	2	IC 74LS174	U27, U35
18	314-0075	2	IC 74LS393	U1, U26
19	314-0076	2	IC 74LS157	U28, U34
20	314-0093	1	IC 74LS374	U44
21	314-0100	1	IC 74LS273	U40
22	314-0101	1	IC 74LS283	U12
23	314-0104	1	IC 74LS138	U50
24	314-0108	1	IC 74LS107	U32
25	314-0122	2	IC 74LS299	U14, U18

BACKGROUND BOARD ASSEMBLY

DRAWING NUMBER 834-0293-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
26	314-0124	2	IC 74LS33	U38, U43
27	314-0046	2	IC 74LS125	U3, U23
28				
29				
30	315-0065	1	IC 93419	U45
31	316-1516	1	IC 2716	U8
32	316-1517	1	IC 2716	U13
33	316-1778	1	IC 2716	U22
34	470-0102	1	Res 1K 1/4W 5%	R8
35	470-0122	2	Res 1.2K Ohm, 1/4W, 5%	R3, R6
36	470-0202	1	Res 2K Ohm, 1/4W	R7
37	470-0245	2	Res 2.4K, 1/4W, 5%	R2, R5
38	470-0472	2	Res 4.7K, 1/4W, 5%	R1, R4
39				
40				
41	477-0025	2	Res Pack 8 X 2.2K Ohm	RA1, RA2
42				
43				
44	481-0246	8	Diode MA-150	D1-D8
45				
46	171-0086	1	PCB Back Scene	



SOUND BOARD ASSEMBLY

DRAWING NUMBER 834-0316-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	150-0009	17	Cap E 1 UF 50V Elec	C25, 29, 34, 45-57, 61
2	150-0010	1	Cap E 100 MF 16V Elec	C59
3	150-0031	6	Cap E 470 MF 16V Elec	C95-C100
4	150-0064	1	Cap 4.7 MF 25V Elec	C28
5	150-0100	12	Cap 2.2 MF 50V Elec	C2-4, 6, 9-14, 20, 30
6	150-0185	3	Cap 47 MF 16V TT	C27, 35, 44
7	150-0023	4	Cap 10 MF 16V	C1, 21, 32-33
8	150-0229	1	Cap E 3.3 MF 50V	C15
9				
10	151-0005	2	Cap Cer 680P 50V	C5, 7
11	151-0041	31	Cap .1MF 25V Ceramic	C63-74, 77-94, 10
12				
13	152-0032	2	Cap 0.022 MF 50V/100V	C17, 37
14	152-0033	3	Cap .01 MF 50V Film	C18, 42, 62
15	152-0045	1	Cap .0022 MF 50V Film	C39
16	152-0072	2	Cap .039 MF 50V Film	C23, 24
17				
18	153-0001	2	Cap Tant 10MF 25V	C26, 31
19	153-0035	1	Cap 0.33 MF 35V Solid	C41
20	153-0026	2	Cap .22 MF 16V	C75-76
21	153-0032	1	Cap 15 MF 16V	C22
22				
23	153-0002	5	Cap 1 MF 25V Tant	C8, 40, 43, 58, 60

SOUND BOARD ASSEMBLY

DRAWING NUMBER 834-0316-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
24				
25				
26	212-0101	1	Conn Male 4 Pin RTA	CN1
27	212-0115	1	Conn Male 50 Pin	CN2
28				
29				
30	313-0034	5	IC LM324	U2, U3, U5, U10,
31	313-0084	1	IC MB4391	U4
32				
33	314-0046	1	IC 74LS04	U37
34	314-0051	1	IC 7417	U22
35	314-0067	1	IC 74LS30	U36
36	314-0144	2	IC 74LS145	U26, U30
37				
38	315-0026	1	IC 82S123	U31
39	315-0043	2	IC CD4069	U25, U29
40	315-0052	1	IC CD4024	U21
41	315-0083	2	IC 2732	U19, U23
42	315-0152	1	IC 8255A	U33
43	315-0185	1	IC 8243	U32
44	315-0186	1	IC TMS 3617 NS	U18
45	315-0033	3	IC 4016	U1, U6, U13
46	314-0016	1	IC 74123	U27
47	313-0126	1	IC 4558	U7
48	315-0184	1	IC 7751	U34

SOUND BOARD ASSEMBLY

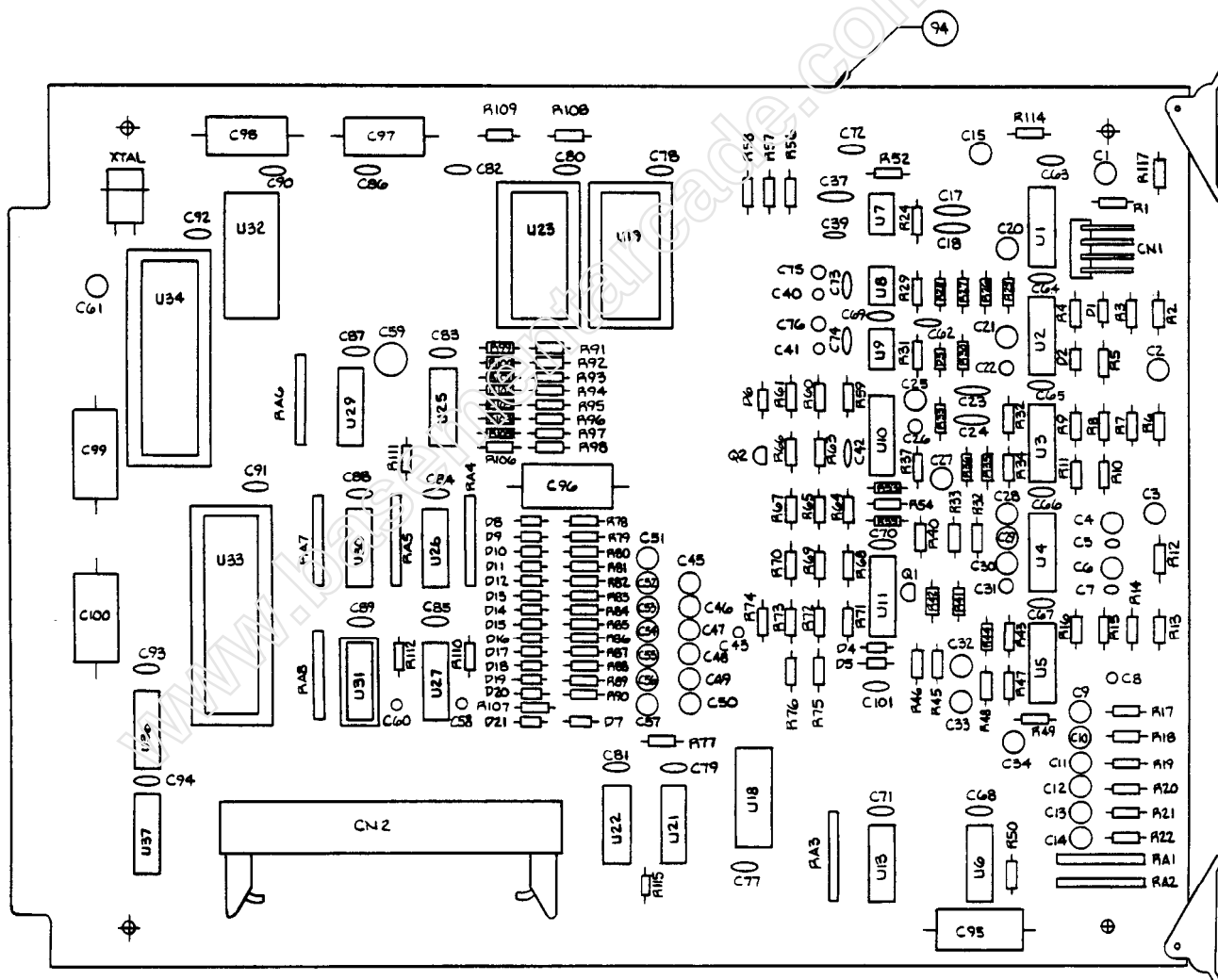
DRAWING NUMBER 834-0316-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
49	314-0001	2	IC 555	U8, U9
50	470-0223	6	Res 1K 1/4W 5%	R1, 27, 39, 49, 108, 109
51	470-0103	17	Res 10K 1/4W 5%	R2, 8, 9, 11, 17-22, 45, 46, 50, 61, 67, 75, 114, 115
52	470-0104	10	Res 100K 1/4W 5%	R54, 59, 99-106
53	470-0105	1	Res 1M 1/4W 5%	R5
54	470-0124	1	Res 120K 1/4W 5%	R16
55	470-0183	3	Res 18K 1/4W 5%	R6, 57, 58
56	470-0152	1	Res 1.5K 1/4W 5%	R42
57	470-0204	2	Res 200K 1/4W 5%	R72, 73
58	470-0222	2	Res 2.2K 1/4W 5%	R66, 71
59	470-0223	3	Res 22K 1/4W 5%	R29, 34, 64
60	470-0243	1	Res 24K 1/4W 5%	R15
61	470-0273	3	Res 27K 1/4W 5%	R7, 26, 56
62	470-0275	1	Res 2.7K 1/4W 5%	R31
63	470-0302	1	Res 3K 1/4W 5%	R52
64	470-0332	14	Res 3.3K 1/4W 5%	R40, 78-90
65	470-0333	6	Res 33K 1/4W 5%	R10, 12, 13, 28, 36, 69
66	470-0331	2	Res 330 Ohm 1/4W 5%	R74, 107
67	470-0392	1	Res 3.9K 1/4W 5%	R77
68	470-0472	3	Res 4.7K 1/4W 5%	R25, 32, 43
69	470-0473	5	Res 47K 1/4W 5%	R3, 4, 110, 112, 117
70				
71	470-0512	1	Res 5.1K 1/4W 5%	R55

