

VCRfacts® Technical Service Data

VCR-278

MODELS PV-4603, PV-4609

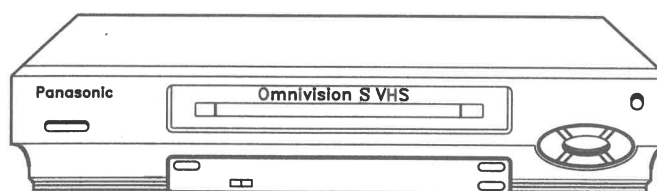
PANASONIC

INDEX

Exploded Views	1
IC Functions	4
Interconnect Diagram	3
Important Parts Information	4
Mechanical Alignment	1
Parts List	
Electrical	4
Mechanical	1
Safety Precautions	1
Schematics	
Audio / Video Jack Board	2
Capstan Motor Drive Board	3
Head Amp Board	3
Main Board	2
Power Supply Board	3
UHF/VHF Tuner & TV Demodulator Unit	2, 3
Schematic Notes	4
Service Information	1
Service Tips	4
Waveforms	4

PANASONIC

Models PV-4603, PV-4609



The following model is similar to this basic coverage and may effectively be repaired using this service information. However, minor differences may be found between this model and those in the basic coverage.

BRAND	MODEL
QUASAR	VHQ650

**Essential coverage
for servicing a video cassette recorder...**

- | | |
|-------------------------|-------------------------|
| • Schematics | • Exploded Views |
| • Interconnect Diagram | • Mechanical Alignment |
| • Electrical Parts List | • Mechanical Parts List |
| • Waveforms | • Service Information |



