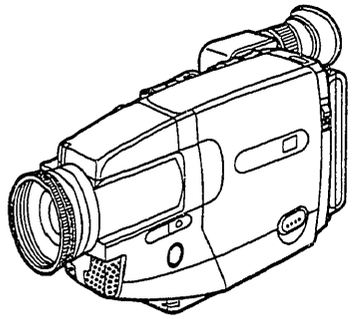
HITACHI

SERVICE MANUAL

TK No.6410E

VM-E52A/E54A
VM-E56A/E58A
VM-H59A

TH MECHANISM



Manuals related to the VM-E52A/E54A/E56A/E58A/H59A

This model uses a TH MECHANISM.
Refer to the following manual for the TH MECHANISM.

Name of manual	Manual No.
TH MECHANISM	6406E
VM-AC83A/91A	6420E
VM-E52A/E56A/H59A Parts List	6410E-1

Hi 8

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

8mm VIDEO CAMERA/RECORDER

May 1994 TOKAI Consumer Electronics Division

CAUTION (COLOR LCD EVF)

LCD display; the liquid crystal display (LCD) panel is mode by highly precise technology. More than 99.99% of its picture elements (pixels) are effective, but some (less than 0.01%) may appear as colored bright dots. This does not indicate a fault as the LCD panel stretches the limits of current technology.

SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine Hitachi replacement parts. Especially critical parts in the power circuit block should not be replaced with other makers'. Critical parts are marked with ⚠ in the schematic diagram.
2. Before returning a repaired unit to the customer, the service technician must thoroughly test the unit to ascertain that it is completely safe to operate without any danger of electrical shock.

X-RAY RADIATION

The primary source of X-ray radiation in this viewfinder is the picture tube. The tube used in this viewfinder is specially constructed to limit X-ray radiation emission. For continued X-ray radiation protection, the replacement tube must be the same type as the original, Hitachi approved one.

How to discriminate the "TYPE" identifications in the service manual

The parts and circuits are identified by "TYPE" in this manual to discriminate the differences between models. The TYPE numbers are the same as the model numbers. The table below shows how to read the TYPE identifications.

TYPE identification		Model name
TYPE52	→	VM-E52A
TYPE54	→	VM-E54A
TYPE56	→	VM-E56A
TYPE58	→	VM-E58A
TYPE59	→	VM-H59A

Differences table of main features

Model name	Nor-8	Hi-8	STEREO	MONO	EIS	FADE	MANU. FOCUS	ELE. ZOOM	SUB REC	W/B EVF	C.EVF
VM-E52A	○			○	×	×	×	×	○	○	
VM-E54A	○			○	×	×	×	○	×	○	
VM-E56A	○		○			○	○	○	×		○
VM-E58A	○			○	○	○	○	○	×		○
VM-H59A		○	○		○	○	○	○	×		○

CONTENTS

CHAPTER 1

SPECIFICATIONS 1-1
COMPARISON OF FEATURES 1-2
COMPARISON OF MAIN CONTROL ICs 1-4
SERVICE MANUAL ABBREVIATION LIST 1-5
WHEN USING THIS SERVICE REFERENCE MATERIAL 1-7
LEADLESS (CHIP) COMPONENT IDENTIFICATION 1-8
JIGS AND TAPES FOR ADJUSTMENT 1-11
HOW TO USE THE EXTENSION CABLE 1-12
MAINTENANCE/INSPECTION PROCEDURE 1-13

CHAPTER 2

1. HOW TO SET TO THE EJECT STATE MANUALLY 2-1
   1. Remove the Cassette Lid 2-1
   2. Unloading Method 2-1
2. COMPONENTS REMOVAL 2-2

DISASSEMBLY
1. Cassette Lid, Lens Hood, Lens Holder, Top Cover, and Right Case Block Removal .. 2-3
2. Disassembly of Right Case Block (LEFT SIDE) 2-4
3. Disassembly of Right Case Block (RIGHT SIDE) 2-4
4. Main Block, Camera Block, Mecrophone (MIC), Left Case Removal 2-5
5. Main (VCA) Circuit Board, VCR Frame and TH Mechanism Removal 2-5
6. Disassembly of Camera Block 2-6
7. Disassembly of Electronic Viewfinder (EVF) Block 2-7
8. Disassembly of Lens Block 2-8

CHAPTER 3

ELECTRICAL ADJUSTMENT
1. CONNECTION FOR ADJUSTMENT 3-1
2. CAMERA SECTION ADJUSTMENT 3-2
   1. CIRCUIT BOARD LOCATIONS 3-2
   2. TEST EQUIPMENT AND CHARTS NECESSARY FOR ADJUSTMENT 3-2
   3. ADJUSTMENT CONDITION 3-2
   4. PRESET POSITIONS OF SWITCHES AND CONTROLS DURING ADJUSTMENT 3-2
   5. LIST OF CHARTS FOR CAMERA ADJUSTMENT ... 3-2
   6. CHEK AFTER REPLACING MAJOR COMPONENT IN THE CAMERA SECTION 3-3
   7. CAMERA SECTION ADJUSTMENT PROCEDURE 3-3
   7-1. Connections for Adjustment 3-4
   7-2. How to Start the MAP 3-4
   7-3. Initial Setting by Model 3-5
   7-4. Electric Volume Adjustment Procedure 3-6
   7-5. Digital Adjustment Procedure 3-9
   7-6. Autofocus Adjustment Procedure 3-15
   7-7. Stabilizer Adjustment Procedure 3-17
   7-8. Spot Noise Adjustment Procedure 3-18
   8. ELECTRONIC VIEWFINDER (EVF) ADJUSTMENT PROCEDURE 3-20
   8-1. CRT EVF Adjustment 3-20
      (1) Deflection Yoke Position Adjustment 3-20
      (2) EVF Centering Adjustment 3-20
      (3) EVF Vertical Size Adjustment 3-20
      (4) EVF Brightness Adjustment 3-20
      (5) EVF Focus Adjustment 3-20
   8-2. LCD EVF Adjustment 3-21
      (1) Output Voltage Adjustment 3-21
      (2) Brightness, Contrast Adjustment 3-21
      (3) Chroma Gain and Color Phase Adjustment 3-22
3. VCR SECTION ADJUSTMENT 3-23
   1. CIRCUIT BOARD LOCATIONS 3-23
   2. TEST EQUIPMENT AND ALIGNMENT TAPES NECESSARY FOR ADJUSTMENT 3-23
   3. ADJUSTMENT CONDITION 3-23
   4. PRESET POSITIONS OF SWITCHES AND CONTROLS DURING ADJUSTMENT 3-23
   5. ADJUSTMENT COMPONENTS LOCATIONS 3-24
   6. CHECK AFTER REPLACING MAJOR COMPONENTS IN THE VCR SECTION 3-25
   7. SYSTEM CONTROL/SERVO CIRCUIT ADJUSTMENT 3-25
      (1) Power Shut offf Level (ODC : Over Discharge) Adjustment 3-26
      (2) Head Switching Point Adjustment 3-26
   8. LUMINANCE/CHROMA CIRCUIT ADJUSTMENT 3-27
      (1) Comb Filter Adjustment 3-27
      (2) E-E Video Signal Level Adjustment 3-27
      (3) White Clip Adjustment 3-27
      (4) Carrier Frequency Adjustment 3-28
      (5) Deviation Adjustment 3-28
      (6) Record Luminance/Chroma Level Adjustment 3-29
      (7) Playback Luminance/Chroma Level Adjustment 3-29
   9. AUDIO CIRCUIT ADJUSTMENT 3-30
      (1) Band Pass Filter (BPF) Adjustment 3-30
      (2) Deviation Adjustment 3-30
4. ERROR MESSAGES 3-31
5. TROUBLESHOOTING OF AUTOFOCUS 3-34

CHAPTER 4

1. BLOCK DIAGRAM
   1. OVERALL 4-1
   2. CAMERA 4-3
   3. POWER 4-5
   4. SYSTEM CONTROL 4-7
   5. SERVO 4-9
   6. VIDEO 4-11
   7. AUDIO (STEREO TYPE) 4-13
   8. AUDIO (MONAURAL TYPE) 4-15
2. MICROPROCESSOR PIN FUNCTION TABLES

CHAPTER 5

SCHEMATIC & CIRCUIT BOARD DIAGRAM
INTERNAL WIRING DIAGRAM 5-1

	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
SENSOR (SP)	5-3	5-63
SENSOR DRIVE (VCA)	5-5	5-47, 55
RPROCESS (VCA)	5-7	5-47, 55
DIGITAL PROCESS (VCA)	5-9	5-47, 55
H.GYRO, V.GYRO, WIRING/SWITCH UNIT	5-11/	—
SERVO (VCA)	5-13/	5-47, 55
SYSTEM CONTROL (VCA)	5-15/	5-47, 55
REC SW/BATT. (RTB)	5-17/	5-48
TROUBLE SENSOR (VCA)	5-18/	5-47
TROUBLE SENSOR (HTS9551B)	5-18/	5-63
AUDIO (VCA) (MONAURAL TYPE)	5-19/	5-47
AUDIO (VCA) (STEREO TYPE)	5-21/	5-47, 55
PRE AMP (VCA) (Nor-8 TYPE)	5-23/	5-47
JACK (VCA)	5-25/	5-47
SUMINANCE/CHROMA (VCA) (Nor-8 TYPE)	5-29/	5-47
PRE-AMP (VCA) (Hi-8 TYPE)	5-31/	5-55
JACK (VCA)	5-33/	5-55
CCD DELAY (VCA) (Hi-8 TYPE)	5-35/	5-55
LUMINANCE/CHROMA (VCA) (Hi-8 TYPE)	5-37/	5-55
DC-DC CONVERTER (VCA)	5-39/	5-47, 55
AUTO FOCUS (VCA)	5-41/	5-47, 55
EVF DRIVE (CRM) (C-EVF TYPE)	5-43/	5-67
LCD DRIVE (HTS9583) (C-EVF TYPE)	5-44/	5-67
ELECTRONIC VIEWFINDER (EMQ) (W/B EVF TYPE)	5-45/	5-67

WAVEFORMS
SENSOR/PROCESS 5-4
SERVO 5-12
SYSTEM CONTROL 5-17
PRE AMP 5-25, 5-33
LUMINANCE/CHROMA 5-28, 5-36
EVF DRIVE/LCD DRIVE 5-45
ELECTRONIC VIEWFINDER 5-46

CHAPTER 6

EXPLODED VIEWS

CABINET SECTION (I) 6-1
CABINET SECTION (II) 6-2
CHASSIS SECTION 6-3
CAMERA BLOCK SECTION 6-4
ELECTRONIC VIEWFINDER (LCD EVF) SECTION ... 6-5
ELECTRONIC VIEWFINDER (CRT EVF) SECTION ... 6-5

CHAPTER 7

REPLACEMENT PARTS LIST 7-1

CHAPTER 8

1. OPERATION
   IDENTIFYING CONTROLS 8-1
   SETTING THE DATE AND TIME 8-2
   USING THE LINEAR TIME COUNTER 8-3
   REMAING TAPE 8-3
   USING THE DISPLAY BUTTON 8-3
   GENERAL MAINTENANCE 8-3
   CLEANING THE CAMERA/RECORDER HEADS 8-3
   CLEANING THE LENS AND PICTURE TUBE OF THE ELECTRONIC VIEWFINDER 8-3
   PERIODIC MAINTENANCE 8-4
   TROUBLESHOOTING 8-4

Specifications

General Specifications

Power requirements	6V DC
Power consumption	VM-E56A: 5.5W (when recording) VM-E58A: 5.6W (when recording)
Dimensions	3-11/16" W x 4-8/16" H x 8-1/16" D (94mm x 114mm x 214mm)
Weight	VM-E56A: 1.65lbs(750g) without battery pack, lens hood, lens cap or cassette VM-E58A: 1.66lbs(755g) without battery pack, lens hood, lens cap or cassette
Operating temperature	32°F ~ 104°F (0°C ~ 40°C)
Storage temperature	-4°F ~ 140°F (20°C ~ 60°C)

Video Recorder Specifications

Format	8mm
Record/playback	Two video record/playback heads
Video signal	EIA standard NTSC color
Tape speed	14.3mm/sec
Video input	1.0Vp-p, 75 ohm
Video output	1.0Vp-p, 75 ohm
Audio input	-7.8dBs (316mVrms)
Audio output	-7.8dBs (316mVrms)
Fast forward/rewind time	Less than 8 minutes with P6-120 cassette

Camera Specifications

Scanning	525 lines/60 fields/30 frames
Required minimum illumination	1lux
Pickup device	1/3" C.C.D.
Lens diameter	46mm

ATTENTION:
The product that you have purchased contains a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Ni-Cd

COMPARISON OF FEATURES

⇦ : SAME AS LEFT

	ITEM	VM-E52A	VM-E54A	VM-E56A	VM-E58A	VM-H59A	VM-H57A
GENERAL	POWER REQUIREMENTS	6V DC	⇦	⇦	⇦	⇦	⇦
	POWER CONSUMPTION	4.7Watts (when recording)	4.9Watts (when recording)	5.5Watts (when recording)	5.6Watts (when recording)	6.0Watts (when recording)	5.9Watts (when recording)
	DIMENSIONS (W×H×D mm)	91×116×214	⇦	91×114×214	91×116×214	94×114×214	91×116×205
	WEIGHT (gr)	Approx. 740	⇦	Approx. 750	Approx. 755	Approx. 760	Approx. 730
	OPERATION TEMPERATURE/HUMIDITY	32° F ~ 104° F	⇦	⇦	⇦	⇦	⇦
	STORAGE TEMPERATURE	-4° F ~ 140° F	⇦	⇦	⇦	⇦	⇦
VIDEO	FORMAT	8mm	⇦	⇦	⇦	8mm (Hi-8)	⇦
	RECORD/PLAYBACK SYSTEM	2 HEADS + Flying Erase HEAD	⇦	⇦	⇦	⇦	⇦
	TAPE SPEED	SP : 14.3mm/sec	⇦	⇦	⇦	⇦	⇦
	F.F/REW TIME	Less than 8minutes With P6-120 cassette	⇦	⇦	⇦	⇦	⇦
	HEAD WEEL	40mm	⇦	⇦	⇦	⇦	⇦
	BASIC CHASSIS TYPE	TH MECHANISM	⇦	⇦	⇦	⇦	⇦
	AUTO HEAD CLEANING	NO	⇦	⇦	⇦	⇦	⇦
CAMERA	REQUIRED MINIMUM ILLUMINATION	1 lux	⇦	⇦	⇦	2 lux	⇦
	CAMERA DEVICE	1/3" C.C.D	⇦	⇦	⇦	⇦	⇦
	LENS DIAMETER	46mm	⇦	⇦	⇦	⇦	34mm
	ZOOM RATIO/APERTURE	12 : 1 (5mm - 60mm) / f1.8	⇦	⇦	⇦	⇦	8 : 1 (6mm - 48mm) / f1.4
	ZOOM SPEED	1 SPEED	⇦	⇦	⇦	⇦	⇦
OTHER FEATURES	ELECTRONIC VIEWFINDER	CRT (Black&White)	⇦	LCD(Color)	⇦	⇦	CRT (Black&White)
	ELECTRONIC IMAGE STABILIZER	NO	⇦	⇦	YES	⇦	⇦
	AI AUTO WHITE BALANCE	YES	⇦	⇦	⇦	⇦	⇦
	DIGITAL SIGNAL PROCESSOR	YES	⇦	⇦	⇦	⇦	⇦
	ELECTRICAL ZOOM	NO	×36 (24 × INST.ZOOM1.5)	⇦	⇦	⇦	×24 (16 × INST.ZOOM1.5)
	INSTANT (INST.) ZOOM	NO	YES (×1.5)	⇦	⇦	⇦	⇦
	SUB REC BUTTON	YES	NO	⇦	⇦	⇦	⇦
	AUTOFOCUS SYSTEM	VIDEO AF	⇦	⇦	⇦	⇦	⇦
	PROGRAMME AE (SHUTTER SPEED)	YES (Programme AE only)	⇦	⇦	⇦	⇦	⇦
	TITLER	YES (2 LINE)	⇦	⇦	⇦	⇦	⇦
	S-CONNECTOR INPUT/OUTPUT	NO	⇦	⇦	⇦	OUTPUT only (AV OUTPUT CABLE)	⇦
	CAMERA LIGHT SHOE	YES	⇦	⇦	⇦	⇦	⇦
	MICROPHONE	MONAURAL	⇦	STEREO	MONAURAL	STEREO	⇦
	MIC/EDIT IN JACK	NO	⇦	⇦	⇦	⇦	⇦
	FADE	NO	⇦	YES	⇦	⇦	⇦
	MANUAL/AUTO FOCUS	AUTO MODE Only	⇦	SELECTIVE	⇦	⇦	⇦
ACCESS-ORIES	AC ADAPTER/CHARGER	VM-AC91A	VM-AC83A	⇦	⇦	⇦	VM-AC82A(R)
	BATTERY PACK	VM-BP82	⇦	⇦	⇦	⇦	⇦
	REMOTE CONTROL	VM-RME55A	⇦	⇦	⇦	⇦	⇦

COMPARISON OF MAIN CONTROL ICs

ITEM	VM-E52A/E54A/E56A/E58A/H59A		VM-H57A	
SENSOR/GYRO				
CCD SENSOR	ICX054AK/058AK	(IC1001)	ICX058AK	(IC1001)
GYRO(VERT.)	ENC-05DA-01	(IC1411)	ENC-05A	(IC1401)
RESET(VERT.)	TC4W66F	(IC1404)	TC4S66F	(IC1404)
V.GYRO AMP	XRA4510F	(IC1402)	TL062CPS	(IC1402)
GYRO(HORIZ.)	ENC-05DB-01	(IC1511)	ENC-05A	(IC1501)
RESET(HORIZ.)	TC4W66F	(IC1504)	TC4S66F	(IC1504)
H.GYRO AMP	XRA4510F	(IC1502)	TL062CPS	(IC1502)
SENSOR DRIVE				
CDS/AGC	HA118184F	(IC1101)	HA118184F	(IC1101)
A/D CONV.	HD49319F	(IC1102)	HD49318F	(IC1102)
DIGITAL PROCESS	HG51B025TF	(IC1103)	HG51B0151TF	(IC1103)
DIGITAL ZOOM	HG51B139FG1	(IC1104)	HG51A017FB	(IC1104)
DRIVE PULSE GEN.	μPD16508GB	(IC1110)	μPD16508GB	(IC1110)
D μP	HD6433378V05/V12	(IC1105)	HD6433378F5	(IC1105)
EEP-ROM	S2939GIF	(IC1106)	S2939GIF10G	(IC1106)
AUTO FOCUS				
IRIS DRIVE	NJM3414M	(IC1201)	NJM3414M	(IC1109)
IRIS MOTOR	NJM3403A	(IC1202)	LM324DB	(IC1306)
GAIN SW	TC4W66F	(IC1203)	TC4W66F	(IC1108)
AUTO FOCUS μP	SC78054GC017/021	(IC1301)	SC78014GC550	(IC1301)
ZOOM MOTOR DRIVE	XPC17A85ZVM	(IC1302)	MM1036	(IC1305)
FOCUS MOTOR DRIVE	XPC17A85ZVM	(IC1303)	XPC17A85V	(IC1303)
INV.	SN74HCT04ADB	(IC1308)	SN74HCT04	(IC1307)
BUF.	HD74HCT125T	(IC1311)	HD74HCT125	(IC1308)
SYSTEM CONTROL				
SYSTEM CONTROL μP	CXP80724	(IC0901)	CXP80724	(IC0901)
RESET PULSE GEN.	S84206F	(IC0902)	S84206F	(IC0902)
CHARA. GEN.	XLU5949AFS	(IC0904)	XLU5949FS	(IC0904)
LEVEL SHIFT	HD74HCT125	(IC0903)	HD74HCT125	(IC0903)
SERVO				
SERVO CONTROL	CXP80724	(IC0901)	CXP80724	(IC0901)
ATF	XR10823CQ	(IC0601)	XR1080CV	(IC0601)
LOADING MOTOR DRIVE	BA6417F	(IC0603)	BA6417F	(IC0603)
CAPST.MOTOR DRIVE	LB1881	———	LB1881	———
CYL.MOTOR DRIVE	LB1885MA	(IC0602)	LB1885MB	(IC0602)
AUDIO/MIC AMP				
AUDIO PROCESS	HA118176F	(IC0401)	HA118176F	(IC0401)
MIC AMP	LA7471M	(IC0402)	LA7471M	(IC0402)
DC-DC CONVERTER				
PWM	TL1464	(IC0551)	TL1464	(IC0551)
PRE AMP				
HEAD SW	HA118189MPER	(IC0101)	HA118189MPER	(IC0101)
LUMINANCE/CHROMA				
LUMA/CHROMA PROCESS	HA118192F	(IC0201)	HA118192F	(IC0201)
1H DELAY	CXL5502N	(IC0202)	CXL5502N	(IC0202)
CCD 1H DELAY	CXL5507M	(IC0203)	CXL5507M	(IC0203)
VIDEO AMP	MM1029AT	(IC0204)	MM1029AT	(IC0204)
OUTPUT SELECT	NJM2249M	(IC0205)	———	———
INPUT SELECT	NJM2249M	(IC0207)	NJM2249M	(IC0207)
CRT EVF				
VIDEO AMP/V.H DEFLECTION	HA118179F	(IC2001)	HA118179FP	(IC2001)
LCD EVF				
VIDEO PROCESS	IR3Y05	(IC2101)	———	———
PULSE GEN.	ETM3030T0A	(IC2202)	———	———
EVF PWM	FA761ON	(IC2181)	———	———

SERVICE MANUAL ABBREVIATION LIST

A	
ACC	Automatic Color Control
ACK	Automatic Color Killer
ADC B-Y	Analog to Digital Converted B-Y Signal
ADC R-Y	Analog to Digital Converted R-Y Signal
ADC Y	Analog to Digital Converted Luminance
ADD	Adder
ADRS	Address
A.DUB	Audio Dubbing
AF	Autofocus
AFC	Automatic Frequency Control
AGC	Automatic Gain Control
AGC KILLER	AGC Killer Voltage
ALC	Automatic Level Control
AIC	Automatic Iris Control
AM	Amplitude Modulation
AMP	Amplifier
APC	Automatic Phase Control
ASBL	Assemble (Phase Matching)
AUD.	Audio
AUX	Auxiliary
A5V	Always 5V B+ Source
B	
B (BLU)	Color Signal BLUE
BATT.	Battery
BF	Burst Flag
BG	Burst Gate or Back Ground
BGP	Burst Gate Pulse
BH	Power Supply for Selecting VHF High Band
BL	Power Supply for Selecting VHF Low Band
BLK	Blanking
BM	Power Supply for Selecting VHF Mid Band
BPF	Bandpass Filter
BS	Power Supply for Selecting VHF Super Band
BU	Power Supply for Selecting UHF Band
BU	Back-up
BUF.	Buffer Amplifier
B-YL	Battery
C	
C	Chroma
C (CHROMA)	Chrominance Signal
CAPST.	Capstan
CAS	Column Address Strobe
CARRI.	Carrier
CATV	Cable TV
C.BLANK	Chroma Blanking
C.BLK	Composite Blanking
CCD	Charge Coupled Device
CG	Character Generator
C.FG/CFG	Capstan Frequency Generater
C.FREE RUN	Chapstan Free Run
CH	Channel
CHD	Camera Horizontal Drive Pulse
CHAR.	Character
CHROMA	Chrominance
C.MEMORY	Counter Memory
CNR	Chroma Noise Reducer
COM.	Common
COM.	Composite
COMPA	Comparator
COMPE	Compensator
COMPO	Composite
COMP-EXP	Compressor-Expander
CONV.	Converter
CONT	Control
CORR.	Correlation
COUNT.	Counter
CP	Clamp Pulse
C.PAUSE	Camera Pause
C/R	Capacitor/Resistor
C.RESET	Counter Reset
C.REVERSE	Count Reverse
CST	Cassette

C	
C.SYNC	Composite Synchronizing Signal
CTL	Control Track Pulse (Control)
CYL	Cylinder
CY (CYAN)	Color Signal CYAN
D	
DA	Double Azimuth
D/A	Digital to Analog Converter
D-D	Direct Drive
DEEMPHA.	Deemphasis
DEF	Deflection
DEMOD.	Demodulator
DEMPX	Demultiplexer
DET	Detector
DIFF. AMP	Differential Amplifier
DISCRI.	Discriminator
DISP.	Display
DL	Delay Line
DN	Down
DO	Dropout
DOC	Dropout Compensator
DRAM	Dynamic Random Access Memory
D.REF 25/30	Delayed Reference 25/30Hz
D.SW 25/30	Delayed Switching 25/30Hz
DSP	Digital Signal Processor
DT/OE	Data Transfer/Output Enable
D/W	Dark/White
DWC	Delayed Write Clock
E	
EA-ROM	Electrically Alterable Read Only Memory
E-E	Electronic-to-Electronic
EMPHA.	Emphasis
EQ	Equalizer
EVF	Electronic Viewfinder
EXT.	External
F	
F.ADV	Frame Advance
F/V	Frequency-to-Voltage Converter
FB	Feed Back
FF	Flip Flop
F.FWD	Fast Forward
FG	Frequency Generator
FM	Frequency Modulation
FREQ.	Frequency
FRAME ADV	Frame Advance
Fsc	Color Sub Carrier Frequency
FWD	Forward
G	
GEN	Generator
GND	Ground
H	
H	Horizontal
HBF	Horizontal Burst Flag
HD	Horizontal Drive
Hi-Fi	High Fidelity
HLT	Halt
HPF	High-pass Filter
HPL	High-pass Limiter
HSS	Horizontal Sync. Separator
I	
IF	Intermediate Frequency
INC	Row Counter Increment
INDI.	Indicator
INT.	Internal
INV.	Inverter
I/O	In/Out (Input/Output)
IR	Infrared Rays
IRIS DET	Iris Detection
IRT	Instant Recording Timer
L	
LCD	Liquid Crystal Display
LIN.	Linear
LM	Loading Motor

L	
LNC	Line Noise Canceller
LOG	Logarithm
LP	Long Play
LP (H)	Long Play Signal (Active High)
LPF	Low-pass Filter
LUMA	Luminance
L/R	Left/Right
M	
MAN	Manual
M.BRAKE	Main Brake
M.CUT	Monitor Cut
MEM.	Memory
MEM ON	Memory ON
MEM SW	Memory Switch
MEM VIDEO	Memorized Video
MIX	Mixer
MMV	Monostable Multivibrator
MOD.	Modulator
MPX	Multiplex
MPX VIDEO	Multiplexed Video
M.STATE	Mechanism State
M.STOP	Memory Stop
MTS	Multi Channel Television Sound
N	
NEG	Negative
NFB	Negative Feed Back
NORM. or NOR.	Normal
NR	Noise Reduction
O	
OB	Optical Black
O/E	Odd/Even Field
OSC	Oscillator
OSD	On-Screen Display
P	
PB/PLAY	Playback
P.CONT	Power Control
PIF	Picture Intermediate Frequency
PG	Pulse Generator
P IN P	Picture in Picture
PIX MOVE	Picture Move
PLL	Phase Locked Loop
POS.	Positive
POWER CONT.	Power Control
PROG.	Program
PROTECT.	Protector
PWM	Pulse Width Modulation
R	
R (RED)	Color Signal RED
RAM	Random Access Memory
RAS	Row Address Strobe
RC	Reading Clock
RCC	Reading Clock Clear
RCR	Row Counter Reset
REC	Record
RECT.	Rectifier
REF	Reference
REF 25/30	Reference 25/30Hz from servo circuit
REG	Regulator
REL	Refresh Control
REW	Rewind
REV	Reverse
RF	Radio Frequency
RM	Reel Motor
ROM	Read Only Memory
R-YL	Color Difference Signal R-YL
S	
SAP	Second Audio Program
SAW	Sawtooth
SC	Serial Control
SC1 (0°)	3.58MHz Subcarrier Signal 1 (0-degree Phase Shifted)

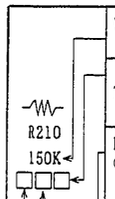
S	
SC2 (90°)	3.58MHz Subcarrier Signal 2 (90-degree Phase Shifted)
SEP.	Separator
SG	Signal Generator
S/H	Sample and Hold
SIF	Sound Intermediate Frequency
SOL	Solenoid
SP	Standard Play
SP/LP	Standard Play/Long Play
S.REEL	Supply Reel Sensor
SRCH	Search
SRV	Servo
STABI.	Stabilizer
S.TRACK	Slow Tracking
STBY	Standby Mode
S-VHS	Super VHS
SW 15Hz	15Hz Head Switching Pulse
SW 25/30Hz	25/30Hz Head Switching Pulse
SYNC	Synchronizing signal
SYS.CON	System Control
T	
T (TELE)	Telephoto Angle
T.BRAKE	Take-up Brake
T/L	Tuner/Line
TP	Test Point
T.REEL	Take-up Reel Sensor
T.RESET	Timer Reset
TRS	Transfer
TμP	Timer Microprocessor
TU-μP	Tuning Microprocessor
U	
U/D	Up/Down
UNI.	Unified
V	
V (VERT)	Vertical
VAR	Variable
V.AGC	AGC Voltage
VCA	Voltage Controlled Amplitier
VCO	Voltage Controlled Oscillator
V.DRV	Vertical Drive Pulse
V.DUB	Video Dubbing
V/F	Voltage to Frequency Converter
VHS	Video Home System
VF	Focus Voltage
VOL.	Volume
V-REF	Voltage Reference
VP	Vertical Pulse
VSS	Vertical Sync. Separator
Vss	Voltage Super Source
VT	Tuning Voltage
VT-U	Tuning Voltage-UHF
VT-V	Tuning Voltage-VHF
VCXO	Voltage Controlled Crystal Oscillator
W	
WC	Write Clock
WCC	Write Clock Clear
WE	Weighting
WHT	Color Signal WHITE
WIDE	Wide Angle
WHD	Wide Horizontal Drive
WHT BAL CONT.	White Balance Control
Y	
Y	Luminance Signal
Y/C	Luminance/Chrominance
YE (YEL)	Color Singal YELLOW
YL	Luminance Signal (Low Component)
ANOTHER	
μP	Microprocessor
5V	ON 5V B+ Source
9V	ON 9V B+ Source

WHEN USING THIS SERVICE REFERENCE MATERIAL

1. How to Read Abbreviations

Values, dielectric resistances (power capacitances), tolerances, grades of resistors (excluding variable resistors, etc.) and capacitors are indicated in the schematic diagrams using abbreviations. Collate these abbreviations and the following tables to read abbreviations and replace parts correctly.

[RESISTORS]

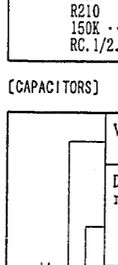


Value	No indication ····· ohm K ····· kohm
Tolerance	No indication ····· ± 5% K ····· ±10% M ····· ±20%
Power capacitance	No indication ····· 1/8W (All capacitances other than 1/8W are indicated in schematic diagrams with W omitted.)
Type	No indication ·· Carbon film fixed RC ····· Carbon solid RW ····· Power-type wire wound solid RS ····· Metal oxide film solid RN ····· Metal film solid

Example

R210
150K ····· 150 kohm, carbon solid
RC.1/2.K 1/2W, ±10%

[CAPACITORS]



Value	No indication ····· μF P ····· PF
Dielectric resistance	No indication ····· 50WV (All resistances other than 50WV and those of electrolytic capacitors are indicated with WV omitted.)
Tolerances	No indication ····· ±10% J ····· ± 5% M ····· ±20% C ····· ±0.25PF Z ····· +80%-20% (No indication for electrolytic capacitors. (excluding tantalum and high stability electrolytic capacitors.)
Type	No indication ··· Ceramic, general electrolytic (see circuit symbol to distinguish from ceramic.) MYL ····· Mylar (Polyester film) STY ····· Styrol TA ····· Tantalum KU ····· High stability electrolytic MP ····· Metallized paper

Example

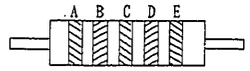
C210
0.01/25 ····· Mylar, 0.01μF, 25WV
MYL.J ±5%

2. Markings in Schematic and Circuit Board Diagrams

(1) Parts with marks "■" attached to circuit numbers in the schematic and circuit board diagrams are discrete components.
(2) Parts with marks "●" attached to circuit numbers in the schematic and circuit board diagrams are chip components.
(3) Parts with marks Ⓩ in the circuit board diagrams are leadless jumpers.