SOUND BOARD ASSEMBLY

DRAWING NUMBER 834-0316-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
72	470-0513	13	Res 51K 1/4W 5%	R33, 35, 60,63, 65, 91-98
73				
74	470-0562	1	Res 5.6K 1/4W 5%	R48
75	470-0622	1	Res 6.2K 1/4W 5%	R47
76	470-0682	1	Res 6.8K 1/4W 5%	R44
77	470-0123	4	Res 12K 1/4W 5%	R30, 38, 68, 70
78	470-0133	1	Res 13K 1/4W 5%	R24
79	470-0153	3	Res 15K 1/4W 5%	R14, 37, 76
80	470-0101	2	Res 100 Ohm, 1/4W, 5%	R41, 111
81	470-0154	1	Res 150K 1/4W 5%	R53
82				
83	477-0005	8	Res Pack 8 X 4.7K	RA1-RA8
84				
85				
86				
87	481-0031	21	Rect Diode MA150	D1-D21
88				
89				
90	230-0037	1	Crystal 6mHz	
91				
92				
93				
94	171-0099	1	Sound Board PCB	



G-80 POWER SUPPLY CHASSIS ASSEMBLY

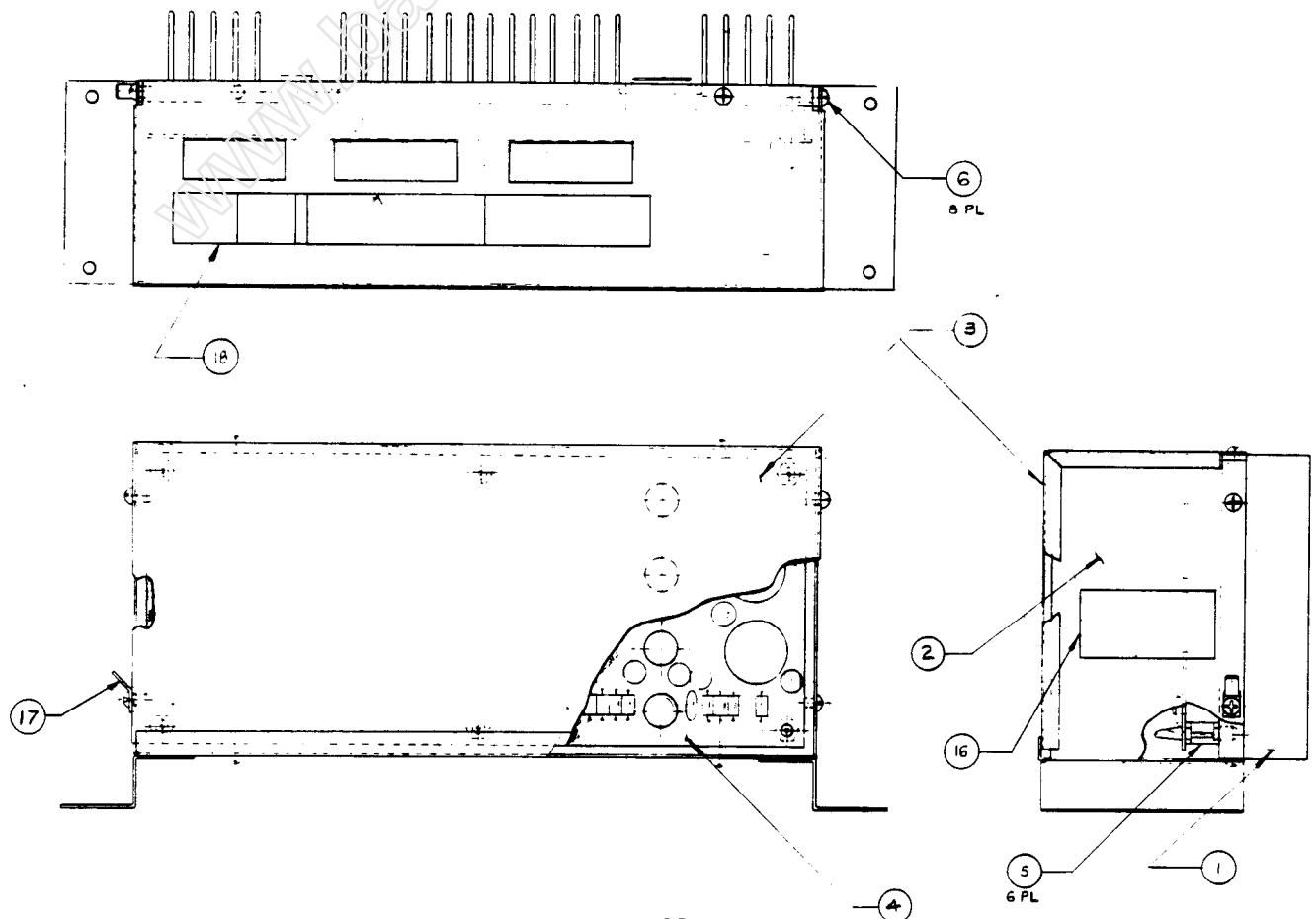
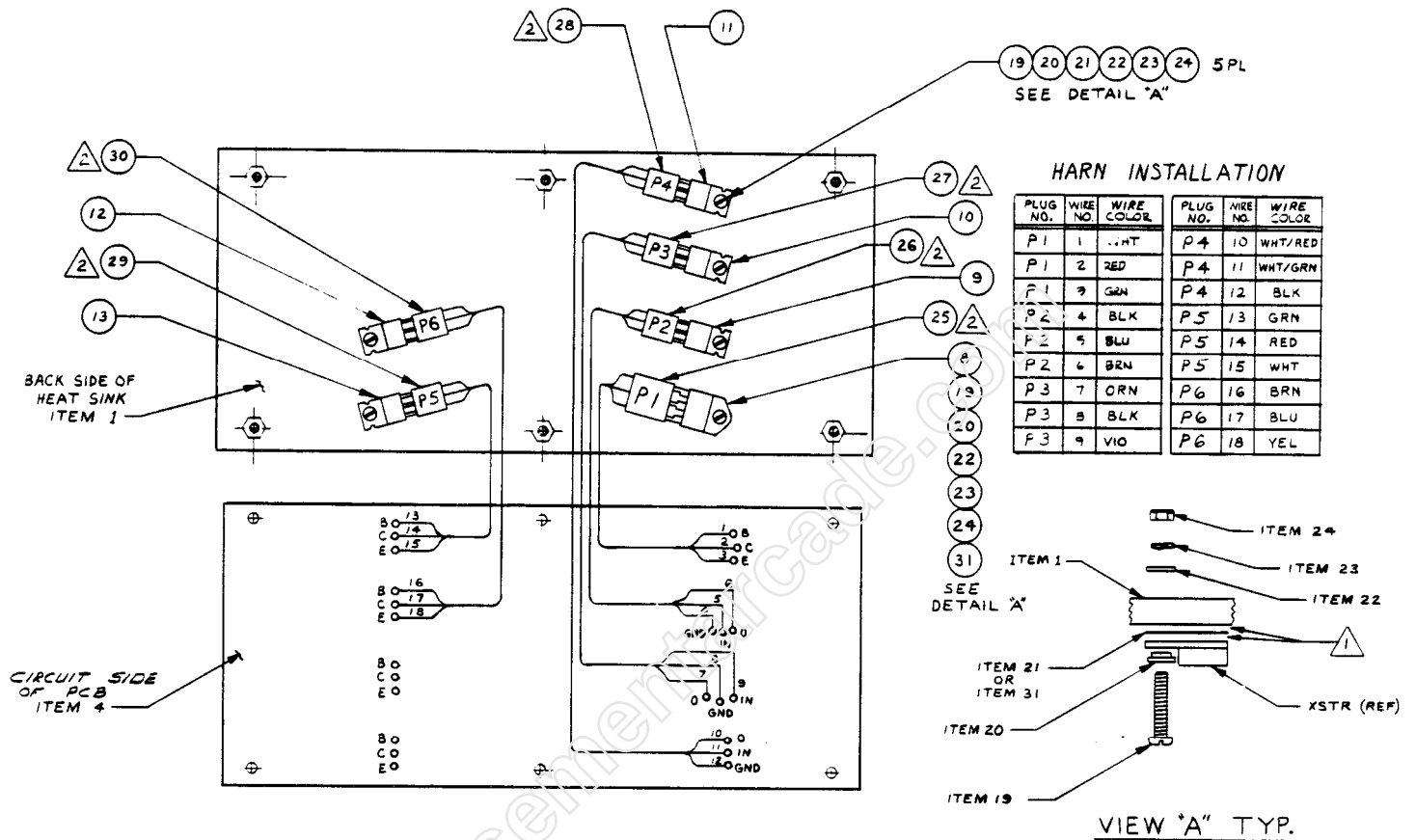
DRAWING NUMBER 800-0191-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	530-0016	1	Heat Sink G-80 Power Supply	
2	250-0460	1	Chassis Support G-80 Power Supply	
3	250-0461	1	Cover G-80 Power Supply	
4	800-0170	1	PCB Assy. G-80 Power Supply	
5	253-0206	6	Support PCB Threaded	
6	281-0032	8	SCR PN HD Phil Thrd Frmg 6-32 X .375 Lg	
7				
8	482-0104	1	Power Transister	TIP 141
9	313-0023	1	Neg. 5 Volt Regulator	320T5
10	313-0014	1	Pos 12 Volt Regulator	340T12
11	313-0015	1	Neg 12 Volt Regulator	320T12
12	482-0100	1	Power Transistor (Audio AMP)	TIP 125
13	482-0019	1	Power Transistor (Audio AMP)	TIP 120
14				
15				
16	420-0557	1	Decal, Fuse	
17	280-0117	1	TAB Rivet, Male 1/4"	
18	420-0575	1	Decal - Power Supply B	
19	281-0001	6	SCR PN HD Phil #4-40 X .500 Lg	
20	280-0341	6	Washer Shoulder #4	
21	310-0006	5	Ins1 XSTR To -220	

G-80 POWER SUPPLY CHASSIS ASSEMBLY

DRAWING NUMBER 800-0191-00

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
22	284-0001	6	Washer Flat #4	
23	284-0031	6	Washer Lock Split #4	
24	283-0021	6	Nut Hex Mach #4-40	
25	800-0243	1	Assy. Harn XSTR G-80 P1	
26	800-0244	1	Assy. Harn XSTR G-80 P2	
27	800-0245	1	Assy. Harn XSTR G-80 P3	
28	800-0246	1	Assy. Harn XSTR G-80 P4	
29	800-0247	1	Assy. Harn XSTR G-80 P5	
30	800-0248	1	Assy. Harn XSTR G-80 P6	
31	310-0007	1	Ins1 XSTR "H" (To-218)	