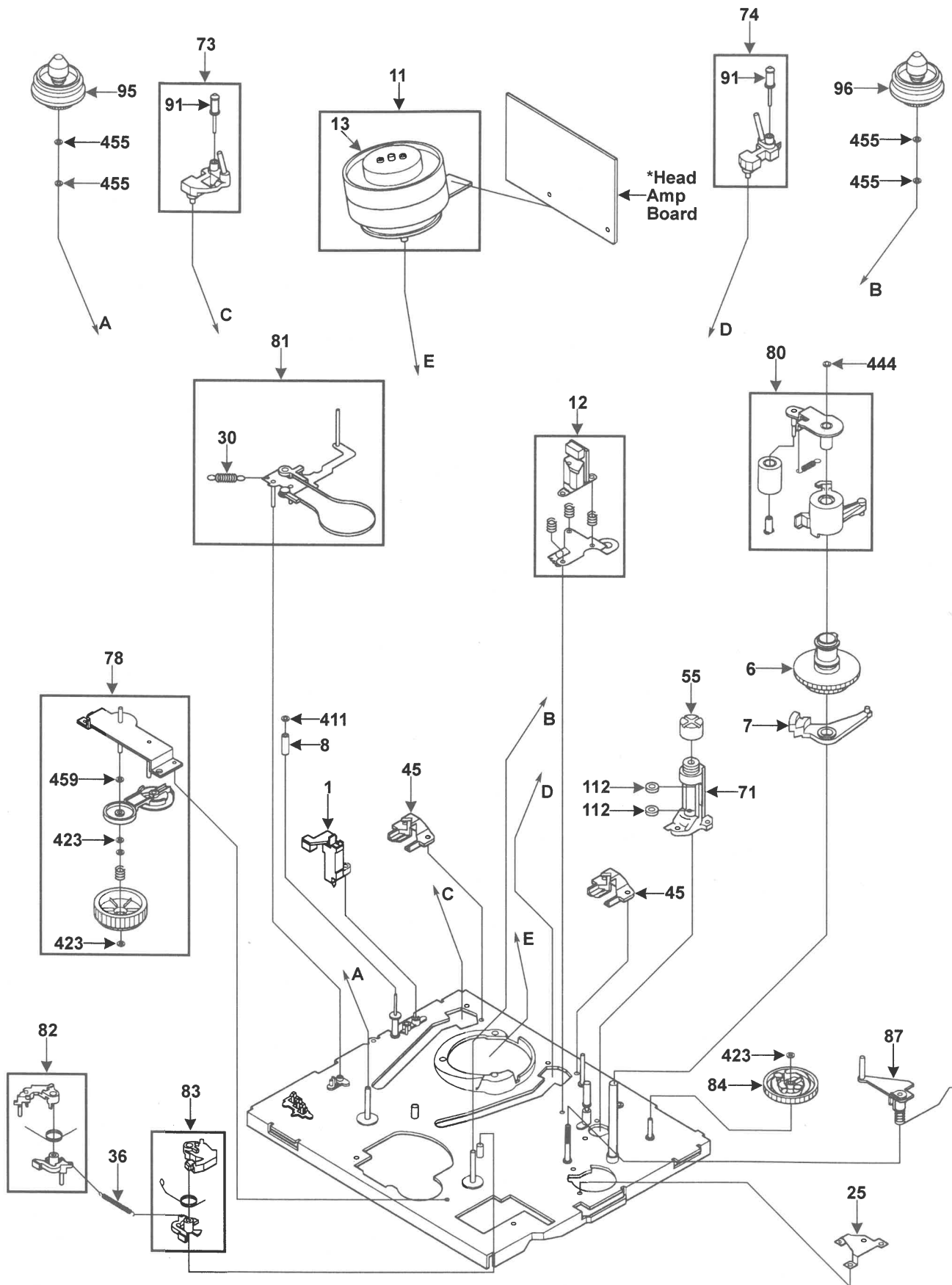
HOWARD W. SAMS & COMPANY

JULY 1996 VCR-278

For Supplier Address,
See PHOTOFACT Annual Index

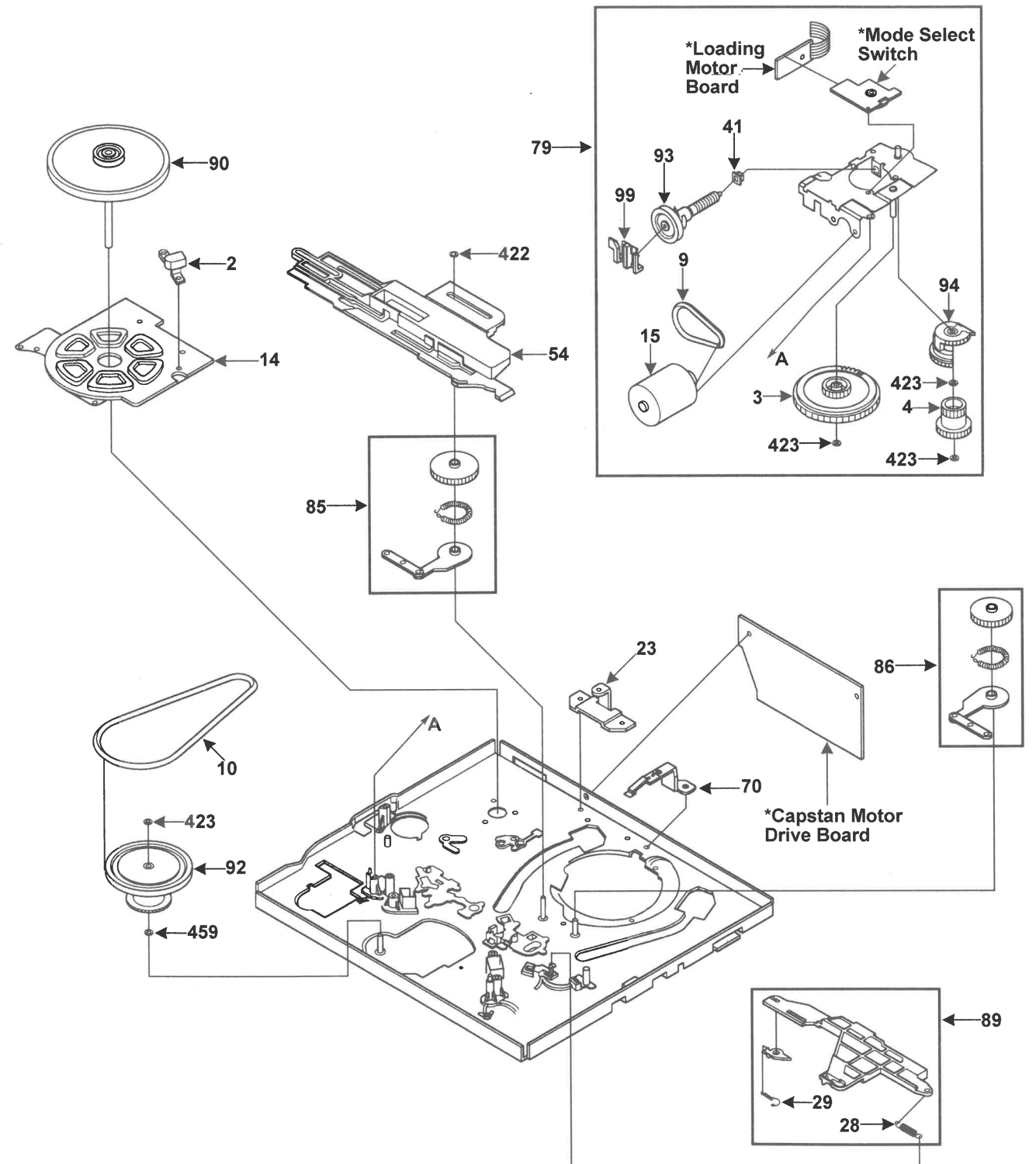
VCR-278

EXPLODED VIEW - TOP



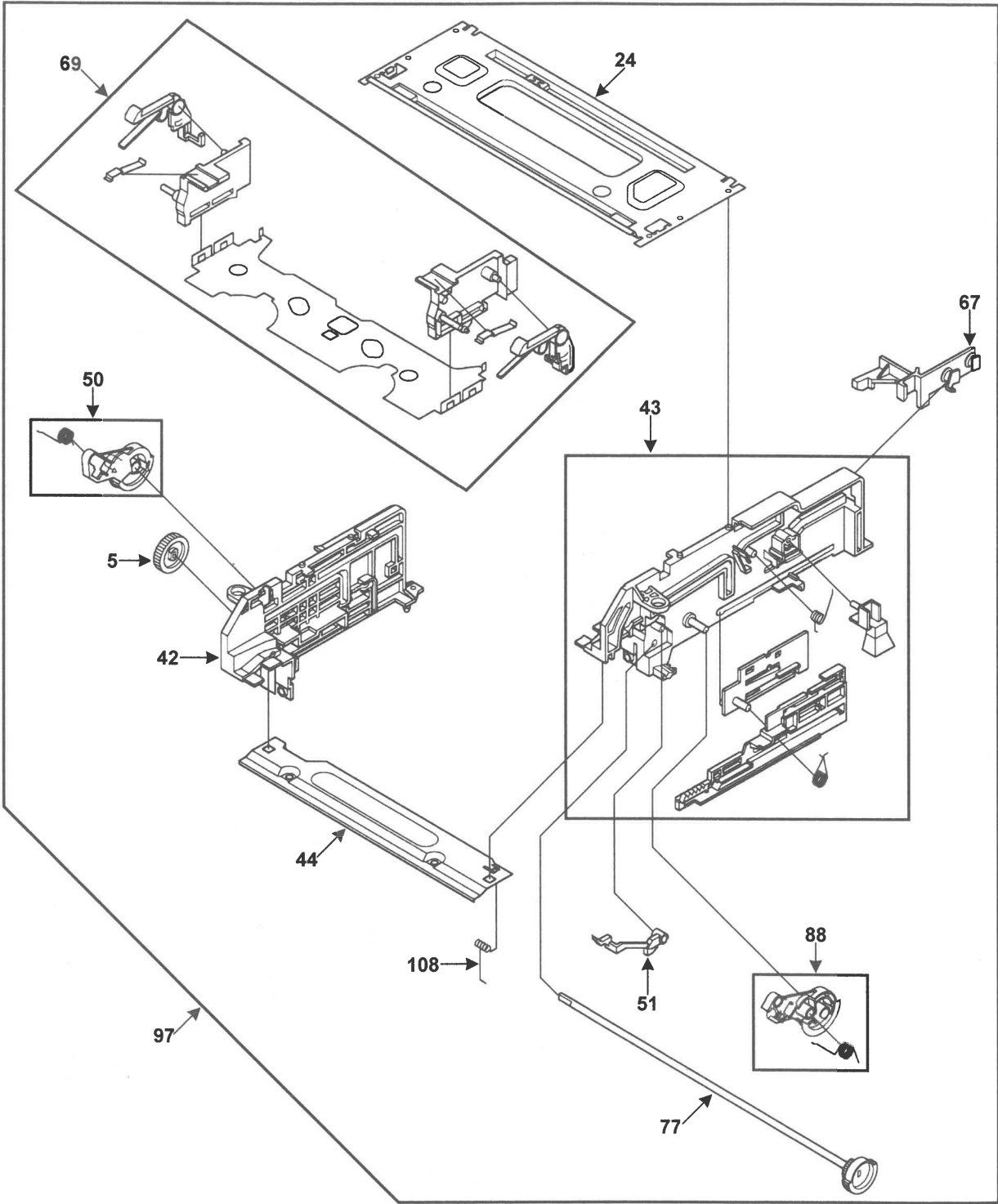
***See Electrical Parts List.**

EXPLODED VIEW - BOTTOM



***See Electrical Parts List.**

EXPLODED VIEW - CASSETTE UP ASSEMBLY



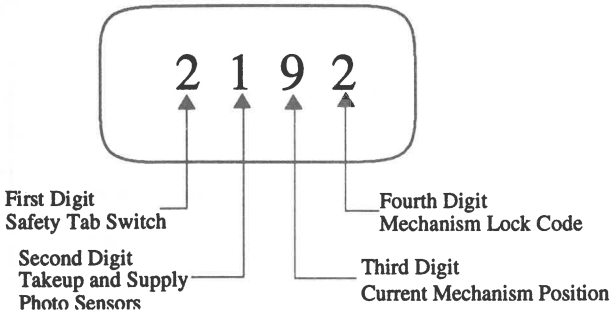
SERVICE INFORMATION

SELF-DIAGNOSIS SYSTEM

This VCR contains a self-diagnostic system that will show the cause of a mechanism problem. The self-diagnostic system displays a four digit code on the front panel display. The four digit code is retained for about twelve hours after a problem is detected. The four digit code is cleared after being displayed and the power button depressed.

Entering Self-Diagnosis System

To enter the self-diagnostic system, the VCR must be turned off. Press and hold the fast forward button on the VCR front panel for about 3 seconds. The front panel display will show the following.



OPERATION BUTTONS CHECK

While entering the self-diagnostic system, press any operation button on the front panel or remote control. If the operation button is detected, the first digit of the four digit code will change to zero.

SERVICE POSITION 1

This service position is used for checking and replacing mechanical and electrical parts. Remove the top cover, power supply assembly, and front panel assembly. Remove the audio/video jack assembly in model PV-4609 only. After removing the two screws, remove the bottom panel. Remove the ten screws and chassis plate that hold the main board and complete mechanism to the frame. Remove the main board and complete mechanism from the frame. Remove the two screws from the bottom of the main board. Tilt the front of the complete mechanism from the main board and use the frame as a prop. Reinstall the audio/video jack assembly in model PV-4609 only. Reinstall the power supply assembly. Refer to the Service Mode section of this guide.

SERVICE POSITION 2

This service position is used to check mechanism and electronic circuits. Remove the top cover and front panel assembly. Remove the screw from the middle of the bottom panel. Remove the eight screws that hold the complete mechanism and chassis plate to the frame. Remove the ten screws and chassis plate that hold the main board and complete mechanism to the frame. Remove the main board and complete mechanism from the frame. Remove the two screws from the bottom of the main board. Tilt the front of the cassette mechanism from the complete mechanism and use the chassis plate frame as a prop. Refer to the Service Mode section of this guide.

Explanation of the Four Digit Code

Code No.

First Digit	Safety tab switch is off.	1		
	Safety tab switch is on.	2		
Second Digit	No light detected at any sensor.	1		
	Light detected at takeup sensor.	2		
	Light detected at supply sensor.	3		
	Light detected at both sensors.	4		
Third Digit	Eject mode.		1	
	Between eject and stop modes.		2	
	Stop mode.		3	
	Between stop and review modes.		4	
	Review mode.		5	
	Between review and standby modes.		6	
	Standby mode.		7	
	Between standby and play/cue/slow/still modes.		8	
	Play/cue/slow/still mode.		9	
	Fast forward/rewind modes.		A	
Fourth Digit	Normal operation.			0
	Reel is locked-up.			1
	Cylinder is locked-up.			2
	Mechanism is locked-up.			3
	Cassette locked-up in unloading direction.		1	4
	Cassette locked-up in loading direction.		2	4

NOTE: When the fourth digit displays 1 through 4, the VCR will go into shut-off and all function buttons except power, will become inoperative.

SERVICE MODE

This mode allows the mechanism to operate without a cassette inserted. This is done by disabling the end of tape sensors, reel sensors, and cylinder lock sensor. The VCR must be turned off to enter the Service Mode. To enter the Service Mode, press and hold the VCR/TV and channel down buttons on the VCR front panel for about five seconds or place a jumper between TP6001 and ground. The power comes on and the mechanism will work without a cassette inserted. To exit the Service Mode, press the power button or remove AC power.

MEMORY RESETING

To reset the channel, clock, and language functions, press and hold the play and rewind buttons on the VCR front panel for about five seconds.

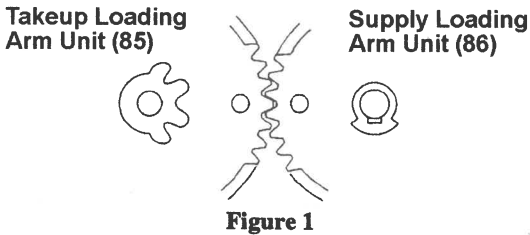
MECHANICAL ALIGNMENT

Numbers in parenthesis indicate the number used in the Mechanical Parts List and Exploded Views. All alignments are made with the VCR in the eject mode.

GEAR ALIGNMENT

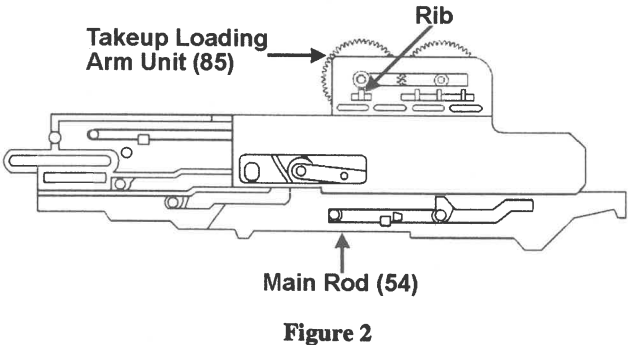
Takeup Loading Arm Unit / Supply Loading Arm Unit

Align the takeup loading arm unit (85) with the supply loading arm unit (86) as shown in figure 1.



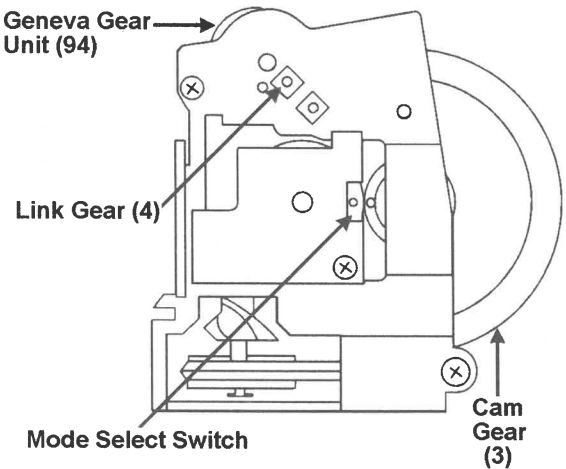
Takeup Loading Arm Unit / Main Rod

Align the shaft of the takeup loading arm unit (85) with the rib on the main rod (54) as shown in figure 2.



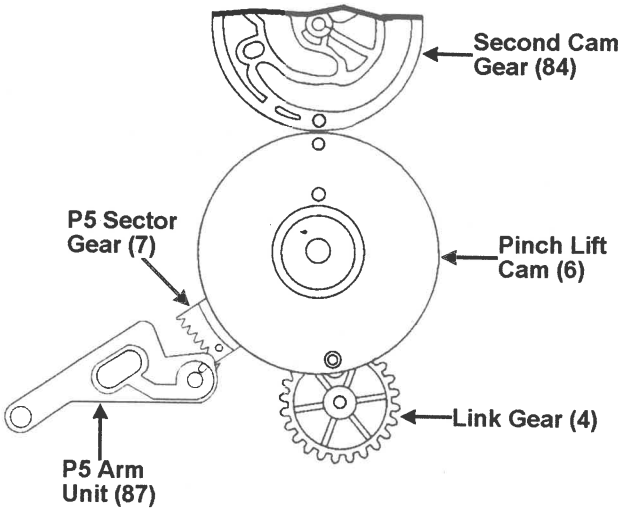
Cam Gear / Link Gear / Geneva Gear Unit

Align the geneva gear unit (94) and the mode select switch with the cam gear (3) as shown in figure 3. Align the holes on the link gear (4) with the holes on the geneva gear unit and the cam gear.



P5 Arm Unit / P5 Sector Gear / Pinch Lift Cam / Link Gear / Second Cam Gear

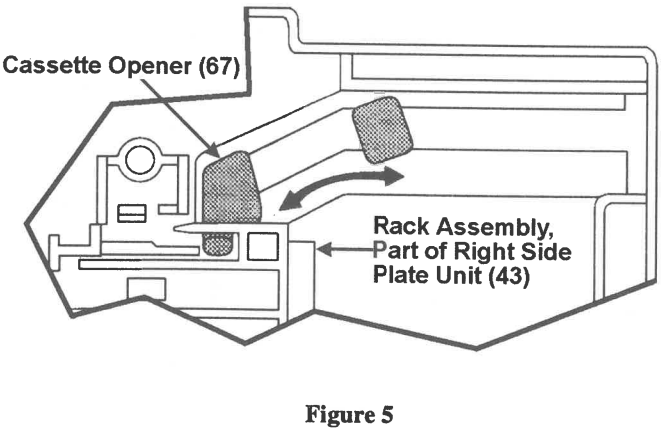
Align the P5 arm unit (87) with the P5 sector gear (7). Align the pinch lift cam (6) with the link gear (4). Align the second cam gear (84) with the pinch lift cam. See figure 4.