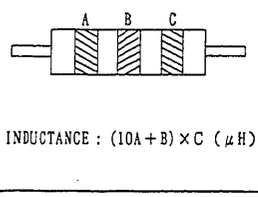
3. How to Read Capacitance of Resistance-Type Capacitors and Coils

[CAPACITOR]



CAPACITY : (10A+B)×C (PF)
TOLERANCE : D
RATED VOLTAGE : BODY COLOR
PINK : 25V
GREEN : 50V
CHARACTERISTICS : E

[COIL]



INDUCTANCE : (10A+B)×C (μH)

COLOR	A, B	C	D	E
Black	0	10^0	±20%	For temperature compensation
Brown	1	10^1		
Red	2	10^2		
Orange	3	10^3		
Yellow	4	10^4		
Green	5	10^5		
Blue	6			
Violet	7			
Gray	8		±30%	High dielectric constant type
White	9			For temperature compensation
Gold		10^{-1}	± 5%	
Silver		10^{-2}	±10%	High dielectric constant type

4. Cautions on Use of MOS ICs

(1) MOS ICs are inserted in black foam for shipment. This foam is a conductor which short-circuits between the leads to prevent damage. Do not remove ICs from this foam during storage. Avoid removing ICs from this foam, placing them on plastic which is likely to be charged with static electricity or inserting them into styrol foam.
(2) High voltages may be applied during soldering caused by leakages from the soldering iron. Be sure to ground the tip of the soldering iron or use a low voltage soldering iron.
(3) The human body and clothes made of synthetic fiber or nylon gloves may be charged with several thousand volts of static electricity because of friction. Workers should be grounded.

LEADLESS (CHIP) COMPONENT IDENTIFICATION

1. Leadless Transistor

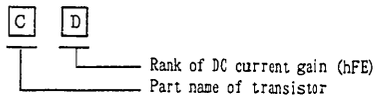
The part name of a leadless transistor is indicated by a code on its surface, using one letter, one letter and one numeral, two letters, two letters and one numeral, two numerals, two numerals and one letter, three letters, or four letters.

Note: There are transistors with the same code but different part names, or with the same part name but different codes. Refer to the parts lists to finally identify a transistor.

CODE	PART NAME	CODE	PART NAME
Leadless (Chip) Transistor			
3925	2SC3925	BR	2SC2412K
1CQ	2SB902	BR	2SC4617
1D	2SC3127	BS	2SC2412K
1DS	2SD1328S	C-7	2SA811
1DT	2SD1328	C1G	KSC1623
1R	2SB970TX	CB	2SC3646
2BQ	2SK374PQ	CC	2SA1122C
2BR	2SK374QR	CC	2SC3647T
2Y	2SC3757	CC	2SC3647
2YQ	2SC4691	CD	2SA1122D
3N	2SK620	CE	2SA1122E
4N	XN5601	CK	2SD999
4Q	XN1B301	CP	2SC4097
4R	XN1C301	CQ	2SC2411K
5C	XN4601	CR	2SB710
5C	XP4601	CR	2SC2411
5H	XP4501	CR	2SB1219
5H	XN4501	D16	2SC1622A
5K	XP4401	D17	2SC1622A
5K	XN4401	D18	2SC1622A
5L	XN5501	DB	2SD1766
5N	XN6501	DE	2SC2463
5O	XN6401	DF	2SD1623
5R	XP1501	DF	2SD1898
5R	XN1501	DG	2SD1624
5S	XN1504	DK	2SB798
5V	XN1401	EC	2SA1022
5W	XN2501	F-2	2SC1009F2
5X	XN4504	F-3	2SC1009F3
7R	XN2401	F-4	2SC1009F4
7S	XN1601	FC	2SC2619
AA	2SD1757K	FR	2SA1774
AKQ	2SA1738	FR	2SA1037K
AKQ	2SA1806	FR	2SA1576R
AL	2SA1791	FS	2SA1037K
AM	2SC4656	GC	2SC2734
AO	2SB709AQR	GM	3SD1615
AQ	2SB709AQ	HQ	2SA1036K
AQ	2SB766	IC	2SC3016
AR	2SB1462	IRD	2SA1484
AR	2SB766	IS	2SB792S
AR	2SB709ARS	IT	2SB792T
AR	ASB1218R	L-4	2SC1623L4
AS	2SB766	L-5	2SC1623L5
AS	2SB709AS	L-6	2SC1623L6
B3	2SC1621B3	L-6	2SC2812L6
B4	2SC1621B4	L-7	2SC2812L7
BC	2SB1188	L5	MMBC1623L5
BD	2SB1121	L6	MMBC1623L6
BE	2SB1260	LB	2SC2462B
BF	2SB1123	LC	2SC2462C
BF	2SB1308	LD	2SC2462D
BG	2SB1124	LR	2SC2412KLN
BH	2SB1001	M-5	2SA812
BQ	2SB709A	M-6	2SA1179
BR	2SC4081R	MC	2SA1052MC
CODE	PART NAME	CODE	PART NAME
Leadless (Chip) Transistor			
MD	2SA1052MC-D	ZS	2SD874S
N3	2SC1653	VR	2SD968A
ND	2SD1306ND	W1	FMW1
NE	2SD1306NE	W10	FMW10
PD	2SA1171D	W2	FMW2
PS	2SD814	W3	FMW3
QB	2SC2620QB	WR	2SD602
QC	2SC2620QC	X1	UMX1
QO	2SC2714	X1	IMX1
R22	2SC4226	X2	IMX2
R22	2SC3356	Y1	FMY1
R32	2SC4227	Y12	2SA1464
R34	2SC3583	Y25	NTM3906
R42	2SC3585	Y3	FMY3
RB	2SC2618RB	YCD	2SK197
RC	2SC2618RC	YI	2SA1666
RK	2SC3357	YQ	2SD601YQ
S1	FMS1	YR	2SD601YR
S2	FMS2	YR	2SD1819R
SC	2SA1121	YR	2SD2216
SO	2SA1162	YS	2SD601YS
SP	2SC3082K	Z1	IMZ1
T1	IMT1	Z2	IMZ2
T1	UMT1	ZO	2SD874T
T2	IMT2	ZQ	2SD601A
UD	2SC2404	ZR	2SD874R
Digital Transistor			
3	DTC143TK	6C	UN9113
4	DTC114TK	6S	XP4113
6	DTC144TK	8B	UN5212
13	DTA143EK	8C	UN9213
14	DTA144EK	8C	UN2213
15	DTA124K	8S	XP4213
15	DTA124EU	9L	XP1213
16	DTA144EU	9L	XN1213
16	XDA144EK	A1	FMA1
16	DTA144EE	A1	UMA1
23	DTC143EK	A2	FMA2
24	DTC114EU	B2	UMB2
24	DTC144EK	B2	IMB2
25	DTC124EU	C2	FMC2
25	DTC124K	C5	FMC5
26	DTC144EE	D2	IMD2
26	DTC144EU	F52	DTB123
26	XDC144EK	G1	FMG1
33	DTA143XK	G2	FMG2
43	DTC143XK	G21	DTD113ZK
52	DTA123YK	G5	FMG5
60	UN511F	HO3	DTC343TK
64	DTC114YK	H2	IMH2
80	UN521F	H2	UNH2
4P	XN1A312T	H27	DTC363EK
6B	UN5112	RO4	KSR1104
6C	UN2113	R31	FP1L2Q
FET			
30	2SK621	WS	2SK322T
1FQ	2SK321FQ	WT	2SK322T
1FR	2SK321FQR	X15	2SK425
1KP	2SK316	X4	2SK94
2BQ	2SK663	XAF	2SK980FG
DY	2SK1579	YC	2SK197YC
JO	2SK208	YD	2SK197YD
K	3SK166	YE	2SK197YE
K4	2SK160K4	ZD	2SK2177D
K5	2SK160K5	ZE	2SK217ZE
KB	2SK323		

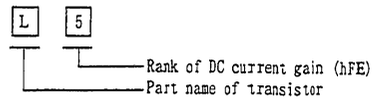
(1) Identification with two letters
Use this code and the following chart for transistor identification.
Example :

Code	Part name
CD	2SA1122D
LD	2SC2462D



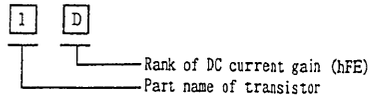
(2) Identification with one letter and one numeral
Use this code and the following chart for transistor identification.
Example :

Code	Part name
L5	2SC1623(5)
L6	2SC1623(6)



Example :

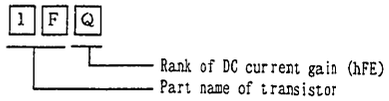
Code	Part name
1D	2SC3127D



Note: Codes S1,S2,T1,W1,W2,W3,X1,Y1,Y3,Z1 and Z2 encode only the part names.

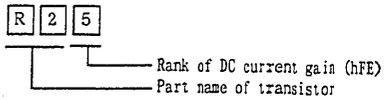
(3) Identification with one numeral and two letters
Use this code and the following chart for tarnsistor identification.
Example :

Code	Part name
1FQ	2SK321Q



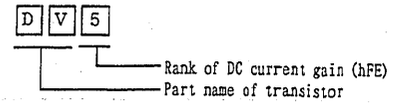
(4) Identification with one letter and two numerals
Use this code and the following chart for transistor identificaion.
Example :

Code	Part name
R25	25C3356



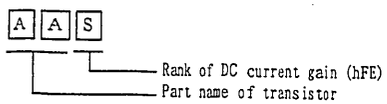
(5) Identification with to letters and one numeral
Use this code and the following chart for transistor identification.
Example :

Code	Part name
DV5	2SD596



(6) Identification with three letters
Use this code and the following chart for transistor identification.
Example :

Code	Part name
AAS	2SD1757KS



2. Leadless Diode
The part name of a leadless diode is indicated by a code on the surface, using one letter and one numeral, two letters, two letters and one numeral, two numerals and one letter, or three numerals. Use this code and the following table to identify the part name of a diode.

Note: Refer to the parts lists to finally identify a diode.

CODE	PART NAME	CODE	PART NAME
Diode			
0	HVU300A	3D	RB715F
1.0	1SV201	3.0L	MA3030L
2.0	MA3020	3.6L	MA3036L
5.1	MA3051L	3.9L	MA3039L
5.1	MA3051M	4.3H	MA3043H
6.8	MA3068	4.3L	MA3043L
6.8	MA3068M	4.3M	MA3043M
7.5	MA3075L	4.7L	MA3047L
8.2	MA3082M	4.7M	MA3047M
9.1	MA3091	5.1H	MA3051H
20	HZM6	5.1L	MA3051L
24	1SV221	5.1M	MA3051M
27	RD2.7M B	5.6M	MA3056M
30	RD3.0M B	6.2L	MA3062L
51	RD5.1M B2	6.2M	MA3062M
56	RD5.6M B	6.8H	MA3068H
91	RD9.1M B	6.8L	MA3068L
102	RD10M B2	6.8M	MA3068M
122	RD12M B2	6.8M	MA3068
163	RD16M B3	7.5H	MA3075H
182	RD10M B2	7.5L	MA3075L
271	RD2.7M B	8A	UN221D
272	D2.7M B2	8.2H	MA3082H
301	RD3.0M B	8.2M	MA3082M
362	D3.6M B2	9.1M	MA3091M
391	D3.9M B1	9.1M	MA3091
512	RD5.1M B2	10L	MA3100L
561	RD5.6M B	10M	MA3100M
621	RD6.2M B1	11L	MA3110L
681	RD6.8M	12M	MA3120M
683	RD6.8M B3	13H	MA3130H
911	RD9.1M B	18M	MA3180M
2.7H	MA3027H	36M	MA3360
Zener Diode			
1A	MA110	M3A	MA199
A3	1S2835	MC	MA153
A4	HSM2836C	MC	MA143
A5	1S2837	MH	MA141K
A6	HSM2838C	MH	MA151K

CODE	PART NAME	CODE	PART NAME
Zener Diode			
B	SB0505CP	MH	MA152K
B64	SFPB64	MI	MA132K
B74	SFPB74	MN	MA141WA
BE	1SV172	MN	MA152WK
C1	HSM88S	MN	MA151WA
C2	HSM276S	MO	MA132WA
C3	1SS226	MO	MA152WA
C4	HSM88WK	MP	MA133
F7	KV1470	MT	MA151WK
H5	HVM14	MT	MA141WK
J	SB07-03C	MU	MA132WK
K	DA221	MU	MA151WA
M1A	MA159	N	DAN222
M1C	MA158	N	DAN202T
M1M	MA721	NU	MA152WK
M1N	MA713DAT	P	DAP202T
M1P	MA714	S4	D1FS4
M2A	MA122	SA	SB10-05P
M2B	MA123	Z	DA106K

3. Leadless Resistor
The resistor value is indicated on its surface, using three numerals, or one letter and one numeral.

(1) Identification with three numerals
Read this code following the same procedure as when reading the color code on discrete resistors.

Example :

code	value
330	33 x 10^0 = 33 ohms
561	56 x 10^1 = 560 ohms
123	12 x 10^3 = 12K ohms
1R2	1 + 0.2 = 1.2 ohms

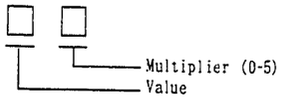
(R : Decimal point)

(2) Identification with one letter and one numeral
Use this code and the following chart for resisitor identification.

Letter	Value	Letter	Value	Letter	Value
A	1	J	2.2	S	4.7
C	1.2	L	2.7	U	5.6
E	1.5	N	3.3	W	6.8
G	1.8	Q	3.9	Y	8.2

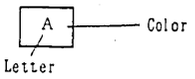
Example :

code	value
A1	1 x 10^1 = 10 ohms
G2	1.8 x 10^2 = 180 ohms
L3	2.7 x 10^3 = 2700 ohms
S4	4.7 x 10^4 = 47K ohms
W5	6.8 x 10^5 = 680K ohms



4. Leadless Capacitors
The capacitor value is indicated on its surface, using body color and one letter, or one letter and one numeral.

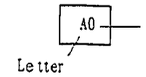
(1) Identification with body color and one letter



Body Color	Letter	Value	Body Color	Letter	Value
Red	A	1(PF)	Blue	A	100(PF)
	C	2		C	120
	E	3		E	150
	G	4		G	180
	J	5		J	220
	L	6		L	270
	N	7		N	330
	Q	8		Q	390
	S	9		S	470
Black	A	10(PF)		U	560
	C	12		W	680
	E	15		Y	820
	G	18	White	A	0.001(μF)
	J	22		E	0.0015
	L	27		J	0.0022
	N	33		L	0.0027
	Q	39		N	0.0033
	S	47		S	0.0047
	U	56		W	0.0068
	W	68	Green	A	0.01(μF)
	Y	82		E	0.015
				J	0.022
				N	0.033
				S	0.047
				U	0.056
				W	0.068
				Y	0.082
			Yellow	A	0.1(μF)

Example : Color — Letter — Value
Red — A — 1PF
Black — A — 10PF

(2) Identification with one letter and one numeral

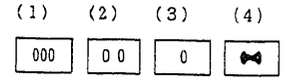


Letter/Numeral	Value	Letter/Numeral	Value
A0	1(PF)	A2	100(PF)
H0	2	C2	120
M0	3	E2	150
d0	4	G2	180
f0	5	J2	220
m0	6	L2	270
n0	7	N2	330
t0	8	Q2	390
y0	9	S2	470
A1	10(PF)	U2	560
C1	12	W2	680
E1	15	Y2	820
G1	18	A3	0.001(μF)
J1	22	E3	0.0015
L1	27	J3	0.0022
N1	33	N3	0.0033
Q1	39	S3	0.0047
S1	47	W3	0.0068
U1	56	A4	0.01(μF)
W1	68	E4	0.015
Y1	82	J4	0.022
		N4	0.033
		S4	0.047
		U4	0.056
		W4	0.068
		A5	0.1

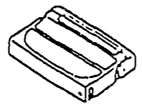
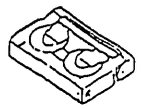
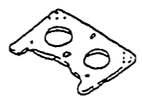
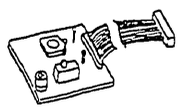
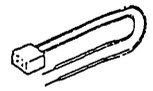
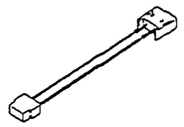
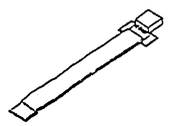
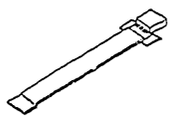
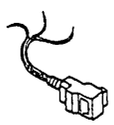
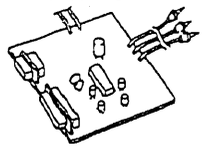
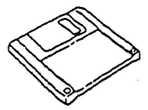
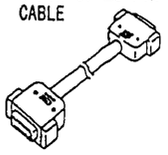
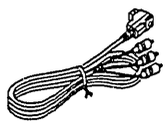
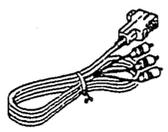
Example :
Letter/Numeral — Value
A0 — 1PF
A1 — 10PF

5. Leadless Jumper
The leadless jumper is indicated as shown below.

(1) (2) (3) (4)



JIGS AND TAPES FOR ADJUSTMENT

1. ALIGNMENT TAPE COLOR BAR/400Hz (20HSC-3) No.7099231 	2. CASSETTE TORQUE METER SRK-8T-132 No.7099235 SRK-8T-112 No.7099385 	3. MASTER PLANE No.7099237 	4. REEL DISK HEIGHT JIG No.7099238 
5. SPECIAL DRIVER No.7099239 	6. ATF-R JIG (SW3:ON) No.7099461 	7. C12 LIGHT BALANCE FILTER 46mmφ No.7099369 	8. 2-PIN EXTENSION CABLE No.7069056 
9. 2-PIN EXTENSION CABLE No.7069038 	10. 10-PIN EXTENSION CABLE No.7069039 	11. 9-PIN EXTENSION CABLE No.7069040 	12. 17-PIN EXTENSION CABLE No.7069033 
13. DSP AV OUTPUT JIG No.7099456 	14. DSP-R JIG No.7099448 	※15. CAMERA ADJ. FLOPPY DISK No.7069080 	★16. PERSONAL COMPUTER 
★17. PERSONAL COMPUTER 9-PIN or 25-PIN CABLE 	◎18. AV OUTPUT CABLE 	◆19. AV INPUT CABLE 	

MARKS
- ※ : New jigs and tools
- ★ : Goods on the Market
- ◆ : Optional Accessory
- ◎ : Accessory

—NOTE—
1: Always set SW3 on the ATF-R jig to ON.
2: The ATF jig (No.7099386) can also be used in place of ATF-R jig to adjust this model.
3: The DSP jig (No.7099442) can also be used in place of DSP-R jig to adjust this model.

HOW TO USE THE EXTENSION CABLE

No.	NAME OF EXTENSION CABLE	PARTS No.	HOW TO USE (PURPOSE OF USE)
8	2-PIN EXTENSION CABLE	7099283	• For power supply. (Blue: Negative, Yellow:Positive) • Power supply cable after the case removed.
9	2-PIN EXTENSION CABLE	7069038	• Installed between the VCA circuit board and loading motor.
10	10-PIN EXTENSION CABLE	7069039	• Installed between the VCA circuit board and cylinder. —NOTE— Using this extension cable causes noise to occur in the playback picture. This cable is used to check voltage and waveforms. Check the picture quality in the regular connection state.
11	9-PIN EXTENSION CABLE	7069040	• Installed between the VCA circuit board and capstan motor.
12	17-PIN EXTENSION CABLE	7069033	• Installed between the sensor and VCA circuit boards.

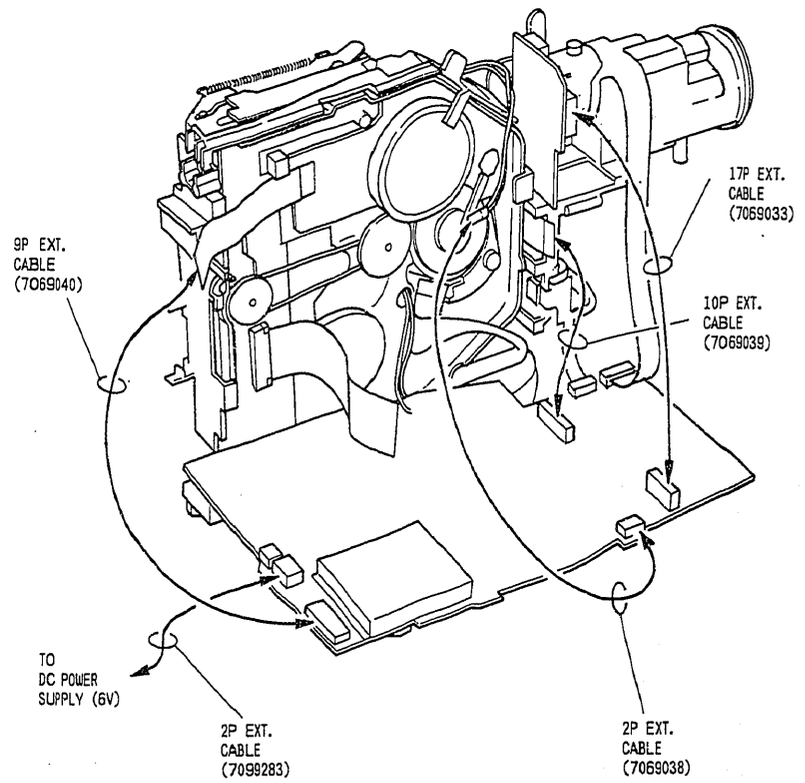


Fig. 1-i Extension Cable Connection Diagram

MAINTENANCE/INSPECTION PROCEDURE

1. Required Maintenance

The recording density of a VCR is much higher than that of an audio tape recorder. VCR components must be very precise to ensure compatible with other VCRs. If any of these components are worn or dirty, the symptoms will be the same as if the part is defective.
To ensure a good picture, periodic inspection and maintenance, including replacement of worn-out parts and lubrications, is necessary.

2. Scheduled Maintenance

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR, and the environment in which the VCR is used. But, in general home use, a good picture will be maintained if the inspection and maintenance is done every 500 hours. Table 1 shows the relation between time used per day and inspection period.

Table 1

Average hours used per day	When inspection is necessary: About 6 months ↓	About 9 months ↓	About 18 months ↓
One hour			
Two hours			
Three hours			

3. Check before starting Repairs

The faults occurring in the playback picture as shown in Table 2 can be remedied by cleaning and oiling. Check the need for lubrication and the conditions of cleanliness in the unit.
Check with the customer to find out how often the unit is used. If from that you determine that the unit is ready for inspection and maintenance, check the parts shown in Table 2.

Table 2

Phenomenon	Inspection Location
Poor S/N, no color	Dirt on video head or worn video head
Tape does not run or tape is slack	Dirt on pressure roller, cylinder or in tape transport system
Vertical jitter	Dirt on video head or in tape transport system
Low volume or sound distorted	Dirt on video head or worn video head

4. Tools Needed for Inspection and Maintenance

(1) Head cleaning kit
(2) VCR oil and grease (Table 3)
(3) Alcohol
(4) Gauze
(5) Cleaning tape [Maxell 8M-CL MCA (dry type)]

Table 3 Locations for Greasing and Oiling

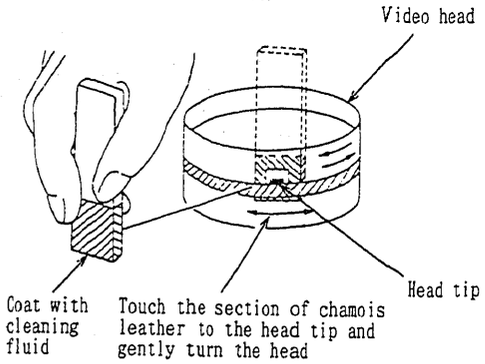
Name	Oil or Greasing Location
Sonic Slidas Oil (#1600)	Oil low-speed rotating sections
Froil (G31-SA)	Lubricate metal or molded section under light load
Molicoat (PG-641)	Lubricate metal or molded sections under light load
Lock paint	Fix adjustment screws and nuts.

5. Maintenance Procedures

5-1 Cleaning

(1) Cleaning video head
First use a cleaning tape. Be sure to use the specified cleaning tape and read its instruction sheet carefully before using it. If dirt on head is too stubborn to remove by tape, use the cleaning kit. Moisten the cleaning stick with cleaning fluid at the point indicated.
Touch the stick to the head tip and gently turn the head (rotating cylinder) to the right and left. (Do not move the stick vertically and make sure that only the chamois leather on the stick comes into contact with the head. Otherwise, the head may be damaged.) Thoroughly dry the head. Then test run a tape.
If cleaning fluid remains on the video head, the tape may be damaged when it comes into contact with the head surface.

(2) Cleaning the tape transport system and drive system, etc.
Wipe with gauze moistened with alcohol.
Notes: 1) The tape transport system is the system which comes into contact with the running tape. The drive system consists of those parts which run the tape.
2) Make sure that during cleaning you do not touch the tape transport system with the tip of a screwdriver and that no force is applied to the system that could deform it.



5-2 Lubrication

(1) Guide lines for lubricating with oil
Use the oiler to apply one or two drop of Sonic Slidas oil. Make sure not to use too mach oil because it may spill over or leak out coming into contact with rotating parts and causing slippage or other problems. If too much oil is applied, wipe clean with alchohol.

(2) Periodic oil lubrication
Lubricate the specified locations only when replacing components. Refer to the exploded views for the lubricating locations.

5-3 Greasing

(1) Greasing guidelines
Apply grease Froil or Molicoat, with a stick or brush. DO not use excess grease. It may come into contact with the tape transport or drive system. Wipe any excess and clean with gauze moistend with alcohol.

(2) Periodic greasing
Grease the specified locations only when replacing components. Refer to the exploded views for the greasing locations.

Table 4 Parts to be Maintained/Inspected and Maintenance/Inspection Schedules

Caution: The following table does not apply to all units. The maintenance/inspection schedules depend on how the unit is used and the environment in which it is used.

Component \ Hours	500	1000	1500	2000	2500	3000
Video heads (cylinder assembly)	C	C/R	C	C/R	C	C/R
Supply guide roller	C	C	C	C	C	C
Supply guide pole	C	C	C	C	C	C
Take-up guide roller	C	C	C	C	C	C
Pull-out pole	C	C	C	C	C	C
Tension pole	C	C	C	C	C	C
Tension band		R		R		R
Supply reel disk	C	C	C	C/R	C	C
Take-up reel disk	C	C	C	C/R	C	C
Pressure roller	C	C	C	C/R	C	C
Impedance roller	C	C	C	C	C	C
Capstan belt				R		
Reel drive idler				R		
Capstan shaft (capstan motor)	C	C	C	C/R	C	C
Loading motor				R		

C : Cleaning
R : Parts replacing

CHAPTER 2

1. HOW TO SET TO THE EJECT STATE MANUALLY

This is not necessary for camera/recorders which are set to the eject state normally.

1. REMOVE THE CASSETTE LID

<PROCEDURE>
① Lift the cassette lid in the direction of arrow (A) and insert tweezers between the cassette lid and left case. (Fig. 1-1)
② Release two (2) tabs (C) of the plate spring in the cassette lid in the direction of arrows (B) and remove the cassette lid in the direction of arrow (D).

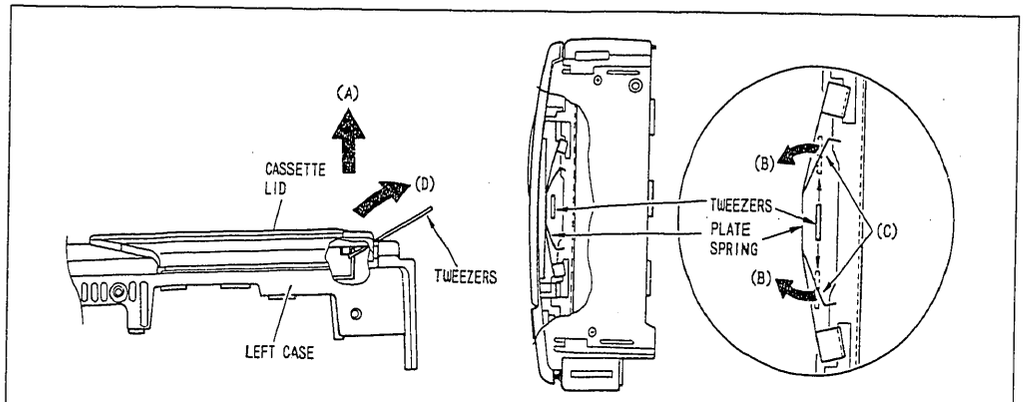


Fig. 1-1

2. UNLOADING METHOD

If the electrical circuit is defective, connect a power supply directly to the loading motor that can be seen through hole (E) in the left case; the camera/recorder can be set to the eject state. (Fig. 1-2) Be careful of the following when supplying power.

1) When the loading motor is normal

<PROCEDURE>
① Set the power supply to 3-5 V DC.
② Connect the red wire to the positive terminal and the brown wire to the negative terminal to activate unloading. Connect the brown wire to the positive terminal and the red wire to the negative terminal to activate loading.