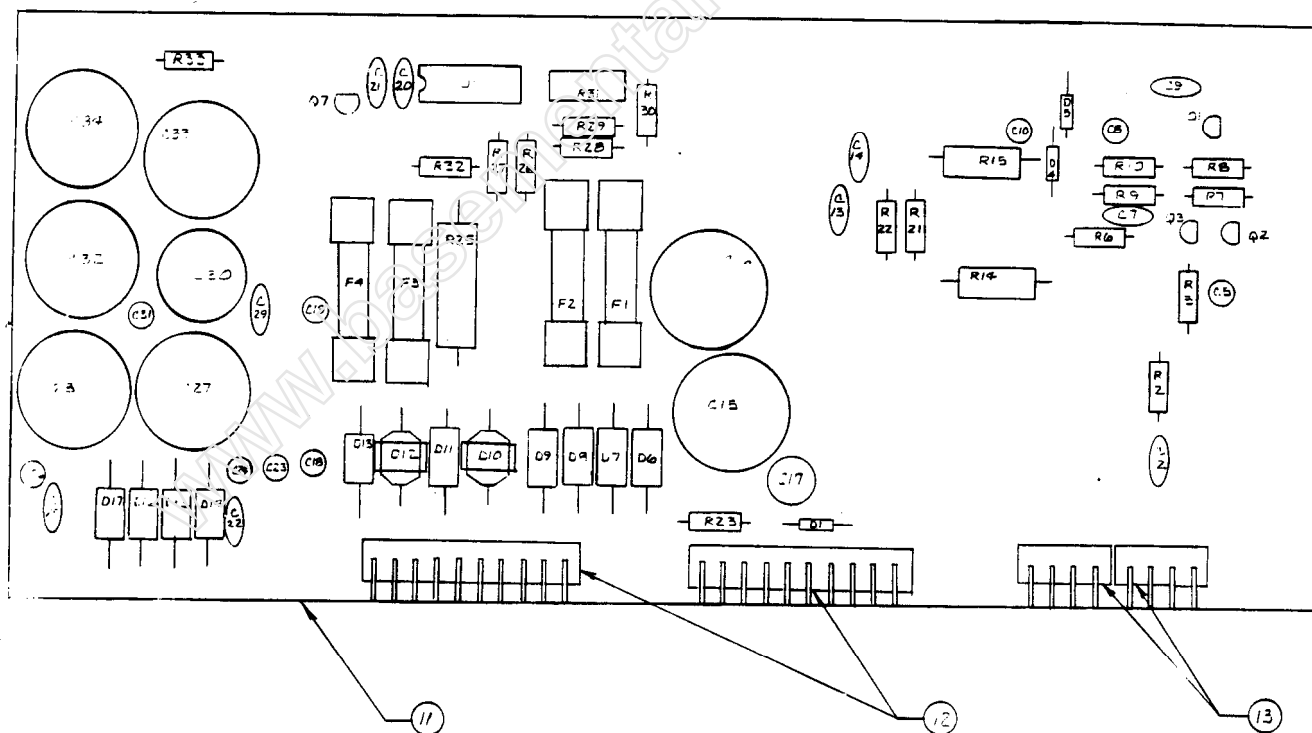


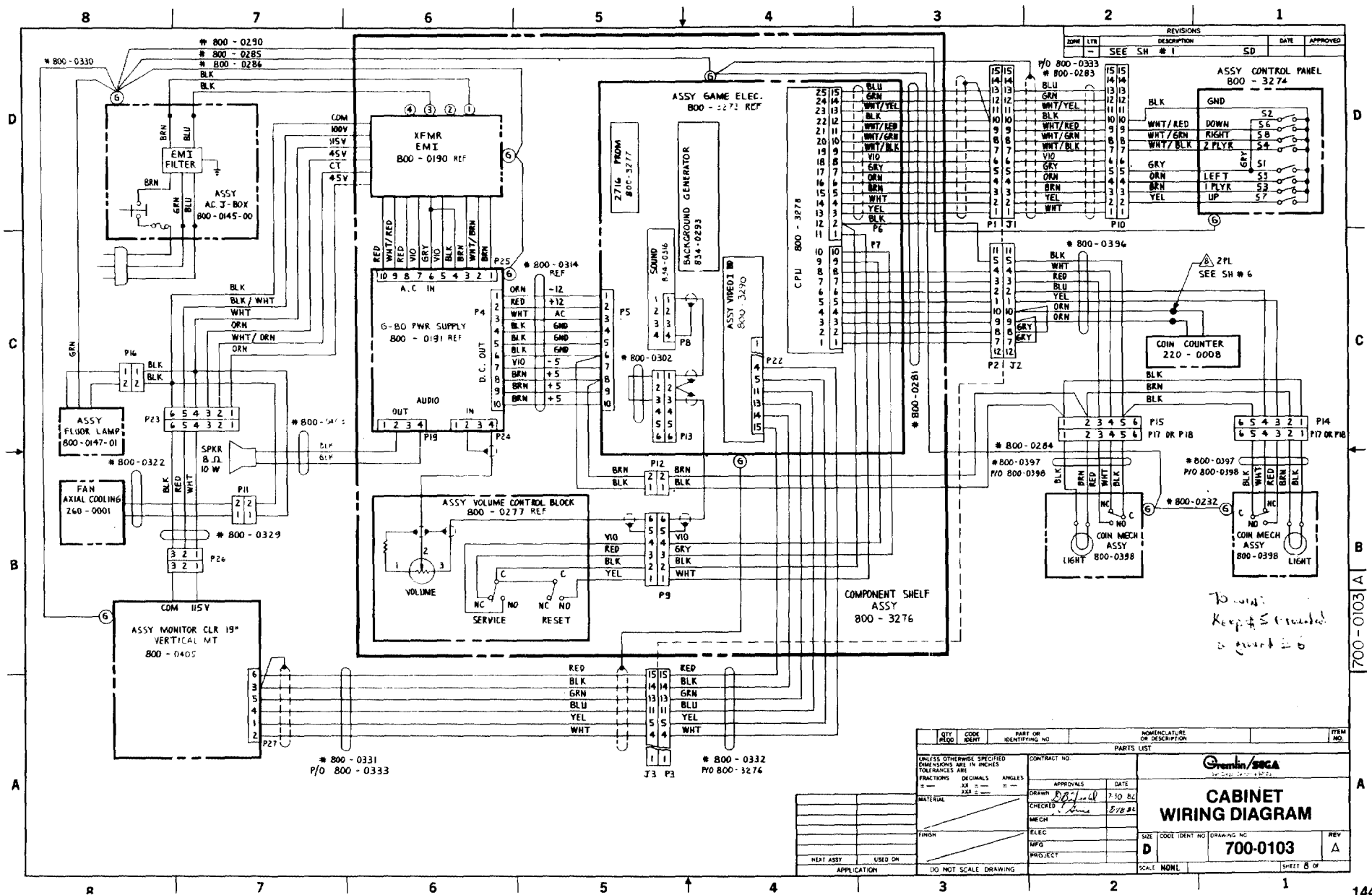
G-80 POWER SUPPLY PC ASSEMBLY

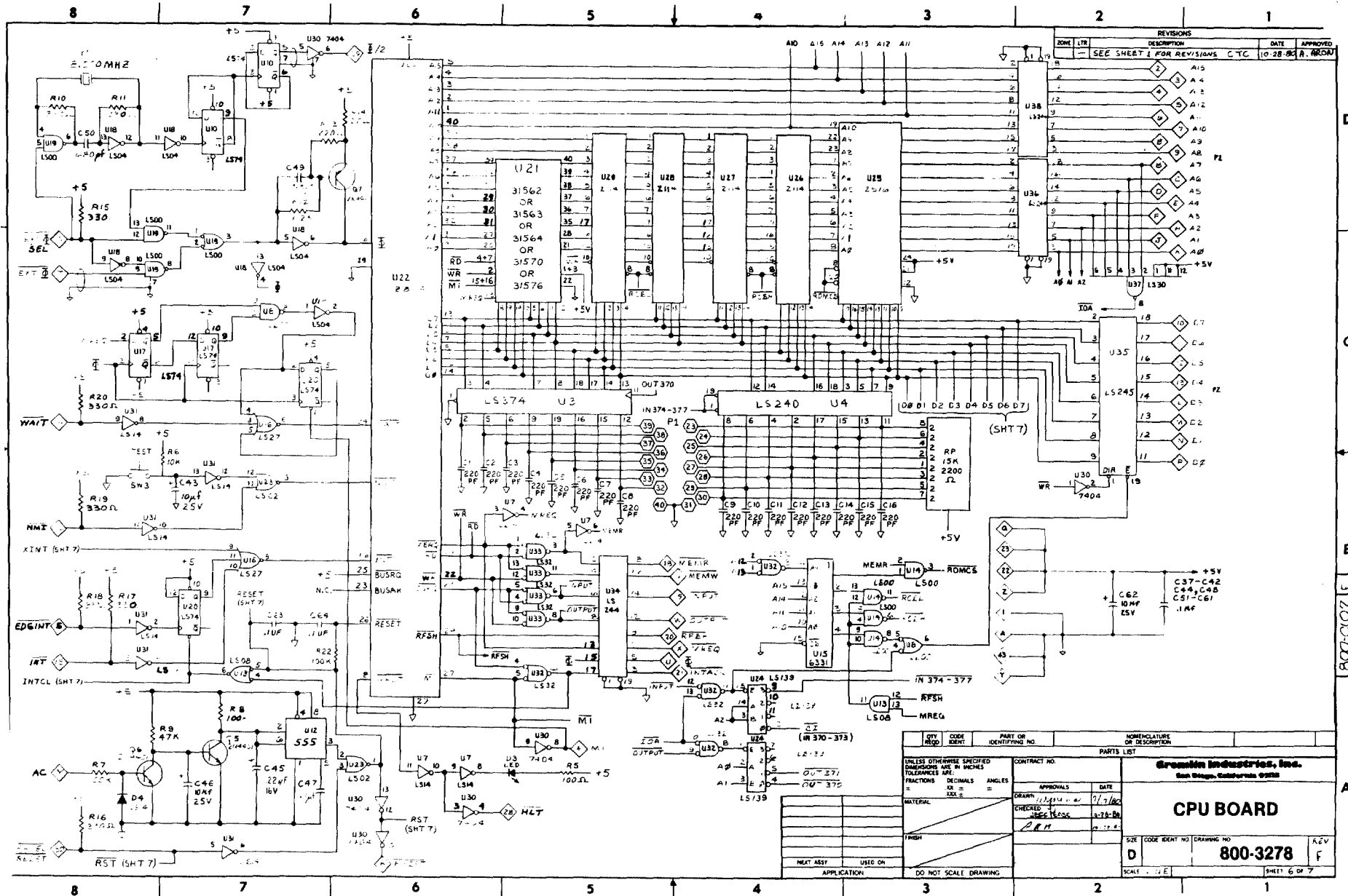
DRAWING NUMBER 800-0170-00

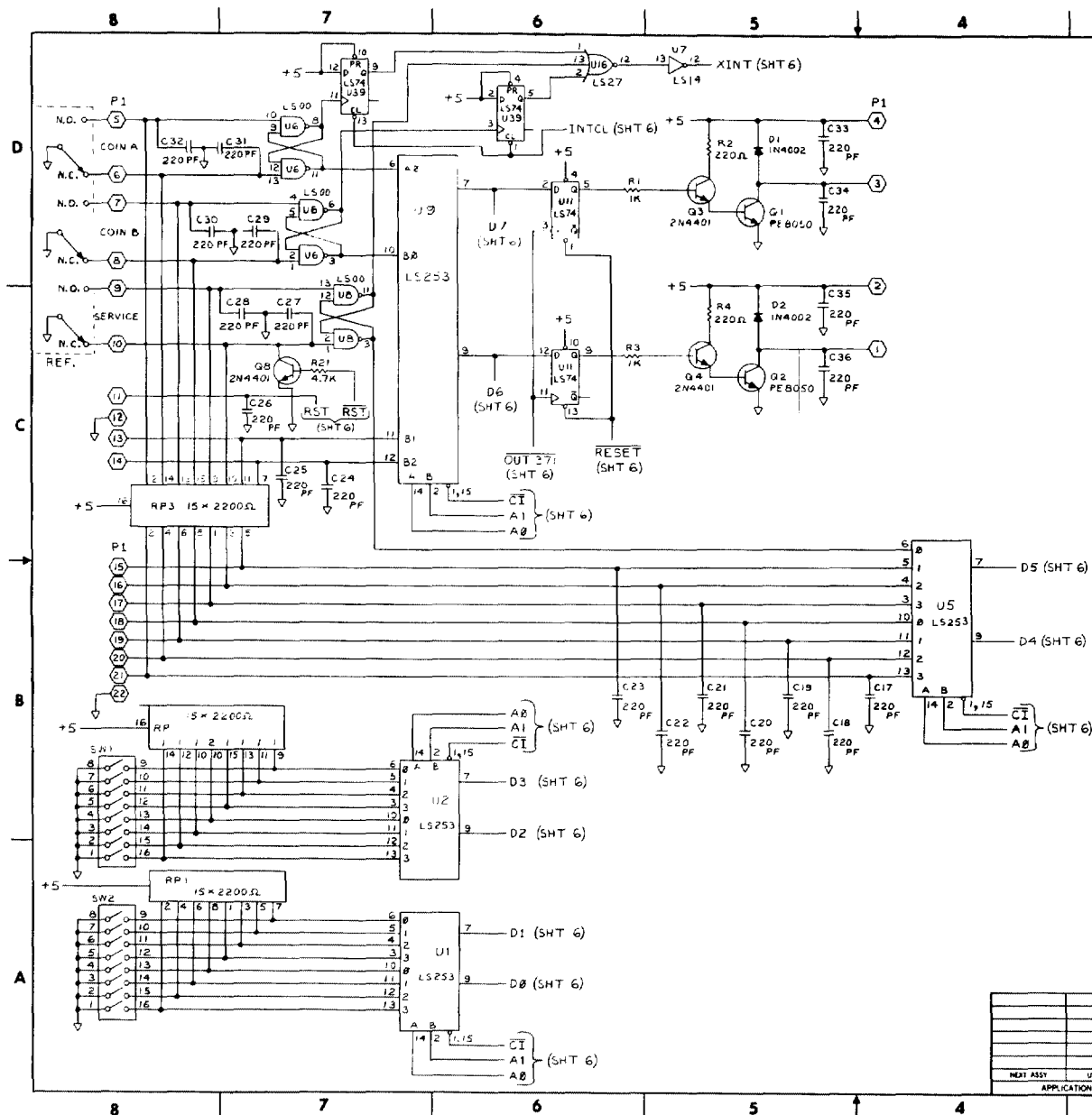
<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
1	150-0088	9	Cap E 10 uf 25V	C5, C8, C10, C18, C19, C23, C24, C26, C31
2	150-0092	1	Cap E 100 uf 25V	C17
3	150-0095	1	Cap E 3300 uf 25V	C30
4	150-0096	3	Cap E 6800 uf 16V	C32-C34
5	150-0097	4	Cap E 4700 uf 25V	C15, C16, C27, C28
6	151-0002	1	Cap Cer 100 pf 50V	C9
7	151-0007	1	Cap Cer .005 uf 100V	C20
8	151-0011	4	Cap Cer .01 uf 50V	C21, C22, C25, C29
9	151-0012	3	Cap Cer .1 uf 50V	C2, C13, C14
10	151-0021	1	Cap Cer 20 pf 50V	C7
11	170-0222	1	P.C. Board	
12	212-0020	2	Conn M 10 Pin RTA	
13	212-0081	2	Conn M 4 Pin RTA	
14	313-0001	1	IC LM723 Dip	U1
15	471-0011	1	Res 10 Ohm 1/2W 5%	R2
16	471-0101	1	Res 100 Ohm 1/2W 5%	R32