CASSETTE UP ASSEMBLY ALIGNMENT

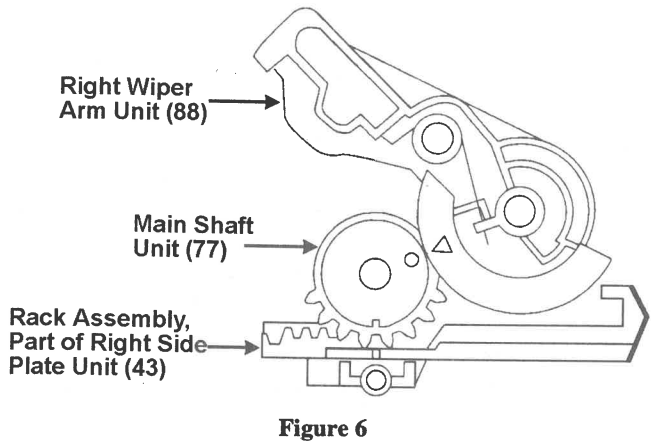
Cassette Opener / Rack Assembly

Align the cassette opener (67) with the rack assembly, part of the right side plate unit (43). See figure 5.



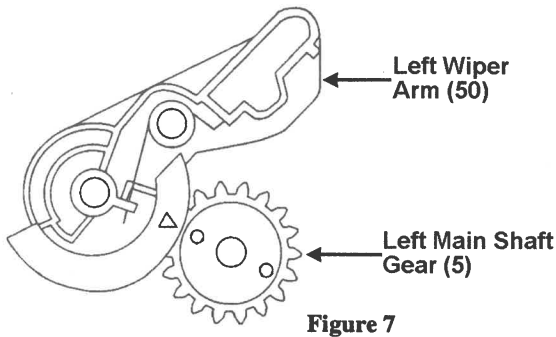
Main Shaft Unit / Rack Assembly / Right Wiper Arm Unit

Align the main shaft unit (77) with the rack assembly, part of the right side plate unit (43). Align the right wiper arm unit (88) with the main shaft unit. See figure 6.



Left Main Shaft Gear / Left Wiper Arm Unit

Align the left main shaft gear (5) with the left wiper arm unit (50) as shown in figure 7.



MECHANICAL PARTS LIST

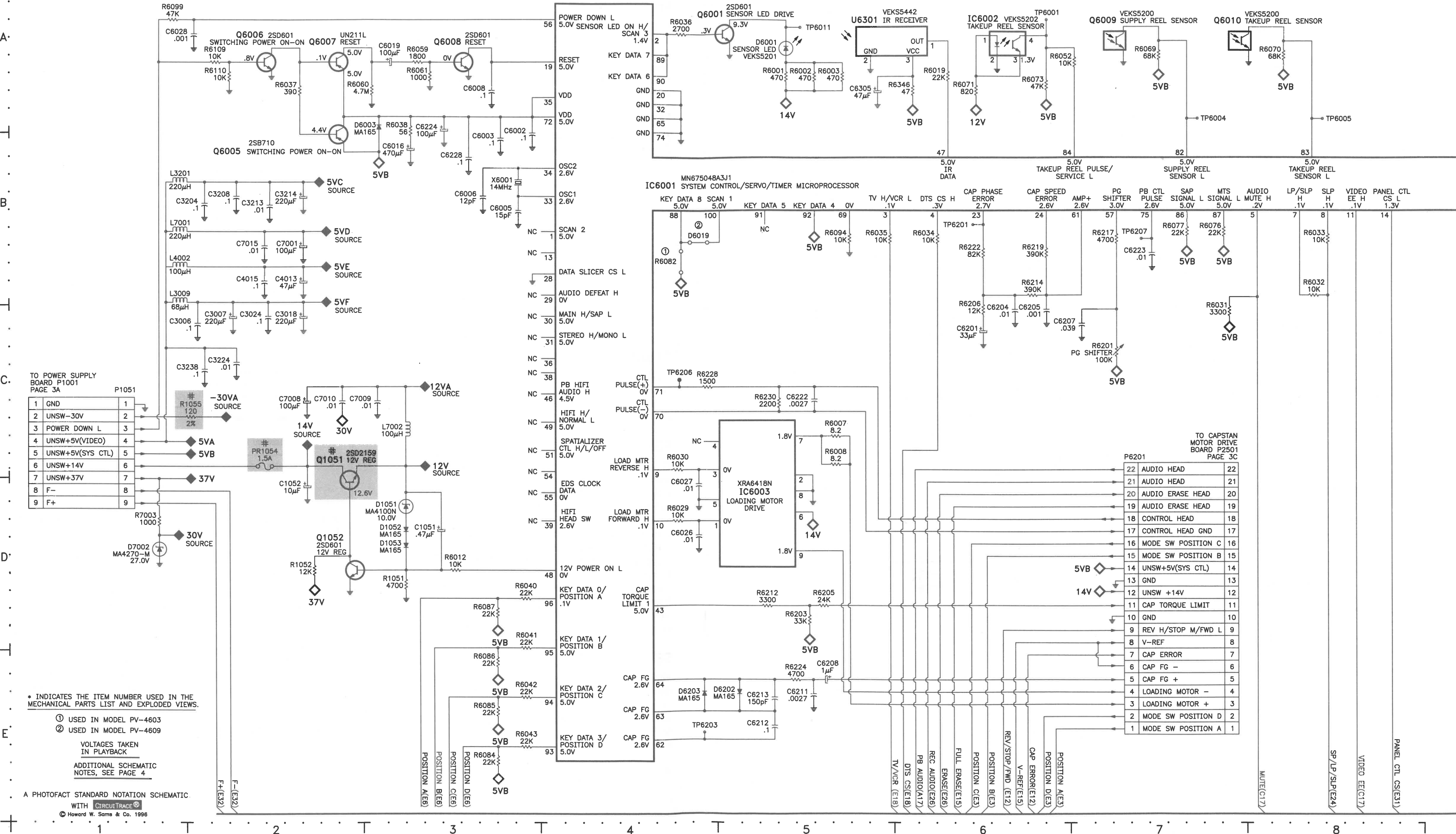
Item No.	Description	Part No.	Item No.	Description	Part No.	Item No.	Description	Part No.
1	Full Erase Head Unit	VEPS0541	43	Right Side Plate Unit	VXAS1709	86	Supply Loading Arm Unit	VXLS0852
2	FG Head	VBKS0024	44	Cassette Guide	VMAS2100	87	P5 Arm Unit	VXLS1012
3	Cam Gear	VDGS0416	45	Post Stopper	VMDS0942	88	Right Wiper Arm Unit	VXLS1027
4	Link Gear	VDGS0415	50	Left Wiper Arm Unit	VXLS1026	89	Secondary Rod Unit	VXMS0129
5	Left Main Shaft Gear	VDGS0408	51	Cassette Door Opener (1)	VMLS0951	90	Capstan Rotor Unit	VXPS0367
6	Pinch Lift Cam	VDGS0409		Cassette Door Opener (2)	VMLS0959	91	Roller Post Unit	VXPS0374
7	P5 Sector Gear	VDGS0412	54	Main Rod	VMMS0105	92	Clutch Unit	VXPS0376
8	P1 Roller	VDPS0210	55	Thrust Screw Unit	VXDS0190	93	Worm Unit	VXPS0369
9	Loading Motor Belt	VDVS0069	67	Cassette Opener	VMLS0948	94	Geneva Gear Unit	VXPS0372
10	Capstan Belt	VDVS0070	69	Cassette Holder Unit	VXAS1716	95	Supply Reel Table	VDRS0053
11	Upper and Lower Cylinder Unit	VEGS0387	70	Earth Plate Unit	VXBS0058	96	Takeup Reel Table Unit	VXRS0062
12	Audio Control Head Unit	VEHS0548	71	Capstan Holder Unit	VXDS0180	97	Cassette Up Assembly (1)	VXYS0945
13	Upper Cylinder Unit	VEHS0554	73	Supply Loading Post Base Unit	VXDS0186		Cassette Up Assembly (2)	VXYS1063
14	Capstan Stator Unit	VEMS0295	74	Takeup Loading Post Base Unit	VXDS0187	99	Worm Shaft Support B	VDBS0341
15	Loading Motor Unit	VEMS0296	77	Main Shaft Unit (1)	VXJS0080	108	Earth Spring	VMBS1091
23	PC Board Bracket	VMAS2094		Main Shaft Unit (2)	VXJS0081	112	Dust Seal	VMXS0511
24	Top Plate	VMAS2099	78	Center Block Unit	VXKS0817	411	Cut Washer (3)	VMXS0664
25	Support Angle	VMAS2103	79	Motor Block Assembly	VXKS0778	422	Poly Slider Washer 2	XWGV2D5G
28	Rod Return Spring	VMBS1099	80	Pressure Roller Arm Unit	VXLS1014	423	Cut Washer (3)	VMXS0336
29	Release Piece Spring	VMBS0896	81	Tension Arm Unit	VXLS1019	444	Cut Washer (3)	VMXS0857
30	Tension Spring	VMBS1103	82	Supply Brake Unit	VXLS0843	455	Poly Slider Washer 3	XWGV3Z54G
36	Main Brake Spring	VMBS0910	83	Takeup Brake Unit	VXLS1018	459	Poly Slider Washer 3	XWGV3D54G
41	Worm Shaft Support A	VDBS0246	84	Second Cam Gear	VDGS0413			
42	Left Side Plate	VMDS0949	85	Takeup Loading Arm Unit	VXLS0850			

- (1) Used in models PV-4603.
(2) Used in models PV-4609.
(3) Cut washer is not reusable. If removed, replace with a new one.