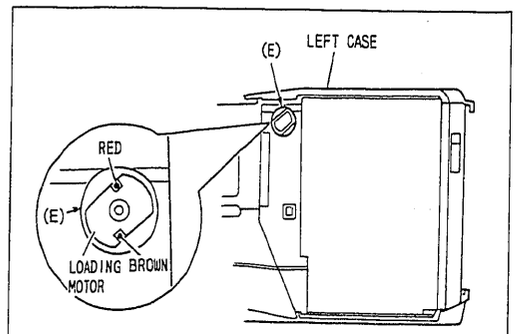


Fig. 1-2

2) When the loading motor is faulty

<PROCEDURE>
① Remove the following parts in advance, referring to subsequent items.
- Lens hood holder
- Top cover
- Open the right case
- Main block
- Main circuit board
- VCR frame and tape transport mechanism
- Loading motor

② Turn the Loading Gear (1) in the direction of arrow (F) to unload. (Fig. 1-3)

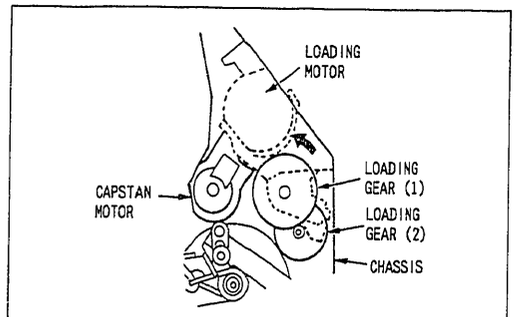


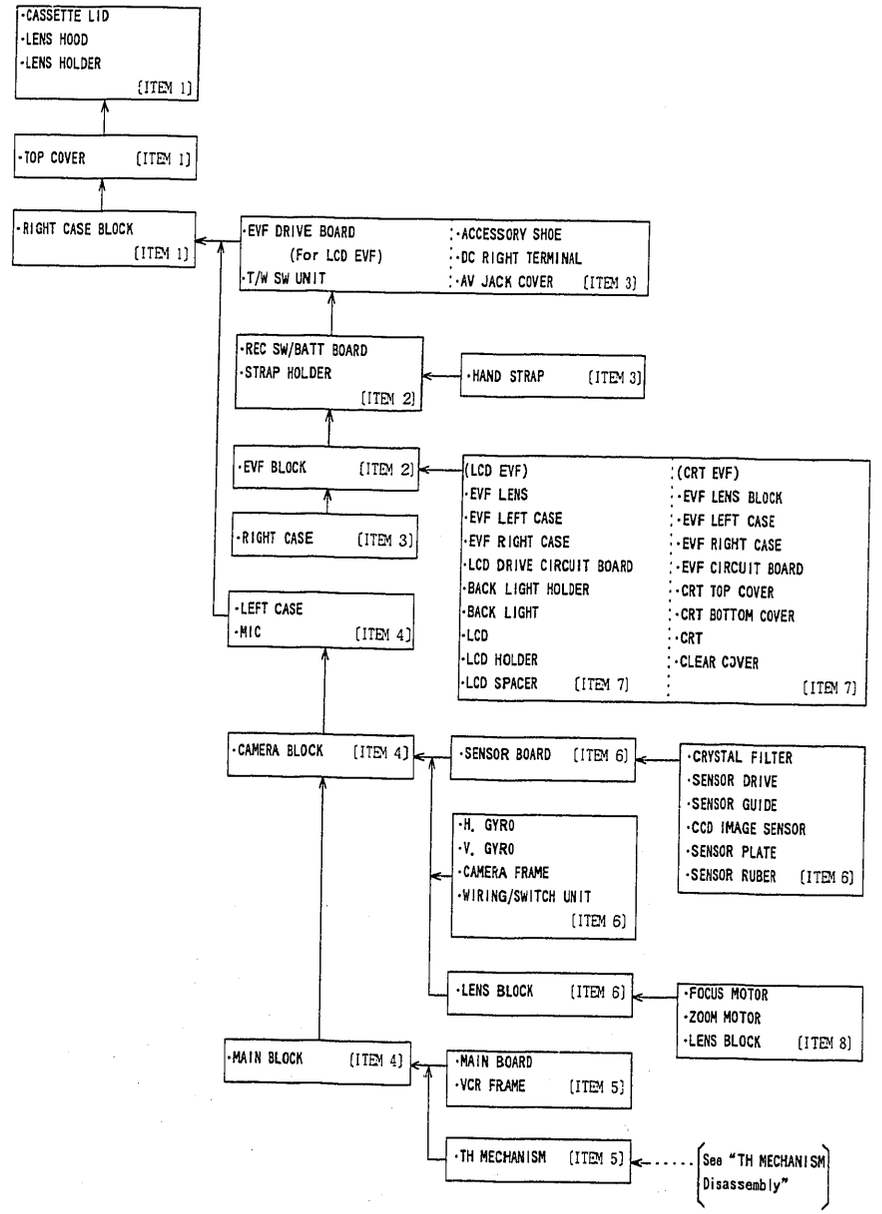
Fig. 1-3

2. COMPONENTS REMOVAL

Refer to the following "parts hierarchy chart" first when replacing defective parts. This chart shows theparts removal procedure as the hierarchy in which parts should be replaced.

[How to use the parts hierarchy chart]
(1) Search for the part to be replaced in the chart.
(2) Check the part in the rank above the part to be replaced and then start dismantling.
(3) Replace the defective part and install it by the reverse procedure to that in the hierarchy chart.
(4) [Procedure when removing]
Remove the components in the order of letter (A,B,C···) in the illustrations.
[Procedure when reinstalling]
Reinstall the components by the reverse procedure to removal when not otherwise specified.

• Parts Hierarchy Chart

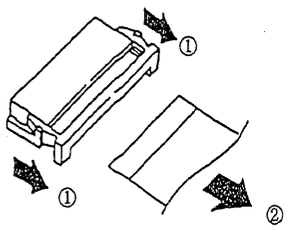


DISASSEMBLY

BEFORE STARTING DISASSEMBLY

1. When dismantling the lens block, never remove components other than the zoom motor, iris block, focus motor and flat cable of the lens.
2. Set the camera/recorder to the eject state before dismantling it. If the camera/recorder will not enter the eject state due to a defect, refer to "1. HOW TO SET TO THE EJECT STATE MANUALLY"
3. Disconnect flat cables from connectors by the procedure shown in Fig. A. Since many circuit boards in the camera/recorder are connected by in-board connectors, be sure to follow DISASSEMBLY when removing the circuit boards.

HOW TO DISCONNECT A FLAT CABLE



① Release the lock of the connector on the left and right simultaneously.
② Pull out the flat cable.

Fig. A

1. Cassette Lid, Lens Hood, Lens Holder, Top Cover, and Right Case Block Removal

◆ Caution during work
1) Set the unit to the eject state and remove the lens cap from the lens hood.
2) The rubber rings is removed on its own when the lens hood holder is removed. Be sure to reinstall the rubber ring as show in Fig. 2-1.

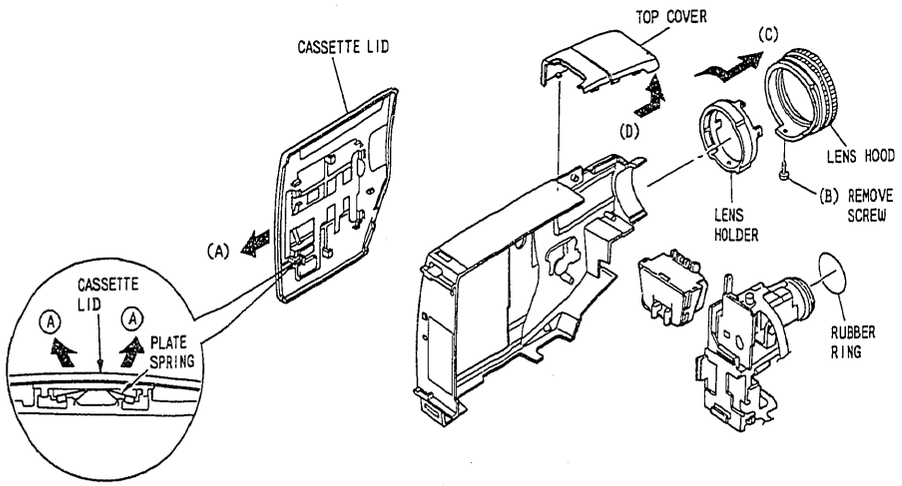


Fig.2-1

2. Disassembly of Right Case Block (LEFT SIDE)

◆ Caution during work
1) The EVF plate and plate spring are removed on their own when the EVF is removed.
2) The lithium battery on the REC SW/Batt. circuit board can be recharged. It cannot be removed from the board.

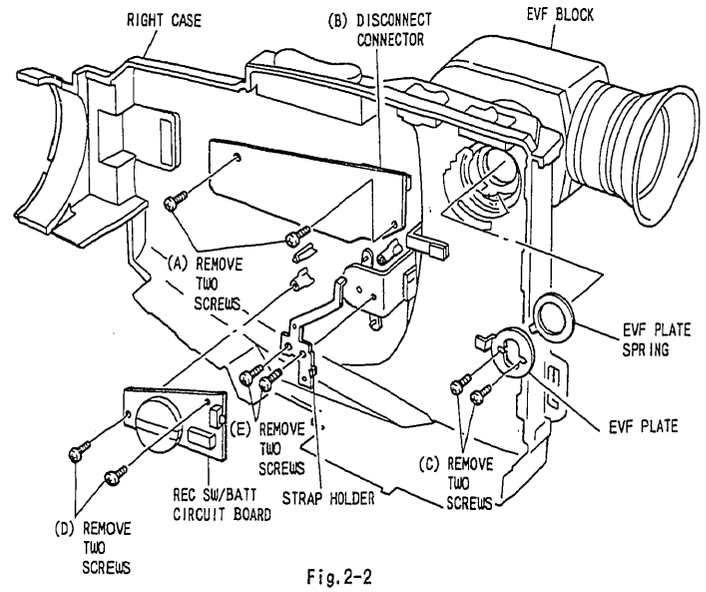


Fig.2-2

3. Disassembly of Right Case Block (RIGHT SIDE)

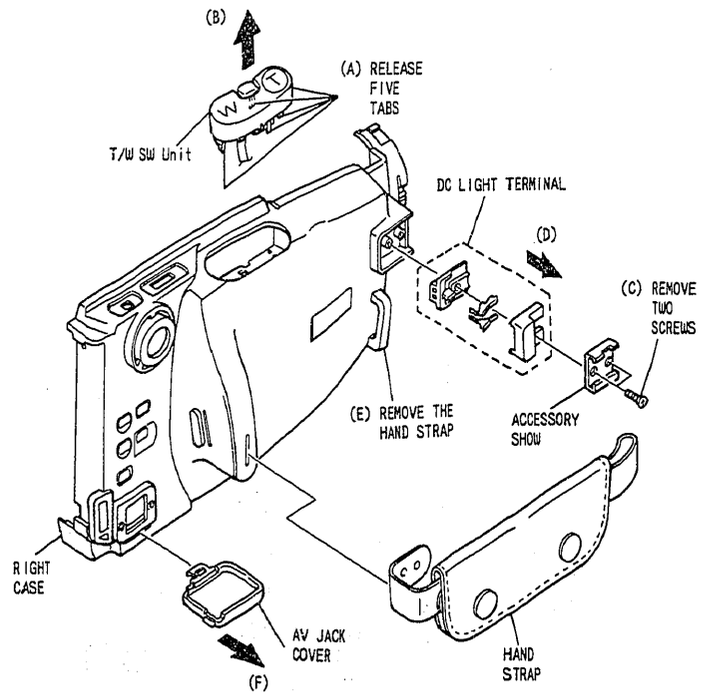


Fig.2-3

4. Main Block, Camera Block, Microphone (MIC), left Case Removal

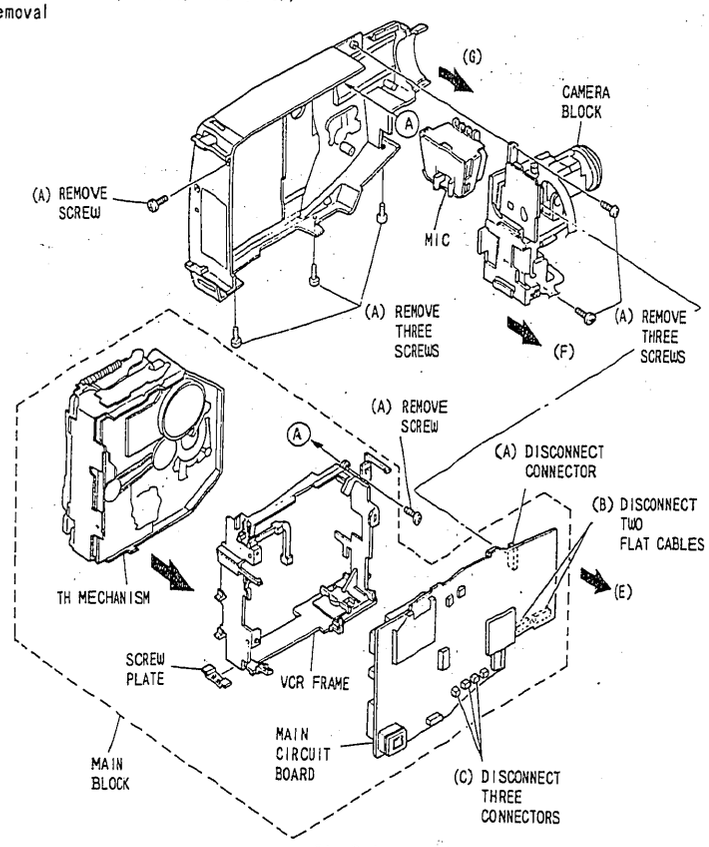


Fig. 2-4

5. Main(VCA) Circuit Board, VCR Frame and TH Mechanism Removal

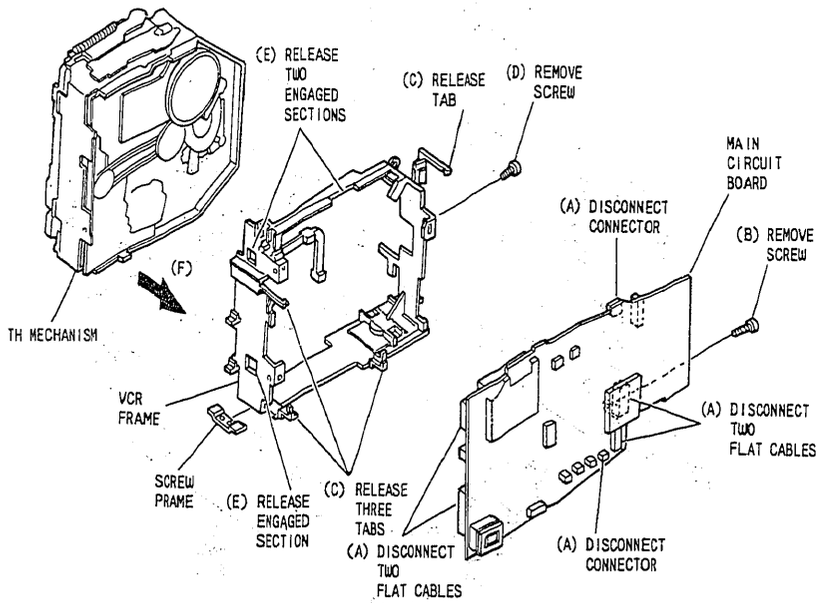


Fig. 2-5

6. Disassembly of Camera Block

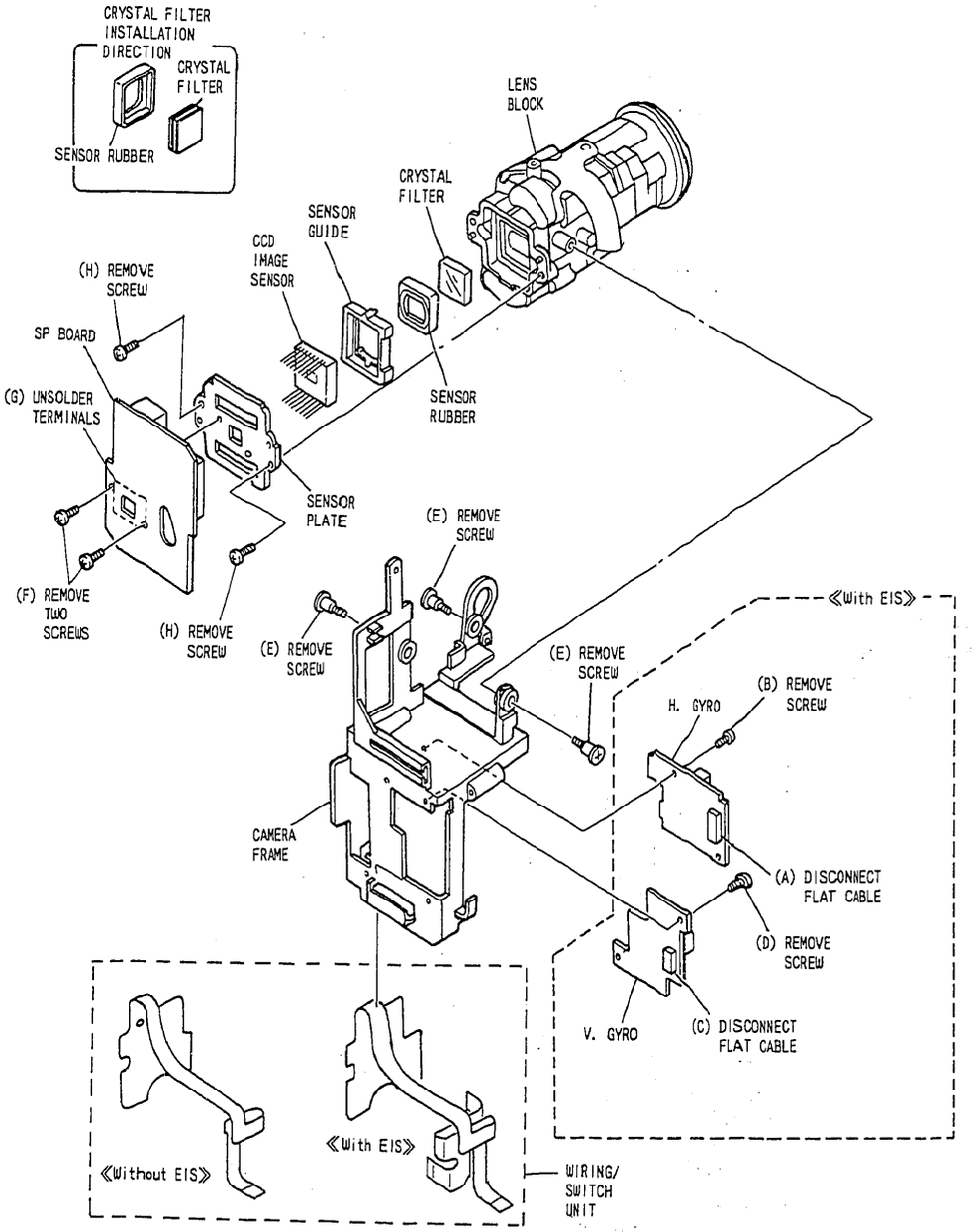


Fig. 2-6

7. Disassembly of Electronic Viewfinder (EVF) Block

《CRT EVF》

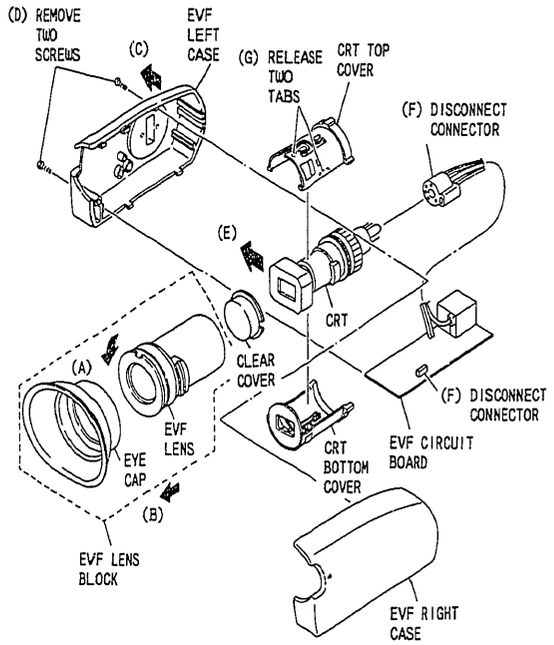


Fig.2-7 CRT EVF MODEL

《LCD EVF》

◆ Caution during work

1) When handling the LCD, never touch the LCD panel surface and flat cable connection section. Otherwise, it could cause a defect.

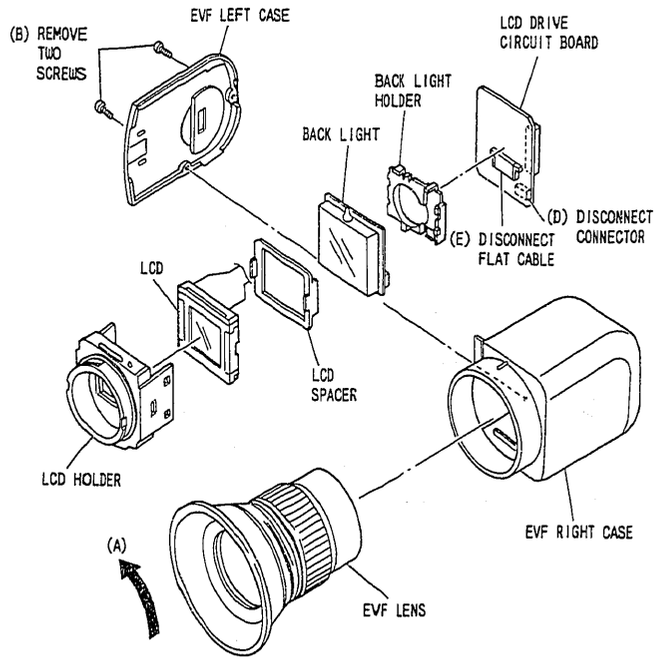
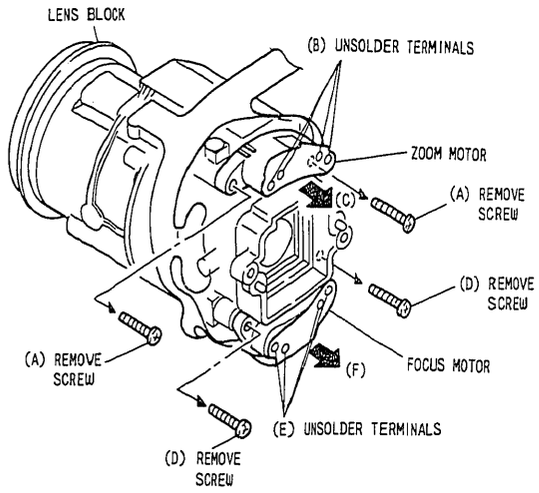


Fig.2-8 LCD EVF MODEL

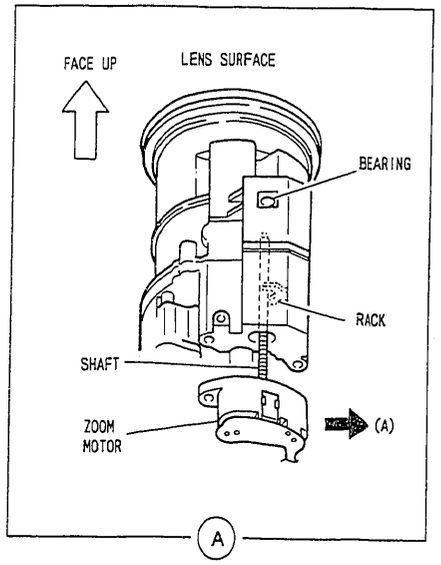
8. Disassembly of Lens Block

◆ Cautions during work

1) Follow Ⓑ when reinstalling the zoom motor.
2) Follow Ⓒ when removing the focus motor.
3) After reinstalling, be sure to re-attach the plastic tape in its original position.

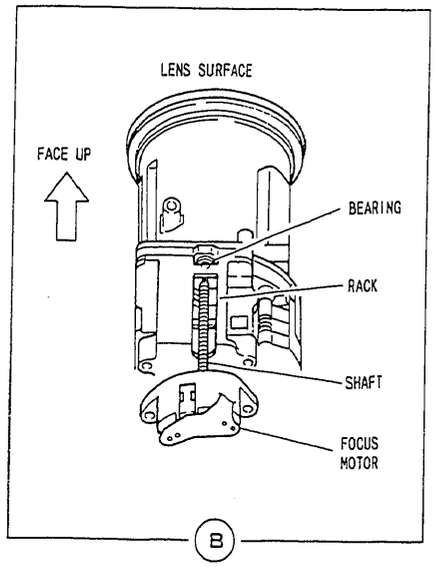


<Zoom Motor Section>



1) Remove the plastic tape from the side.
2) With the lens facing up, move the rack down.
3) Insert the shaft halfway and move it in the direction of arrow (A) to engage it with the rack.
4) Further insert the shaft and push it into the bearing securely to fix it. Check this state through the window on the side.

<Focus Motor Section>



1) Remove the plastic tape from the side.
2) With the lens facing up, move the rack down.
3) Engage the middle of the shaft into the rack from the side.
4) Move the shaft up and push it into the bearing securely to fix it. Check this state through the window on the side.

Fig.2-9

CHAPTER 3

ELECTRICAL ADJUSTMENT

Abbreviation

MAP ···· Digital adjustment programme for the camera.
DSP ···· Digital signal processor.

1. CONNECTION FOR ADJUSTMENT

NOTE

·Most adjustment items can be done without dismantling the camera/recorder.
·The EVF must be connected to display the operation mode on the monitor screen.

◆ To perform the following adjustments, set the camera/recorder to the state shown in "Extension Cable Connection Diagram in CHAPTER 1", referring to "CHAPTER 2 DISASSEMBLY".

·7-4 Electric Volume Adjustment
(1) Sensor Drive Voltage Adjustment
·VCR Section Adjustment
·Electric Viewfinder Adjustment
(The EVF block should be further taken apart.)

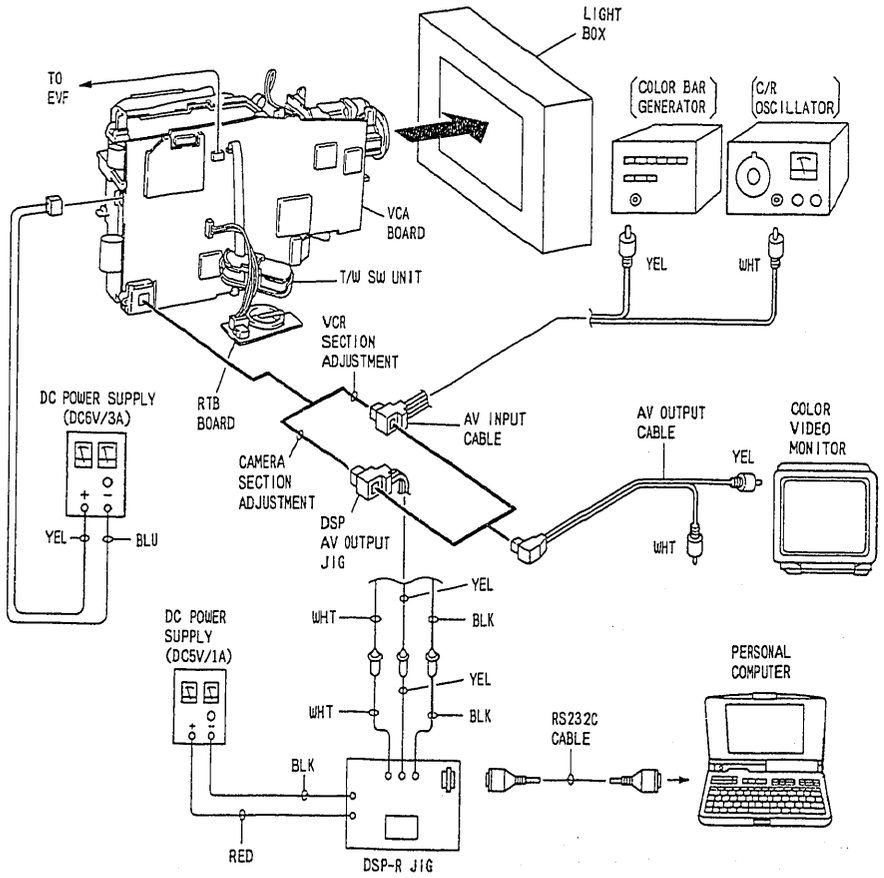


Fig. 1-1

2. CAMERA SECTION ADJUSTMENT

1. CIRCUIT BOARD LOCATIONS

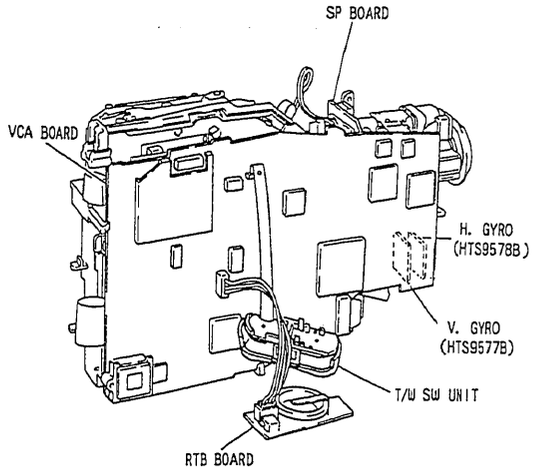


Fig. 2-1

2. TEST EQUIPMENT AND CHARTS NECESSARY FOR ADJUSTMENT

1) Test Equipment
·Oscilloscope (dual trace)
[Vectorscope]
·Digital Voltmeter (DVM)
·Frequency Counter
·Color Video Monitor
2) Charts, etc.
·Adjustment Floppy Disk
·Personal Computer
·Personal Computer 9-pin or 25-pin (RS232C) Cable
·DSP-R Jig
·DSP AV Output Cable
·Gray Scale Chart
·Color Bar Chart
·Resolution Chart
·Backfocus Adjustment Chart
·Light Box (3100°K)
·Light Balancing Filter C12
·DC Power Supply (DC7.2V/3A)
·DC Power Supply (DC5V/1A)

3. ADJUSTMENT CONDITION

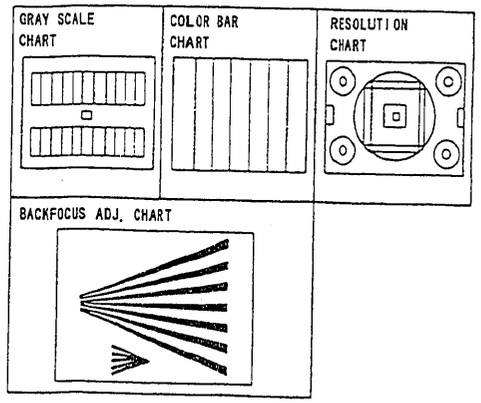
1) Check that the VCR section has been adjusted correctly before adjusting the camera section.
2) Use a light box with minimum flickering. Control the color temperature of the light box strictly.
3) Connect this unit, a power supply and a color video monitor as shown in Fig. 1-1.
4) When using the video out (AV OUT) to perform adjustment, be sure to terminate the AV OUT jack with 75 ohms.
5) Place the chart (light box) approx. 30cm away from the camera (lens surface) when otherwise not specified.
6) Point the camera at the chart to full the video period when otherwise not specified.
7) Use the 10:1 probe of the oscilloscope when otherwise not specified.
8) When "Trigger the oscilloscope internally" is specified, set the time base of the oscilloscope to 10μs/div.

4. PRESET POSITIONS OF SWITCHES AND CONTROLS DURING ADJUSTMENT

·CAMERA/OFF/VIDEO switch ... "CAMERA" position
·INST. ZOOM ..... Not Display mode
·DATE ..... Not Display mode
·DISPLAY ..... Not Display mode
·FADE ..... Not Display mode
·EIS ..... Not Display mode
·16×9 ..... OFF mode
·B.LIGHT ..... Not Display mode
·TITLE ..... Not Display mode
·FOCUS ..... AUTO mode

5. LIST OF CHARTS FOR CAMERA ADJUSTMENT

Table 2-1



6. CHECK AFTER REPLACING MAJOR COMPONENTS IN THE CAMERA SECTION

After replacing major components, perform checks, referring to the table below.
The following table shows the minimum adjustments required after major components are replaced.
The table below may not apply when several components are replaced, depending on the symptom of the defect.

Caution: When EEP ROM or the main circuit board is replaced, initialize the EEP ROM, referring to "7-3 Initial Setting by Model", then perform all the camera section and system control/ servo circuits adjustments.