17	471-0102	3	Res 1K Ohm 1/2W 5%	R10, R27, R29
18	471-0103	2	Res 10K Ohm 1/2W 5%	R6, R30
19	471-0104	1	Res 100K Ohm 1/2W 5%	R23
20	471-0222	2	Res 2.2K Ohm 1/2W 5%	R21, R22
21	471-0223	2	Res 22K Ohm 1/2W 5%	R5, R9
22	471-0332	1	Res 3.3K Ohm 1/2W 5%	R28
23	471-0182	1	Res 1.8K Ohm 1/2W 5%	R26

<u>ITEM NO.</u>	<u>PART NO.</u>	<u>QTY. REQ'D</u>	<u>DESCRIPTION</u>	<u>REF. DESG.</u>
24	471-0681	1	Res 680 Ohm 1/2W 5%	R7
25	473-05R0	1	Res .05 Ohm 5W 3%	R25
26	473-00R2	2	Res .2 Ohm 3W 5%	R14, R15
27	475-0004	1	Pot 1K Car PCMTV	R31
28	481-0002	2	Diode MR751	D10, D12
29	481-0004	10	Diode MR501	D6-D9, D11, D13-D17
30	481-0006	3	Diode IN914/IN4148	D1, D4, D5
31	482-0006	2	XSTR 2N4403	Q1, Q7
32	482-0014	2	XSTR 2N4401	Q2, Q3
33	514-0002	2	Fuse 3 A Norm	F1, F2
34	514-0003	8	Clip Fuse Mtg	
35	514-0006	1	Fuse 1.5 A Norm	F4
36	514-0008	1	Fuse 10 A SLO	F3
37	800-0191	1	Schematic Ref	
38	471-0220	1	Res 22 Ohm 1/2W 5%	R8
39	471-0221	1	Res 220 Ohm 1/2W 5%	R33