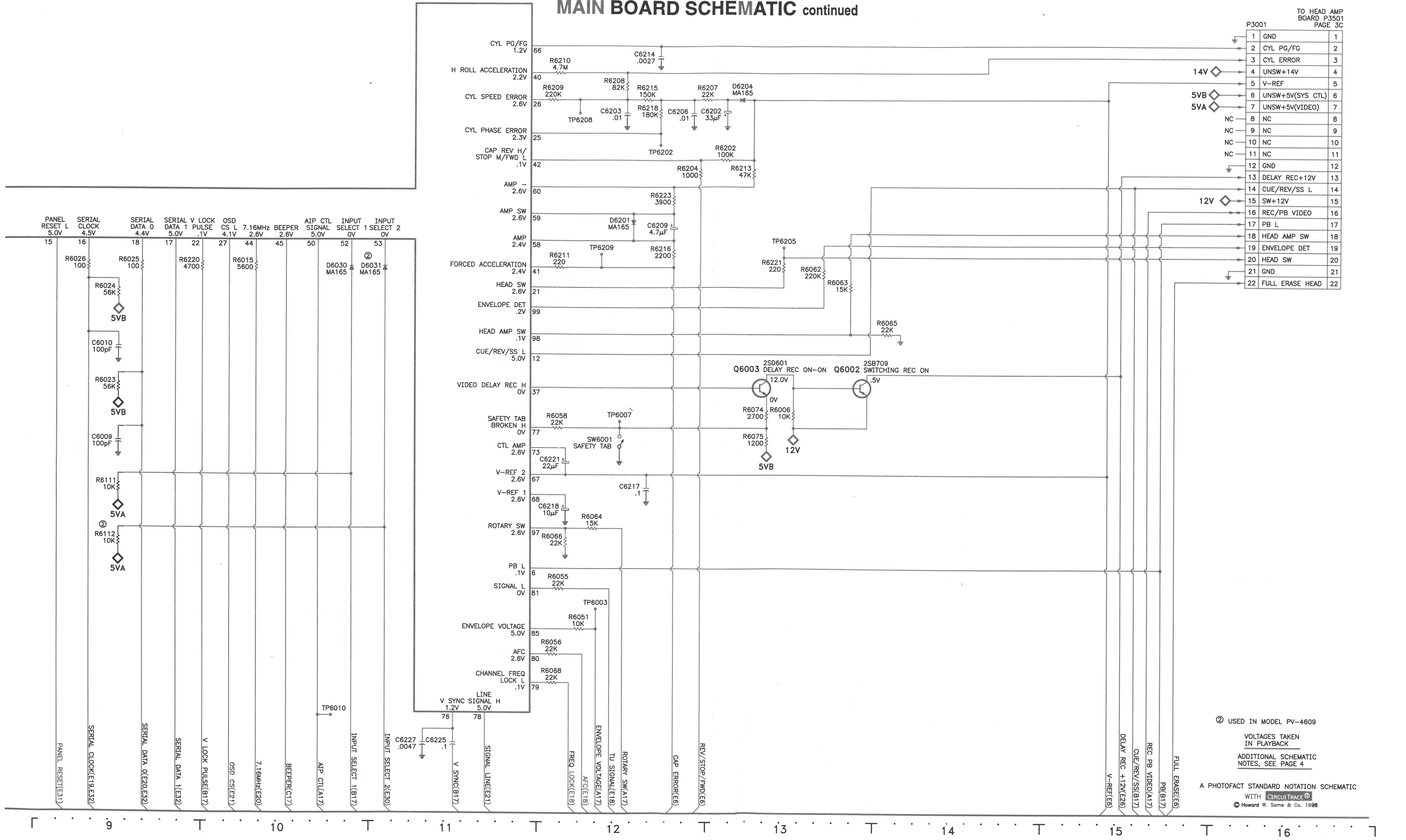
A

B

MAIN BOARD SCHEMATIC



MAIN BOARD SCHEMATIC continued



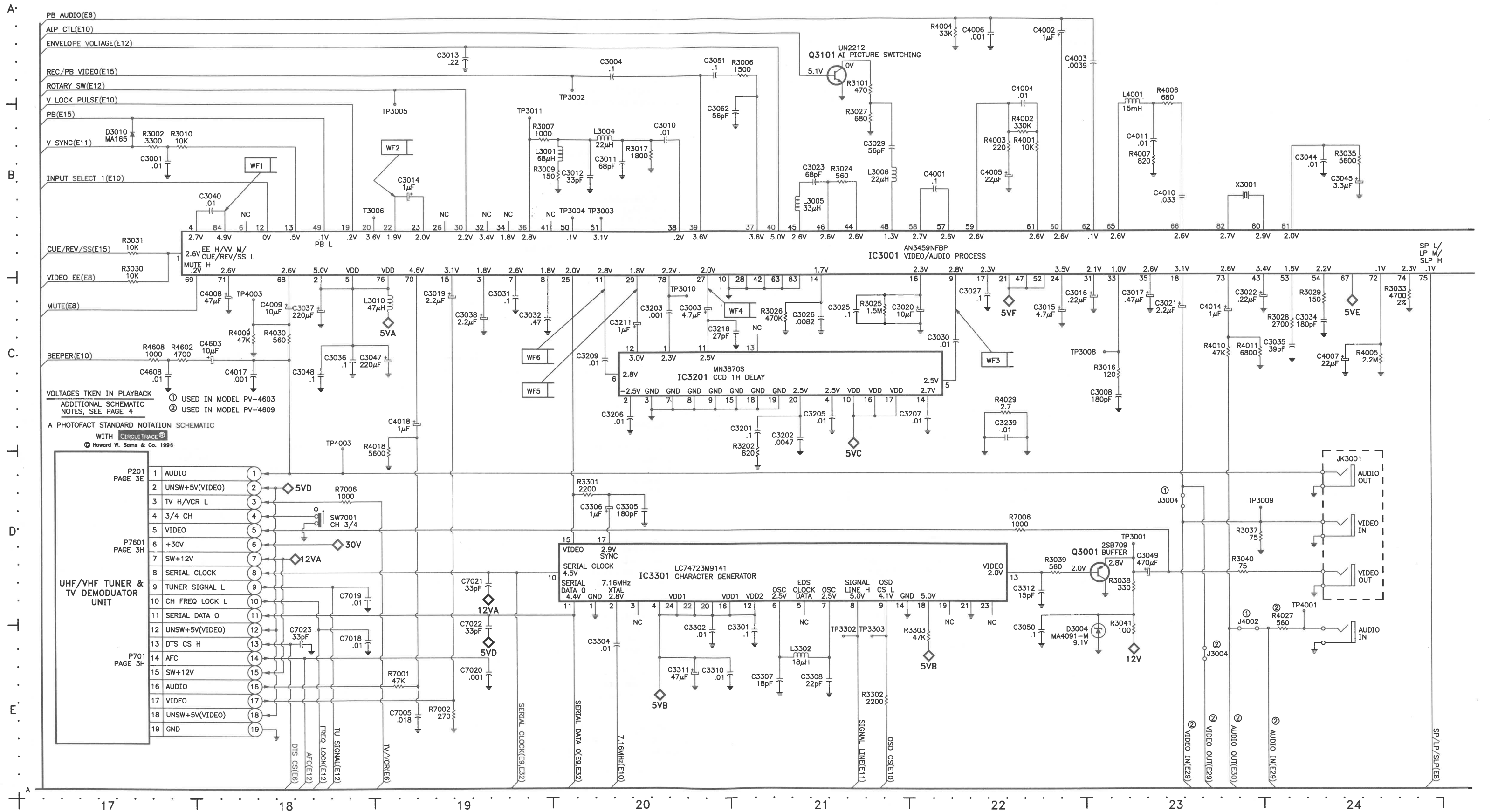
② USED IN MODEL PV-4609

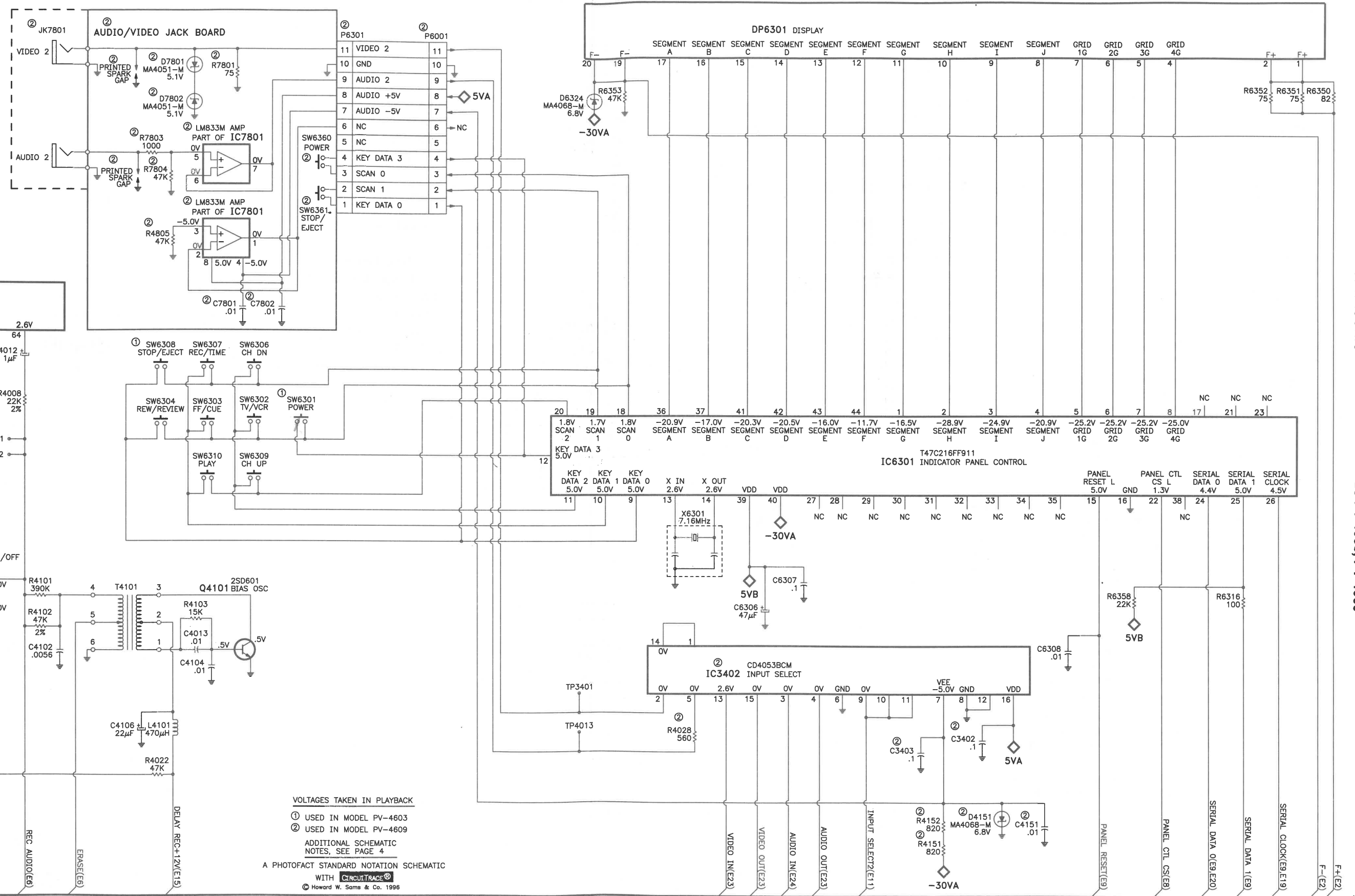
VOLTAGES TAKEN IN PLAYBACK

ADDITIONAL SCHEMATIC NOTES, SEE PAGE 4

A PHOTOFAC STANDARD NOTATION SCHEMATIC WITH CIRCUITTRACE © Howard W. Sams & Co. 1996

UHF/VHF TUNER & TV DEMODULATOR
UNIT, MAIN BOARD SCHEMATIC continued





VOLTAGES TAKEN IN PLAYBACK

① USED IN MODEL PV-4603
② USED IN MODEL PV-4609

ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 4

A PHOTOFACIT STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE®**
© Howard W. Sams & Co. 1996

SAFETY PRECAUTIONS

SERVICE WARNING

ONLY qualified service technicians who are familiar with safety checks and guidelines should perform service work. For continued SAFETY:

1. Before replacing parts, disconnect power source to protect electrostatically sensitive parts. Examples of typical electrostatically sensitive parts are integrated circuits, some field effect transistors, and semiconductor "chip" components.
2. Do not attempt to modify any circuit unless so recommended by the manufacturer.
3. When servicing chassis, use an isolation transformer between the line cord and power receptacle. Maintain AC line voltage at rated input.
4. Many electrical and mechanical parts are used in this VCR to provide protection against electrical shock, fire, and RF interference. These parts should be replaced with exact replacements only.
5. Use extreme caution when handling the printed circuit boards. Some semiconductor devices can be damaged easily by static electricity. Drain off any electrostatic charge on your body by touching a known earth ground. Wear a commercially available discharging wrist strap device. This should be removed prior to applying power to the VCR under test.
6. Use a grounded-tip, low voltage soldering iron. After removing an electrical assembly containing electrostatically sensitive parts, place the assembly on a conductive surface such as aluminum foil.
7. Minimize body movement to avoid building an electrostatic charge when handling electrostatically sensitive parts.
8. Use an isolation (times 10) probe on oscilloscope.
9. Do not remove or install boards with AC power applied.
10. Do not use freon-propelled sprays or vacuum operated desoldering devices. These can generate electrical charges sufficient to damage semiconductor devices.
11. This VCR is equipped with a grounded three-prong AC plug. This plug must fit into a grounded AC power outlet. Do not defeat the AC plug safety feature.
12. Periodically examine the AC power cord for damaged or cracked insulation.
13. The VCR cabinet is equipped with vents to prevent heat build-up. Never block, cover, or obstruct these vents. Instructions should be given, especially to children, that objects

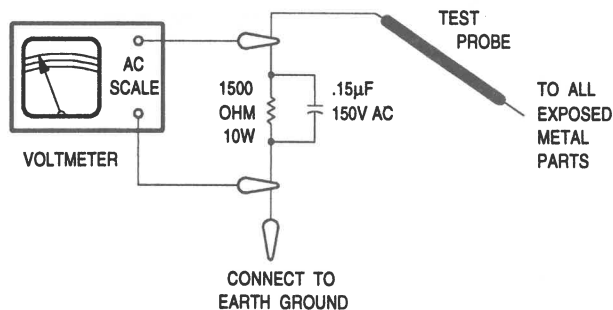
should not be dropped or pushed into the vents of the cabinet. This could cause shock or equipment damage.

14. Remove plug from AC outlet during electrical storms. Do not allow anything to rest on AC power cord. Unplug AC power cord from outlet before cleaning VCR.
15. Never use liquids or aerosols directly on the VCR. Spray on cloth and then apply to the VCR cabinet. Make sure the VCR is disconnected from the AC power line. Never expose the VCR to liquids. If exposed to liquids, turn the VCR off. Do not place the VCR near possible liquid sources.

SAFETY CHECKS -- FIRE AND SHOCK HAZARD

Hot Leakage Current Check

1. Plug the AC cord directly into AC outlet. DO NOT use an isolation transformer.
2. Use a 1500-ohm, 10-watt resistor in parallel with a .15-microfarad 150 Volts AC capacitor to connect between any exposed metal parts on the set and a good earth ground. (See figure below.)
3. Use an AC voltmeter with at least 5000 ohms-per-volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point.
4. Voltage readings should not exceed .3 volts RMS. Any value exceeding this limit constitutes a potential shock hazard and must be corrected.
5. If AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.



The listing of any available replacement part herein in no case constitutes a recommendation, warranty, or guarantee by Howard W. Sams & Company as to the quality and suitability of such replacement part. The numbers of the listed parts have been compiled from information furnished to Howard W. Sams & Company by the manufacturers of the specific type of replacement part listed.

Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein.

©1996 by Howard W. Sams & Company
A Bell Atlantic Company
2647 Waterfront Parkway East Drive, Suite 300
Indianapolis, IN 46214-2012

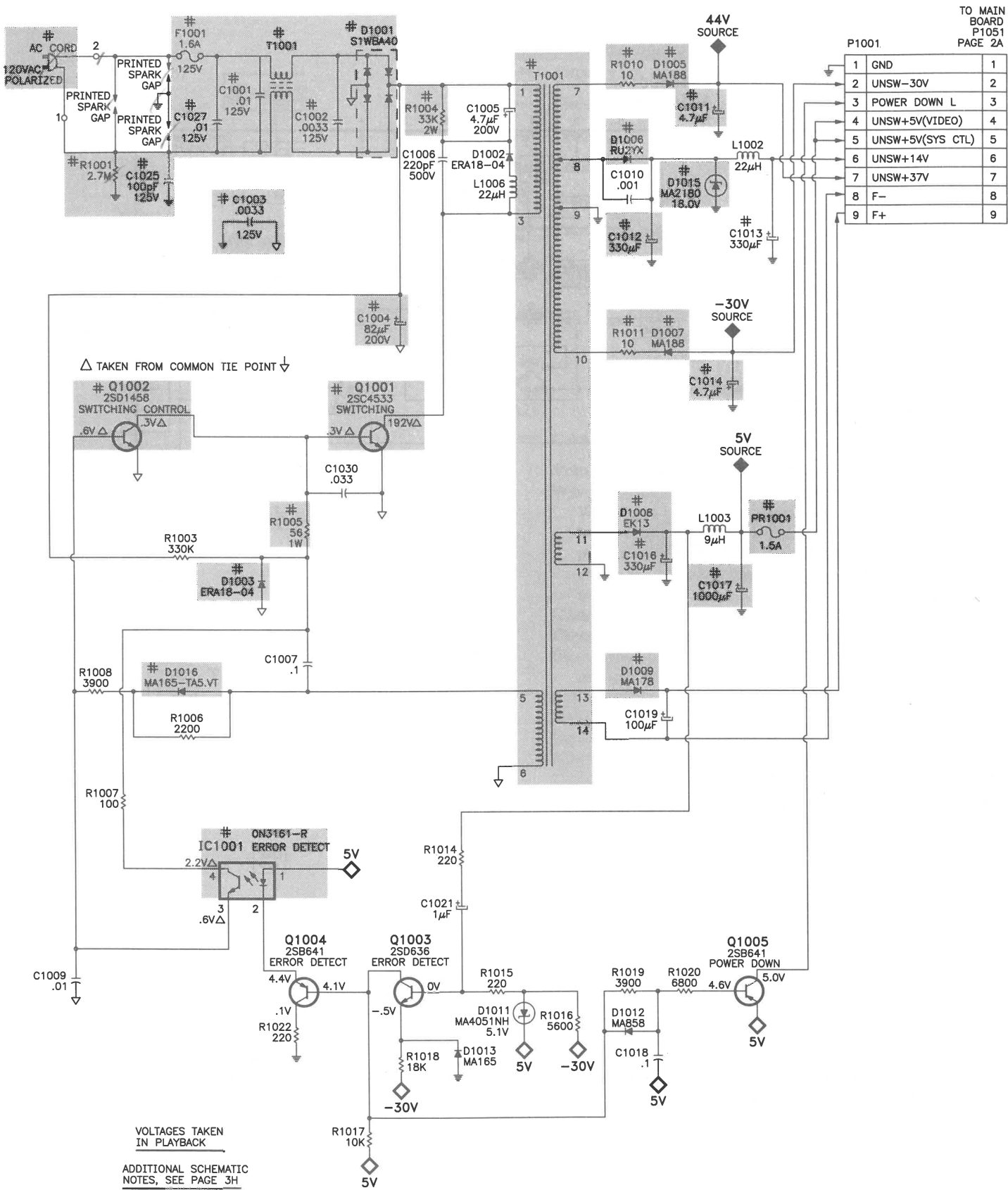
Printed in the United States of America 5 4 3 2 1