ITEM No.	NAME OF ADJUSTMENT	NAME OF MAJOR COMPONENTS										
		SENSOR C.B.A	VCA C.B.A	IC1001	IC1101	IC1106	IC1110	IC1201 IC1202	IC1105	IC1103	IC1401	IC1501
—	Initial Setting by Model		●			●				●		
ELECTRIC VOLUME ADJUSTMENT PROCEDURE												
(1)	Sensor Drive Voltage Adjustment	●	●	●		●	●			●		
(2)	CDS Offset Adjustment		●		●	●				●		
(3)	Sensor Drive Pulse & Sub Voltage Adjustment	●	●	●		●	●			●		
(4)	CDS Sampling pulse		●			●				●		
DIGITAL ADJUSTMENT PROCEDURE												
(1)	Auto Iris Control Adjustment	●	●	●		●		●	●	●		
(2)	Knee Adjustment		●			●				●		
(3)	Matrix Adjustment	●	●	●		●				●		
(4)	White balance Adjustment	●	●	●		●				●		
(5)	Chroma gain Adjustment	●	●	●		●				●		
AUTO FOCUS ADJUSTMENT PROCEDURE												
(1)	Zoom Trace Adjustment	●	●	●		●				●		
(2)	AF Noise Level Adjustment	●	●	●		●				●		
STABILIZER ADJUSTMENT PROCEDURE												
(1)	Stabilizer Adjustment	●	●	●		●				●	●	●
SPOT NOISE ADJUSTMENT PROCEDURE												
(1)	Spot Noise Adjustment		●	●		●				●		

7. CAMERA SECTION ADJUSTMENT PROCEDURE

— NOTE —

1. Refer to the instruction manual of the personal computer for how tostart the computer.
2. To complete adjustment, press the ESC (escape) key twice to restore the MS-DOS screen and then turn off the camera recorder and jigs.
3. The following describes an example of the instructions of the personal computer and the menu display; they are different depending on the personal computer manufacturer and model. Refer to the instruction manual of personal computer.
4. When the error message appears during adjsustment, refer to "4. Error Messages". If a key is pressed after an error message appears, the ADJSTMENT MENU is restored.

```
F>
```

Fig. 2-2

↓

LOAD THE CAMERA ADJ. FLOPPY DISK INTO DISK DRIVE B

↓

Press [B] [:] [ENTER]

↓

```
F>B:
B>
```

Fig. 2-3

↓

Press [M] [A] [P] [_] [I] [B] [M] [(SPACE)] [1] [ENTER]

↓

(A)

7-1. Connections for Adjustment

Connect the camera/recorder, DSP jig, personal computer, power supply, etc. as shown in Fig. 1-1. during Check that the camera/recorder is turned on.

7-2. How to start the MAP

— PROCEDURE —

1) Turn the personal computer on and start the MS-DOS system. (Fig. 2-2)

2) Load the adjustment floppy disk into disk
   - drive B and press [B] [:] then [ENTER] .
   - or
   - drive A and press [A] [:] then [ENTER] .

   (Fig. 2-3)

3) Press [M] [A] [P] [_] [I] [B] [M] [(SPACE)] [1] then [ENTER] .
   The MAP starts and the MODEL SELECT shown Fig. 2-6 appears.

— NOTE —

- When you use a personal computer with two serial interface connectors and connect the DSP jig to serial interface connector 2, press MAP_IBM 2.

4) Select the number accodding to the model. If [ESC] (escape) is pressed, the display before the MAP starts (MS-DOS) is restored.

— NOTE —

1. If you specify the wrong model, press [ESC] (escape) to restore the MODEL SELECT display, then specify the correct model.
2. If you select number without a model name by mistake, the message shown in Fig. 2-8 will appear in the computer's display. Press any key to return the display to Fig. 2-6 (MODEL SELECT).
3. If there are more than 5 models and [P] is pressed, the computer's display changes to the next page.

(A)

↓

```
F>B:
B>MAP_IBM 1
```

Fig. 2-4

↓

```
Manual adjustment program for service station
Copyright (C) Hitachi LTD
```

Fig. 2-5

↓

MODEL SELECT

```
**********************************************
*************** MODEL SELECT *****************
**********************************************

        [1]   XXXXXXXX
        [2]   XXXXXXXX
        [3]   XXXXXXXX
        [4]   XXXXXXXX
        [5]   XXXXXXXX
        [P]   NEXT SELECTION
        [ESC] END

   Please select the type of the set.
   Press [1] - [5] or [P] or [ESC]
```

Fig. 2-6

↓

Press numeric key

↓

MAIN MENU

```
**********************************************
********* MANUAL ADJUSTMENT PROGRAM **********
**********************************************

        [A]   DATA INITIALIZE
        [B]   ELECTRIC VOLUME
        [C]   ADJUSTMENT
        [D]   AUTO FOCUS
        [E]   VCR ADJUSTMENT
        [F]   EIS
        [G]   SPOT NOISE
        [ESC] END

Please select [A], [B], [C], [D], [E], [F], [G]
              or [ESC]
```

Fig. 2-7

MESSAGE WHEN OPERATED BY MISTAKE

```
Can not find the DATA FILE
**** PRESS ANY KEY ****
```

Fig. 2-8

7-3. Initial Setting by Model

◆ Before Starting Adjstment

- This item describes how to initialize the EEP ROM. Be sure to perform this item after replacing EEP ROM or the main circuit board. When other components are replaced, normally, it is not necessary to initialize the EEP ROM. Press [ESC] (escape) to return the computer's display to MAIN MENU.
- Be sure to perform the following adjustments after completing the initial setting.

CAMERA	7-4	Electric Volume Adjustment Procedure
CAMERA	7-5	Digital Adjustment Procedure
CAMERA	7-6	Autofocus Adjustment Procedure
VCR	7	System Control/Servo Circuits Adjustment

—— PROCEDURE ——

1) Start the MAP.

2) Press [A] to select INITIALIZE. (Figs. 2-9, 2-10)

3) Press [Y] to start. (Figs. 2-10, 2-11)

—— NOTE ——

- Press [N] to return to MAIN MENU. (Fig. 2-10)
- The Fig. 2-10 appears a few time Press the [Y] key each time.

4) If there are no abnormalities in the camera/recorder, the message shown in Fig. 2-11 is displayed in the computer's display for a while, and then the message informing you that the initial setting has been completed (shown in Fig. 2-12) is displayed.

5) If the message shown in Fig. 2-12 appears in the computer's display, press any key. The computer's display returns to Fig. 2-9 (MAIN MENU).

MAIN MENU

```
**********************************************
********* MANUAL ADJUSTMENT PROGRAM ***********
**********************************************
          [A]   DATA INITIALIZE
          [B]   ELECTRIC VOLUME
          [C]   ADJUSTMENT
          [D]   AUTO FOCUS
          [E]   VCR ADJUSTMENT
          [F]   EIS
          [G]   SPOT NOISE
          [ESC] END
Please select [A], [B], [C], [D], [E], [F], [G]
              or [ESC]
```

Fig. 2-9

⬇

Press [A]

⬇

```
<< DATA WRITING >>
START TO SEND DATA.    (Y/N)
```

Fig. 2-10

⬇

Press [Y]

⬇

```
<< DATA WRITING >>
PLEASE WAIT A MOMENT
```

Fig. 2-11

⬇

```
<< DATA WRITING >>
PLEASE WAIT A MOMENT
FINISHED WRITING DATA !!
PRESS ANY KEY !
```

Fig. 2-12

⬇

Press any key to return to Fig. 2-9

7-4. Electric Volume Adjustment Procedure

◆ Before Starting Adjstment

- When EEP ROM or the main circuit board is replaced, initialize the EEP ROM, referring to "7-3. Initial Setting By Model" then perform all the electric volume adjustments.

—— PROCEDURE ——

1) Start the MAP.

2) Press [B] to select ELETRIC VOLUME. (Figs. 2-13, 2-14)

3) Select the number of the required adjustment.

—— NOTE ——

1. If [ESC] (escape) is pressed, the computer's display returns to Fig. 2-13 (MAIN MENU).
2. To complete adjustment, press the [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

MAIN MENU

```
**********************************************
********* MANUAL ADJUSTMENT PROGRAM ***********
**********************************************
          [A]   DATA INITIALIZE
          [B]   ELECTRIC VOLUME
          [C]   ADJUSTMENT
          [D]   AUTO FOCUS
          [E]   VCR ADJUSTMENT
          [F]   EIS
          [G]   SPOT NOISE
          [ESC] END
Please select [A], [B], [C], [D], [E], [F], [G]
              or[ESC]
```

Fig. 2-13

⬇

Press [B]

⬇

ELECTRIC VOLUME ADJ. MENU

```
**********************************************
************ ELECTRIC VOLUME ***************
**********************************************
  [1]   SENSOR DRIVE VOLTAGE
  [2]   CDS OFFSET
  [3]   SENSOR DRIVE PULSE & SUB VOLTAGE
  [5]   CDS SAMPLING PULSE
  [ESC] RETURN TO MAIN MENU
  Please select [1], [2], [3], [5] or [ESC]
```

Fig. 2-14

—— ADJUSTMENT PARTS LOCATION ——

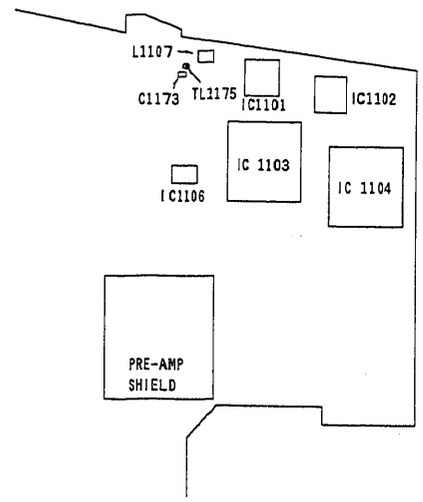


Fig. 2-15 Main Circuit Board (B Side)

(1) Sensor Drive Voltage Adjustment (Fig. 2-15)

PURPOSE	·To measure the supply voltage of the CCD sensor.
INCOMPLETED PHENOMENON	·The CCD sensor output level drops and the picture is distorted.
TEST POINT	·TL1175 VCA ·JK200-9 (GND : Black lead of DSP Output jig)
EQUIPMENT/JIG	·DVM
CONDITION	———

PROCEDURE

ELECTRIC VOLUME ADJ. MENU

```
**********************************************
************* ELECTRIC VOLUME ****************
**********************************************
   [1]    SENSOR DRIVE VOLTAGE
   [2]    CDS OFFSET
   [3]    SENSOR DRIVE PULSE & SUB VOLTAGE
   [5]    CDS SAMPLING PULSE
   [ESC]  RETURN TO MAIN MENU
  Please select [1], [2], [3], [5] or [ESC]
```

Press [1] key to select the SENSOR DRIVE VOLTAGE.

```
<< ADJUSTMENT OF SENSOR DRIVE VOLTAGE >>
SET VOLTAGE OF TL1175 AT 15 (+/- 0.1) V.
[U]       UP
[D]       DOWN
[ENTER]   SAVE & RETURN TO MENU
[ESC]     QUIT
```

Press the [U] and [D] keys to set the voltage to 15V ± 0.1V.

Press [ENTER] key, and the display changes as follows.

```
<< ADJUSTMENT OF SENSOR DRIVE VOLTAGE >>
FINISHED WRITING DATA.
ADJUSTMENT FINISHED.
PRESS ANY KEY
```

Press any key to return to ELECTRIC VOLUME ADJ. MENU.

(2) CDS Offset Adjustment

PURPOSE	·To determine the DC offset levels when the AGC is set to the minimum and maximum gains.
INCOMPLETED PHENOMENON	·When a subject is illuminated brightly in low lighting, a white band appears across the top of the screen.
TEST POINT	———
EQUIPMENT/JIG	———
CONDITION	———

PROCEDURE

ELECTRIC VOLUME ADJ. MENU

```
**********************************************
************* ELECTRIC VOLUME ****************
**********************************************
   [1]    SENSOR DRIVE VOLTAGE
   [2]    CDS OFFSET
   [3]    SENSOR DRIVE PULSE & SUB VOLTAGE
   [5]    CDS SAMPLING PULSE
   [ESC]  RETURN TO MAIN MENU
  Please select [1], [2], [3], [5] or [ESC]
```

Press [2] key to select the CDS OFFSET.

```
<< ADJUSTMENT OF CDS OFFSET >>
PLEASE WAIT AROUND 50 SEC.
```

```
<< ADJUSTMENT OF CDS OFFSET >>
FINISHED WRITING DATA.
ADJUSTMENT FINISHED.
PRESS ANY KEY
```

Press any key to return to ELECTRIC VOLUME ADJ. MENU.

(3) Sensor Drive Pulse and Sub Voltage Adjustment

PURPOSE	·To determine the level of the pulse output from the CCD sensor. To determine the bias voltage of the CCD sensor.
INCOMPLETED PHENOMENON	·No picture. ·No color. ·Rough picture. ·Smear occurs.
TEST POINT	———
EQUIPMENT/JIG	———
CONDITION	·Point the camera at the light box without a chart to full the screen (at wide-angle).

PROCEDURE

ELECTRIC VOLUME ADJ. MENU

```
**********************************************
************* ELECTRIC VOLUME ****************
**********************************************
   [1]    SENSOR DRIVE VOLTAGE
   [2]    CDS OFFSET
   [3]    SENSOR DRIVE PULSE & SUB VOLTAGE
   [5]    CDS SAMPLING PULSE
   [ESC]  RETURN TO MAIN MENU
  Please select [1], [2], [3], [5] or [ESC]
```

Press [3] key to select the SENSOR DRIVE PULSE & SUB VOLTAGE.

Check the number in the seal at the back of the CCD image sensor and enter the number into the personal computer.

Press [ENTER] key, and the display changes as follows.

```
<< ADJUSTMENT OF SUB VOLTAGE &
                    SENSOR DRIVE PULSE >>
          << NOW ADJUSTING >>
```

```
<< ADJUSTMENT OF SUB VOLTAGE &
                    SENSOR DRIVE PULSE >>
FINISHED WRITING DATA.
ADJUSTMENT FINISHED.
PRESS ANY KEY.
```

Press any key to return to ELECTRIC VOLUME ADJ. MENU.

(4) CDS Sampling Pulse Adjustment

PURPOSE	·To suppress noise in the CCD sensor output signal and maximize the signal level.
INCOMPLETED PHENOMENON	·Diagonal beats and horizontal noise occur.
TEST POINT	———
EQUIPMENT/JIG	———
CONDITION	·Leave the camera/recorder for more than 2 minutes untill the circuits are stabilized after turing it on, then start adjustment.

PROCEDURE

ELECTRIC VOLUME ADJ. MENU

```
**********************************************
************* ELECTRIC VOLUME ****************
**********************************************
   [1]    SENSOR DRIVE VOLTAGE
   [2]    CDS OFFSET
   [3]    SENSOR DRIVE PULSE & SUB VOLTAGE
   [5]    CDS SAMPLING PULSE
   [ESC]  RETURN TO MAIN MENU
  Please select [1], [2], [3], [5] or [ESC]
```

Press [5] key to select the CDS SAMPLING PULSE.

```
<< ADJUSTMENT OF CDS SAMPLING PULSE >>
          << NOW ADJUSTING >>
```

```
<< ADJUSTMENT OF CDS SAMPLING PULSE >>
FINISHED WRITING DATA.
ADJUSTMENT FINISHED.
PRESS ANY KEY !
```

Press any key to return to ELECTRIC VOLUME MENU.

7-5. Digital Adjustment Procedure

◆Before Starting Adjustment

- When EEP ROM or the main circuit board is replaced, initialize the EEP ROM, referring to "7-3 Initial Setting By Model" then perform all the digital adjustments.

◆Caution when adjustment

Caution: Perform auto iris adjustment [1. AUTO IRIS CONTROL] and knee adjustment [2. KNEE] in the following order.

① Auto Iris Adjustment (Perform the following autofocus adjustment if "ADJUSTMENT OF HALL CURVE" is not completed).
② Zoom Trace Adjustment in AUTOFOCUS ADJUSTMENT PROCEDURE.
③ AF Noise Level Adjustment in AUTOFOCUS ADJUSTMENT PROCEDURE.
④ Auto Iris Adjustment (All three items, "ADJUSTMENT OF IRIS OPEN & CLOSE", "ADJUSTMENT OF IRIS" and "ADJUSTMENT OF HALL CURVE" should be complete).
⑤ Knee Adjustment.

—— PRROCEDURE ——

1) Start the MAP.

2) Press [C] to select ADJUSTMENT. (Figs. 2-16, 2-17)

3) Select the number of the required adjustment.

—— NOTE ——

1. If [ESC] (escape) is pressed, the computer's display returns to Fig. 2-16 (MAIN MENU).
2. To complete adjustment, press the [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

MAIN MENU

```
**********************************************
********* MANUAL ADJUSTMENT PROGRAM ***********
**********************************************
          [A]   DATA INITIALIZE
          [B]   ELECTRIC VOLUME
          [C]   ADJUSTMENT
          [D]   AUTO FOCUS
          [E]   VCR ADJUSTMENT
          [F]   EIS
          [G]   SPOT NOISE
          [ESC] END
Please select [A], [B], [C], [D], [E], [F], [G]
              or [ESC]
```

Fig. 2-16

↓

Press [C]

↓

ADJUSTMENT MENU

```
**********************************************
*************** ADJUSTMENT *******************
**********************************************
          [1]   AUTO IRIS CONTROL
          [2]   KNEE
          [3]   MATRIX
          [4]   WHITE BALANCE
          [5]   CHROMA GAIN
          [ESC] RETURN TO MAIN MENU
Please select [1], [2], [3], [4], [5] or [ESC]
```

Fig. 2-17

(1) Auto Iris Control Adjustment

- Perform this adjustment, following the order described in "◆Caution When Adjustment" on the previous page.

PURPOSE	·To set the iris control data.
INCOMPLETED PHENOMENON	·The picture becomes too bright. ·The picture becomes too dark.
TEST POINT	————
EQUIPMENT/JIG	————
CONDITION	·Point the camera at the light box without a chart to full the screen (at wide-angle).

PROCEDURE

ADJUSTMENT MENU

```
**********************************************
*************** ADJUSTMENT *******************
**********************************************
          [1]   AUTO IRIS CONTROL
          [2]   KNEE
          [3]   MATRIX
          [4]   WHITE BALANCE
          [5]   CHROMA GAIN
          [ESC] RETURN TO MAIN MENU
Please select [1], [2], [3], [4], [5] or [ESC]
```

↓

Press [1] key to select the AUTO IRIS CONTROL.

↓

```
<<ADJUSTMENT OF IRIS OPEN & CLOSE>>
PLEASE WAIT AROUND 10 SEC.
```

↓

```
<<ADJUSTMENT OF IRIS OPEN & CLOSE>>
PLEASE WAIT AROUND 10 SEC.

DATA WRITEN INTO EEPROM
ADJUSTMENT FINISHED

PRESS ANY KEY
```

↓

Press any key, and the display changes as follows.

↓

```
<< ADJUSTMENT IRIS >>
PLEASE WAIT AROUND 20 SEC.
```

—— ※1 ——

↓

```
<< ADJUSTMENT IRIS >>
PLEASE WAIT AROUND 20 SEC.

ROUGH ADJUSTMENT     : xx TIMES
FINE ADJUSTMENT      : xx TIMES

ADJUSTMENT FINISHED

PRESS ANY KEY
```

↓ [B]

↓ [B]

Press any key, and the display changes as follows.

↓

```
<< ADJUSTMENT OF HALLCURVE >>
PLEASE WAIT AROUND 30 SEC.
PAL SECAM
```

—— ※2 ——

↓

```
<< ADJUSTMENT OF HALLCURVE >>
PLEASE WAIT AROUND 30 SEC.
PAL SECAM

*
ADJUSTMENT POINT 0 1 2 3 4 5 6 7 8 9 A B C
```

↓

```
<< ADJUSTMENT OF HALLCURVE >>
PLEASE WAIT AROUND 30 SEC.
PAL SECAM

* * * * * * * * * * * * * *
ADJUSTMENT POINT 0 1 2 3 4 5 6 7 8 9 A B C

DATA WRITEN INTO EEPROM
ADJUSTMENT FINISHED

PRESS ANY KEY
```

↓

Press any key, and the display changes as follows.

↓

```
ADJUSTMENT FINISHED

PRESS ANY KEY
```

↓

Press any key to return to ADJUSTMENT MENU.

—— NOTE ——

1. With some units the following parameter may not be displayed in the display marked ※1. This is normal; continue adjustment.
   ROUGH ADJUSTMENT: xx TIMES
2. The * mark flashes above the numerals and letters in sequence in the display marked ※2.

(2) Knee Adjustment (Fig. 2-18)

• Perform this adjustment, following the order described in "◆Caution When Adjustment" on the page before the previous page.	
PURPOSE	·To determine the knee level.
INCOMPLETED PHENOMENON	·Color in the very bright section is defective.
TEST POINT	·Video Out (AV OUT)
EQUIPMENT/JIG	·Oscilloscope (Waveform Monitor)
CONDITION	·Point at a gray scale chart.

PROCEDURE

ADJUSTMENT MENU

```
**************************************************
*************** ADJUSTMENT ***********************
**************************************************
          [1]   AUTO IRIS CONTROL
          [2]   KNEE
          [3]   MATRIX
          [4]   WHITE BALANCE
          [5]   CHROMA GAIN
          [ESC] RETURN TO MAIN MENU
Please select [1], [2], [3], [4], [5] or [ESC]
```

↓

Press [2] key to select the KNEE.

↓

```
**** KNEE ADJUSTMENT ****  STEP 1
* THIS ADJUSTMENT ONLY NEEDED
        AFTER REPLACING IC1101 OR IC1107. *
* THE [1] IRIS CONTROL ADJUSTMENT
          SHOULD HAVE JUST BEEN COMPLETED
  BEFORE PERFORMING THE FOLLOWING KNEE
                  ADJUSTMENT PROCEDURE. *

PLEASE POINT AT THE CHART AND
                  PRESS THE FOLLOWING KEY
RETURN TO MENU    [ESC]
GO TO NEXT STEP   [ENTER]
```

↓

Press [ENTER] key to start the next step.

↓

```
*** KNEE ADJUSTMENT ***  STEP 1
*** WAIT A MOMENT ***
```

↓

(C)

(C)

↓

```
**** KNEE ADJUSTMENT ****  STEP 2
SET LUMINANCE LEVEL TO
      100 (+/- 5) IRE OR 715 (+/- 35) mV

ROUGH ADJUSTMENT
[U]             UP
[D]             DOWN

FINE ADJUSTMENT
[Ctrl] + [U]    UP
[Ctrl] + [D]    DOWN

[ENTER]         DECISION
```

↓

Press the [U] and [D] keys to set the amplitude level to around 715mVp-p.
Press the [Ctrl] key and hold it down, then press the [U] and [D] keys to adjust the amplitude level to 715mVp ± 35mVp-p.

↓

Press [ENTER] key to start the next step.

↓

```
**** KNEE ADJUSTMENT ****  STEP 3
ADJUST THE LUMINANCE LEVEL TO
            MATCH THE LEVEL FROM SETP 2

ROUGH ADJUSTMENT
[U]             UP
[D]             DOWN

FINE ADJUSTMENT
[Ctrl] + [U]    UP
[Ctrl] + [D]    DOWN

[C]             REREAD THE LEVEL FROM STEP 2
[ENTER]         DECISION
```

↓

Press the [U] and [D] keys to bring the amplitude level near to the level in step 2.
Press the [Ctrl] key and hold it down, then press the [U] and [D] keys to match the amplitude level to that in step 2.

↕

Press the [C] key. The level in step 2 can be checked.

↕

```
**** KNEE ADJUSTMENT ****  STEP 3
WAVEFORM ON OSCILLOSCOPE IS NOW
DISPLAYING AMPLITUDE AS SET IN SETP 2
(PRESS C TO RETURN TO STEP 3 MENU)
```

(D)

(D)

↓

Press [ENTER] key, and the display changes as follows.

↓

```
WRITING EEPROM NOW
```

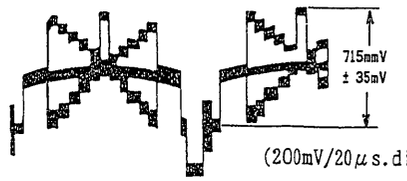
↓

```
*** KNEE ADJUSTMENT ***
END
PRESS ANY KEY
```

↓

Press any key to return to ADJUSTMENT MENU.

Waveforms



(200mV/20μs.div.)

Fig. 2-18

(3) Matrix Adjustment (Fig. 2-19)

PURPOSE	To compensate for uneveness in the chroma signal.
INCOMPLETED PHENOMENON	Color reproduction becomes defective.
TEST POINT	·Video Out (AV OUT)
EQUIPMENT/JIG	·Oscilloscope
CONDITION	·Point at a color bar chart.

PROCEDURE

ADJUSTMENT MENU

```
**************************************************
*************** ADJUSTMENT ***********************
**************************************************
          [1]   AUTO IRIS CONTROL
          [2]   KNEE
          [3]   MATRIX
          [4]   WHITE BALANCE
          [5]   CHROMA GAIN
          [ESC] RETURN TO MAIN MENU
Please select [1], [2], [3], [4], [5] or [ESC]
```

(E)

(E)

↓

Press [3] key to select the MATRIX.

↓

```
<< ADJUSTMENT OF BLUE MATRIX >>
ROUGH ADJUSTMENT
[U]             UP
[D]             DOWN

FINE ADJUSTMENT
[Ctrl] + [U]    UP
[Ctrl] + [D]    DOWN

[ENTER]         RETURN TO MENU
[ESC]           QUIT
```

↓

Press the [D] key to minimize the yellow (YEL) level. Press the [U] key so the ratio between yellow (YEL) and blue (BLU) levels is 6:8
Press the [Ctrl] key and hold it down, then press the [U] and [D] keys so the ratio between yellow (YEL) and blue (BLU) levels is 6:8

↓

Press [ENTER] key, and the display changes as follows.

↓

```
DATA WRITING TO EEPROM
```

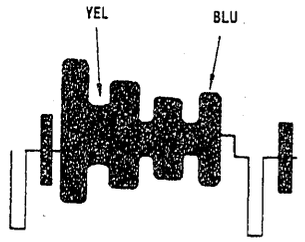
↓

```
ADJUSTMENT FINISHED
PRESS ANY KEY
```

↓

Press any key to return to ADJUSTMENT MENU.

Waveforms



YEL : BLU
6 : 8

(200mV/50μs.div.)

Fig. 2-19

(4) White Balance Adjustment

PURPOSE	To set white balance under the color temperature which becomes a reference for the auto white balance circuit.
INCOMPLETED PHENOMENON	·Color of the subject is different from that of the picture. ·A white subject is not seen as white.
TEST POINT	·Video Out (AV OUT)
EQUIPMENT/JIG	———
CONDITION	·Attach a C12 filter. ·Point at a gray scale chart (at wide-angle).

PROCEDURE

ADJUSTMENT MENU

```
**********************************************
*************** ADJUSTMENT *******************
**********************************************
        [1]   AUTO IRIS CONTROL
        [2]   KNEE
        [3]   MATRIX
        [4]   WHITE BALANCE
        [5]   CHROMA GAIN
        [ESC] RETURN TO MAIN MENU
Please select [1], [2], [3], [4], [5] or [ESC]
```

Press [4] key to select the WHITE BALANCE.

```
WHITE BALANCE ADJUSTMENT
INPUT DATA OF OFFSET (TYPE X) FOR R-B --> 00
```

TYPE_A: Press [0] [C] to input the data.
TYPE_B: Press [1] [5] to input the data.
TYPE_C: Press [0] [A] to input the data.
TYPE_D: Press [1] [2] to input the data.

Press [ENTER] key, and the display changes as follows.

(F)

(F)

```
WHITE BALANCE ADJUSTMENT
INPUT DATA OF OFFSET (TYPE X) FOR Mg-G --> 00
```

TYPE_A: Press [0] [4] to input the data.
TYPE_B: Press [0] [A] to input the data.
TYPE_C: Press [0] [0] to input the data.
TYPE_D: Press [0] [0] to input the data.

Press [ENTER] key, and the display changes as follows.

```
WHITE BALANCE ADJUSTMENT
PLEASE WAIT A MOMENT
```

```
WHITE BALANCE ADJUSTMENT
  ADJUSTMENT COMPLETED.
  COMPLETED EEPROM WRITING.
  PRESS ANY KEY
```

Press any key to return to ADJUSTMENT MENU.

(5) Chroma Gain Adjustment (Figs. 2-20, 2-21)

PURPOSE	To set the color saturation under the reference color temperature.
INCOMPLETED PHENOMENON	·Color of the picture is denser than that of the subject. ·Color of the picture is lighter than that of the subject.
TEST POINT	·Video Out (AV OUT)
EQUIPMENT/JIG	·Oscilloscope (Vectorscope)
CONDITION	·Attach a C12 filter. ·Point at a color bar chart.

PROCEDURE

ADJUSTMENT MENU

```
**********************************************
*************** ADJUSTMENT *******************
**********************************************
        [1]   AUTO IRIS CONTROL
        [2]   KNEE
        [3]   MATRIX
        [4]   WHITE BALANCE
        [5]   CHROMA GAIN
        [ESC] RETURN TO MAIN MENU
Please select [1], [2], [3], [4], [5] or [ESC]
```

Press [5] key to select the CHROMA GAIN.

```
<< ADJUSTMENT OF CHROMA GAIN >>

ROUGH ADJUSTMENT
[U]          CHROMA GAIN UP
[D]          CHROMA GAIN DOWN

FINE ADJUSTMENT
[Ctrl] + [U] CHROMA GAIN UP
[Ctrl] + [D] CHROMA GAIN DOWN

[ENTER]      SAVE & RETURN TO MENU
[ESC]        QUIT
```

WHEN USING AN OSCILLOSCOPE

Press the [U] and [D] keys to set the red level to around 400mVp-p.
Press the [Ctrl] button and hold it down, then press the [U] and [D] keys so the red level is 400mV ± 20mVp-p. (Fig. 2-20)

(G)

(G)

WHEN USING A VECTORSCOPE

Press the [U] and [D] keys to set the red vector to around 140% of the burst.
Press the [Ctrl] button and hold it down, then press the [U] and [D] keys so the red vector is 140% ± 5%. (Fig. 2-21)

Press [ENTER] key, and the display changes as follows.

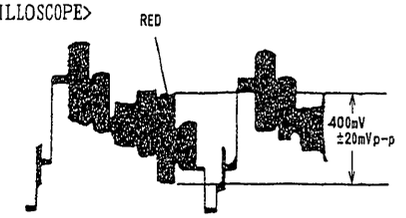
```
DATA WRITING EEPROM
```

```
ADJUSTMENT FINISHED
PRESS ANY KEY
```

Press any key to return to ADJUSTMENT MENU.

Waveforms

<OSCILLOSCOPE>



(100mV/20 μs.div.)

Fig. 2-20

<VECTORSCOPE>

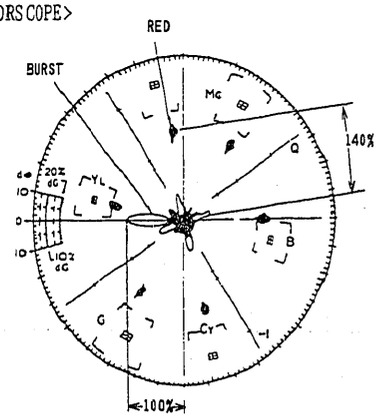


Fig. 2-21

7-6. Autofocus Adjustment Procedure

◆Before Starting Adjustment

- Be sure to perform this adjustment after replacing or initializing the lens block, parts in the autofocus circuit and main circuit board (EEPROM).

—— PROCEDURE ——

1) Start the MAP.

2) Press [D] to select AUTO FOCUS. (Figs. 2-22, 2-23.)

3) Select the number of the required adjustment.