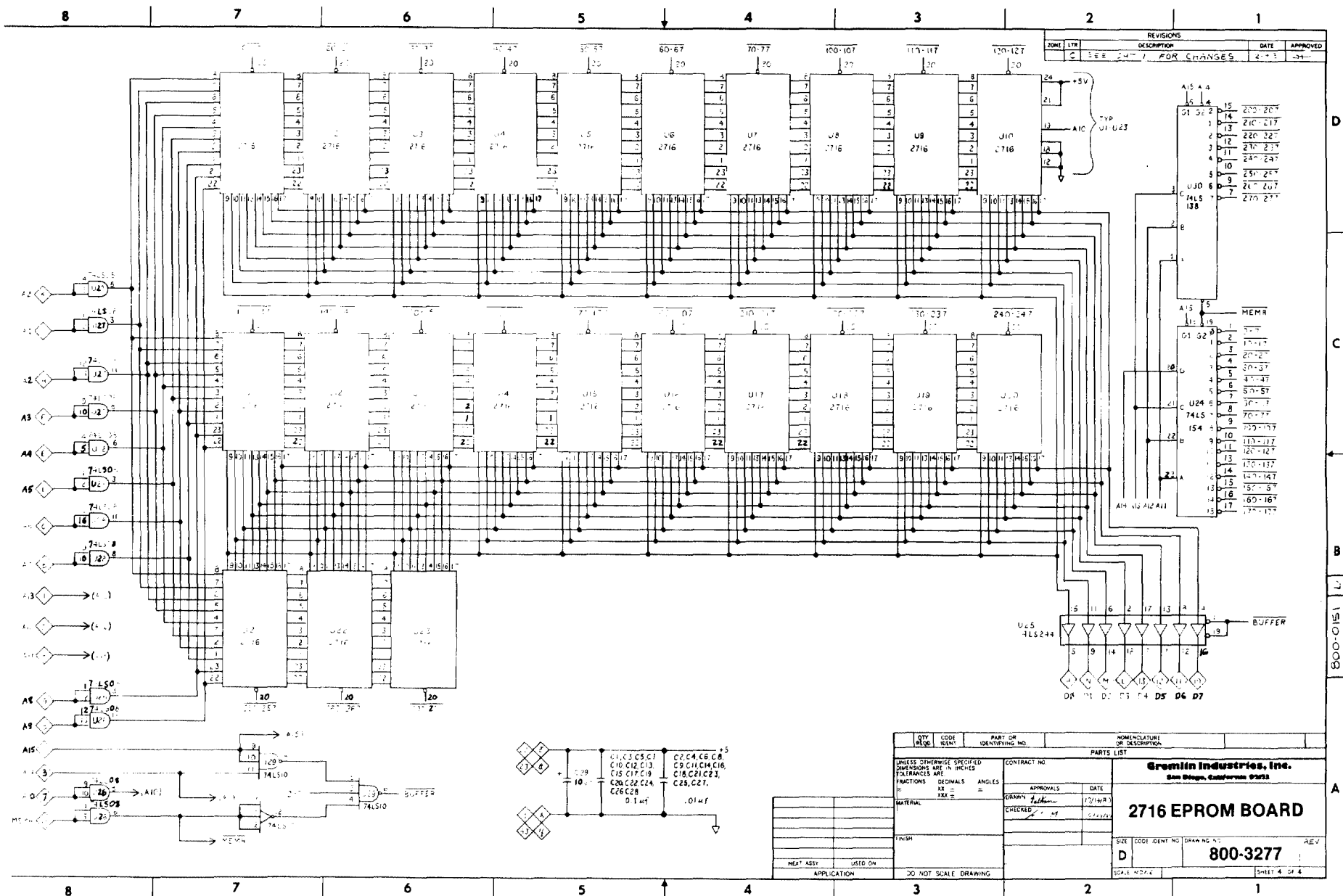


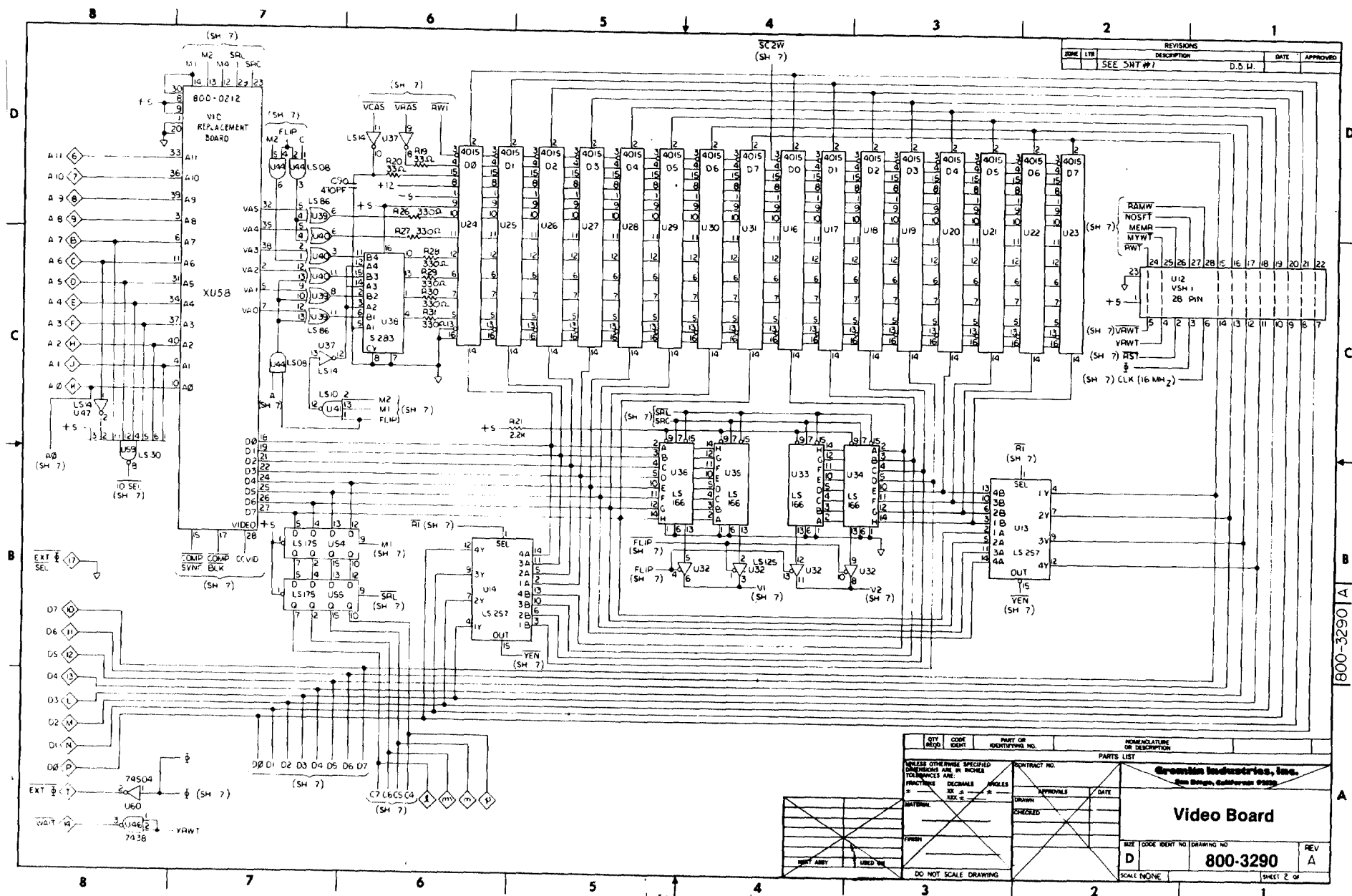




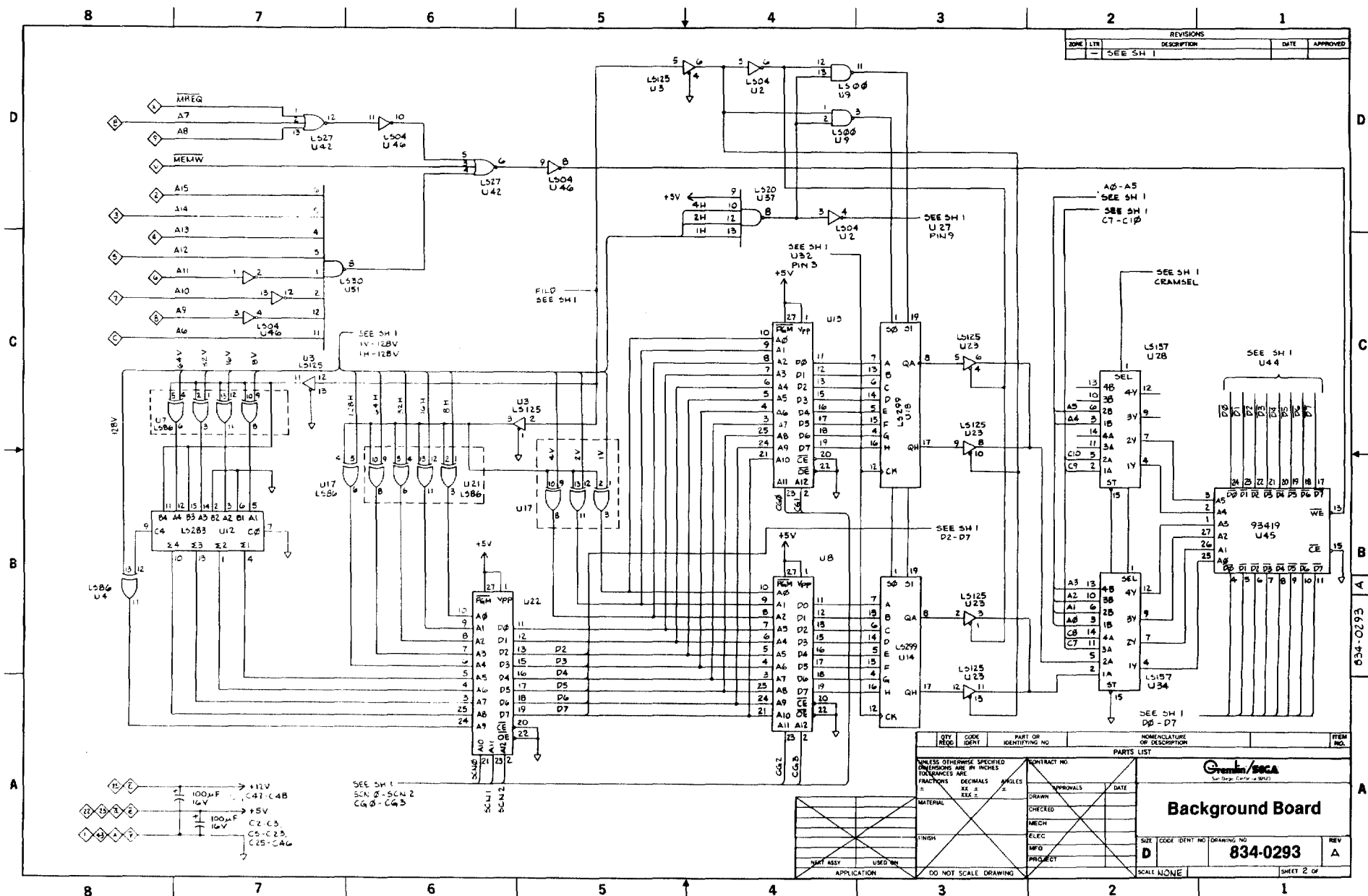
REVISIONS				
ZONE	LTN	DESCRIPTION	DATE	APPROVED
A		RELEASED	10-28-80	R. ARON
B	ECN # 528	CTC	11-13-80	WERTHEIM
C	ECN # 669	CTC	2-2-81	SH
D	ECN # 677A	CTC	2-25-81	SH
E	PERECN # 978	MGA	5-2-81	W. MURPHY