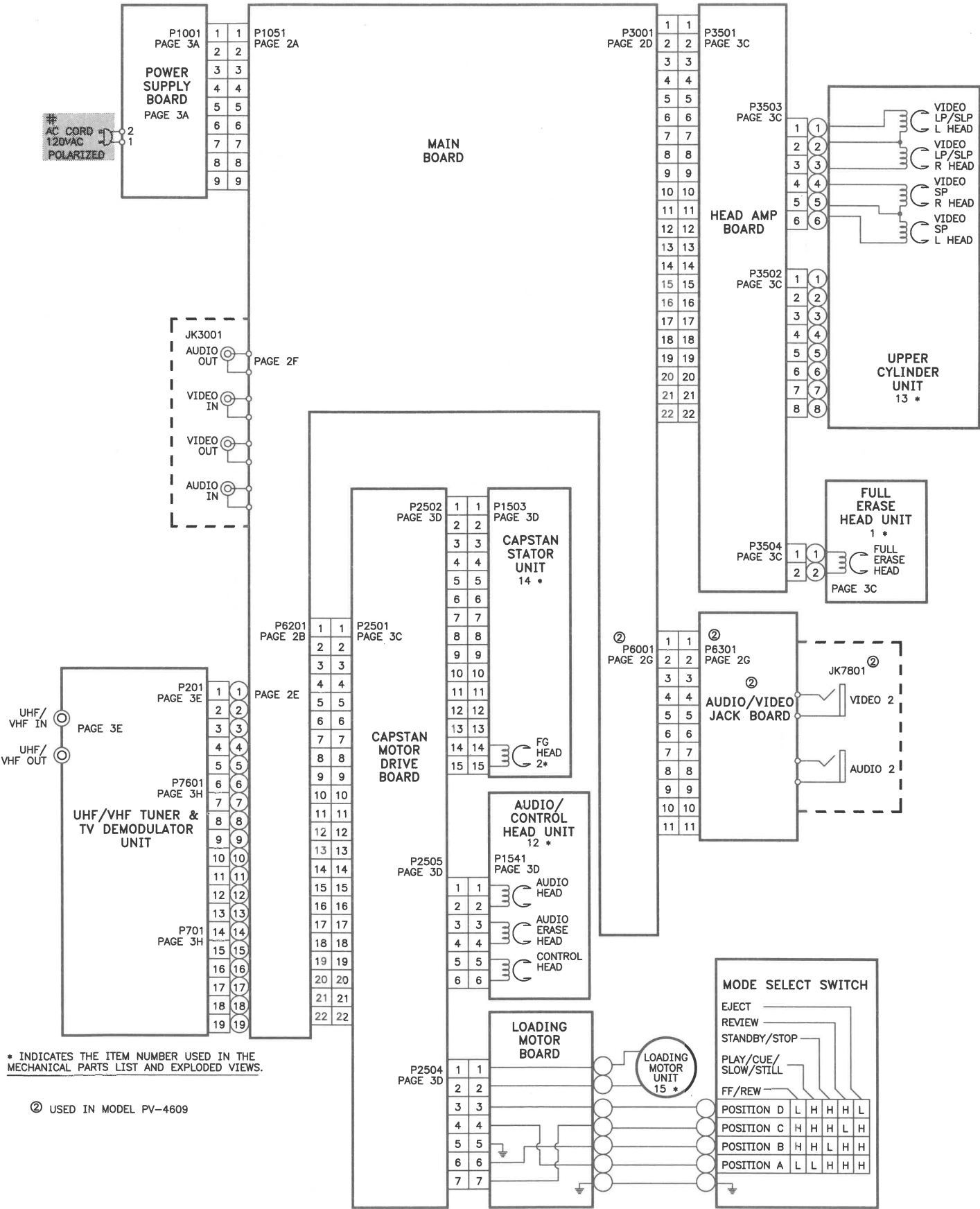
066278



A
POWER SUPPLY BOARD SCHEMATIC

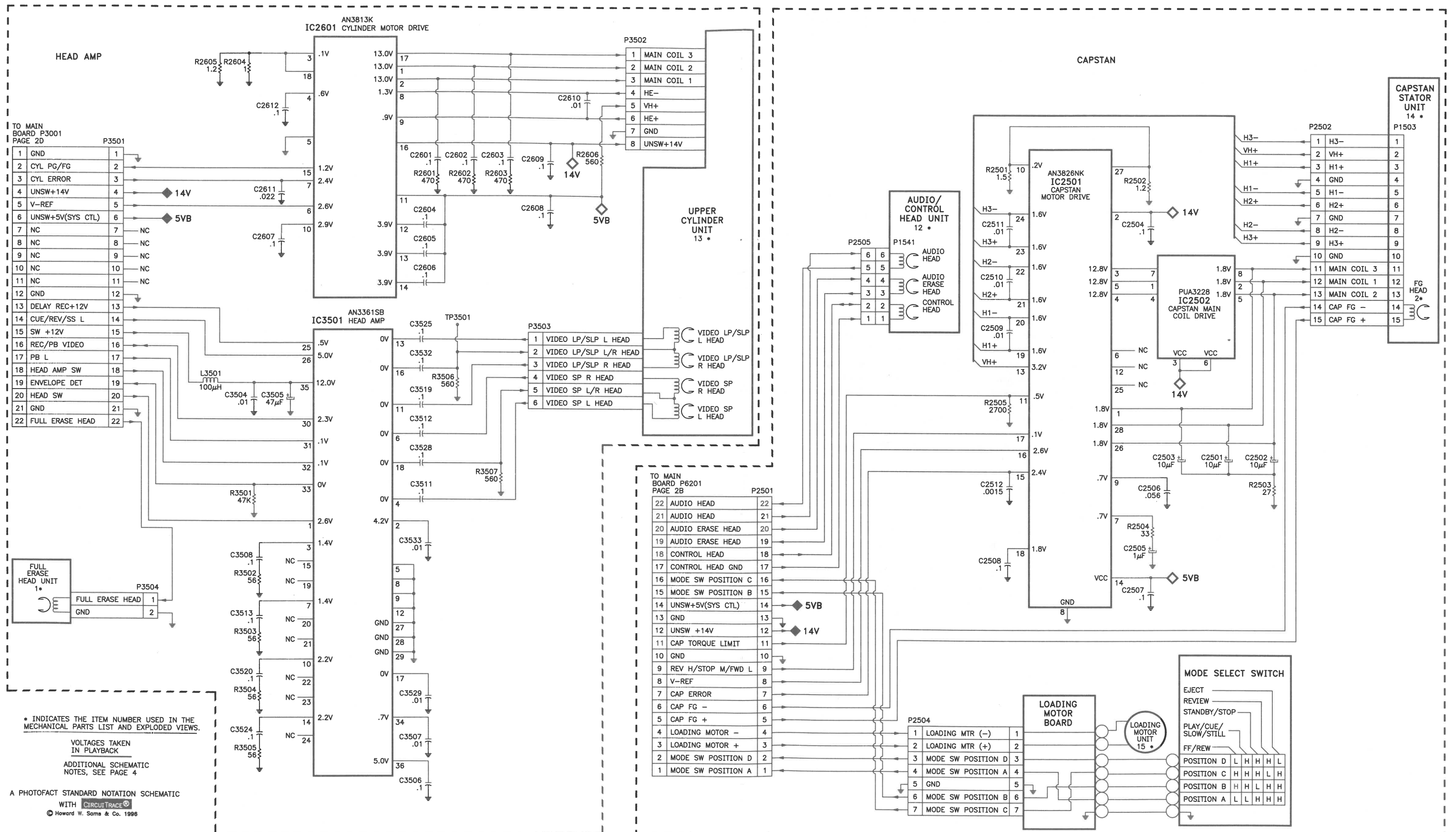


B
INTERCONNECT DIAGRAM

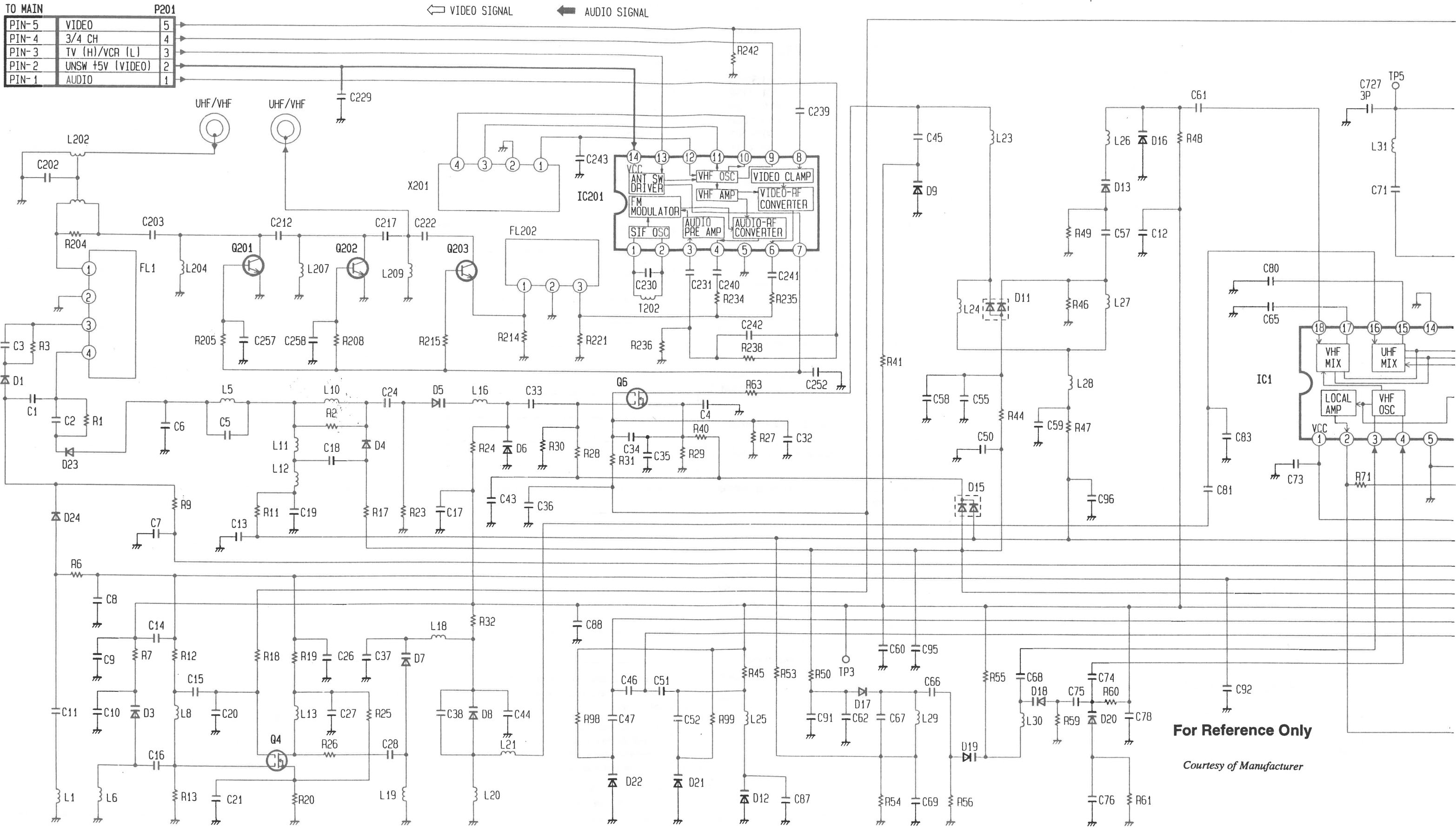


C HEAD AMP BOARD SCHEMATIC

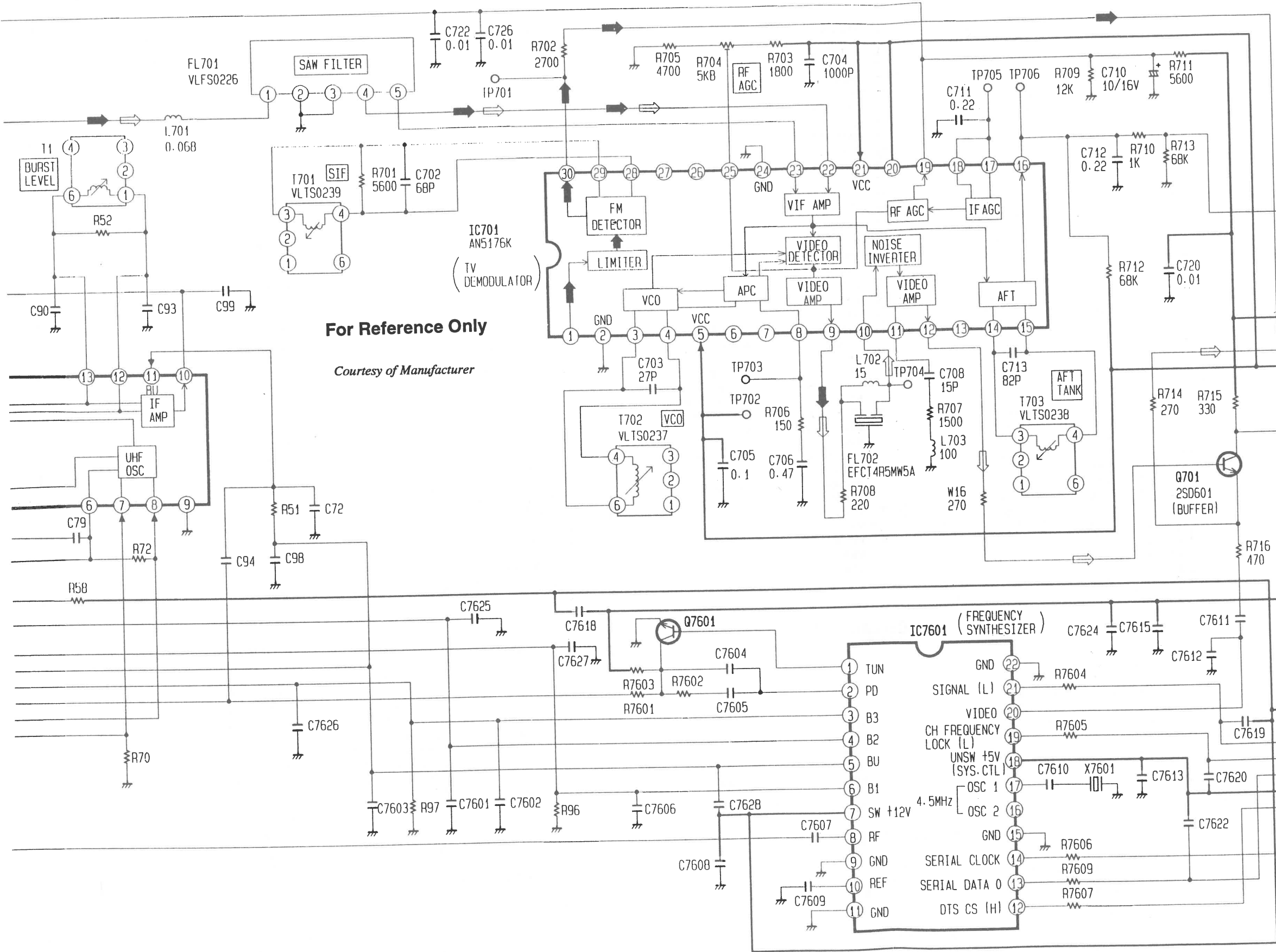
D CAPSTAN MOTOR DRIVE BOARD SCHEMATIC



UHF/VHF TUNER & TV DEMODULATOR UNIT SCHEMATIC



UHF/VHF TUNER & TV DEMODULATOR UNIT SCHEMATIC continued



IMPORTANT NOTICE:

- 1 IF PARTS OF TUNER AND FS SECTION ARE REPLACED INDIVIDUALLY, THE FCC SPECIFICATIONS WILL NOT BE SATISFIED. DURING SERVICING, PLEASE REPLACE AS-A UNIT.
- 2 SINCE THE UHF/VHF TUNER/TV DEMODULATOR UNIT HAS ALREADY BEEN PRE-ADJUSTED AT THE FACTORY, DO NOT TRY TO ADJUST THE UHF/VHF TUNER/TV DEMODULATOR UNIT. THE UHF/VHF TUNER/TV DEMODULATOR UNIT REPLACEMENT PART IS AVAILABLE ONLY AS A COMPLETE ASSEMBLY UNIT.