—— NOTE ——

1. If [ESC] (escape) is pressed, the computer's display returns to Fig. 2-22 (MAIN MENU).
2. To complete adjustment, press the [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

MAIN MENU

```
**********************************************
********* MANUAL ADJUSTMENT PROGRAM **********
**********************************************

          [A]    DATA INITIALIZE
          [B]    ELECTRIC VOLUME
          [C]    ADJUSTMENT
          [D]    AUTO FOCUS
          [E]    VCR ADJUSTMENT
          [F]    EIS
          [G]    SPOT NOISE
          [ESC]  END

Please select [A], [B], [C], [D], [E], [F], [G]
              or [ESC]
```

Fig. 2-22

⇩

Press [D]

⇩

AF ADJ. MENU

```
**********************************************
********** AUTO FOCUS ADJUSTMENT *************
**********************************************

     [1]    ADJUSTMENT OF ZOOM/FOCUS TRACKING
     [2]    ADJUSTMENT OF AF NOISE LEVEL
     [ESC]  RETURN TO MENU

       Please select [1], [2] or [ESC]
```

Fig. 2-23

(1) Zoom Trace Adjustment

PURPOSE	·To set the out-of-focus correction level during zooming.
INCOMPLETED PHENOMENON	·Focus is lost during zooming.
EQUIPMENT/JIG	·Color Video Monitor ·Backfocus Chart
TEST POINT	·Video Out (AV OUT)
CONDITION	·Point at the backfocus chart, 1500±5 mm away from the lens surface. ·Light the chart with 200-400 lux.

CAUTION WHEN ADJUSTMENT

1. Measure the distance between the chart and lens surface precisely.
2. Place the chart as parallel as possible to the lens surface.
3. The backfocus chart should always be at the centre of the monitor screen when the zoom is set to the wide-angle and telephoto ends.
4. The zoom trace adjustment procedure is completed within 2 minutes after it is selected.
5. Do not place any obstruction between the lens and chart during adjustment.

PROCEDURE

AF ADJ. MENU

```
**********************************************
********** AUTO FOCUS ADJUSTMENT *************
**********************************************

     [1]    ADJUSTMENT OF ZOOM/FOCUS TRACKING
     [2]    ADJUSTMENT OF AF NOISE LEVEL
     [ESC]  RETURN TO MENU

       Please select [1], [2] or [ESC]
```

⇩

Press [1] key to select ADJUSTMENT OF ZOOM/TRACE TRACKING

⇩

<CAMERA INIT.>

⇩

(OMISSION)

⇩

```
ADJUSTMENT OF ZOOM/FOCUS TRACKING CURVE STARTED
ADJUSTMENT OF ZOOM/FOCUS TRACKING CURVE COMPLETED
PRESS ANY KEY
```

⇩

Press any key to return to AF ADJ. MENU.

⇩

Turn the power off and then on again.

(2) AF Noise Level Adjustment

PURPOSE	·To set the noise level.
INCOMPLETED PHENOMENON	·It takes time until a subject is brought into focus.
EQUIPMENT/JIG	·Correct focus is not obtained. ·Color Video Monitor
TEST POINT	·Video Out (AV OUT)
CONDITION	·Set the focus to AUTO. ·Point at a light box without a chart inserted at a distance of up to 10cm.

CAUTION WHEN ADJUSTMENT

1. Place the light box as parallel as possible to the lens surface.
2. The AF noise level adjustment procedure will be completed within thirty seconds after it is selected.

PROCEDURE

AF ADJ. MENU

```
**********************************************
********** AUTO FOCUS ADJUSTMENT *************
**********************************************

     [1]    ADJUSTMENT OF ZOOM/FOCUS TRACKING
     [2]    ADJUSTMENT OF AF NOISE LEVEL
     [ESC]  RETURN TO MENU

       Please select [1], [2] or [ESC]
```

⇩

Press [2] key to select ADJUSTMENT OF AF NOISE LEVEL.

⇩

<CAMERA INIT.>

⇩

<ADDRESS INIT.>

⇩

```
ADJUSTMENT OF NOISE LEVEL STARTED
PLEASE WAIT MOMENT
```

⇩

```
ADJUSTMENT OF NOISE LEVEL STARTED
PLEASE WAIT MOMENT
ADJUSTMENT OF NOISE LEVEL COMPLETED
PRESS ANY KEY
```

⇩

Press any key to return to AF ADJ. MENU.

⇩

Turn the power off and then on again.

7-7. Stabilizer Adjustment Procedure

◆Before Starting Adjustment

- Be sure to perform this adjustment after replacing or initializing the V. gyro, H. gyro circuit boards (gyros) and main circuit board (EEPROM).
- This item describes how to rewrite the stabilizer data. The average of the stabilizer data will be written.

—— PROCEDURE ——

1) Start the MAP.

—— NOTE ——

1. If [ESC] (escape) is pressed, the computer's display returns to MAIN MENU.
2. To complete adjustment, press the [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

2) Press [F] to select EIS.

3) Press [Y] key.

—— NOTE ——

1. If [N] is pressed, the computer's display returns to MAIN MENU.
2. If a key other than Y or N is pressed, "PLEASE SELECT (Y/N)?" is displayed.

4) The stabilizer data is rewritten automatically.

5) Press any key to return to MAIN MENU.

MAIN MENU

```
**********************************************
********* MANUAL ADJUSTMENT PROGRAM ***********
**********************************************
          [A]   DATA INITIALIZE
          [B]   ELECTRIC VOLUME
          [C]   ADJUSTMENT
          [D]   AUTO FOCUS
          [E]   VCR ADJUSTMENT
          [F]   EIS
          [G]   SPOT NOISE
          [ESC] END
Please select [A], [B], [C], [D], [E], [F], [G]
              or [ESC]
```

↓ Press [F]

```
<<DATA WRITING>>
START TO SEND DATA          (Y/N)
```

↓ Press [Y]

```
FINISHED WRITING DATA.
PRESS ANY KEY
```

↓ Press any key to return to MAIN MENU.

7-8. SPOT NOISE ADJUSTMENT PROCEDURE

◆Before Startig Adjustment

- The spot noise is identified as the fine white noise that appears when the lens cap is attached after the power is turned on.
- Perform this adjustment only for products with which spot noise occurs. (However, there is no problem even if products free from spot noise are adjusted.)
- After replacing the CCD image sensor or sensor/process circuit board (EEPROM), check whether or not spot noise occurs and then proceed with adjustment.

—— PROCEDURE ——

1) Start the MAP.

—— NOTE ——

1. If [ESC] (escape) is pressed, the computer's display returns to MAIN MENU.
2. To complete adjustment, press the [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camcorder and jig.

2) Cap the lens

3) Connect the color video monitor to video out.

4) Press [G] key to select SPOT NOISE.

—— NOTE ——

·The adjustment procedure in this item is different depending on the amount of spot noise.

MAIN MENU

```
**********************************************
********* MANUAL ADJUSTMENT PROGRAM ***********
**********************************************
          [A]   DATA INITIALIZE
          [B]   ELECTRIC VOLUME
          [C]   ADJUSTMENT
          [D]   AUTO FOCUS
          [E]   VCR ADJUSTMENT
          [F]   EIS
          [G]   SPOT NOISE
          [ESC] END
Please select [A], [B], [C], [D], [E], [F], [G]
              or [ESC]
```

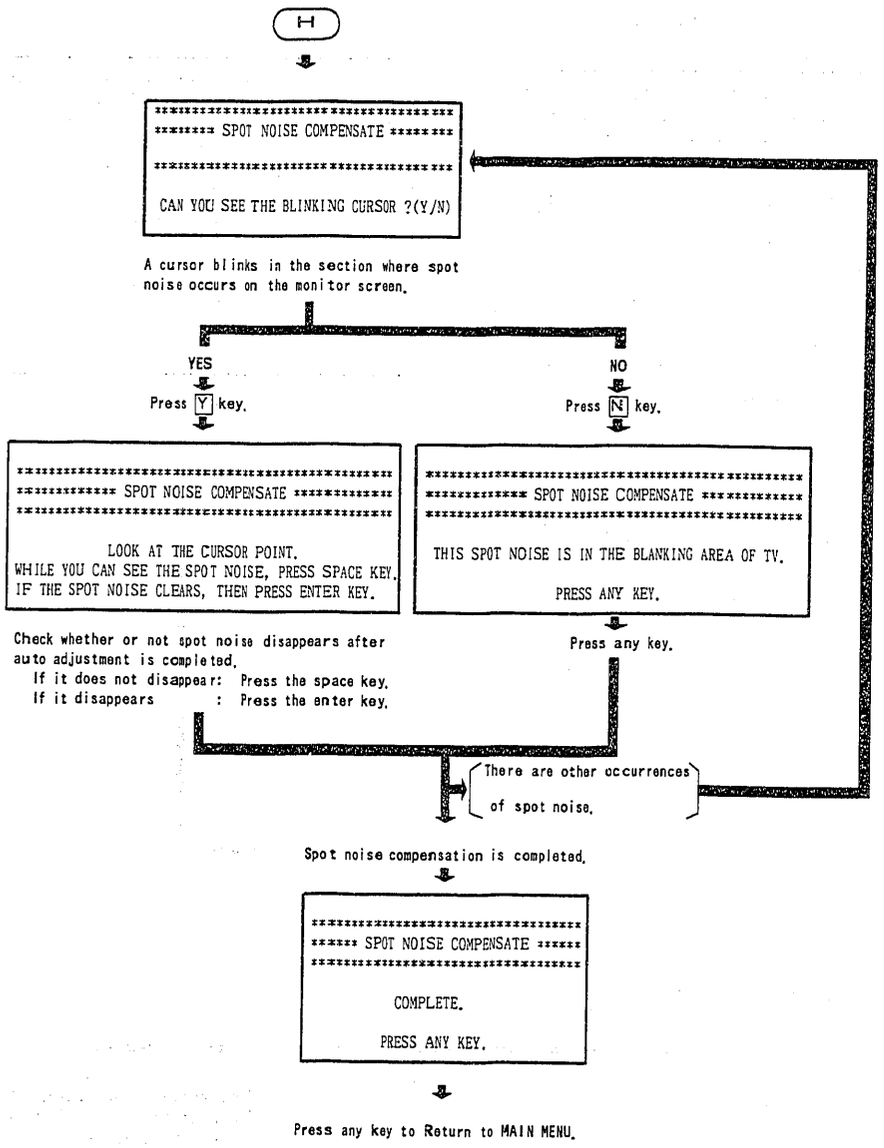
↓ Press [G]

Note: The amount of spot noise is displayed in place marked ×.

One spot noise	Much spot noise	Spot noise is not detected (when products free from spot noise are adjusted)
↓	↓	↓
********** **** SPOT NOISE COMPENSATE **** ********** A SPOT NOISE FOUND. PRESS ANY KEY.	********** ***** SPOT NOISE COMPENSATE **** ********** × SPOT NOISE FOUND PRESS ANY KEY.	********** ***** SPOT NOISE COMPENSATE **** ********** CAN NOT FIND THE SPOT NOISE. PRESS ANY KEY.
		↓ Press any key to return to MAIN MENU.

↓ Press any key.

(H)



8. ELECTRONIC VIEWFINDER (EVF) ADJUSTMENT PROCEDURE

8-1. CRT EVF Adjustment

Adjustment Parts Locations

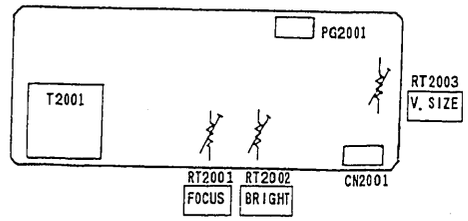


Fig. 2-25 EMQ (Electronic Viewfinder) Circuit Board (Parts Side)

(1) Deflection Yoke Position Adjustment(Fig. 2-24)

PURPOSE	This adjustment procedure eliminates picture tilt in the EVF display.		
EQUIPMENT/JIG	TEST POINTS	CONDITION	ADJUSTMENT POINTS
·EVF Display		·Aim the resolution chart.	·DEFLECTION YOKE

1) Loosen the deflection yoke nut.
2) Turn the deflection yoke so that the EVF picture (chart) is horizontal, matching the edges of the CRT.

Note: (After adjustment is completed, tighten the deflection yoke nut.)

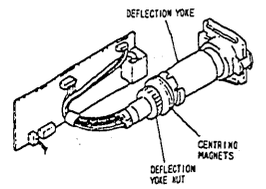


Fig. 2-24

(2) EVF Centring Adjustment (Fig. 2-24)

PURPOSE	This adjustment centres the image observed by the camera in the EVF display.		
EQUIPMENT/JIG	TEST POINTS	CONDITION	ADJUSTMENT POINTS
·EVF Display		·Aim the resolution chart.	·CENTRING MAGNETS

1) Remove the locking paint from the centring magnet.
2) Adjust the centring magnets until the centre of the picture viewed by the camera is positioned in the centre of the EVF display.

(3) EVF Vertical Size Adjustment (Fig. 2-25)

PURPOSE	This adjustment determines the vertical size of the image appearing in the EVF display.		
EQUIPMENT/JIG	TEST POINTS	CONDITION	ADJUSTMENT POINTS
·EVF Display		·Aim the resolution chart.	·RT2003 (V.SIZE) EMQ

1) RT2003: Set the top and bottom edges of the chart match the top and bottom edges of the CRT.

(4) EVF Brightness Adjustment (Fig. 2-25)

PURPOSE	This adjustment sets the brightness of the picture in the EVF display.		
EQUIPMENT/JIG	TEST POINTS	CONDITION	ADJUSTMENT POINTS
·EVF Display		·Aim the resolution chart.	·RT2002 (BRIGHT) EMQ

1) RT2002: Set to optimize the EVF picture.

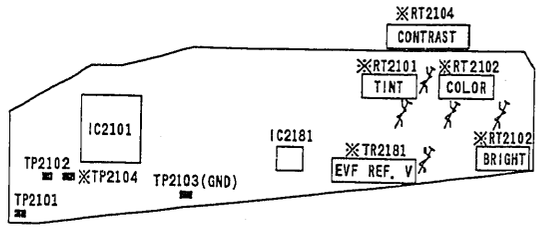
(5) EVF Focus Adjustment (Fig. 2-25)

PURPOSE	This control adjusts for optimum focus of the electronic viewfinder picture.		
EQUIPMENT/JIG	TEST POINTS	CONDITION	ADJUST POINTS
·EVF Display		·Aim the resolution chart.	·RT2001 (FOCUS) EMQ

1) RT2001: Set the EVF picture is clear.

8-2. LCD EVF Adjustment

Adjustment Parts Locations



Note: Components marked ※ are on the side B.

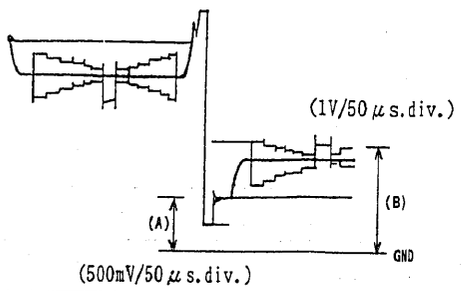
Fig. 2-26 CRM (EVF DRIVE) CIRCUIT BOARD [SIDE-A]

Note : You can adjust the semi-variable resisters marked ★ before their circuit munbers without removing the case. Open the cover at the top of the battery attachment section.

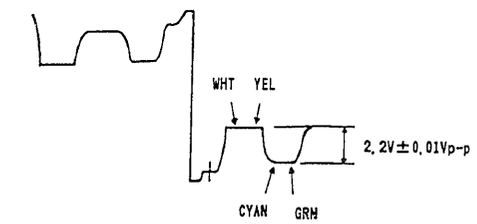
(1) Output Voltage Adjustment (Figs. 2-26)

EQUIPMENT/JIGS	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·DVM	·TP2104 CRM	———	·RT2181 (EVF REF.V) CRM
Adjustment Procedure 1) RT2181: Set the voltage of TP2104 TO 16.5±0.1V.			

(2) Brightness, Contrast Adjustment (Fig. 2-26)

EQUIPMENT/JIGS	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope (DC mode)	·TP2101 CRM	·Aim at the gray scale chart	★RT2102 (BRIGHT) CRM ★RT2104 (CONTRAST) CRM
Adjustment Procedure <BRIGHT> 1) RT2102: Set the section (A) in the waveform is 2.2±0.05Vp-p. <CONTRAST> 1) RT2104: Set the section (B) in the waveform is 4.4±0.05Vp-p.		Waveforms  (1V/50μs.div.) (A) (B) GND (500mV/50μs.div.)	

(3) Chroma Gain and Color Phase Adjustment (Fig. 2-26)

EQUIPMENT/JIG	TEST POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope	·TP2102 CRM	·Aim at the color bar chart (Input the full color bar signal.)	★RT2103 (COLOR) CRM ★RT2101 (TINT) CRM
Adjustment Procedure 1) RT2103: Set to minimize the amplitude of the waveform at TP2102. 2) RT2101: Set the green and cyan levels are the same. 3) RT2103: Set the difference in level between yellow and cyan is 2.2±0.1Vp-p. 4) RT2101: Set the tint of the picture in the EVF is appropriate.		Waveforms  WHT YEL 2.2V±0.01Vp-p CYAN GRN (500mV/50μs.div.)	

3. VCR SECTION ADJUSTMENT

1. CIRCUIT BOARD LOCATIONS

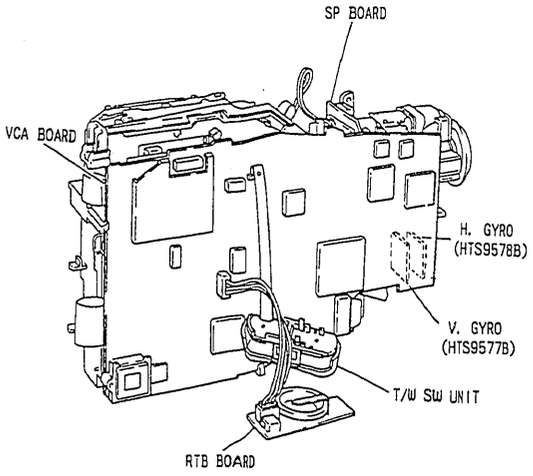


Fig. 3-1

2. TEST EQUIPMENT AND ALIGNMENT TAPES NECESSARY FOR ADJUSTMENT

1) Test Equipment
   - Oscilloscope (dual trace)
   - Digital Voltmeter (DVM)
   - Frequency Counter
   - Millivoltmeter
   - Color Video Monitor
   - Color Bar Generator
   - C/R Oscillator

2) Alignment Tape, etc.
   - Adjustment Floppy Disk
   - Personal Computer
   - Personal Computer 9-pin or 25-pin (RS232C) Cable
   - DSP-R Jig
   - DSP AV Output Cable
   - Alignment Tape (20HSC-2)
   - Normal 8 Blank Tape
   - Hi-8 Blank Tape
   - ATF-R Jig
   - DC Power Supply (DC 0-7V/3A)
   - DC Power Supply (DC 5V/1A)

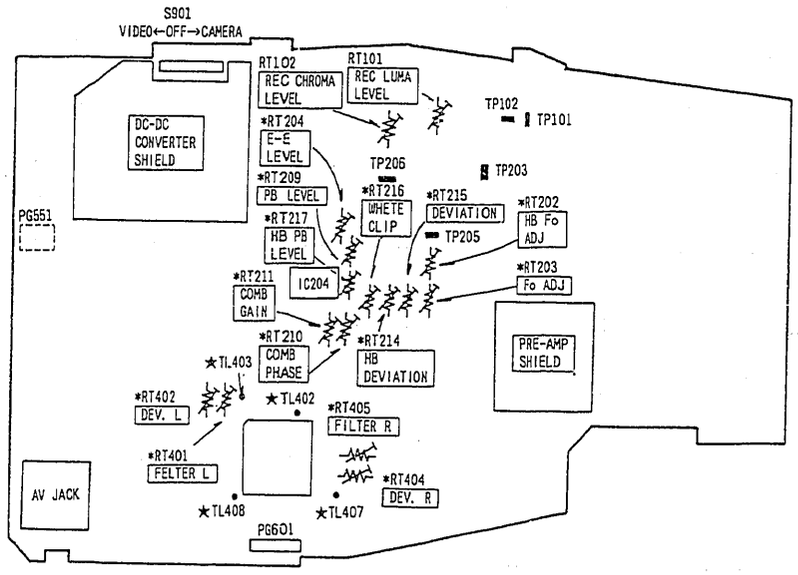
3. ADJUSTMENT CONDITION

1) Check that the camera section has been adjusted correctly before adjusting the VCR section.
2) Connect this unit, a power supply and a color video monitor as shown in Fig. 1-1.
3) Use the 10:1 probe of the oscilloscope when other not specified.
4) When "Record mode" is specified, load a blank tape and set the 8mm video camera/recorder to the record mode by the following procedure.
   ① Set the CAMERA/OFF/VIDEO switch to the CAMERA position.
   ② Press the REC START/STOP button on the unit (or REC START/STOP button on the remote control).
5) Before adjusting the resistors marked with asterisks (*) in the following text, remove the corresponding laser trimming resistors to replace them with the specified semi-variable resistors.
6) Before unsoldering laser trimming resistors be sure to confirm each adjustment value. Remove only the resistors used in the adjustment items that should be adjusted.
7) Earth of test equipment: Pre-Amp Shield (GND).

4. PRESET POSITIONS OF SWITCHES AND CONTROLS DURING ADJUSTMENT

- CAMERA/OFF/VIDEO switch ..... "VIDEO" position
- TITLE ..... Not Display mode

5. ADJUSTMENT COMPONENTS LOCATIONS



SIDE A

NOTE
- Variable resistors marked "※" are laser trimming resistor.
- Components marked "★" are on the side B.
- Test point (TP) are not actually provided on the circuit board.

Fig. 3-2 VCA (Main) Circuit Board

◆ Regarding a semi-variable resistor

1. Before adjusting the resistors marked with asterisks shown in the adjustment parts location diagram, remove the laser trimming resistors to replace them with semi-variable resistors (shown in Table 3-1).
2. Adjust (turn) the soldered semi-variable resistor within the range shown in Fig. 3-3

Table 3-1

ADJUST POINT	SEMI-VARIABLE RESISTOR (Ω)	CIRCUIT BOARD	Name of Adjustment
RT202	10K	VCA	HB FO ADJ
RT203	10K		FO ADJ
RT204	10K		E-E LEVEL
RT209	10K		PB LEVEL
RT210	470		COMB PHASE
RT211	4.7K		COMB GAIN
RT214	4.7K		HB DEVIATION
RT215	10K		DEVIATION
RT216	47K		WHITE CLIP
RT217	10K		HB PB LEVEL
RT401	47K		FILTER L
RT402	47K		DEV. L
RT404	47K		DEV. R
RT405	47K		FILTER R

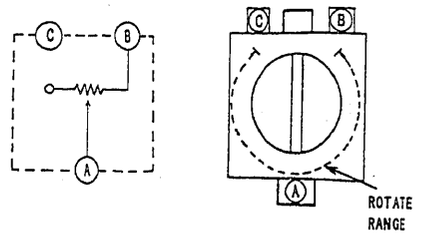


Fig. 3-3

6. CHECK AFTER REPLACING MAJOR COMPONENTS IN THE VCR SECTION

After replacing major components, perform checks, referring to the table below.
The following table shows the minimum adjustments required after major components are placed.
The table below may not apply when several components are replaced, depending on the symptom of the defect.

Note: After replacing the parts, check each adjustment. If you find the items necessary to be adjusted, remove the corresponding laser trimming resistors and replace them with variable resistors for adjustment.

ITEM No.	NAME OF ADJUSTMENT	NAME OF MAJOR COMPONENTS					
		VCA C.B.A	CYLINDER	IC901	IC201	IC202	IC401
	SYSTEM CONTROL/SERVO CIRCUITS ADJUSTMENT						
(1)	Power Shut Off Level Adjustment	●		●			
(2)	Head Switching Point Adjustment	●	●				
	LUMINANCE/CHROMA CIRCUIT ADJUSTMENT						
(1)	Comb Filter Adjustment				●	●	
(2)	E-E Video Signal Levle Adjustment				●		
(3)	White Clip Adjustment				●		
(4)	Carrier Frequency Adjustment				●		
(5)	Deviation Adjustment				●		
(6)	Record Luminance/Chroma level Adjustment				●		
(7)	Playback Luminance Level Adjustment				●		
	AUDIO CIRCUIT ADJUSTMENT						
(1)	Band Pass Filter (BPF) Adjustment						●
(2)	Deviation Adjustment						●

7. SYSTEM CONTROL/SERVO CIRCUIT ADJUSTMENT

—— NOTE ——

1: System control adjustment also needs a personal computer. Connect the camera/recorder, jigs, power supply, etc. in the same way as in Digital Adjustment.
2: Be sure to perform this adjustment after replacing or initializing the EEPROM and main circuit board (EEPROM).
3: When an error message appears during adjustment, refer to "4. Error Messages".
4: If [ESC] (escape) is pressed, the computer's display returns to Fig. 3-4 (MAIN MENU).
5: To complete adjustment, press the [ESC] (escape) key twice to restore the MS-DOS screen and then turn off the camera/recorder and jig.

—— PROCEDURE ——

1) Start the MAP.

2) Press [E] to select VCR ADJUSTMENT. (Figs. 3-4, 3-5)

3) Select the number of the required adjustment.

MAIN MENU

```
**********************************************
********* MANUAL ADJUSTMENT PROGRAM ***********
**********************************************
          [A]   DATA INITIALIZE
          [B]   ELECTRIC VOLUME
          [C]   ADJUSTMENT
          [D]   AUTO FOCUS
          [E]   VCR ADJUSTMENT
          [F]   EIS
          [G]   SPOT NOISE
          [ESC] END
Please select [A], [B], [C], [D], [E] , [F], [G]
              or [ESC]
```

Fig. 3-4

↓

Press [E]

↓

VCR ADJ. MENU

```
**********************************************
************ VCR ADJUSTMENT ****************
**********************************************
     [1]   ADJUSTMENT OF ODC
     [2]   ADJUSTMENT OF SWITCHING POINT
     [ESC] RETURN TO MAIN MENU
      Please select [1], [2] or [ESC]
```

Fig. 3-5

(1) Power Shut Off Level (ODC: Over Discharge) Adjustment

PURPOSE	• To set the minimum voltage required to opreate the camera/recorder.
INCOMPLETED PHENOMENON	• The usable time of the battery becomes short. • The camera/recorder doesn't operate normally.

EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
•DVM	•PG551-2 VCA •PG551-1 (GND) VCA	•Load the blank tape •Connect the DC power supply to PG551. •Set the voltage of PG551-1 to 5.65V±0.05V	
•DC Power Supply (0-7V)	•PG551-2 VCA •PG551-1 (GND) VCA		
•Blank Tape			

Adjustment Procedure

VCR ADJ. MENU

```
**********************************************
************ VCR ADJUSTMENT ****************
**********************************************
     [1]   ADJUSTMENT OF ODC
     [2]   ADJUSTMENT OF SWITCHIG POINT
     [ESC] RETURN TO MAIN MENU
      Please select [1], [2] or [ESC]
```

↓

Press [1] key to select the ADJUSTMENT OF ODC.

↓

```
<< SET UP OF ODC ADJUSTMENT STARTED >>
SET POWER SOURCE AT 5.65 (+/- 0.05) V.
 START ADJUSTING. PRESS ANY KEY.
```

↓

①

①

↓

Set the voltage of PG551-1 to 5.65V±0.05V

↓

Press any key, and the display changes as follows.

↓

```
<< SETUP OF ODC ADJUSTMENT COMPLETED >>
<< ODC ADJUSTMENT STARTED >>
<< ODC ADJUSTMENT COMPLETED >>
PRESS ANY KEY
```

↓

Press any key to return to VCR ADJ. MENU.

(2) Head Switching Point Adjustment

PURPOSE	• To set the switching point of the video heads during playback.
INCOMPLETED PHENOMENON	• Vertical jitter occurs. • Switching noise appears across the bottom of the monitor screen.

EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
•Alignment Tape		•Playback the alignment tape.	

Adjustment Procedure

VCR ADJ. MENU

```
**********************************************
************ VCR ADJUSTMENT ****************
**********************************************
     [1]   ADJUSTMENT OF ODC
     [2]   ADJUSTMENT OF SWITCHIG POINT
     [ESC] RETURN TO MAIN MENU
      Please select [1], [2] or [ESC]
```

↓

Press [2] key to select the ADJUSTMENT OF SWITCHING POINT.

↓

②

②

↓

```
<< SETUP OF SW POINT ADJUSTMENT STARTED >>
<< SETUP OF SW POINT ADJUSTMENT COMPLETED >>
```

↓

```
<< SW POINT ADJUSTMENT STARTED >>
```

↓

```
<< SW POINT ADJUSTMENT DATA CHECKING >>
<< ADJUSTMENT DATA WRITING STARTED >>
<< ADJUSTMENT DATA WRITING COMPLETED >>
 PRESS ANY KEY
```

↓

Press any key to return to VCR ADJ. MENU.

8. LUMINANCE/CHROMA CIRCUIT ADJUSTMENT

(1) Comb Filter Adjustment (Fig. 3-2)

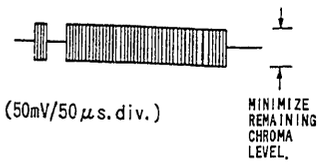
PURPOSE	· To set the characteristic of the comb filter.
INCOMPLETED PHENOMENON	· Jamming occurs at the edges. · The chroma S/N deteriorates.

EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope ·Color Bar Generater ·Blank Tape (Nor-8)	·TP203 VCA ·Video IN (AV IN)	·Input the color bar signal. ·STOP mode	*RT211 (COMB GAIN) VCA *RT210 (COMB PHASE) VCA

Adjustment Procedure
1) Load the blank tape for normal 8.
2) RT210, RT211: Set the Chroma Components to minimize the residual.

<Settings of oscilloscope>
·Trigger with video signal.

Waveforms



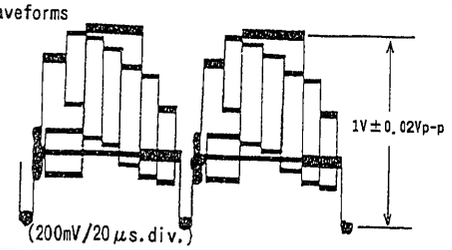
(2) E-E Video Siganl Level Adjustment (Fig. 3-2)

PURPOSE	· To set the video output level in the E-E mode.
INCOMPLETED PHENOMENON	· The picture becomes dark or whitish in the E-E mode.

EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope ·Color Bar Generator ·Blank Tape (Nor-8)	·Video Out (AV OUT) ·Video In (AV IN)	·Input the color bar signal. ·Stop mode	*RT204 (E-E LEVEL) VCA

Adjustment Procedure
1) Load the blank tape for Nor-8.
2) RT204: Set the Video output level to 1V±0.02Vp-p

Waveforms



(3) White Clip Adjustment (Fig. 3-2)

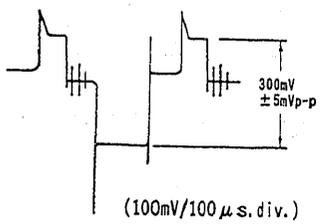
PURPOSE	· To set the white clip level.
INCOMPLETED PHENOMENON	·No colour apperrs in the highly bright subject.

EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope ·Color Bar Generator ·Blank Tape (Nor-8)	·TP205 VCA ·Video IN (AV IN)	·Input the color bar signal. ·Stop mode	*RT216 (WHITE CLIP) VCA

Adjustment Procedure
1) Load the blank tape for Nor-8.
2) RT216: Set the white clip level to 300mV±5mVp-p

<Settings of oscilloscope>
·Trigger with video Signal.