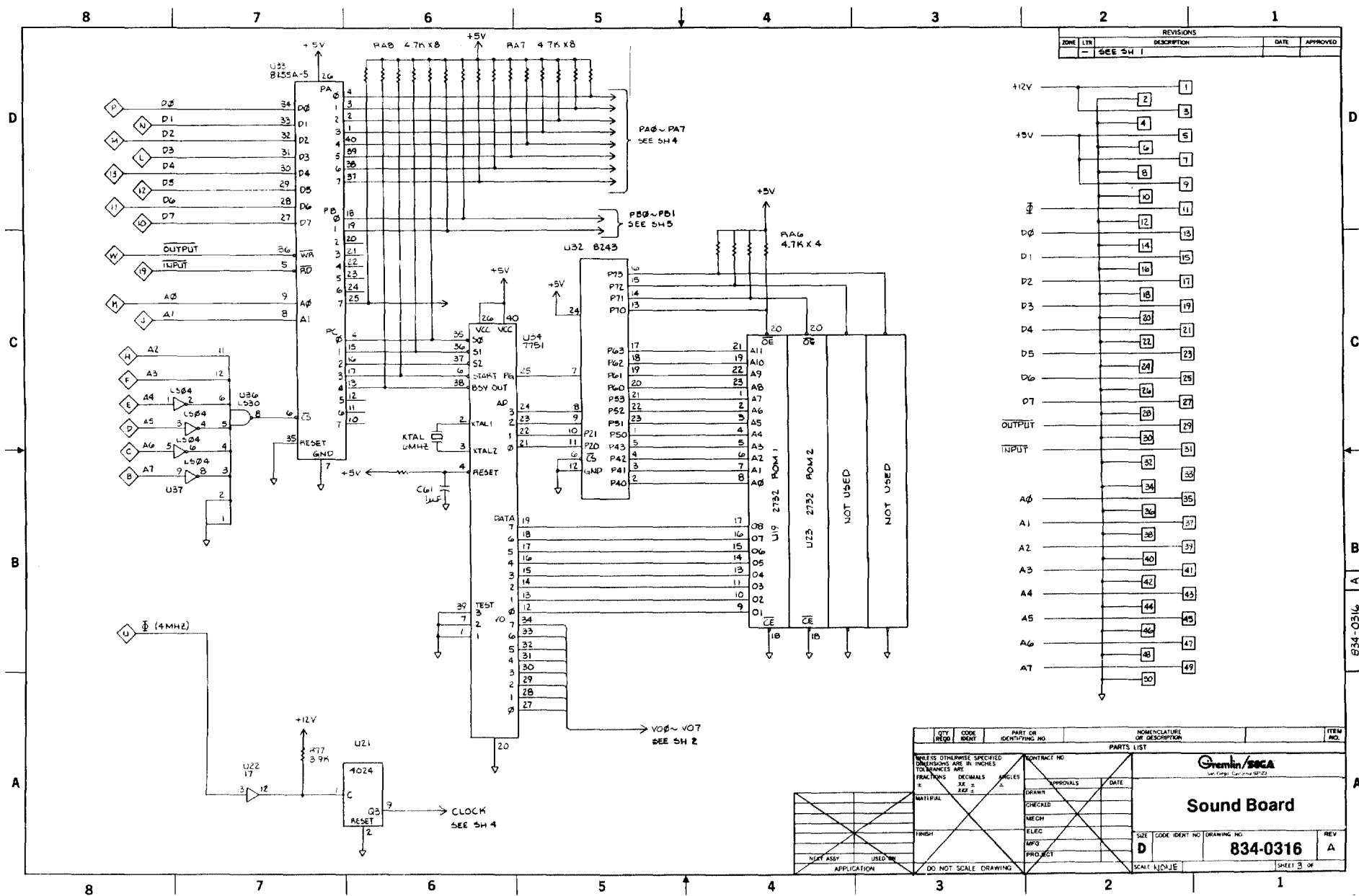
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PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE		CONTRACT NO.	Gromlin Industries, Inc. San Diego, California 92161
FRACTIONS	DECIMALS	DRAWN	
"	"	APPROVALS	
"	"	DATE	
"	"		
MATERIAL		CHECKED J. KATTEL 10-23-80	
		BY R. H. BROWN 10-23-80	
		APP M - 2-1-80	
FINISH		SIZE D	REV F
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DO NOT SCALE DRAWING		SHEET 7 OF 7	