P701		TO TV MAIN	
14	AFC	PIN- 14	
15	SW +12V	PIN- 15	
16	AUDIO	PIN- 16	
17	VIDEO	PIN- 17	
18	UNSW +5V (SYS.CTL)	PIN- 18	
19	GND	PIN- 19	

BAND SELECTION CHART

B2	B3	BU	CHANNEL
11V	0V	0V	2CH-6CH 5A, A-5-A-1, A, B
6V	11V	0V	7CH-13CH C-KK
0V	0V	11.5V	14CH-69CH 65CH-94CH (CATV) 100CH-125CH (CATV) LL-EEE

NOTE: THE VOLTAGES ARE APPROXIMATE.

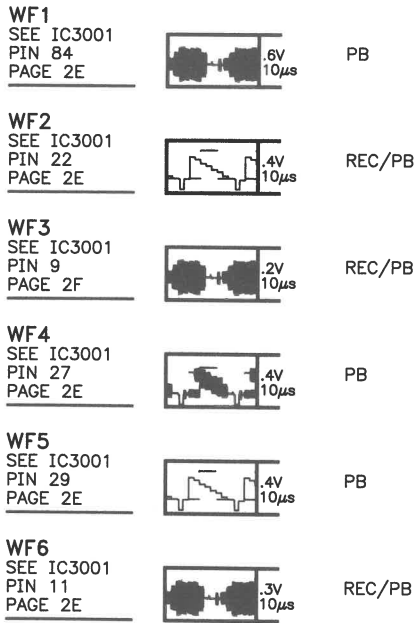
P7601		TO TV MAIN	
6	+30V	PIN- 6	
7	SW +12V	PIN- 7	
8	SERIAL CLOCK	PIN- 8	
9	TUNER SIGNAL (L)	PIN- 9	
10	CH FREQUENCY LOCK (L)	PIN- 10	
11	SERIAL DATA 0	PIN- 11	
12	UNSW +5V (SYS.CTL)	PIN- 12	
13	DTS CS (H)	PIN- 13	

UNLESS OTHERWISE SPECIFIED:
WATTAGE OF RESISTORS ARE 1/8W AND 1/16W.

PANASONIC

MODELS PV-4603, PV-4609

WAVEFORMS



SCHEMATIC NOTES

For SAFETY use only equivalent replacement part, see parts list.

- * Circuitry not used in some sets.
- Circuitry used in some versions.
- ⏏ Ground
- ⏏ Chassis ground
- ⏏ Common tie point
- △ Taken from common tie point
- ◆ 12V SOURCE CIRCUI TRACE® point where a voltage source is developed in the power supply or on a board.
- ◆ 12V CIRCUI TRACE® point where a previously developed voltage source supplies voltage on a board.
- ◇ CIRCUI TRACE® point where a component, or a board, connects to a voltage source supply.

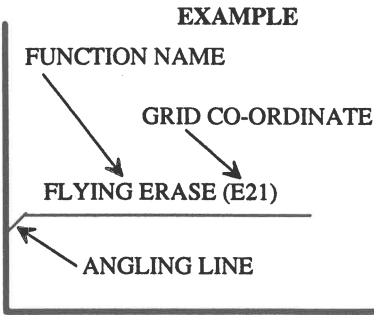
— Cabling: Heavy lines reduce use of multiple lines.

Voltages are taken from ground, unless noted otherwise.
Waveforms are taken from ground, unless noted otherwise.
Waveforms taken with triggered scope and NTSC color bar generator with window pattern. Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions. Supply voltages maintained as seen at input.

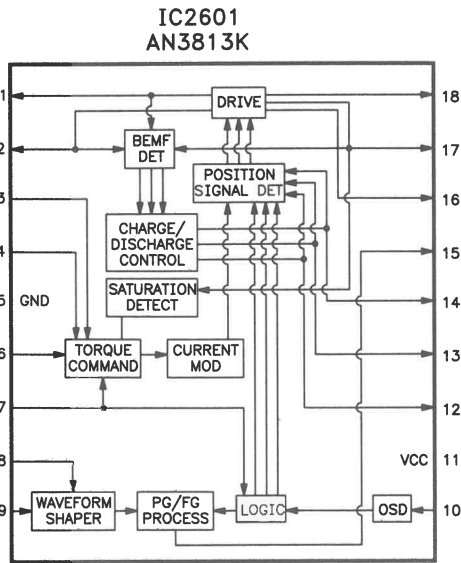
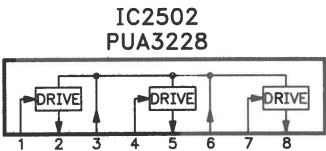
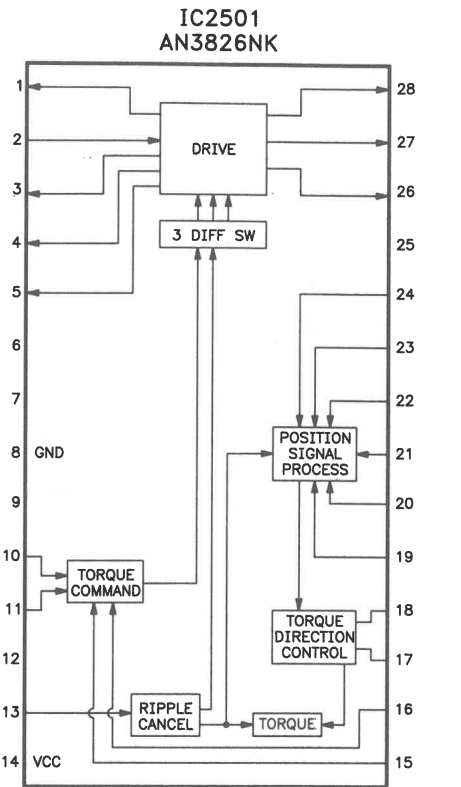
Controls adjusted for normal operation.
Capacitors are 50 volts or less, 5% or greater unless noted.
Electrolytic capacitors are 50 volts or less, 20% or greater unless noted.

Resistors are 1/2 W or less, 5% or greater unless noted.
Value in () used in some versions.
Measurements with switching as shown, unless noted.
Rated voltage shown on zener diodes.
Terminal identification may not be found on unit.

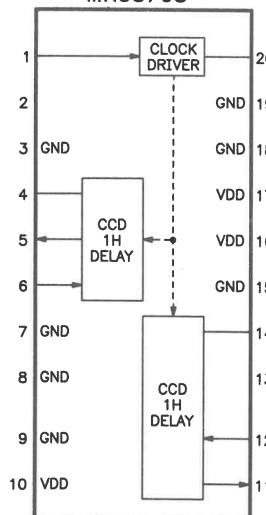
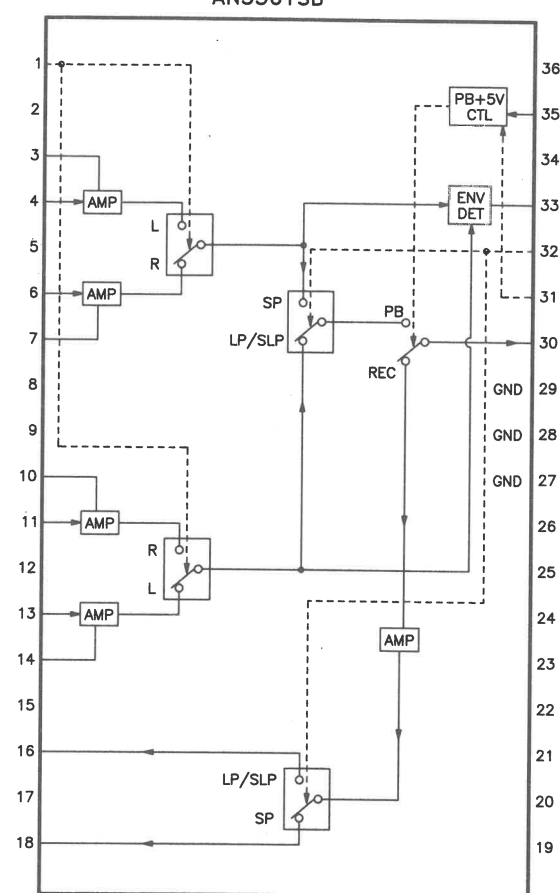
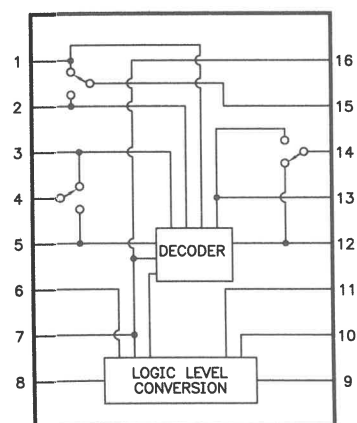
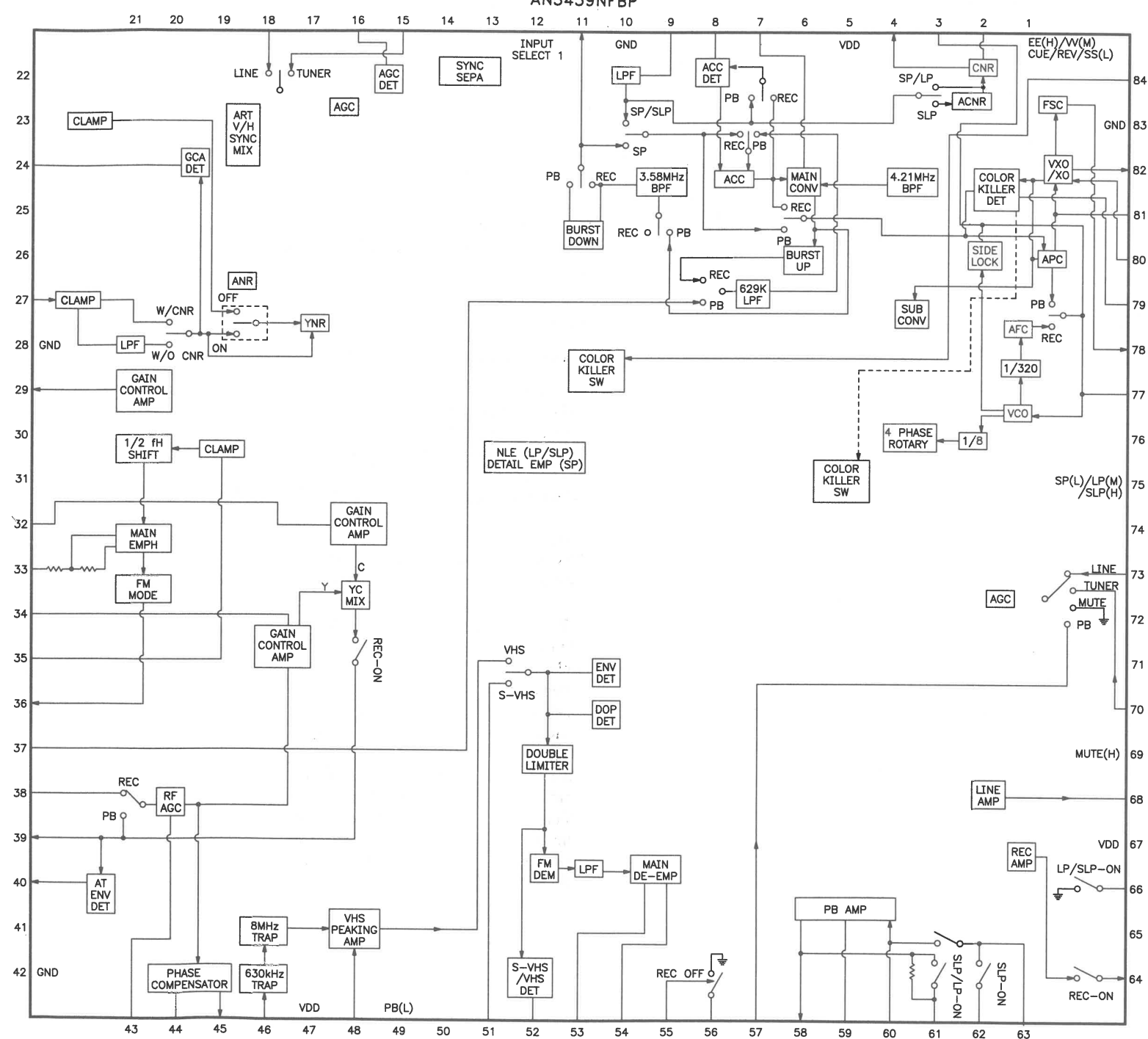
If a board schematic has a grid locator at the left and bottom sides, function names and (grid co-ordinates) are added to lines shown entering or exiting the heavy cabling line. The (grid co-ordinates) help to locate where the other connecting points to the same line are located on the same schematic or on another schematic of the same board. A further help has been to use an angling line to indicate direction of the same line exiting the heavy cabling line.