Waveforms



(4) Carrier Frequency Adjustment (Fig. 3-2)

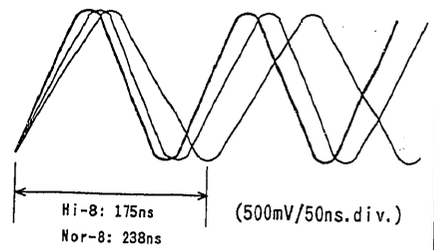
PURPOSE	· To set the modulation frequency at the sync tip of the FM modulator to the specified value.
INCOMPLETED PHENOMENON	· Black and white are inverted in the picture.

EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope ·Color Bar Generator ·Blank Tape (Hi-8, Nor-8)	·TP206 VCA ·Video In (AV IN)	·Input the white (100%) signal.	*RT203 (Fo ADJ) VCA *RT202 (HB Fo ADJ) VCA

Adjustment Procedure
1) Load the normal 8 blank tape.
2) Trigger the oscilloscope internally.
3) RT203: Set the period of the widest pulse is 238ns ± 3ns.

≪ Hi-8 MODEL Only ≫
4) Load the Hi-8 blank tape.
5) RT202: Set the period of the widest pulse is 175ns ± 3ns.

Waveforms



(5) Deviation Adjustment (Fig. 3-2)

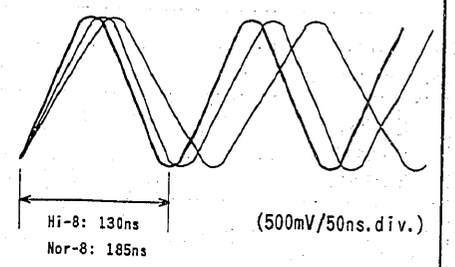
PURPOSE	· To set the modulatien frequency at the white peak of the FM modulator to the specified value.
INCOMPLETED PHENOMENON	· The picture becomes dark or whitish during recording and playback.

EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope ·Color Bar Generator ·Blank Tape (Hi-8, Nor-8)	·TP206 VCA ·Video IN (AV IN)	·Input the white (100%) signal.	*RT215 (DEVIATION) VCA *RT214 (HB DEVIATION) VCA

Adjustment Procedure
1) Load the normal 8 blank tape.
2) Trigger the oscilloscope internally.
3) RT215: Set the period of the narrowest pulse is 185ns ± 2ns.

≪ Hi-8 MODEL Only ≫
4) Load the Hi-8 blank tape.
5) RT214: Set the period of the narrowest pulse is 130ns ± 2ns.

Waveforms



(6) Record Luminance/Chroma Level Adjustment (Fig. 3-2)

PURPOSE	· To set the luminance and chroma signals to the specified values.
INCOMPLETED PHENOMENON	· The luminance and chroma S/N diteriorate. · Cross-beats appear on the monitor screen. · Black and white are inverted in picture.

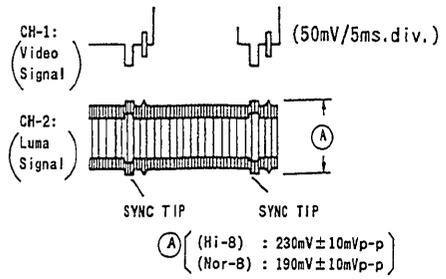
EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope	·CH-1: Video Out (AV OUT) CH-2: TP101 (REC Y) VCA TP102 (REC C) VCA	·Input the colour bar signal.	*RT101 VCA (REC LUMA LEVEL) *RT102 VCA (REC CHROMA LEVEL)
·Colour Bar Generator	·Video IN (AV IN)		
·ATF-R Jig (SW3:ON)	·PG601 VCA		
·Blank Tape (Hi-8)			

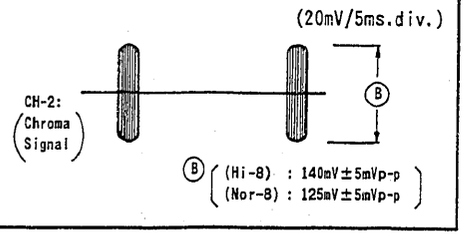
Adjustment Procedure

<< Hi-8 MODEL >>
1) Load the blank tape.
2) Connect the ATF-R jig to PG601 and turn the power off.
3) Press the REW button and hold it, then set the POWER switch to CAMERA position.
4) Trigger the oscilloscope at video signal.
< Luma Level >
5) RT101: Set the sync tip section in record luma signal to 230mV±10mVp-p.
< Chroma Level >
6) RT102: Set the burst section in record chroma signal to 140mV±5mVp-p.

<< Nor-8 MODEL >>
1) Connect the ATF-R jig to PG601 and turn the Power off.
2) Press the REW button and hold it, then set the POWER switch to CAMERA position.
3) Trigger the oscilloscope at video signal.
< Luma Level >
4) RT101: Set the sync tip section in record luma signal to 190mV±10mVp-p.
< Chroma Level >
5) RT102: Set the burst section in record chroma signal to 125mV±5mVp-p.

Waveforms





(7) Playback Luminance Level Adjustment (Fig. 3-2)

Note: Perform this adjustment after completing the record luminance/chroma level adjustment.

PURPOSE	· To set the luminance playback level to the specified value.
INCOMPLETED PHENOMENON	· The picture becomes dark or whitish during playback.

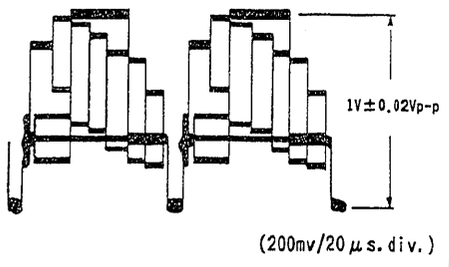
EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope	·Video Out (AV OUT)	·Record color bar signal and play it back with same VCR.	*RT209 VCA (PB LEVEL) *RT217 VCA (HB PB LEVEL)
·Blank Tape (Hi-8, Nor-8)			
·Color Bar Generator			

Adjustment Procedure

<< Nor-8, Hi-8 MODEL >>
1) RT209: Set the Playback luminance level to 1V±0.02Vp-p

<< Hi-8 MODEL >>
1) RT217: Set the Playback luminance level to 1V±0.02Vp-p

Waveforms



9. AUDIO CIRCUIT ADJUSTMENT

Note: Before adjusting the audio circuits, prepare a tape on which 1kHz, -7.8 ± 3dB audio signals are recorded on the L and R channels (referred to as the audio tape hereafter).

(1) Band Pass Filter (BPF) Adjustment (Fig. 3-2)

PURPOSE	· To set the bandpass frequency of the BPF.
INCOMPLETED PHENOMENON	· No audio output.

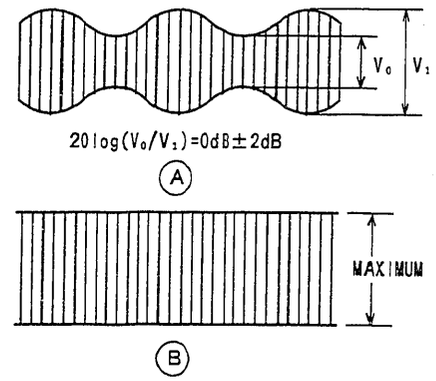
EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Oscilloscope	·TL403 (L-CH) VCA ·TL402 (R-CH) VCA ·Audio GND (A/V OUT)	·Playback the Audio Tape	*RT401 VCA (FILTER L) *RT405 VCA (FILTER R)
·C/R Oscillator			

Adjustment Procedure

≪ MONAURAL, STEREO MODEL ≫
1) RT401: Set the waveform is as shown in Ⓑ

≪ STEREO MODEL ≫
1) RT405: Set the waveform is as shown in Ⓑ

Waveforms



(2) Deviation Adjustment (Fig. 3-2)

PURPOSE	·Set the audio output level.
INCOMPLETED PHENOMENON	·L-channel and R-channel audio levels are different.

EQUIPMENT/JIG	TEST POINTS CONNECTION POINTS	CONDITION	ADJUSTMENT POINTS
·Millivoltmeter	·TL408 VCA ·TL407 VCA ·Audio GND (AV OUT)	·Playback the Audio Tape.	*RT402 VCA (DEV. L) *RT404 VCA (DEV. R)
·C/R Oscillator			

Adjustment Procedure

≪ MONAURAL, STEREO MODEL ≫
(L CH)
1) Adjust RT402 for -15dBs ± 0.5dBs.

≪ STEREO MODEL ≫
(R-CH)
1) Adjust RT404 for -15dBs ± 0.5dBs.

4. ERROR MESSAGES

1. Camera Electric Volume and Digital Adjustments

Error Message	Countermeasure
ERROR OCCURRED. IRIS TROUBLE PRESS ANY KEY	• Check whether or not power is supplied. • Check the values of the iris drive circuit. • Defective soldering, damage to pattern, etc. in the above circuit • Check the iris block and replace it if necessary.
ERROR OCCURRED ON dax ADJUSTMENT PRESS ANY KEY	• Check the values in the hall amp circuit. • Defective soldering, damage to pattern, etc. in the above circuit.
D RANGE OVER. ERROR ON dax ADJUSTMENT PRESS ANY KEY	• Check the values in the hall amp circuit. • Defective soldering, damage to pattern, etc. in the above circuit.
ERROR OCCURRED ON da0 and da1 ADJUSTMENT PRESS ANY KEY	• Check the values in the hall amp circuit and its peripheral circuits. • Defective soldering, damage to pattern, etc. in the above circuits.
FILE NOT FOUND !!!! PRESS ANY KEY	• The adjustment program (file) cannot be found. • Check the adjustment floppy disk and replace it if necessary.
FILE OPEN ERROR !!!! PRESS ANY KEY	• The adjustment program (file) does not start. • Check the adjustment floppy disk and replace it if necessary.
ERROR OCCURRED ON C DUTY ADJUSTMENT PRESS ANY KEY	• Check the values of the iris drive circuit. • Defective soldering, damage to pattern, etc. in the above circuit.
ERROR OCCURRED ON FDET ADJUSTMENT PRESS ANY KEY	• Supply power again and re-adjust. • Check the values in the hall amp circuit. • Defective soldering, damage to pattern, etc. in the above circuit.
ERROR OCCURRED. ZOOM DOES NOT WORK PRESS ANY KEY	• Supply power again and re-adjust.
TOO BRIGHT PRESS ANY KEY	• The subject is too bright. • Move the camera further away from the light box.
TOO DARK PRESS ANY KEY	• The subject is too dark. • Check the light box. • Move the camera closer to the light box.
D RANGE OVER ERROR ON HALL AMP IRIS CANNOT OPEN ANY MORE PRESS ANY KEY	• Supply power again and re-adjust. • The subject is too dark. • Check the light box. • Move the camera closer to the light box. • Check the values in the hall amp circuit. • Defective soldering, damage to pattern, etc. in the above circuit.

Error Message	Countermeasure
STAURATION ERROR. TOO BRIGHT PRESS ANY KEY	• The subject is too bright. • Move the camera further away from the light box.
CAN'T ADJUSTMENT WHITE BALANCE PLEASE RETRY PRESS ANY KEY	• The subject is too bright or too dark. • Check the light box. • Move the camera closer to or away from the light box. • Supply power again and re-adjust.

2 Autofocus and Electronic Stabilizer Adjustments

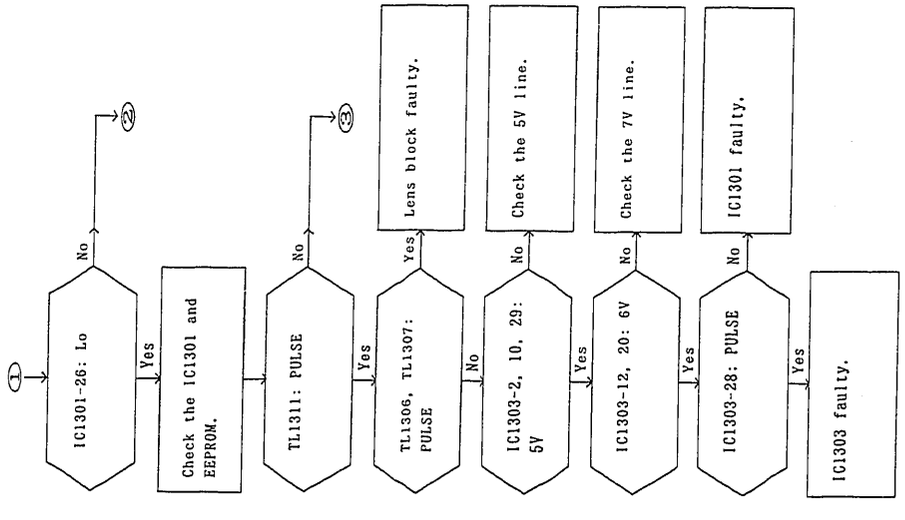
Error Message	Countermeasure
DATA INITIALIZE ERROR	• Error in communications between the DSP uP and autofocus uP. • Check the connections between the DSP uP and autofocus uP.
TIME OUT ERROR ON AF STEP	• If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (1) of TROUBLESHOOTING OF AUTOFOCUS.
TIME OUT ERROR ON ZOOM	• If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (2) of TROUBLESHOOTING OF AUTOFOCUS.
CAN'T COMPLETE AF ADJUSTMENT	• If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (2) of TROUBLESHOOTING OF AUTOFOCUS.
TIME OUT ERROR ON AF ADJUSTMENT	• If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (2) of TROUBLESHOOTING OF AUTOFOCUS.
AF LIMIT OVER	• If this error message appears even when the adjustment is performed 2 or 3 times, the autofocus circuit system is defective. • Refer to (2) of TROUBLESHOOTING OF AUTOFOCUS.
OUT OF RANGE	• Error in communications between the DSP uP and autofocus uP. • Check the connections between the DSP uP and autofocus uP. • The electronic variable resistor adjustment or digital adjustment is incorrect.
CANNOT OPEN THE FILE PRESS ANY KEY	• The EIS adjustment program does not start. • Check the adjustment floppy disk and replace it if necessary.

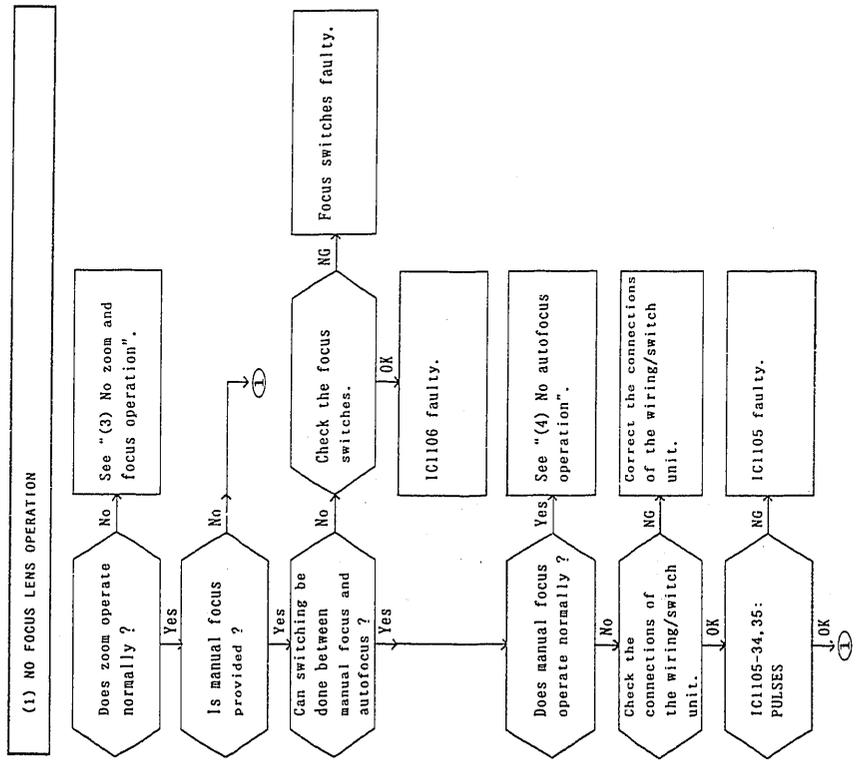
3. VCR Adjustment

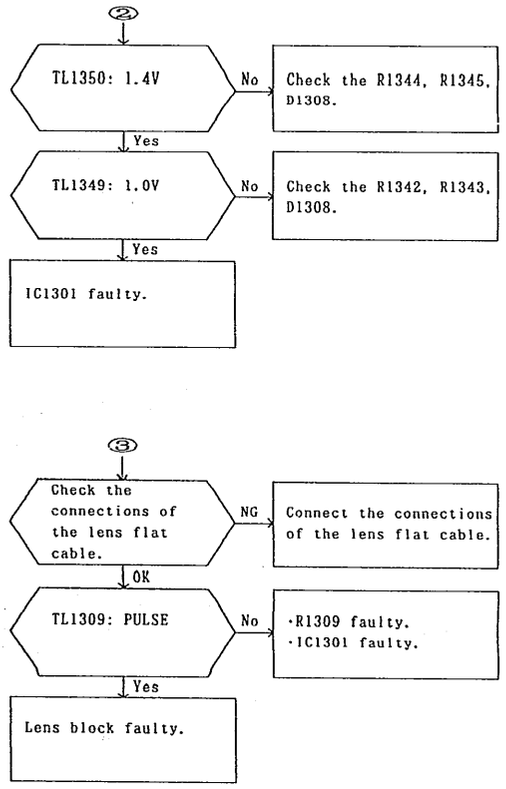
Error Message	Countermeasure
ERROR : SWP_TEST.DAT FILE NO FOUND !	• The adjustment program cannot be found. • Check the adjustment floppy disk and replace it if necessary.
ERROR : INVALID MODEL PRESS ANY KEY	• A wrong model has been selected. • The adjustment program cannot be found. • Check the adjustment floppy disk and replace it if necessary.
THIS MODEL IS NOT NEED THE ADJUSTMENT PRESS ANY KEY	• A wrong model has been selected. • A product that needs analog adjustment is connected.
ADJUSTMENT INCOMPLETED PRESS ANY KEY	• The value set by adjustment defective. • Re-adjust. • Check cylinder. • Check the alignment tape. • Check whether or not the usual operation is done correctly
RETRY ADJUSTING. PRESS ANY KEY	• Supply power again and re-adjust.
CAMERA IS NOT READY	• Check whether or not power is supplied.
ERROR OCCURRED CAN'T PLAY BACK PRESS ANY KEY	• No playback video. • Refer to (1) of TROUBLESHOOTING OF VCR.
ERROR OCCURRED NO V.SYNC FOUND	• Vertical sync loss. • Refer to (2) of TROUBLESHOOTING OF VCR.
INVALID MODEL PRESS ANY KEY	• A wrong model has been selected. • The adjustment program cannot be found. • Check the adjustment floppy disk and replace it if necessary.
ERROR OCCURRED. CAN'T RECORD PRESS ANY KEY	• No video recording. • Refer to (3) of TROUBLESHOOTING OF VCR.