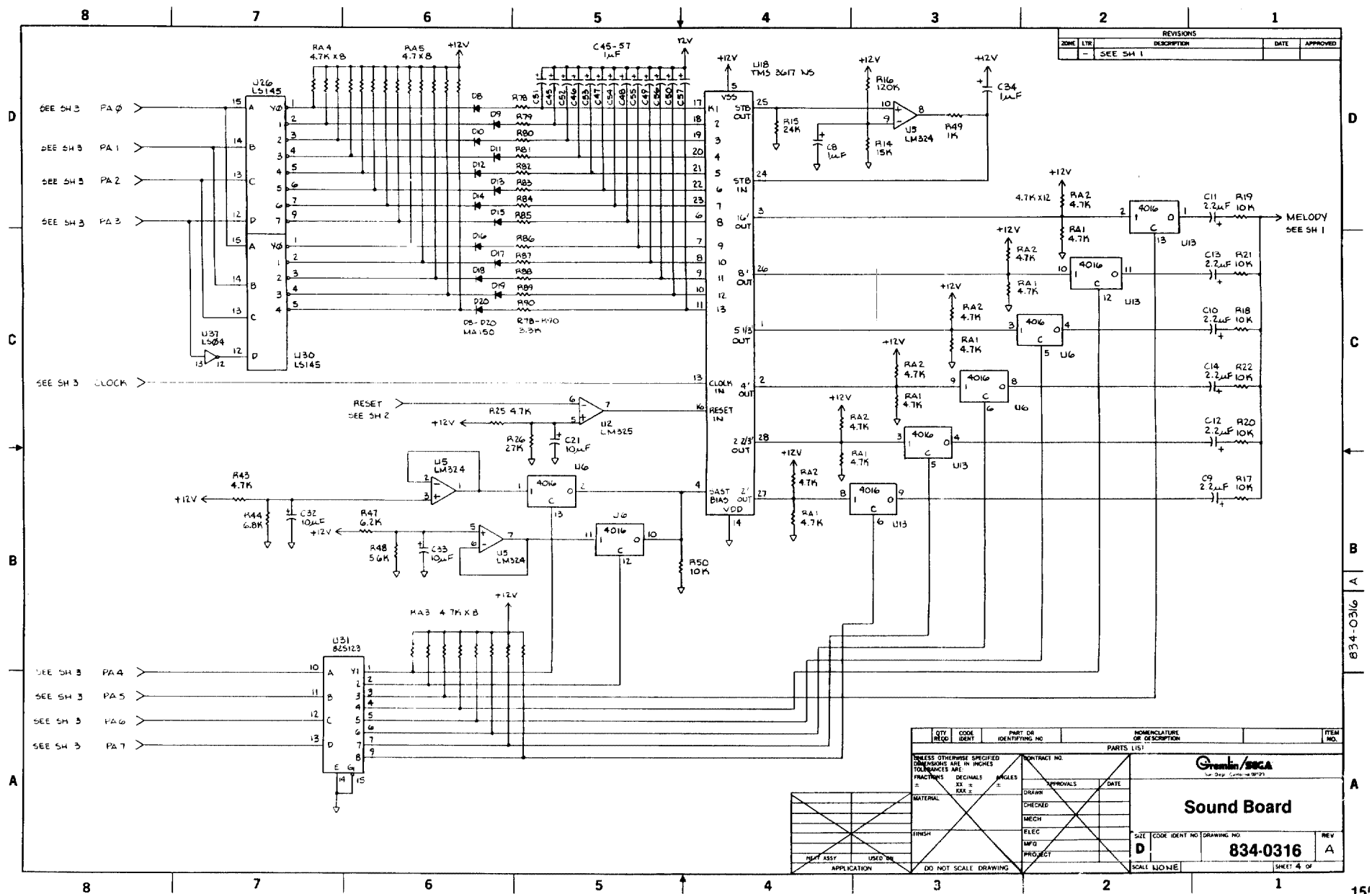


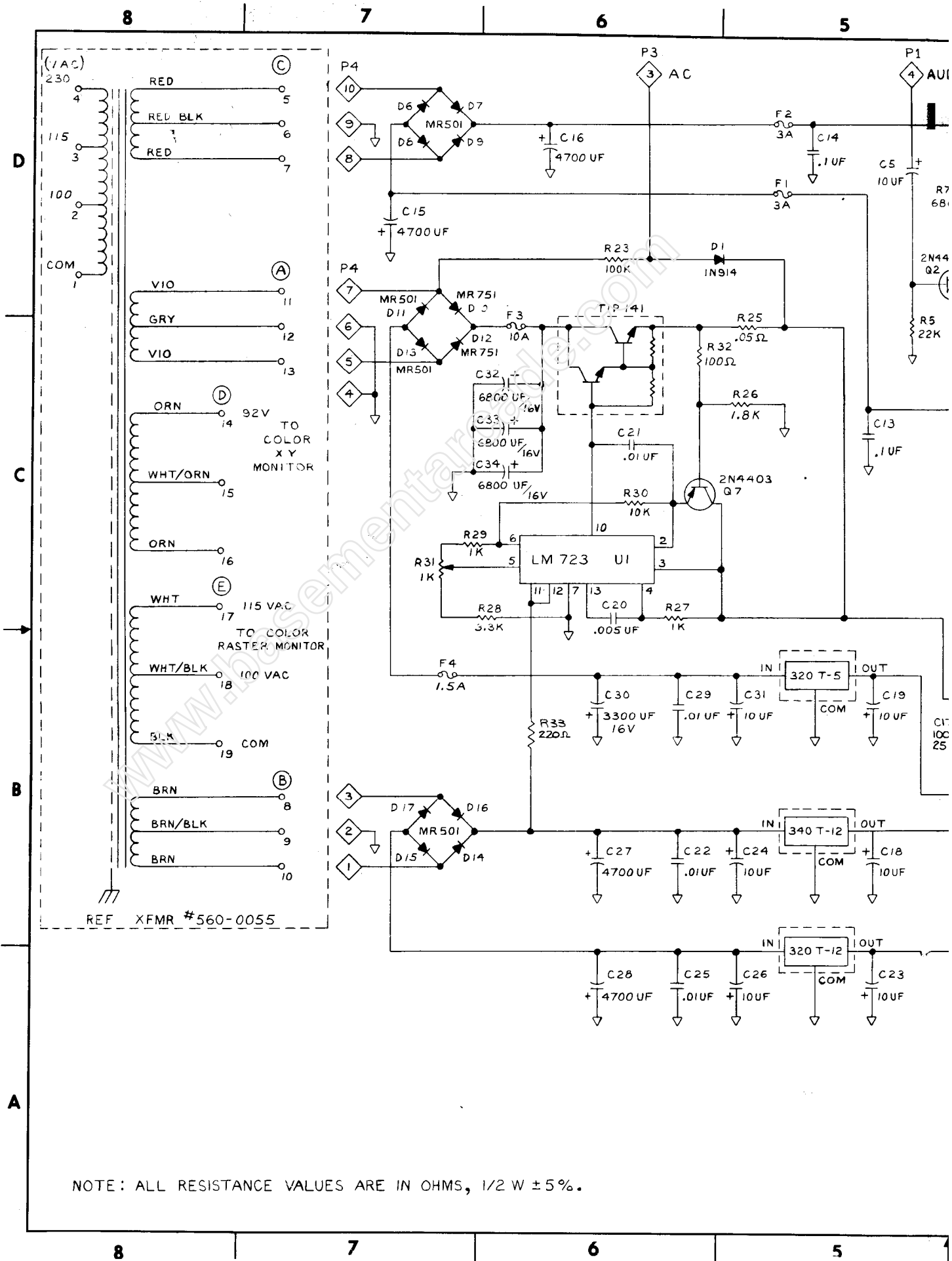


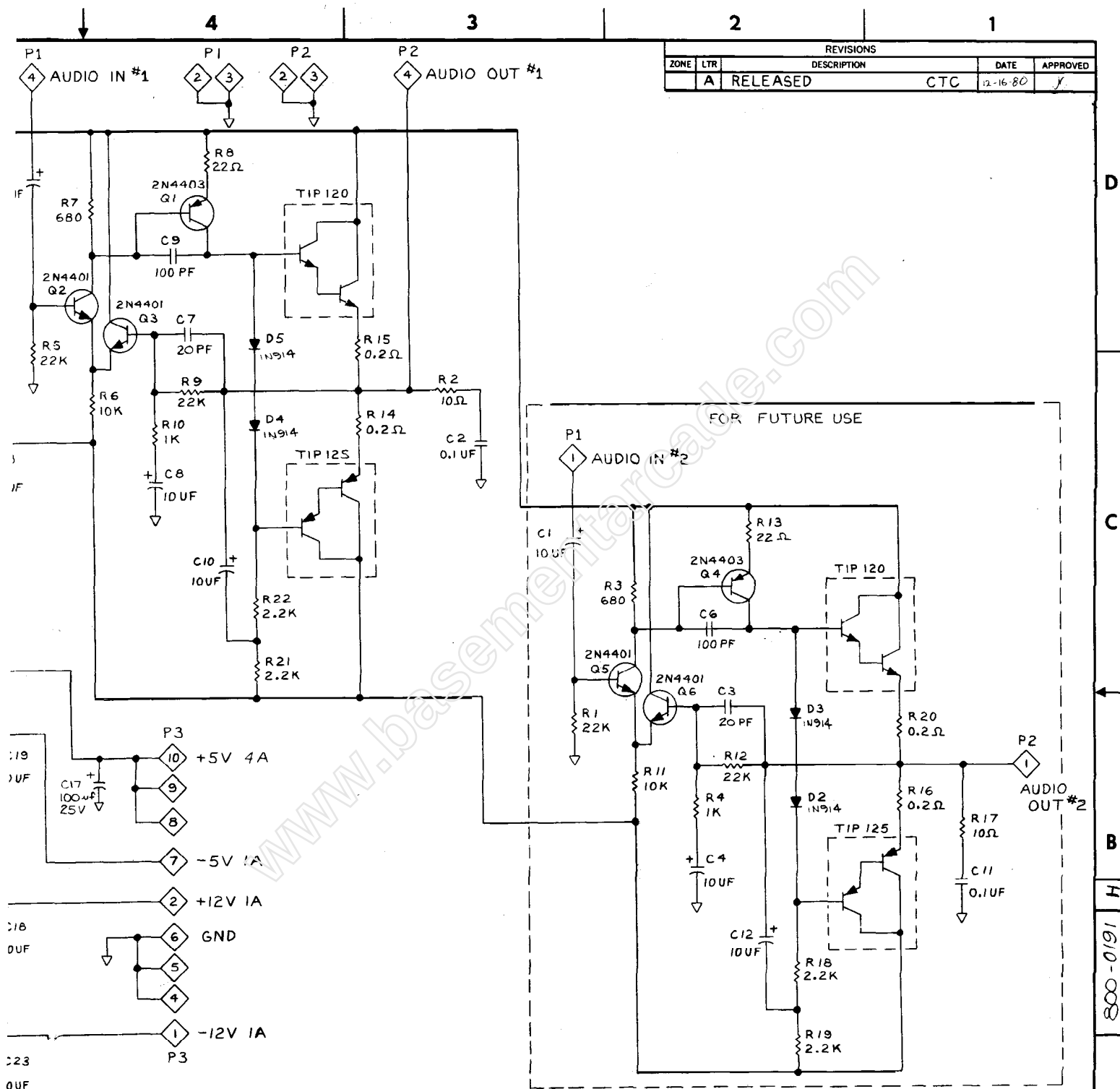




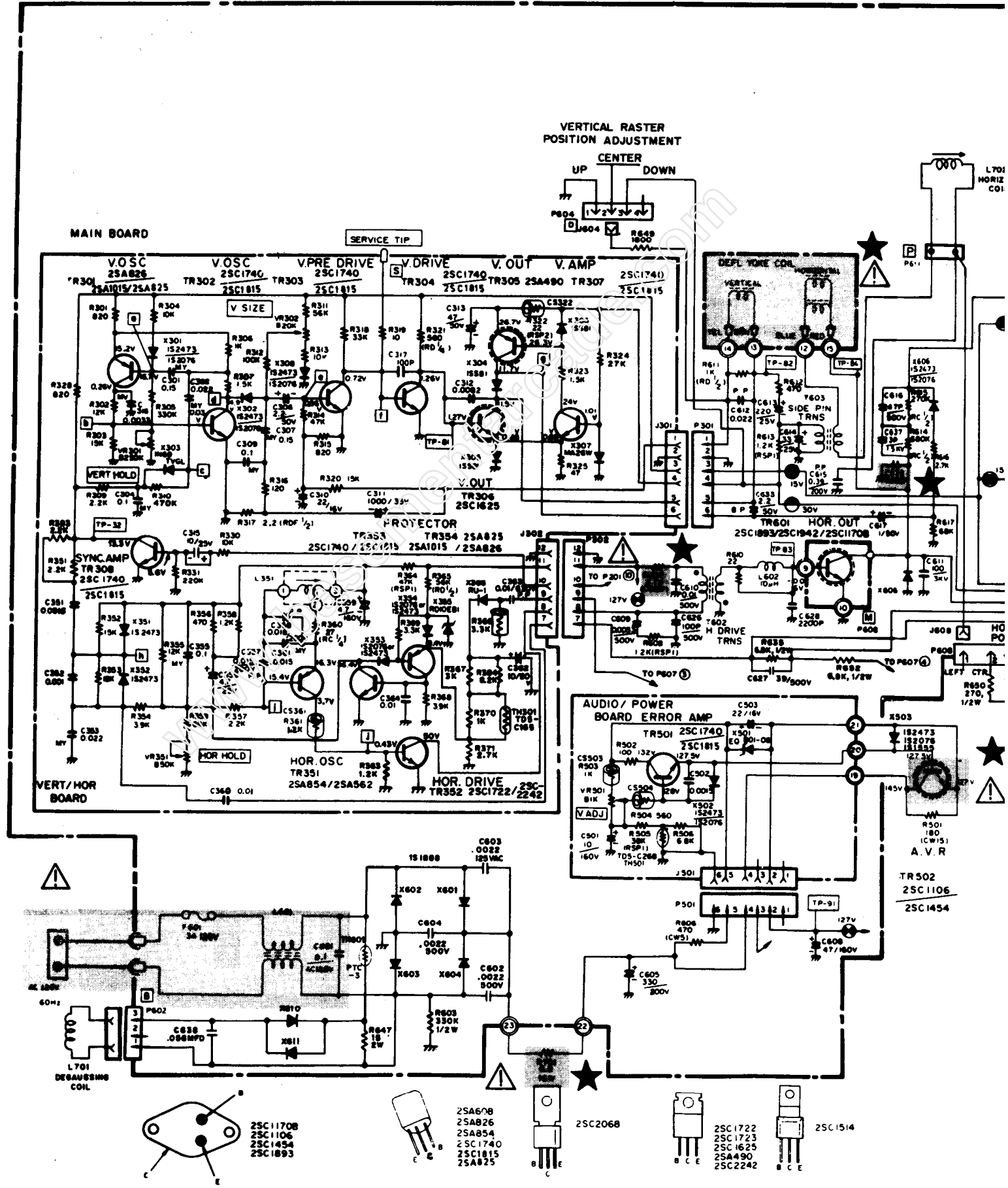


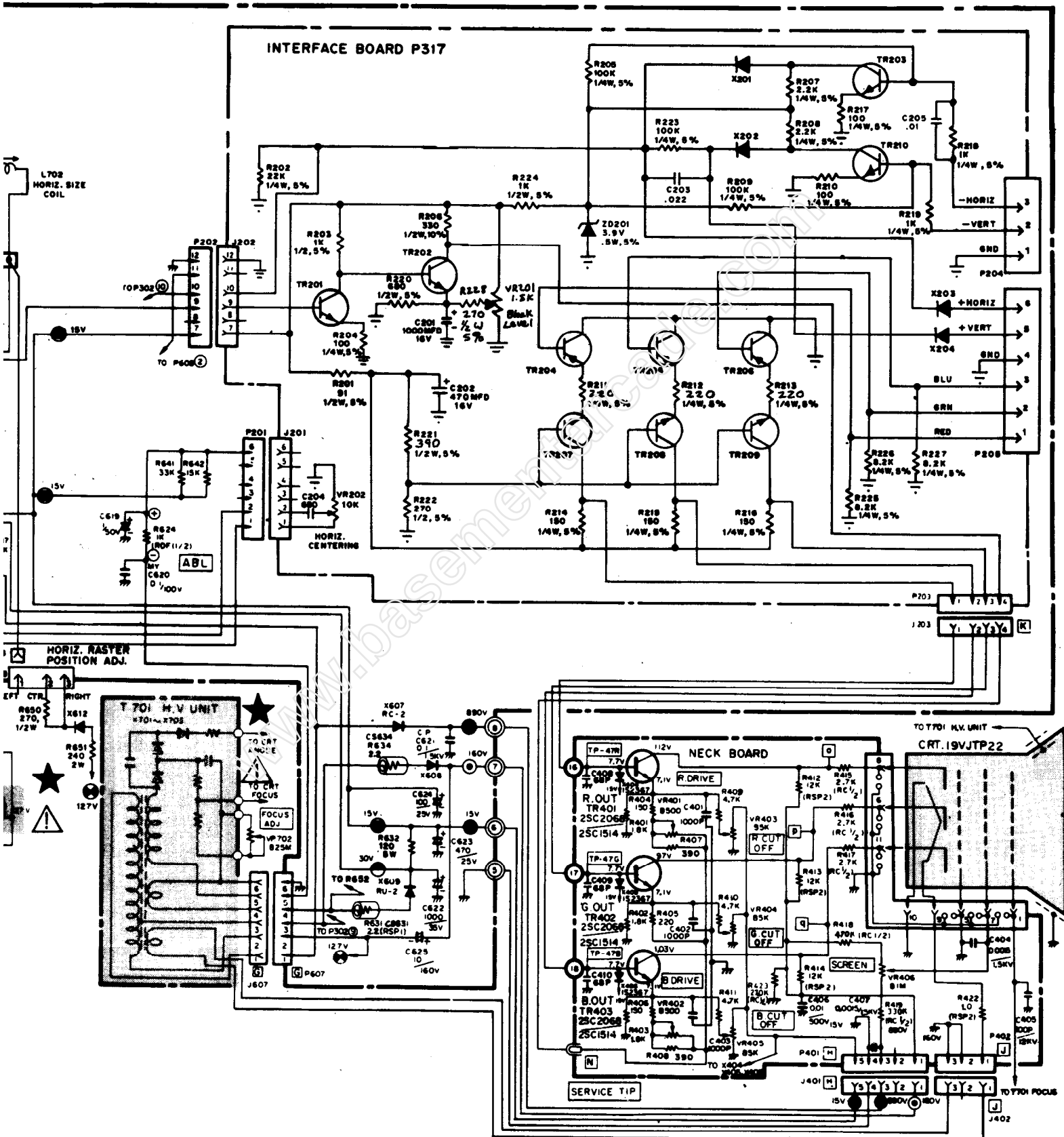




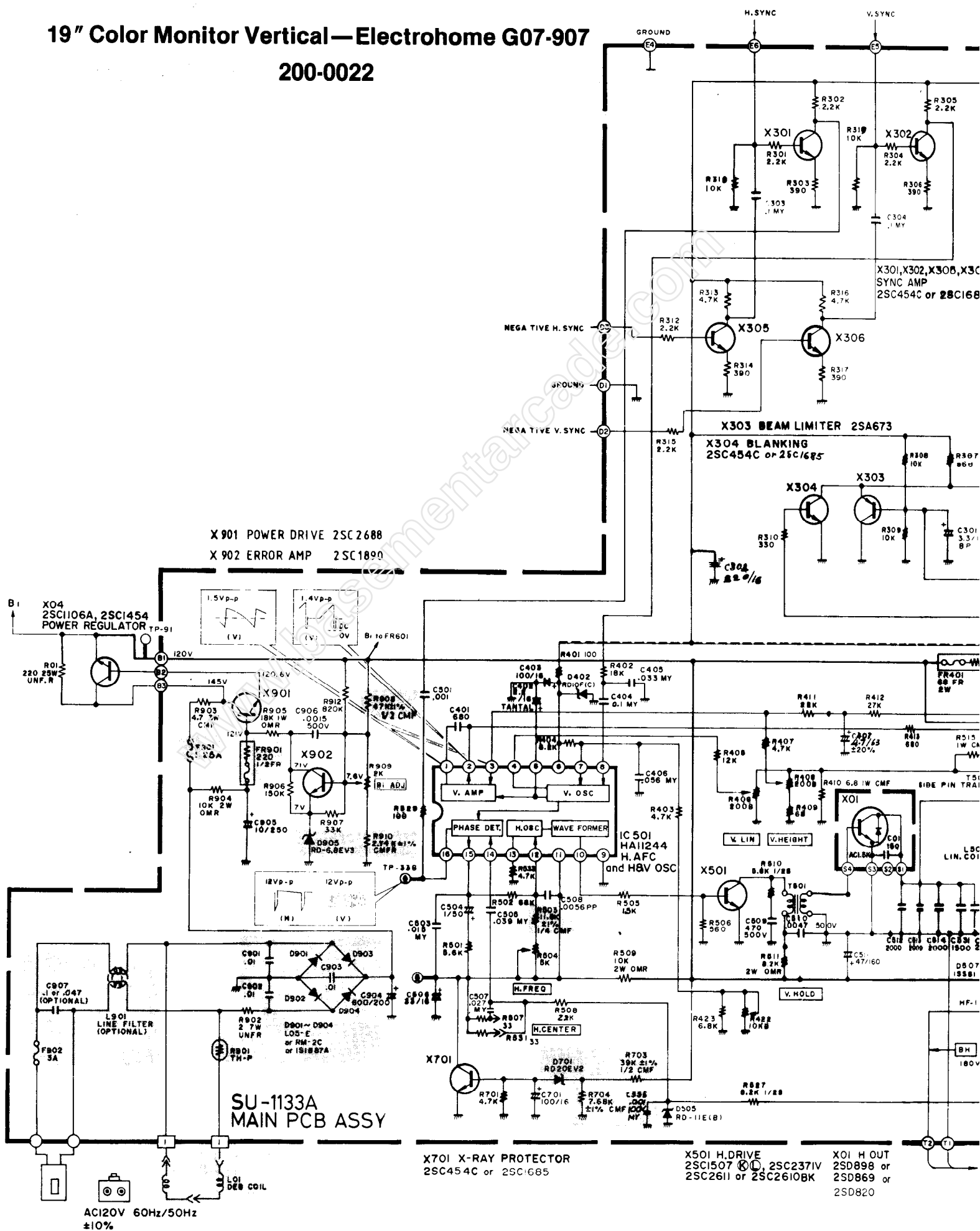


QTY REQD	CODE IDENT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
PARTS LIST			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:		CONTRACT NO.	
FRACTIONS	DECIMALS	ANGLES	
±	.XX ±	±	
MATERIAL		APPROVALS	