IC FUNCTIONS



IC FUNCTIONS continued

IC3201
MN3870SIC3501
AN3361SBIC3402
CD4053BCMIC3001
AN3459NFBP

ELECTRICAL PARTS LIST

Item No.	Description	Mfr. Part No.	Notes
AUDIO/VIDEO JACK BOARD			
SEMICONDUCTORS			
D7801, 02	-	MA4051-M	-
IC7801	-	LM833M	-
OTHER			
JK7801 (2)	Jack	VJHS0711	Assembly
SW6360	Switch	EVQ21405R	Power
SW6361	Switch	EVQ21405R	Stop/Eject
	PC Board	VEPS07608C1	Audio/Video Jack
CAPSTAN MOTOR DRIVE BOARD			
SEMICONDUCTORS			
IC2501	-	AN3826NK	-
IC2502	-	PUA3228	-
	PC Board	VEPS02221C1	Capstan Motor Drive
HEAD AMP BOARD			
SEMICONDUCTORS			
IC2601	-	AN3813K	-
IC3501	-	AN3361SB	-
	PC Board	VEPS5002A1	Head Amp
MAIN BOARD			
SEMICONDUCTORS			
D1051	-	MA4100N	-
D1052, 53	-	MA165	-
D3004	-	MA4091-M	-
D3010	-	MA165	-
D4151 (2)	-	MA4068-M	-
D6001	-	VEKS5201	-
D6003	-	MA165	-
D6030	-	MA165	-
D6031 (2)	-	MA165	-
D6201 Thru	-		-
D6204	-	MA165	-
D6324	-	MA4068-M	-
D7002	-	MA4270-M	-
IC3001	-	AN3459NFBP	-
IC3201	-	MN3870S	-
IC3301	-	LC74723M9141	-
IC3402 (2)	-	CD4053BCM	-
IC6001	-	MN675048A3J1	-
IC6002	-	VEKS5202	-
IC6003	-	XRA6418N	-
IC6301	-	T47C216FF911	-
# Q1051	-	2SD1581(T)	-
	-	2SD2159(T)	-
Q1052	-	2SD601(R)	-
Q3001	-	2SB709(R)	-
Q3101	-	UN2212	-
Q4001	-	2SB709A(R)	-
# For SAFETY use only equivalent replacement part.			

Item No.	Description	Mfr. Part No.	Notes
Q4002, 03	-	2SD601A(R)	-
Q4101	-	2SD601(R)	-
Q6001	-	2SD601(R)	-
Q6002	-	2SB709(R)	-
Q6003	-	2SD601(R)	-
Q6005	-	2SB710(R)	-
Q6006	-	2SD601(R)	-
Q6007	-	UN211L	-
Q6008	-	2SD601(R)	-
Q6009, 10	-	VEKS5200	-
OTHER			
DP6301	Tube	VEKS5381	Display
JK3001	Jack	VJHS0328	Assembly
# PR1054	IC Protector	ICP-N38-TP1	1.5Amp
	IC Protector	UNH00010FA	1.5Amp
	IC Protector	UNH000600A	1.5Amp
	IC Protector	VSFS0029D25	1.5Amp
# R1055	120 2% 1/4W	ERD2FCVG121T	-
R6201	100K	EVNCYAA03B15	PG Shifter
SW6001	Switch	VSHS0051	Safety Tab
SW6301 (1)	Switch	EVQ21309K	Power
SW6302	Switch	EVQ21309K	TV/VCR
SW6303	Switch	EVQ21309K	FF/Cue
SW6304	Switch	EVQ21309K	Rewind/Review
SW6306	Switch	EVQ21309K	Channel Down
SW6307	Switch	EVQ21309K	Record/Time
SW6308 (1)	Switch	EVQ21309K	Stop/Eject
SW6309	Switch	EVQ21309K	Channel Up
SW6310	Switch	EVQ21309K	Play
SW7001	Switch	VSSS0152	Channel 3/4
U6301	Receiver	VEKS5442	IR
X3001	Crystal	VSXS0195	-
X6001	Crystal	VSXS0191	14MHz
X6301	Crystal	EF0EC7164T4	7.16MHz
	PC Board (1)	VEPS6011GA1	Main
	PC Board (2)	VEPS6012GA1	Main
	UHF/VHF Tuner & TV Demodulator	VEQS0591	Unit
MISCELLANEOUS			
OTHER			
1 *	Head	VEPS0541	Full Erase, Unit
2 *	Head	VBKS0024	FG
12 *	Head	VEHS0548	Audio/Control, Unit
13 *	Upper Cylinder	VEHS0554	Unit
14 *	Capstan Stator	VEMS0295	Unit
15 *	Motor	VEMS0296	Loading, Unit
	PC Board	VJBS00C05	Loading Motor
	Switch	VSSS0150	Mode Select
	Transmitter	VSQS1402	IR
POWER SUPPLY BOARD			
SEMICONDUCTORS			
# D1001	-	SW1BA40	-
	-	SW1BA60	-
# For SAFETY use only equivalent replacement part.			

Item No.	Description	Mfr. Part No.	Notes
# D1002	-	EG01	-
	-	EG01LFH1A	-
	-	ERA18-04	-
	-	RMPG06J6203	-
	-	SRF104S	-
# D1003	-	ERA18-04	-
D1005	-	MA188	-
# D1006	-	ERB32-01L3	-
	-	RU2YXLFC1	-
# D1007	-	MA188	-
	-	1SS244T-77	-
# D1008	-	D2S4M	-
	-	EK13	-
	-	EK13F7	-
	-	ERB83-004	-
	-	ERB83-004G1	-
# D1009	-	MA178	-
	-	1SS137T-77	-
	-	MA4051NH	-
	-	MA858	-
	-	MA165	-
# D1015	-	MA2180LA	-
	-	1N4746ARL	-
	-	1N4746A-T	-
# D1016	-	MA165-TA5.VT	-
	-	1SS119	-
	-	1SS133T	-
# IC1001	-	PS2501-1-X	-
	-	0N3131-R.KT	-
# Q1001	-	2SC4533LP.KT	-
	-	2SC5130LF608	-
# Q1002	-	2SD1458	-
Q1003	-	2SD636(Q)	-
Q1004	-	2SB641(Q)	-
Q1005	-	2SB641(R)	-
OTHER			
# C1001	.01 +80% -20% 125V	ECKDRS103ZV	-
	.01 +80% -20% 125V	VCKSEKD103PZ	-
	.01 +80% -20% 125V	VCKSEMD103PZ	-
	.01 +80% -20% 125V	VCKSGD103QZ	-
	.01 +80% -20% 125V	VCKSGMD103QZ	-
# C1002	.0033 20% 125V	ECKCN332ME	-
	.0033 20% 125V	ECKDNS332MED	-
	.0033 20% 125V	ECKDRS332MED	-
	.0033 20% 125V	VCKSEKD332MY	-
# C1003	.0033 20% 125V	VCKSEVD332MY	-
	.0033 20% 125V	VCKSEKD332MY	-
	.0033 20% 125V	VCKSEVD332MY	-
	.0033 20% 125V	VCKSFKK332MY	-
	.0033 20% 125V	VCKSFKM332MY	-
# C1004	82µF 200V	ECEA2DU820YE	-
	82µF 200V	VCESR2D820XE	-
# C1011	4.7µF 50V	ECEA1HU4R7B	-
	4.7µF 50V	VCESP1H4R7B	-
	4.7µF 50V	VCESQ1H4R7B	-
	4.7µF 50V	VCESR1H4R7B	-
# C1012, 13	330µF 18V	ECEA1PEE331B	-
	330µF 18V	VCESN1P331B	-
	330µF 18V	VCESU1P331B	-
# For SAFETY use only equivalent replacement part.			

SERVICE TIPS

Item	Mfr. Part No.
CABINET PARTS	
Bottom Panel	VKUS0266
Cassette Door (2)	VGPS3134
Cassette Door Spring (1)	VMBS1108
Cassette Door Spring (2)	VMBS1109
Cassette Door Unit (1)	VYPS6505
Front Panel (1)	VYPS6511
Front Panel (2)	VYPS6519
Rear Panel	VGPS2924
Rubber Foot	VKAS0047
Top Cover	VKMS2175
Remote Transmitter	
Battery Cover	VKFS1111
(1) Used in model PV-4603.	
(2) Used in model PV-4609.	

[illegible]

Write your service tips in the table above and you will have a record of the defects and repairs you have made using this service information.

Have you ever wanted service tips to fix that VCR quickly? We would like to provide that service for you. As you and other servicemen send in your service tips, we will put the service tips in a database and make the service available.

We invite you to Fax or mail your service tips, together we can make servicing a VCR easier for all of us.

Fax 1-317-298-5604

or mail to:

Howard W. Sams & Company
Attention: VCRfacts
2647 Waterfront Parkway, East Drive
Suite 300
Indianapolis, IN 46214-2041