5. TROUBLESHOOTING OF AUTOFOCUS

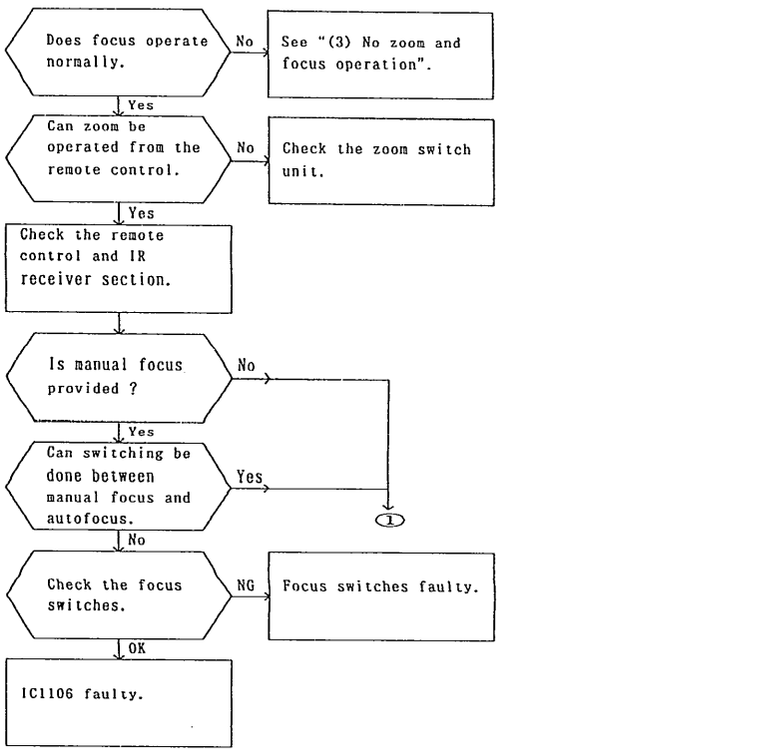
1. Autofocus

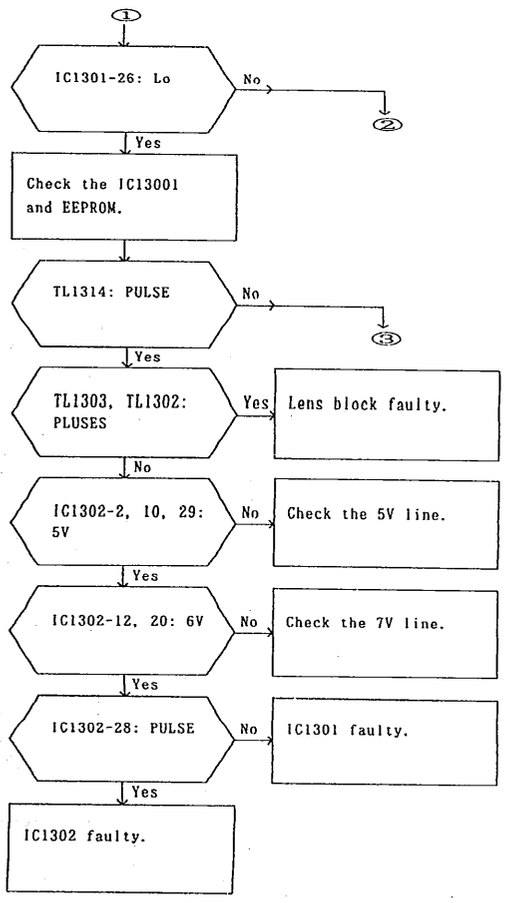


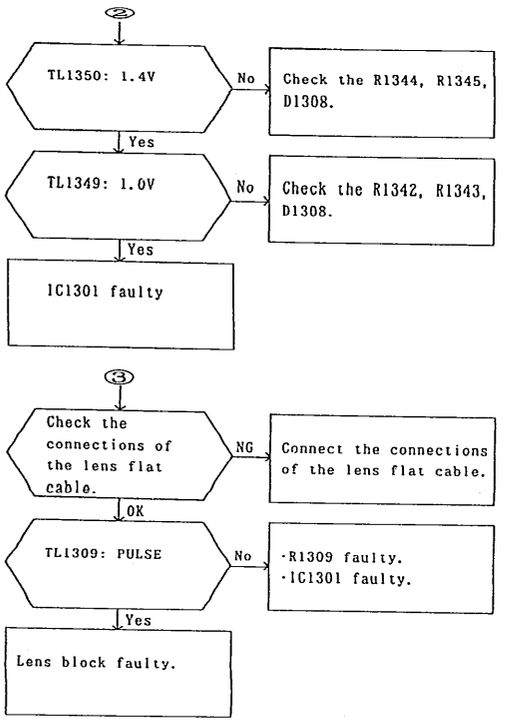




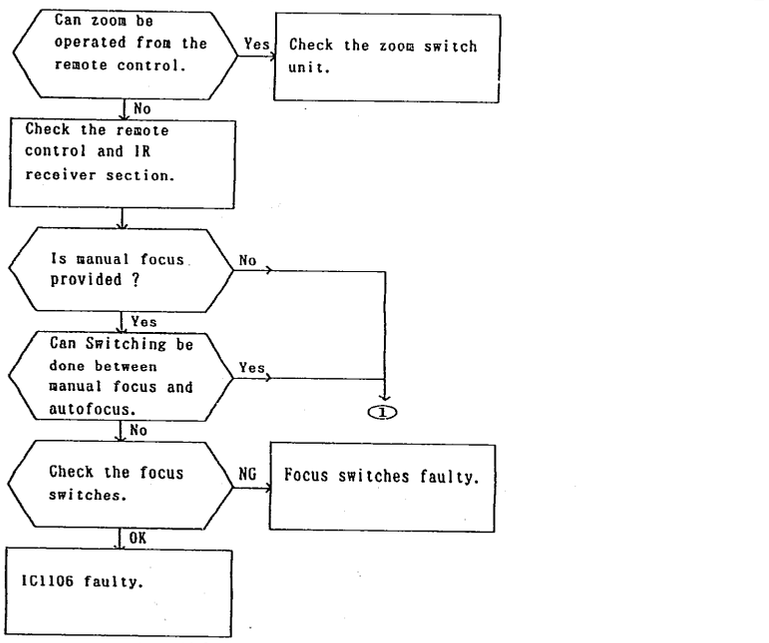
(2) NO ZOOM OPERATION

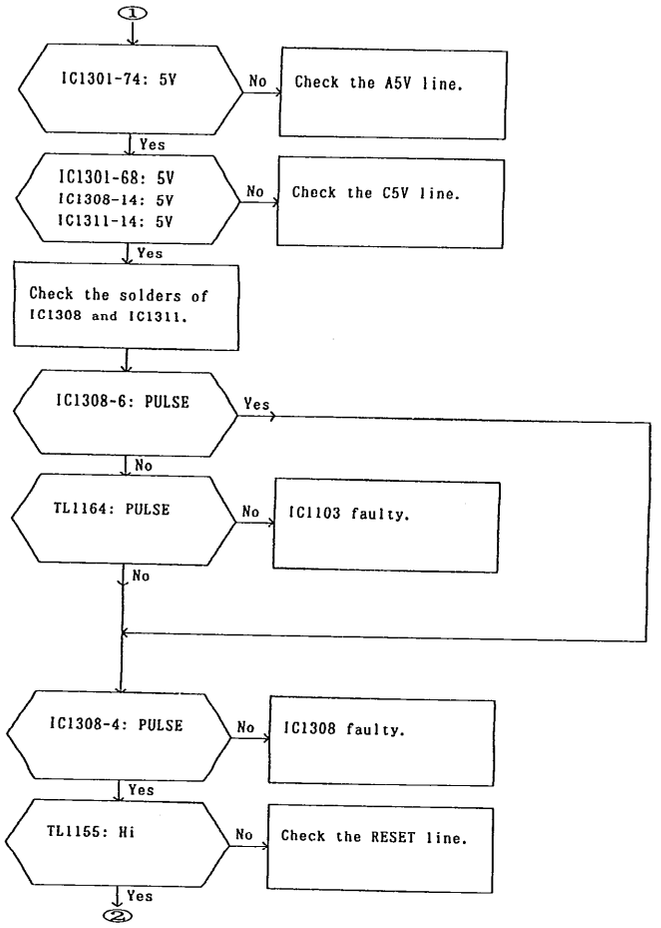


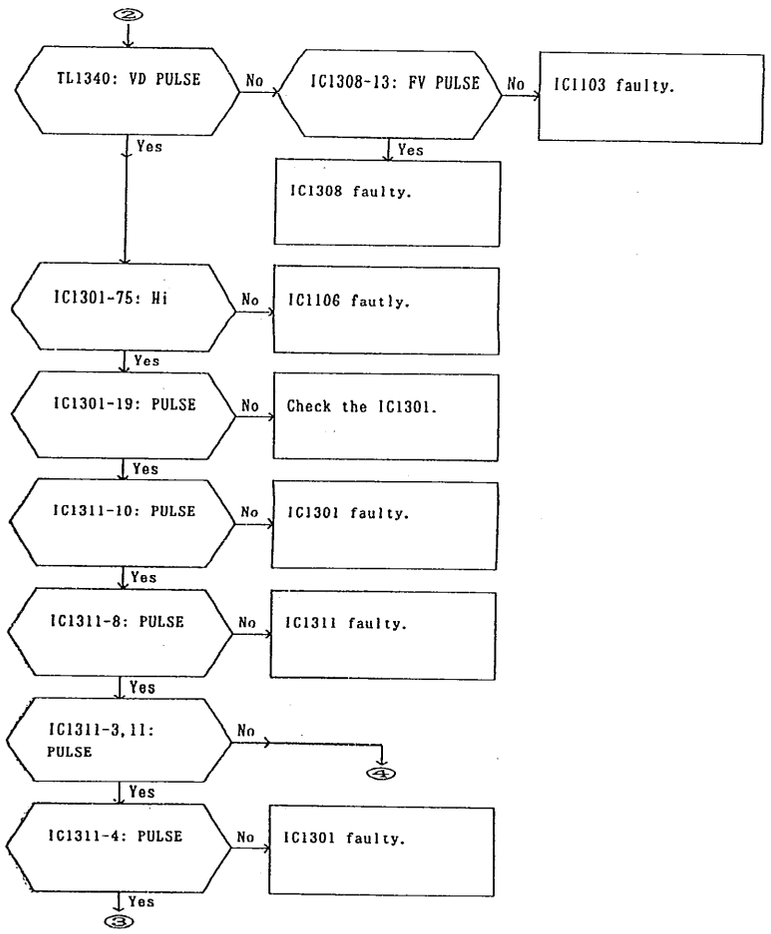


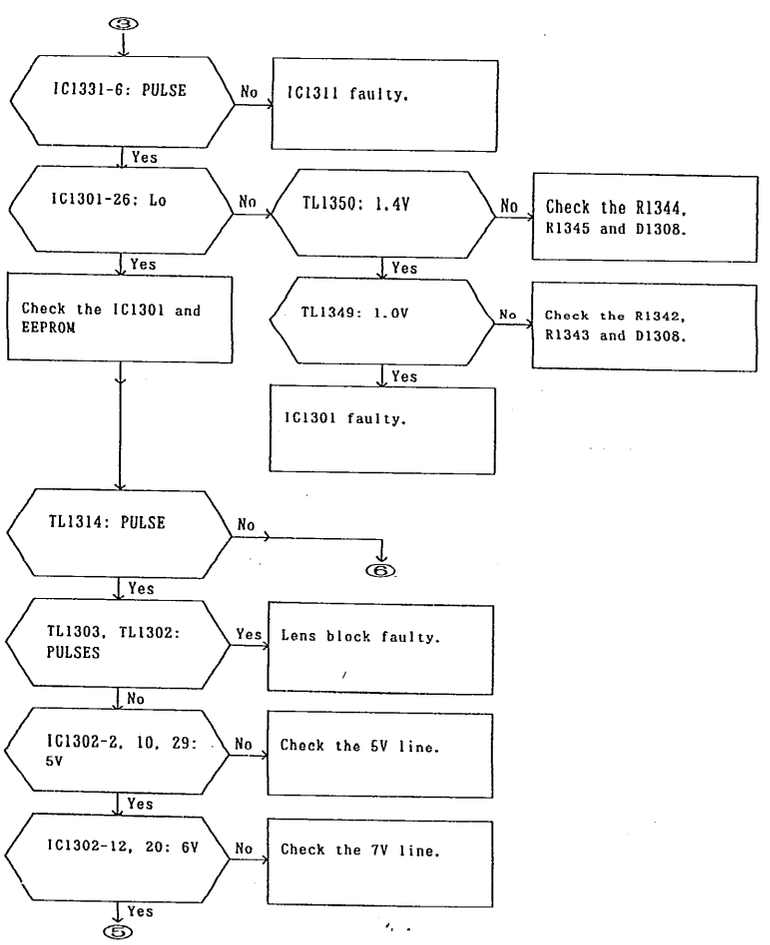


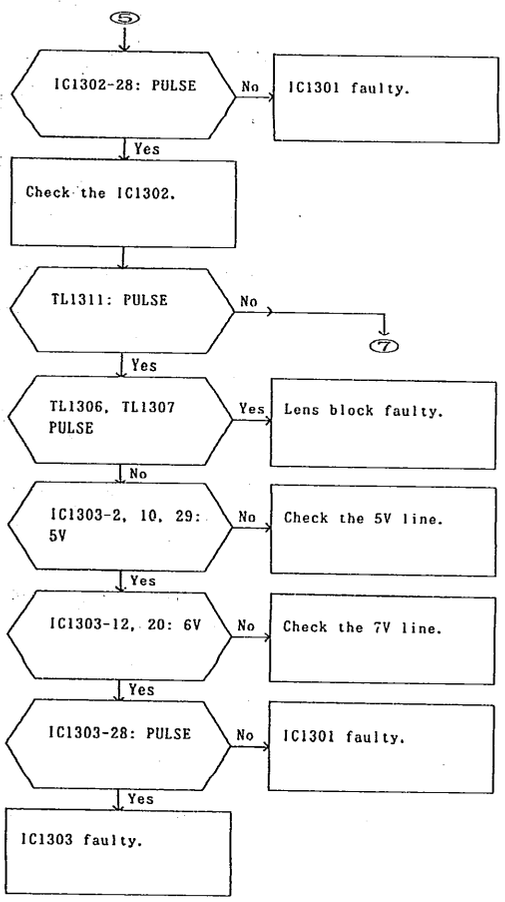
(3) NO ZOOM AND FOCUS OPERATION

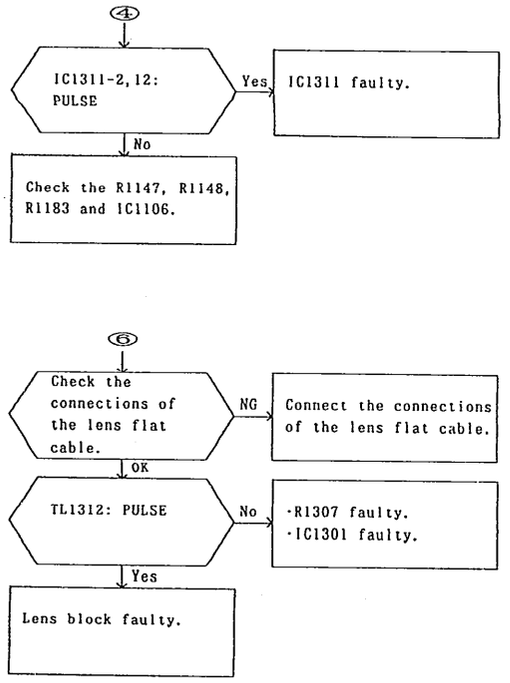


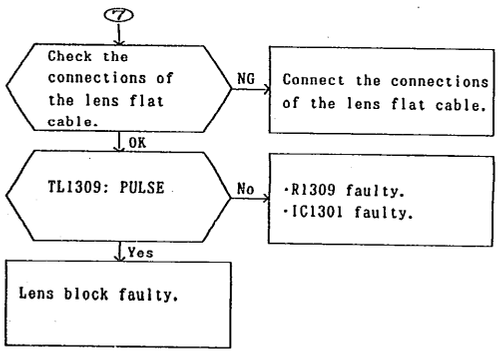


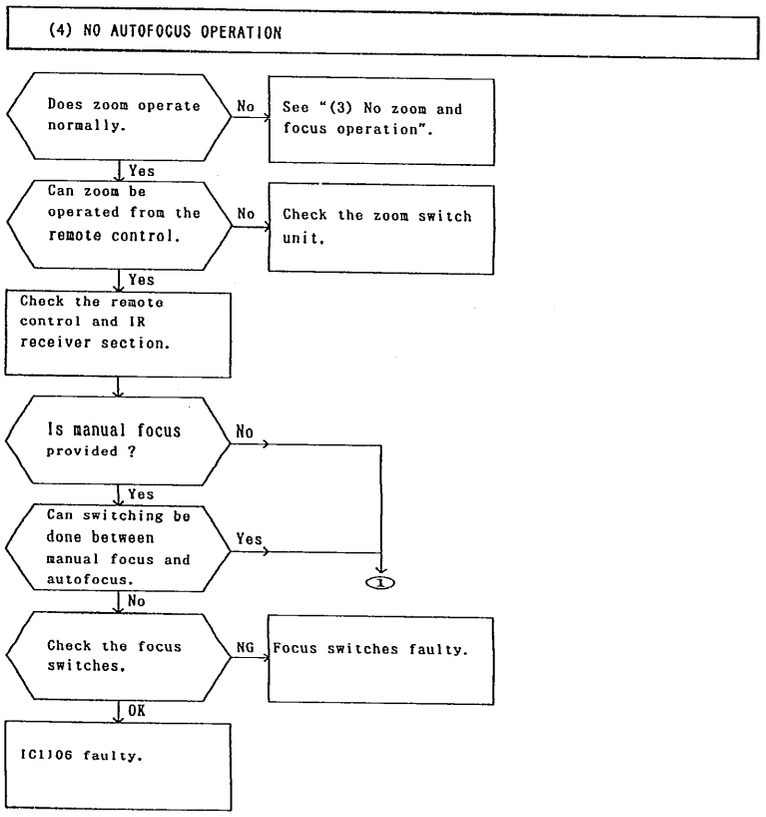


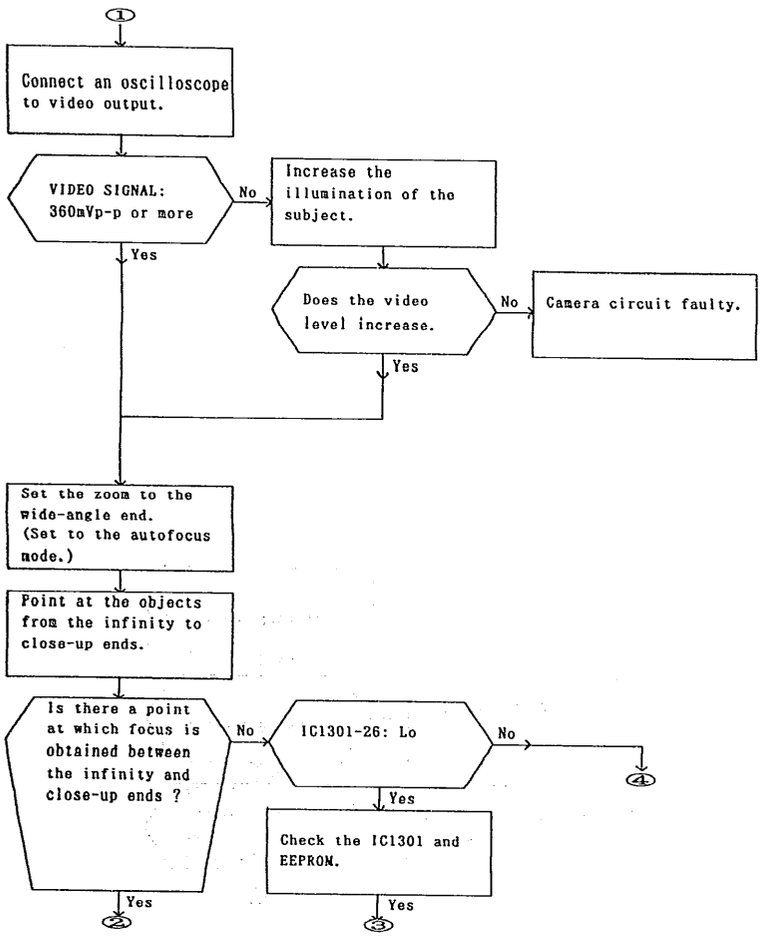


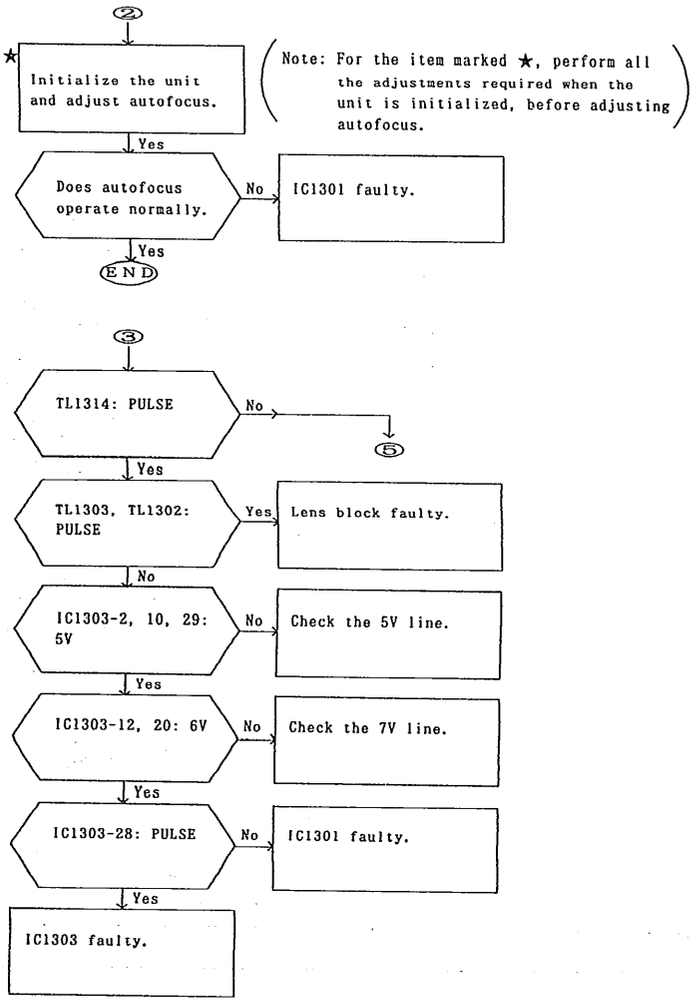

⑤
IC1302-28: PULSE
No
IC1301 faulty.
Yes
Check the IC1302.
TL1311: PULSE
No
⑦
Yes
TL1306, TL1307 PULSE
Yes
Lens block faulty.
No
IC1303-2, 10, 29: 5V
No
Check the 5V line.
Yes
IC1303-12, 20: 6V
No
Check the 7V line.
Yes
IC1303-28: PULSE
No
IC1301 faulty.
Yes
IC1303 faulty.

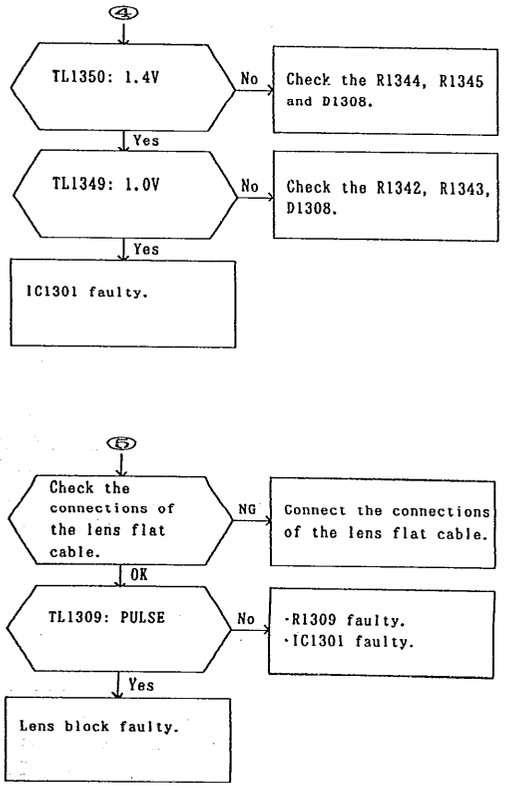

④
IC1311-2, 12: PULSE
Yes
IC1311 faulty.
No
Check the R1147, R1148, R1183 and IC1106.
⑥
Check the connections of the lens flat cable.
NG
Connect the connections of the lens flat cable.
OK
TL1312: PULSE
No
·R1307 faulty.
·IC1301 faulty.
Yes
Lens block faulty.

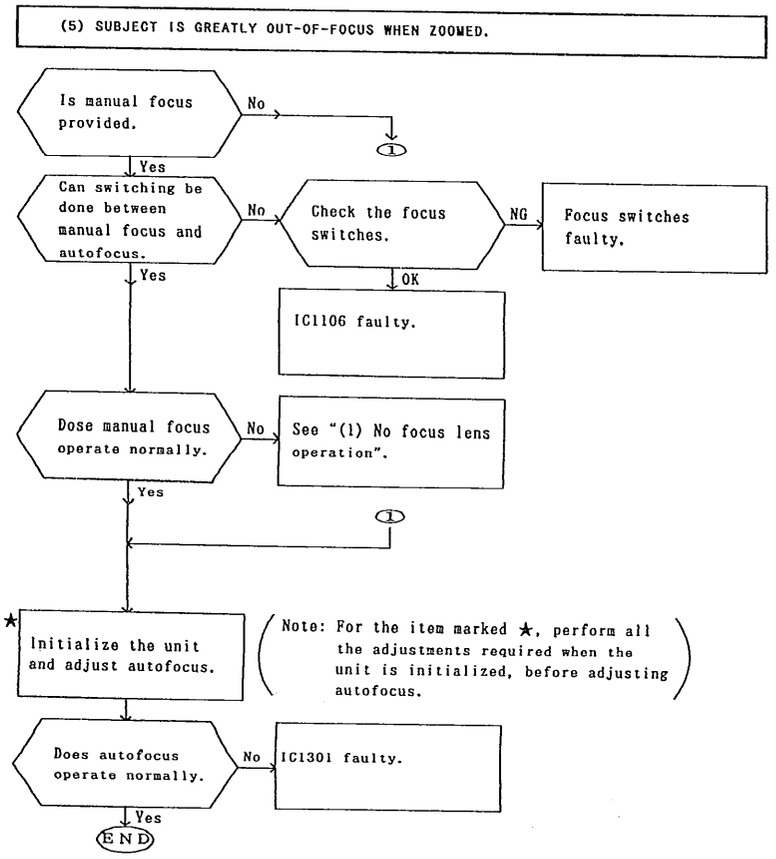

⑦
Check the connections of the lens flat cable.
NG
Connect the connections of the lens flat cable.
OK
TL1309: PULSE
No
·R1309 faulty.
·IC1301 faulty.
Yes
Lens block faulty.


(4) NO AUTOFOCUS OPERATION
Does zoom operate normally.
No
See "(3) No zoom and focus operation".
Yes
Can zoom be operated from the remote control.
No
Check the zoom switch unit.
Yes
Check the remote control and IR receiver section.
Is manual focus provided ?
No
Yes
Can switching be done between manual focus and autofocus.
Yes
①
No
Check the focus switches.
NG
Focus switches faulty.
OK
IC1106 faulty.

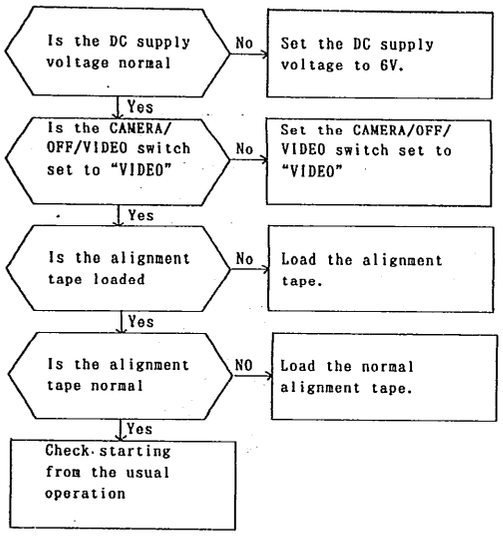

①
Connect an oscilloscope to video output.
VIDEO SIGNAL: 360mVp-p or more
No
Increase the illumination of the subject.
Yes
Does the video level increase.
No
Camera circuit faulty.
Yes
Set the zoom to the wide-angle end. (Set to the autofocus mode.)
Point at the objects from the infinity to close-up ends.
Is there a point at which focus is obtained between the infinity and close-up ends ?
No
IC1301-26: Lo
No
④
Yes
Check the IC1301 and EEPROM.
Yes
③
Yes
②


②
★
Initialize the unit and adjust autofocus.
Note: For the item marked ★, perform all the adjustments required when the unit is initialized, before adjusting autofocus.
Yes
Does autofocus operate normally.
No
IC1301 faulty.
Yes
END
③
TL1314: PULSE
No
⑤
Yes
TL1303, TL1302: PULSE
Yes
Lens block faulty.
No
IC1303-2, 10, 29: 5V
No
Check the 5V line.
Yes
IC1303-12, 20: 6V
No
Check the 7V line.
Yes
IC1303-28: PULSE
No
IC1301 faulty.
Yes
IC1303 faulty.

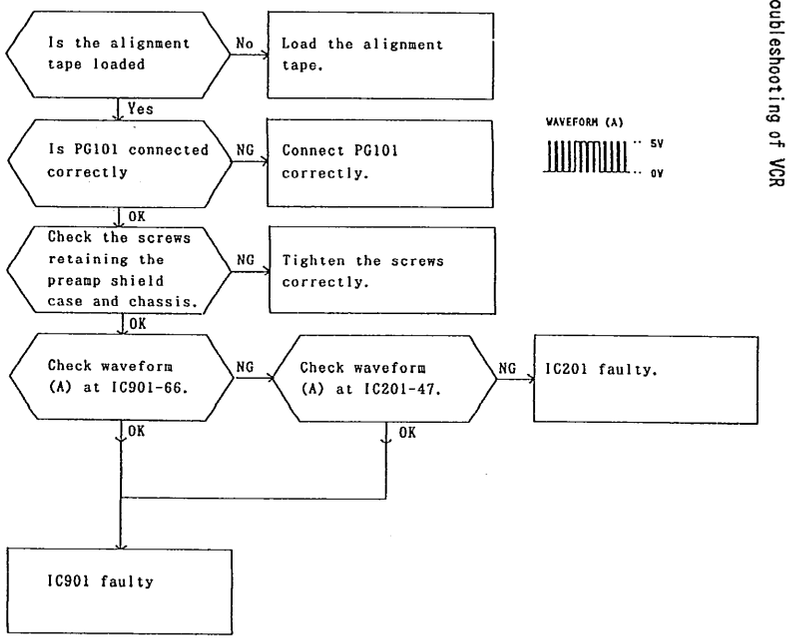

④
TL1350: 1.4V
No
Check the R1344, R1345 and D1308.
Yes
TL1349: 1.0V
No
Check the R1342, R1343, D1308.
Yes
IC1301 faulty.
⑤
Check the connections of the lens flat cable.
NG
Connect the connections of the lens flat cable.
OK
TL1309: PULSE
No
·R1309 faulty.
·IC1301 faulty.
Yes
Lens block faulty.


(5) SUBJECT IS GREATLY OUT-OF-FOCUS WHEN ZOOMED.
Is manual focus provided.
No
①
Yes
Can switching be done between manual focus and autofocus.
No
Check the focus switches.
NG
Focus switches faulty.
Yes
OK
IC1106 faulty.
Dose manual focus operate normally.
No
See "(1) No focus lens operation".
Yes
①
★
Initialize the unit and adjust autofocus.
Note: For the item marked ★, perform all the adjustments required when the unit is initialized, before adjusting autofocus.
Does autofocus operate normally.
No
IC1301 faulty.
Yes
END

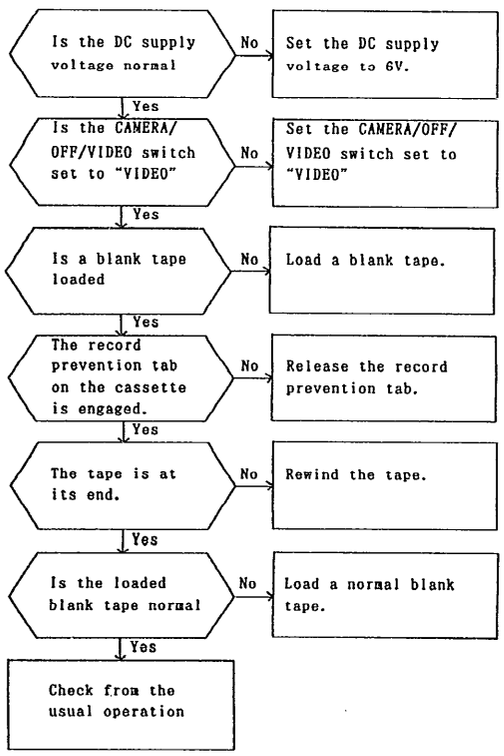
(1) NO PLAYBACK VIDEO



(2) VERTICAL SYNC LOSS



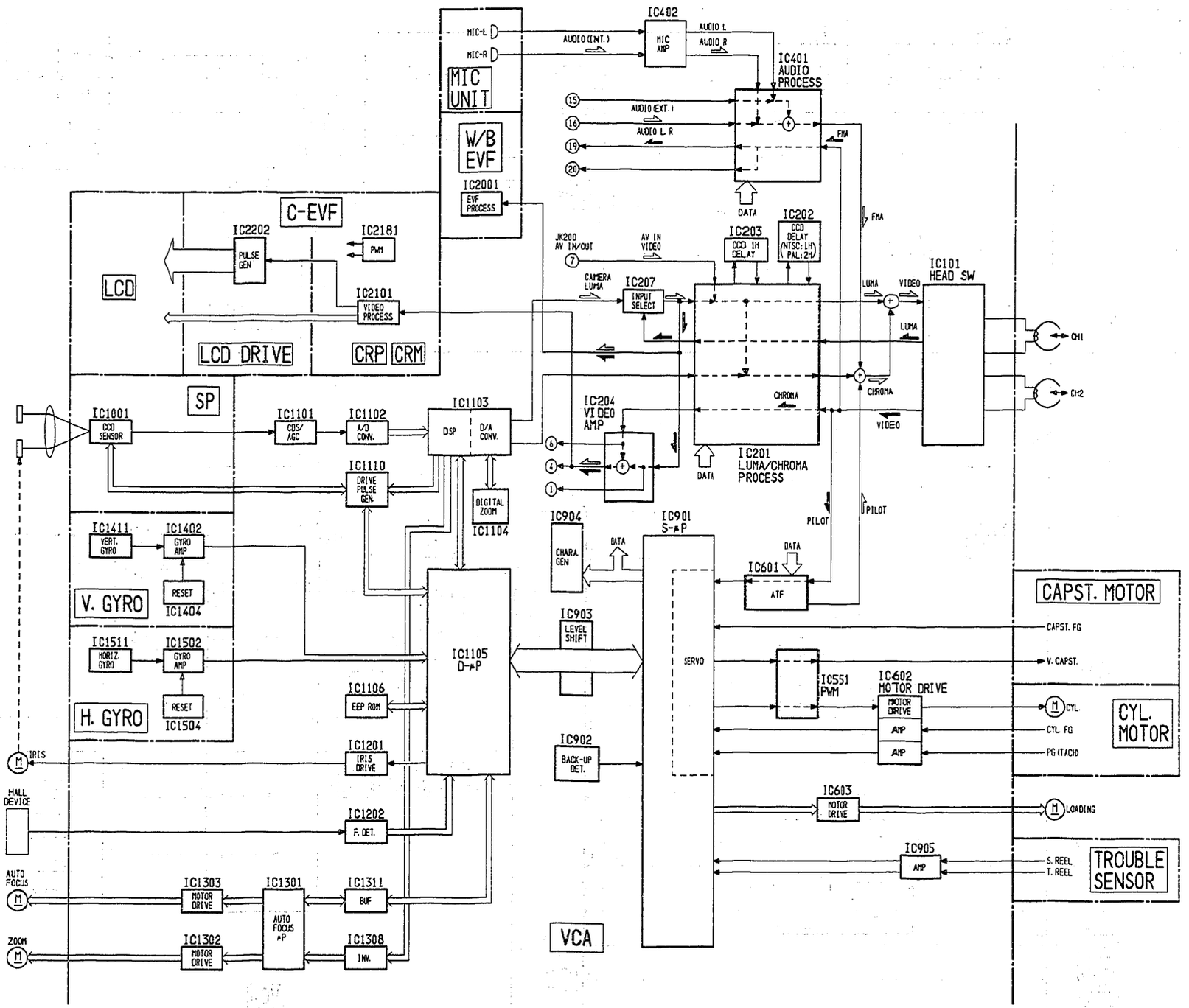
(3) NO VIDEO RECORDING



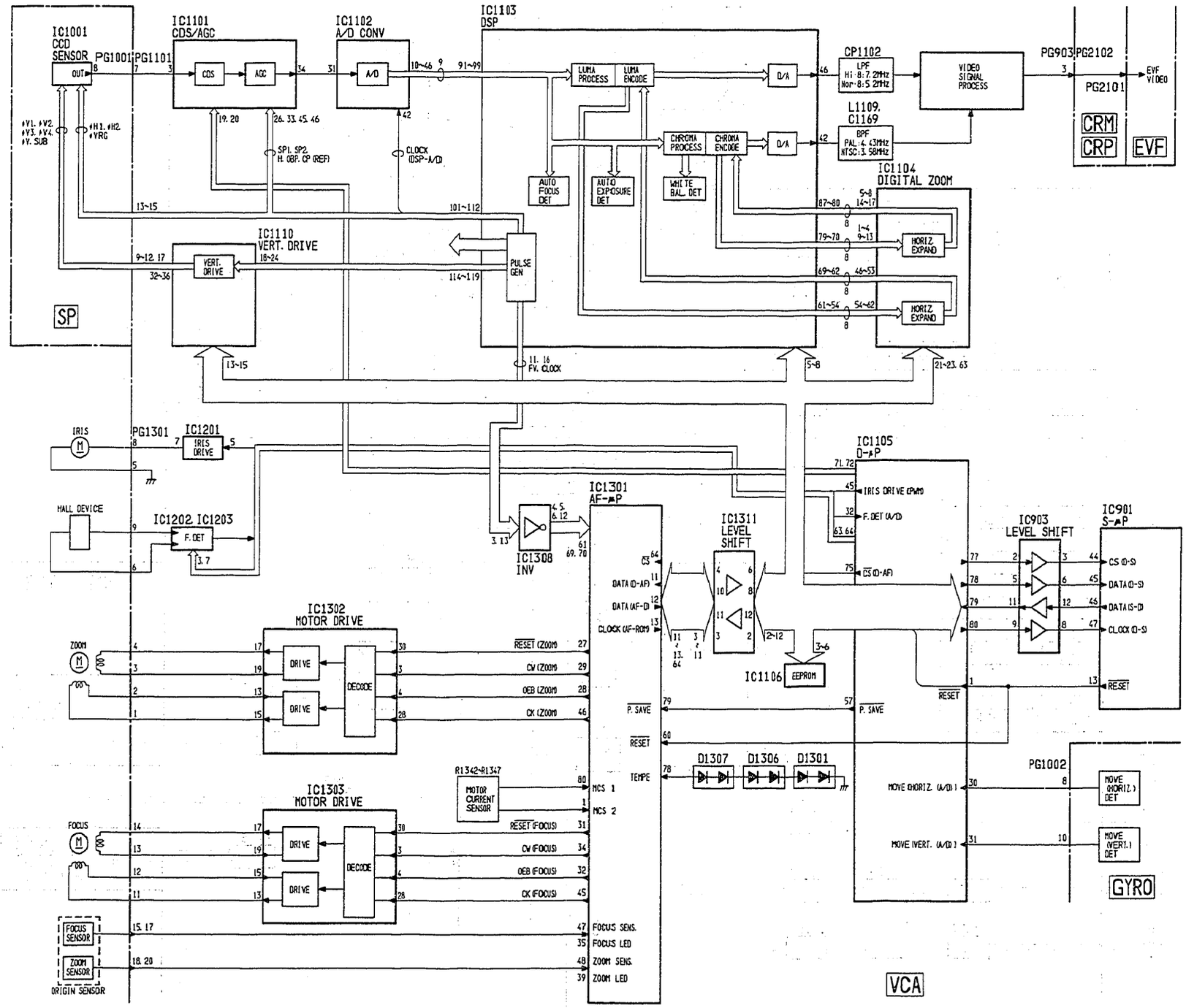
CHAPTER 4

BLOCK DIAGRAMS & MICROPROCESSOR PIN FUNCTION TABLES

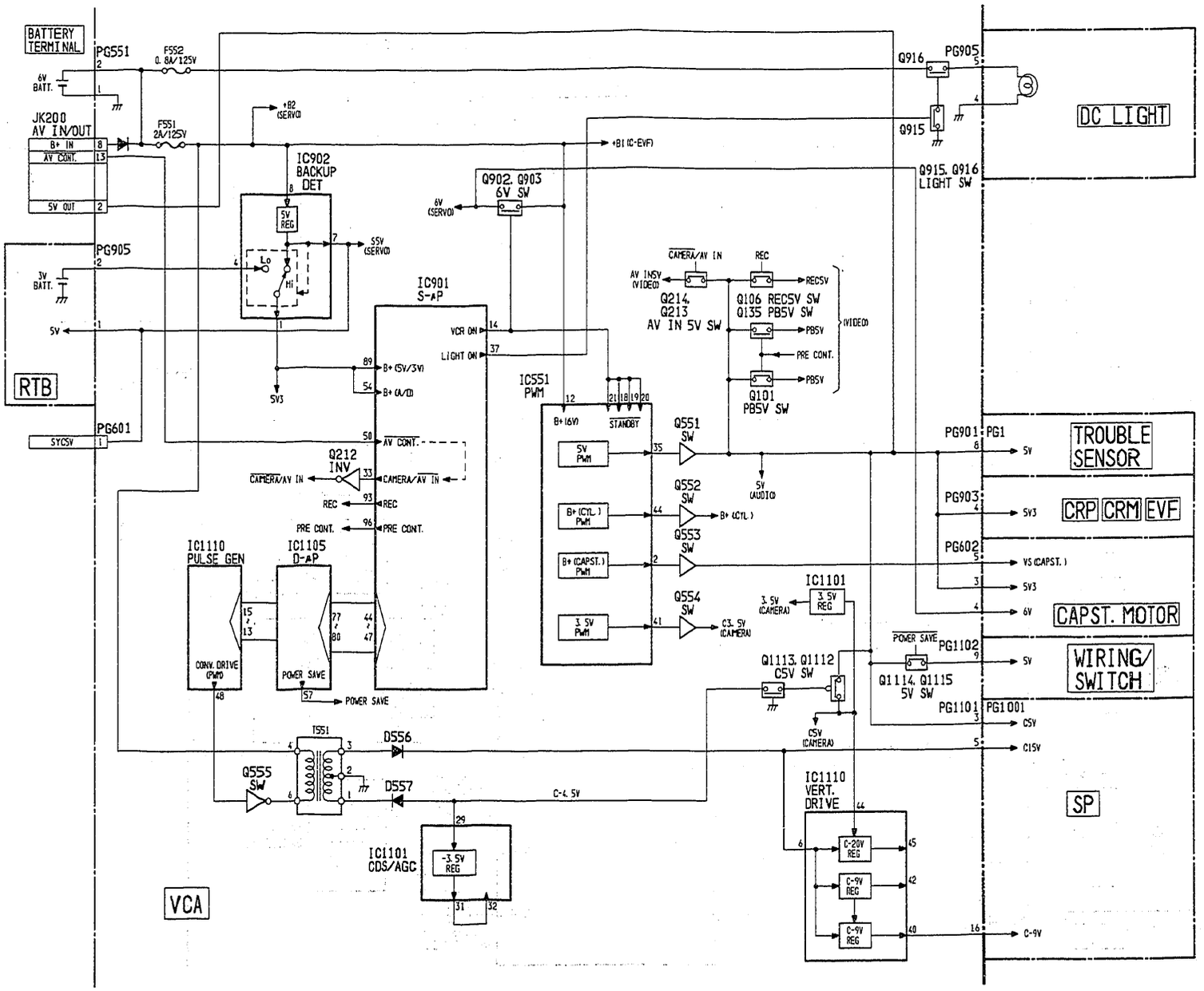
1. OVERALL


MIC-L
MIC-R
MIC UNIT
IC402
MIC AMP
AUDIO (INT.)
AUDIO L
AUDIO R
IC401 AUDIO PROCESS
AUDIO (EXT.)
AUDIO L, R
FM
DATA
W/B EVF
IC2001
EVF PROCESS
C-EVF
IC2202
PULSE GEN
IC2181
PWM
LCD
IC2101
VIDEO PROCESS
LCD DRIVE
CRP
CRM
JK200 AV IN/OUT
AV IN VIDEO
IC203
CCD 1H DELAY
IC202
CCD DELAY (NTSC: 1H) (PAL: 2H)
CAMERA LUMA
IC207
INPUT SELECT
IC101 HEAD SW
LUMA
VIDEO
CHROMA
CH1
CH2
SP
IC1001
CCD SENSOR
IC1101
CDS/AGC
IC1102
A/D CONV.
IC1103
DSP
D/A CONV.
IC204 VIDEO AMP
IC201 LUMA/CHROMA PROCESS
IC1110
DRIVE PULSE GEN.
DIGITAL ZOOM
IC1104
IC904
CHARA GEN
IC901 S-AP
IC601
ATF
PILOT
IC1411
VERT. GYRO
IC1402
GYRO AMP
RESET
IC1404
V. GYRO
IC1511
HORIZ. GYRO
IC1502
GYRO AMP
RESET
IC1504
H. GYRO
IC1105 D-AP
IC903
LEVEL SHIFT
SERVO
IC1106
EEP ROM
IC902
BACK-UP DET.
IC551 PWM
IC602 MOTOR DRIVE
MOTOR DRIVE
AMP
AMP
CAPST. MOTOR
CAPST. FG
V. CAPST.
CYL.
CYL. FG
PG (TACH)
CYL. MOTOR
IRIS
IC1201
IRIS DRIVE
HALL DEVICE
IC1202
F. DET.
IC603
MOTOR DRIVE
LOADING
IC905
AMP
S. REEL
T. REEL
TROUBLE SENSOR
AUTO FOCUS
IC1303
MOTOR DRIVE
IC1301
AUTO FOCUS AP
IC1311
BUF
ZOOM
IC1302
MOTOR DRIVE
IC1308
INV.
VCA