		DATE	
FINISH		DRAWN GATTELL 12/11/80	
		CHECKED JEFF PACE 12-16-80	
NEXT ASSY		USED ON	
APPLICATION		DO NOT SCALE DRAWING	
		Gremlin Industries, Inc. San Diego, California 92123	
		G-80 POWER SUPPLY	
SIZE	CODE IDENT NO.	DRAWING NO.	REV
D		800-0191	H
SCALE NONE		SHEET 3 OF 3	

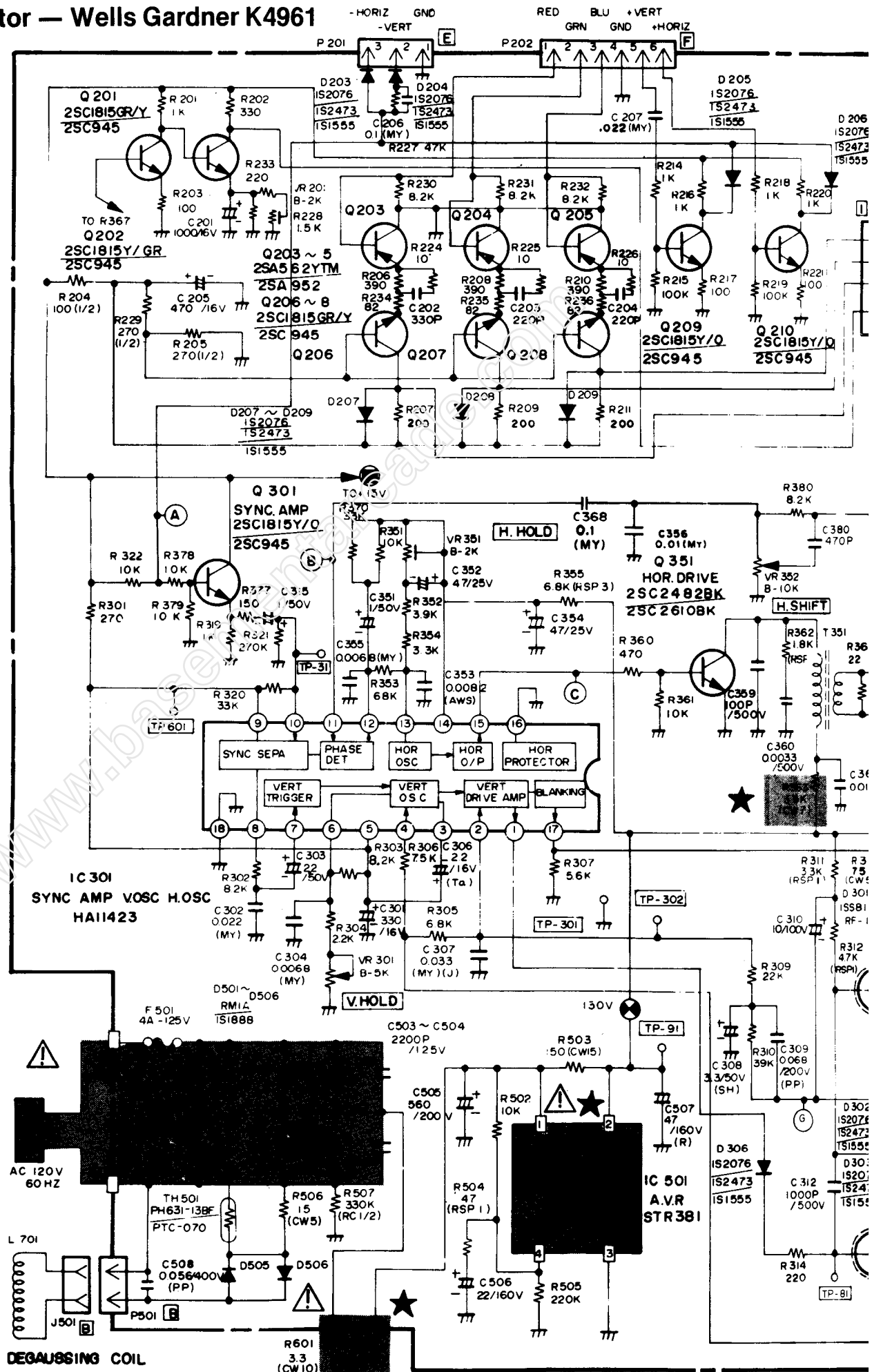


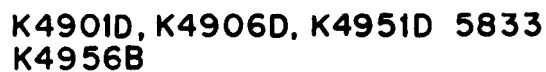


200-0022



19" Color Monitor — Wells Gardner K4961





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