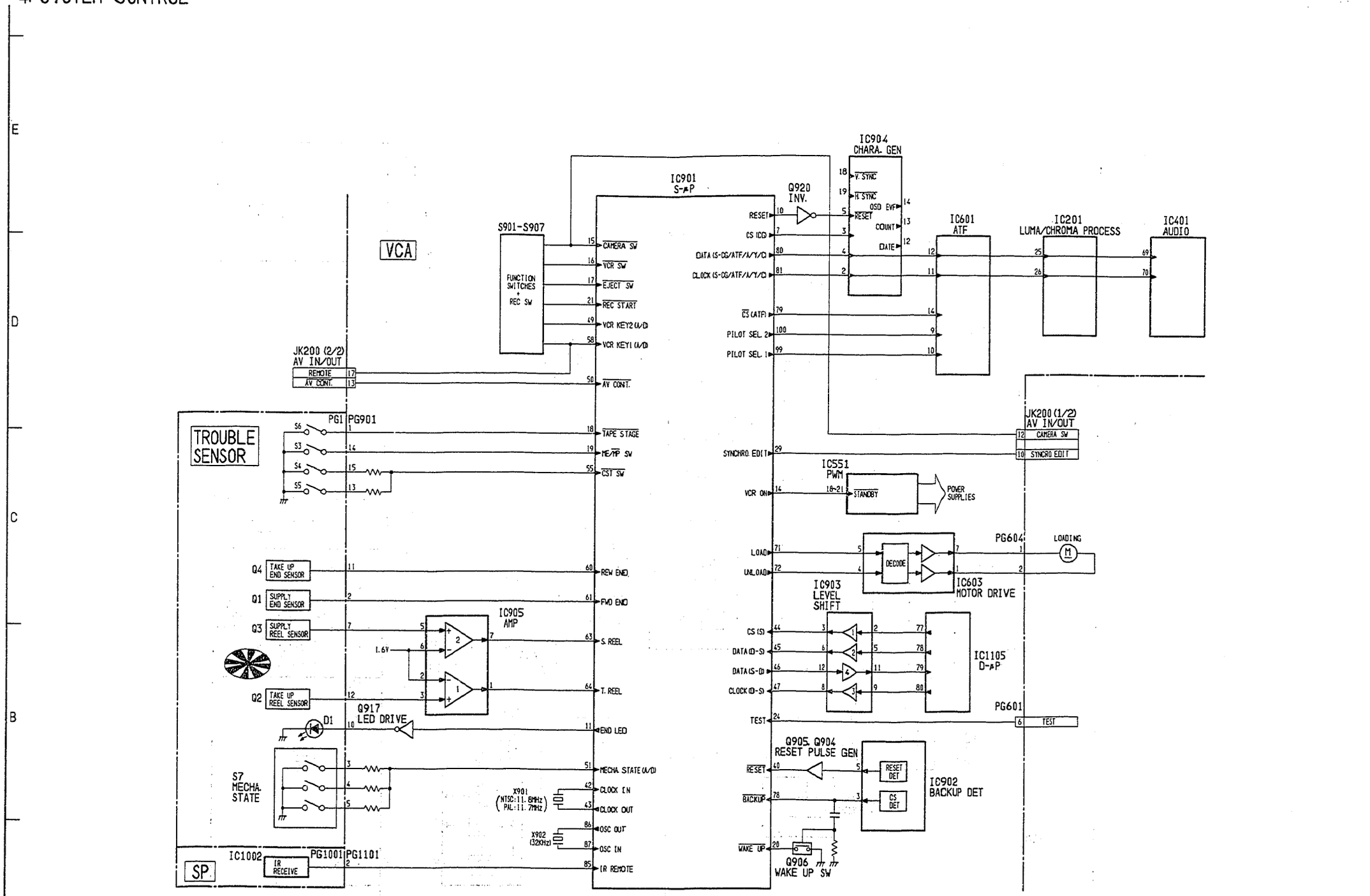
2. CAMERA

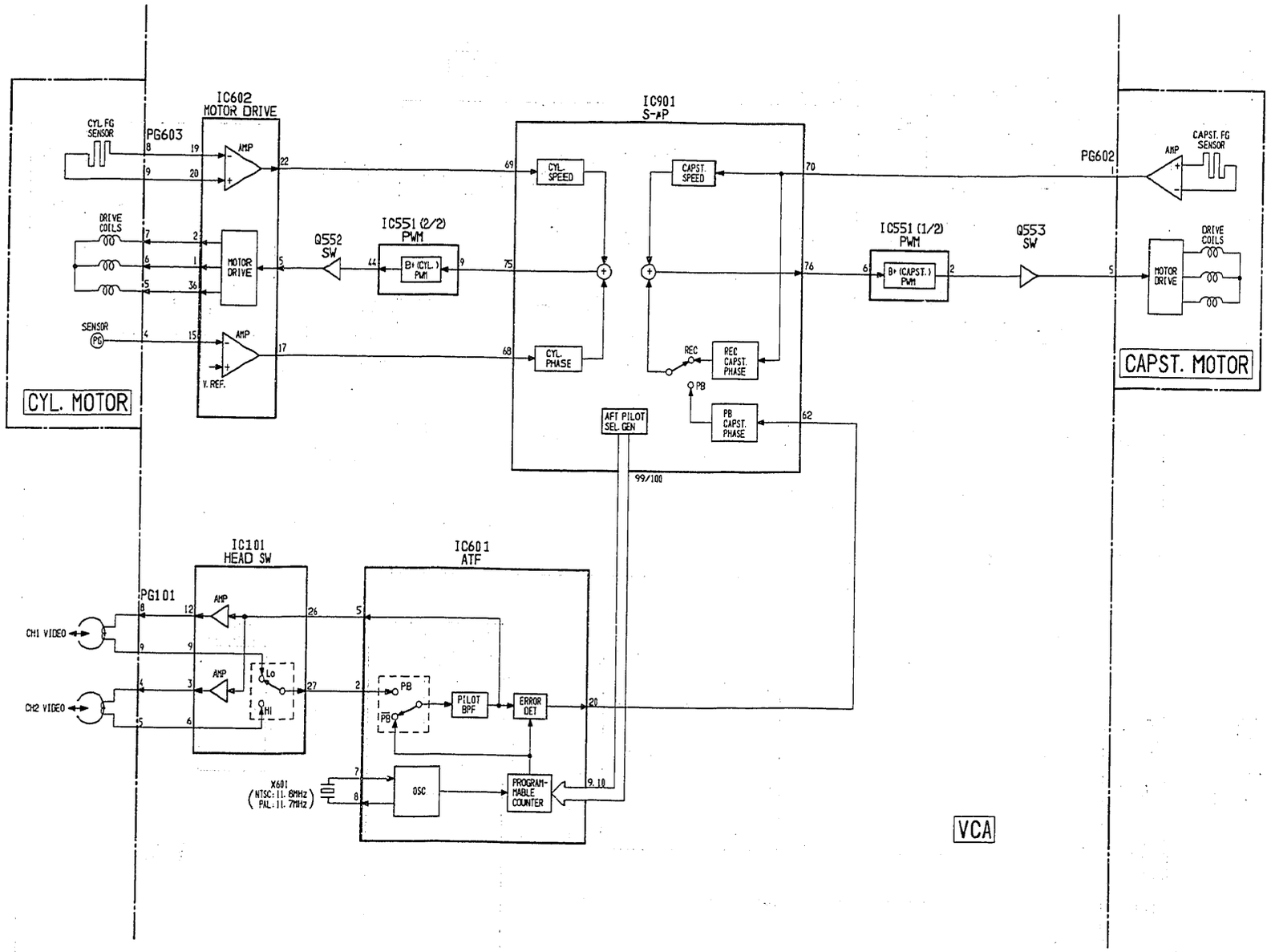

IC1001
CCD SENSOR
OUT
PG1001 PG1101
IC1101
CDS/AGC
CDS
AGC
IC1102
A/D CONV
A/D
IC1103
DSP
LUMA PROCESS
LUMA ENCODE
CHROMA PROCESS
CHROMA ENCODE
D/A
AUTO FOCUS DET
AUTO EXPOSURE DET
WHITE BAL. DET
CP1102
LPF
Hi: 8.7.2MHz
Nor-8.5.2MHz
L1109, C1169
BPF
PAL: 4.43MHz
NTSC: 3.58MHz
VIDEO SIGNAL PROCESS
PG903 PG2102
PG2101
CRM
CRP
EVF
EVF VIDEO
IC1104
DIGITAL ZOOM
HORIZ. EXPAND
IC1110
VERT. DRIVE
VERT. DRIVE
PULSE GEN
SP
φV1. φV2. φV3. φV4. φV. SUB
φH1. φH2. φVRG
SP1. SP2. H. OBP. CP (REF)
CLOCK (DSP-A/D)
11. 16 FV. CLOCK
IRIS
PG1301
IC1201
IRIS DRIVE
HALL DEVICE
IC1202. IC1203
F. DET
IC1308
INV
IC1301
AF-μP
IC1311
LEVEL SHIFT
IC1105
D-μP
IRIS DRIVE (PWM)
F. DET (A/D)
CS (D-AF)
IC903
LEVEL SHIFT
IC901
S-μP
CS (D-S)
DATA (D-S)
DATA (S-D)
CLOCK (D-S)
RESET
DATA (D-AF)
DATA (AF-D)
CLOCK (AF-ROM)
IC1106
EEPROM
P. SAVE
RESET
TEMPE
D1307
D1306
D1301
PG1002
MOVE (HORIZ.) DET
MOVE (VERT.) DET
GYRO
IC1302
MOTOR DRIVE
ZOOM
DRIVE
DECODE
RESET (ZOOM)
CW (ZOOM)
OEB (ZOOM)
CK (ZOOM)
IC1303
MOTOR DRIVE
FOCUS
RESET (FOCUS)
CW (FOCUS)
OEB (FOCUS)
CK (FOCUS)
R1342-R1347
MOTOR CURRENT SENSOR
MCS 1
MCS 2
FOCUS SENSOR
ZOOM SENSOR
ORIGIN SENSOR
FOCUS SENS.
FOCUS LED
ZOOM SENS.
ZOOM LED
VCA

3. POWER

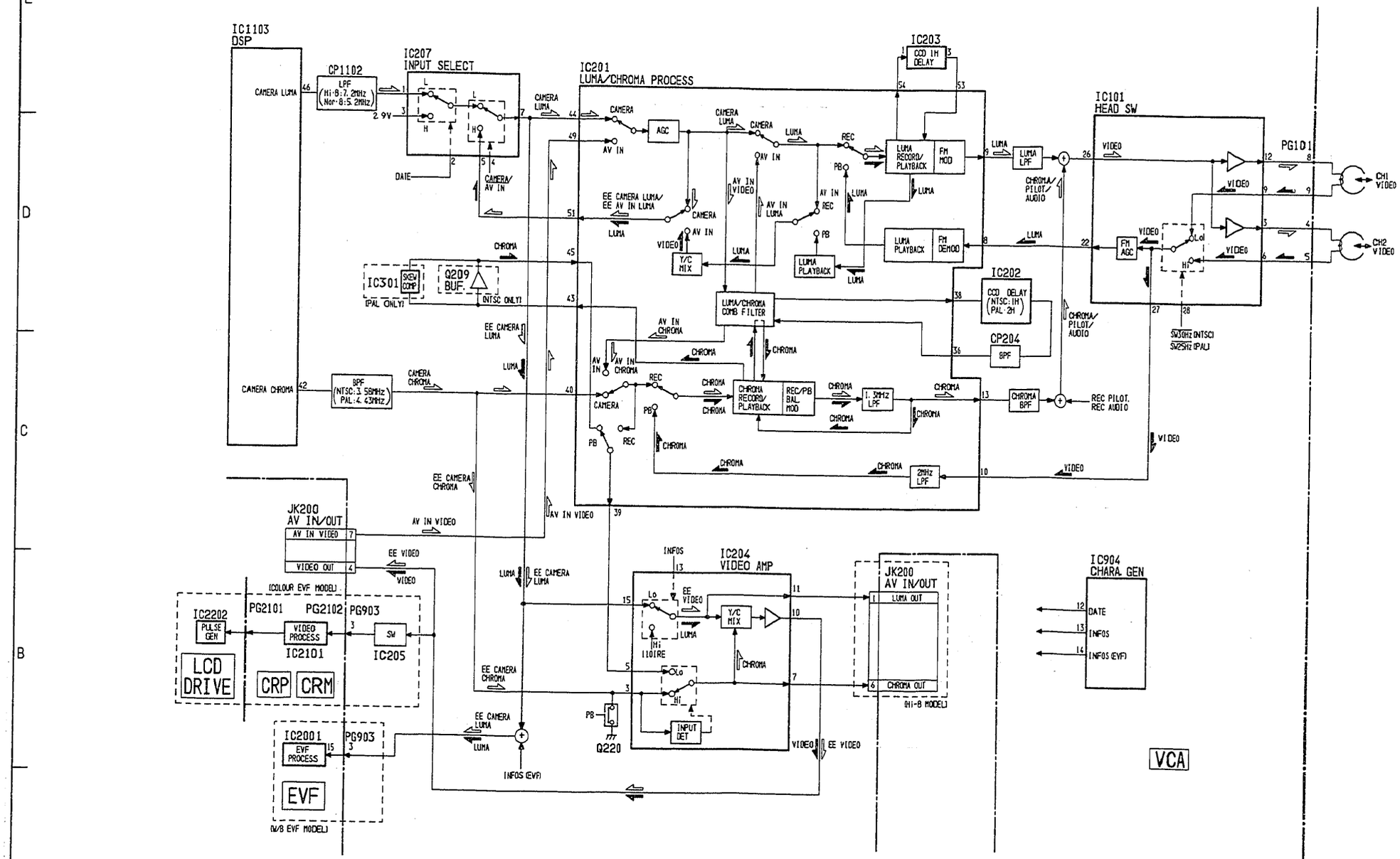

BATTERY TERMINAL
PG551
F552 0.8A/125V
6V BATT.
JK200 AV IN/OUT
B+ IN
AV CONT.
5V OUT
F551 2A/125V
+B2 (SERVO)
+B1 (C-EVF)
IC902 BACKUP DET
5V REG
5SV (SERVO)
Q902, Q903 6V SW
6V (SERVO)
PG905
3V BATT.
5V
Lo
Hi
IC901 S-AP
VCR ON
LIGHT ON
B+ (5V/3V)
B+ (A/D)
5V3
RTB
PG601
5YC5V
AV CONT.
Q212 INV
CAMERA/AV IN
REC
PRE CONT.
IC1110 PULSE GEN
IC1105 D-AP
CONV. DRIVE (PWM)
POWER SAVE
IC551 PWM
B+16V
STANDBY
5V PWM
B+ (CYL.) PWM
B+ (CAPST.) PWM
3.5V PWM
Q551 SW
Q552 SW
Q553 SW
Q554 SW
5V (AUDIO)
B+ (CYL.)
IC1101 3.5V REG
3.5V (CAMERA)
C3.5V (CAMERA)
Q1113, Q1112 C5V SW
C5V (CAMERA)
Q1114, Q1115 5V SW
T551
D556
D557
Q555 SW
C-4.5V
IC1101 CDS/AGC
-3.5V REG
VCA
IC1110 VERT. DRIVE
C-20V REG
C-9V REG
C-9V
Q916
PG905
Q915
DC LIGHT
Q915, Q916 LIGHT SW
CAMERA/AV IN
REC
AV IN5V (VIDEO)
Q214, Q213 AV IN 5V SW
Q106 REC5V SW
Q135 PB5V SW
REC5V
PB5V
PRE CONT.
Q101 PB5V SW
(VIDEO)
PG901
PG1
TROUBLE SENSOR
PG903
CRP CRM EVF
PG602
VS (CAPST.)
CAPST. MOTOR
POWER SAVE
PG1102
WIRING/ SWITCH
PG1101
PG1001
C5V
C15V
SP

4. SYSTEM CONTROL

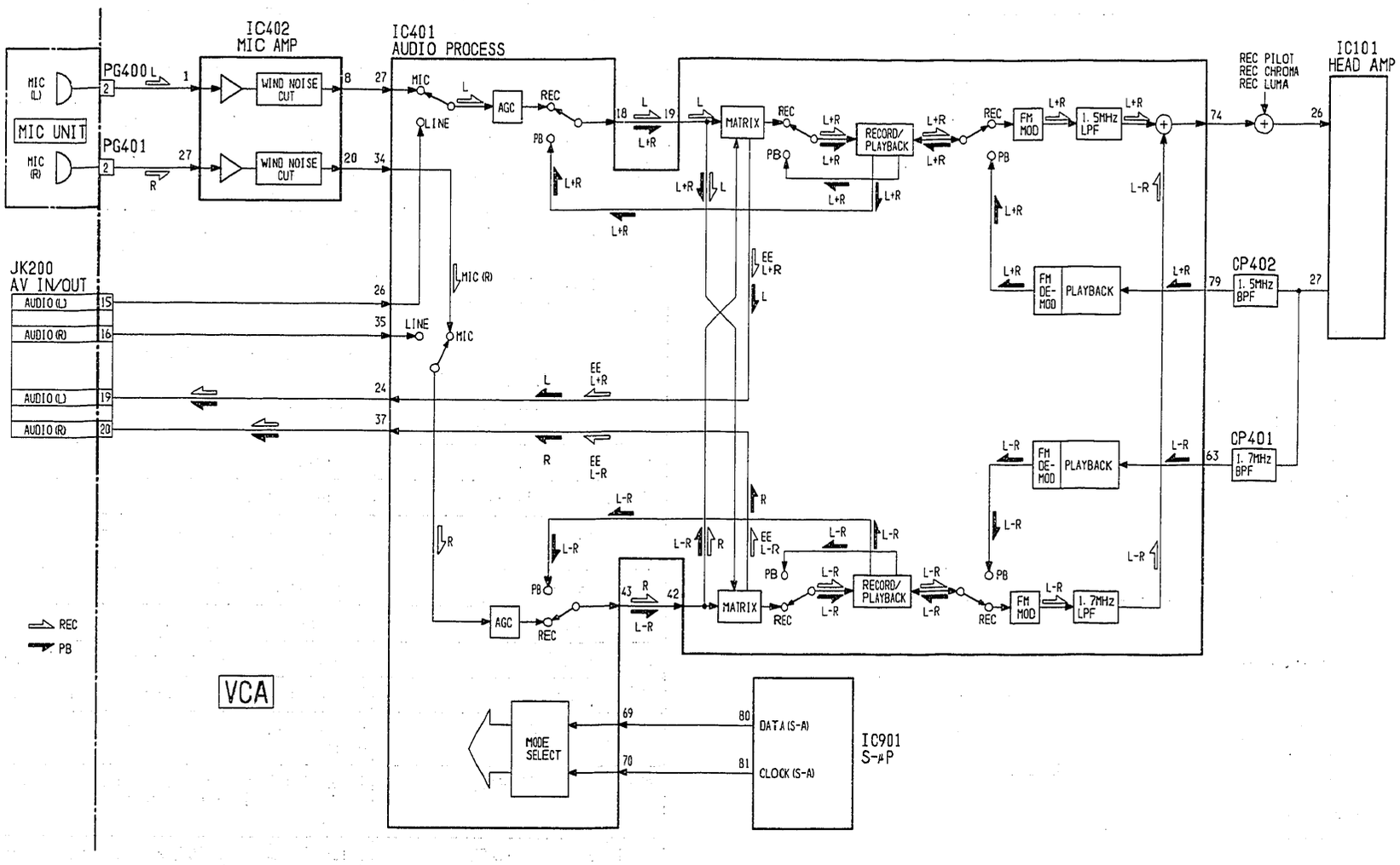



IC602
MOTOR DRIVE
IC901
S-AP
CYL. FG SENSOR
PG603
AMP
DRIVE COILS
MOTOR DRIVE
SENSOR
PG
V. REF.
CYL. MOTOR
IC551 (2/2) PWM
B+ (CYL.) PWM
Q552 SW
CYL. SPEED
CYL. PHASE
CAPST. SPEED
REC
REC CAPST. PHASE
PB
PB CAPST. PHASE
AFT PILOT SEL. GEN
99/100
IC551 (1/2) PWM
B+ (CAPST.) PWM
Q553 SW
PG602
CAPST. FG SENSOR
CAPST. MOTOR
IC101
HEAD SW
PG101
CH1 VIDEO
CH2 VIDEO
Lo
Hi
IC601
ATF
PILOT BPF
ERROR DET
OSC
X601
(NTSC: 11.6MHz
PAL: 11.7MHz)
PROGRAM-MABLE COUNTER
VCA

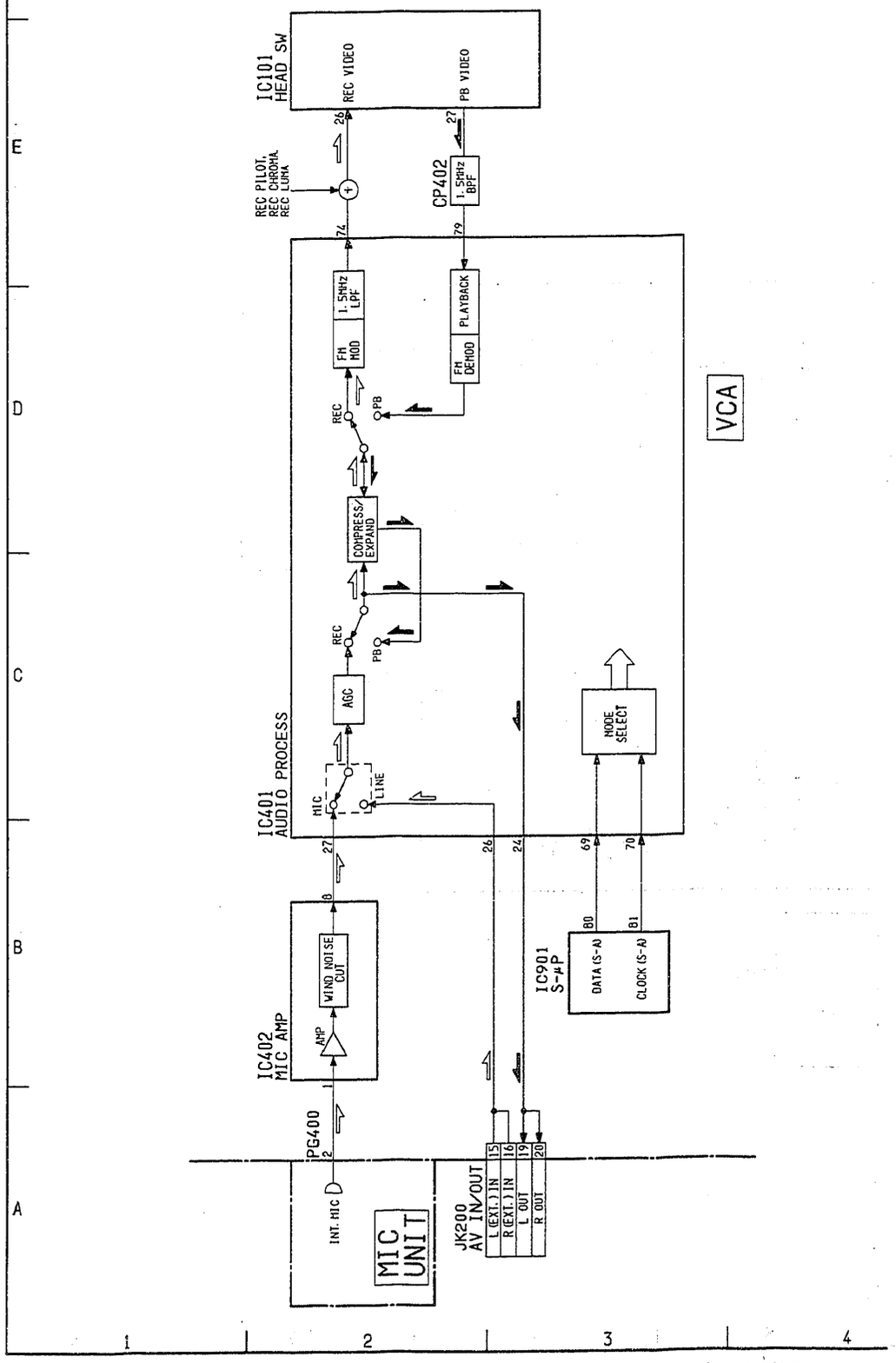
6. VIDEO


IC1103
DSP
CAMERA LUMA
CAMERA CHROMA
CP1102
LPF
(Hi:8.7.2MHz
Nor:8.5.2MHz)
2.9V
IC207
INPUT SELECT
DATE
CAMERA/
AV IN
IC201
LUMA/CHROMA PROCESS
AGC
AV IN
EE CAMERA LUMA/
EE AV IN LUMA
Y/C
MIX
IC301
SKEW
COMP
Q209
BUF.
(PAL ONLY)
(NTSC ONLY)
LUMA/CHROMA
COMB FILTER
AV IN
CHROMA
EE CAMERA
LUMA
BPF
(NTSC:3.58MHz
PAL:4.43MHz)
CHROMA
RECORD/
PLAYBACK
REC/PB
BAL.
MOD
1.3MHz
LPF
2MHz
LPF
EE CAMERA
CHROMA
IC203
CCD 1H
DELAY
LUMA
RECORD/
PLAYBACK
FM
MOD
LUMA
PLAYBACK
FM
DEMOD
LUMA
LPF
CHROMA/
PILOT/
AUDIO
IC202
CCD DELAY
(NTSC:1H)
(PAL:2H)
CP204
BPF
REC PILOT.
REC AUDIO
IC101
HEAD SW
VIDEO
FM
AGC
PG101
CH1
VIDEO
CH2
VIDEO
SW30HZ(NTSC)
SW25HZ(PAL)
JK200
AV IN/OUT
AV IN VIDEO
VIDEO OUT
AV IN VIDEO
EE VIDEO
VIDEO
(COLOUR EVF MODEL)
IC2202
PULSE
GEN
PG2101
PG2102
PG903
VIDEO
PROCESS
IC2101
SW
IC205
LCD
DRIVE
CRP
CRM
IC2001
EVF
PROCESS
PG903
EVF
(W/B EVF MODEL)
IC204
VIDEO AMP
INFOS
EE
VIDEO
Y/C
MIX
INPUT
DET
Q220
JK200
AV IN/OUT
LUMA OUT
CHROMA OUT
(Hi-8 MODEL)
IC904
CHARA. GEN
DATE
INFOS
INFOS (EVF)
VCA

7. AUDIO (STEREO TYPE)



8. AUDIO (MONAURAL TYPE)



2. MICROPROCESSOR PIN FUNCTION TABLES

2-1. Digital Microprocessor (IC1105: D-μP)

Pin No.	I/O	Active Level	Abbreviation	Function
1	I	Lo	RESET(Lo)	Initializes IC1105.
2	0	(Pulse)	OSC OUT	Not used. Open
3	I	(Pulse)	CLOCK(14MHz) IN	Receives the 4fsc (14.32MHz) signal from IC1103 (DSP) as a reference clock signal.
4	I	–	–	Set the IC1105 operation mode. Connected to 3.5V power supply.
5	I	–	–	
6	–	–	–	Not used. Connected to 3.5V power supply.
7	I	Lo	STANDBY(Lo)	Not used. Connected to 3.5V power supply.
8	–	–	V_{CC}	3.5V power input
9	–	–	–	Not used. Open
10	I	(Pulse)	RX DATA(R)	Perform initial settings and for data communicate with the personal computer used for adjustment.
11	0	(Pulse)	TX DATA(S)	
12	–	–	GND	Ground
13	I	Lo	TELE SW(Lo)	Zoom switch detection inputs
14	I	Lo	WIDE SW(Lo)	
15	I	Hi	T/W SLOW	Not used. Open
16	I	–	FAR-SW	Not used. Open
17	I	–	NEAR-SW	Not used. Open
20	I	(Pulse)	AREA2	Receive pulses that detect the iris control area from IC1103 (DSP).
18	I	(Pulse)	FV	V. sync pulse input
19	I	(Pulse)	FP	Field detection pulse input
21	I	(Pulse)	HD	H. sync pulse input (to control the 9x16 mode (cinema) signal)
42	I	(Pulse)	HD	H. sync pulse input (to control communications)
22	0	(Pulse)	CINEMA	Supplies pulses to IC1103 (DSP) to control the wipe fade operation.
23	I	Lo	Hi-8(Lo)	Internal mode (handling Hi-8) setting input. This is grounded in Hi-8 models and connected to the 3.5V power supply in other models.
24	I	Lo	ELE-ZOOM	Internal mode (ELE-ZOOM) setting input. This is grounded in models with the electronic zoom function and connected to the 3.5V power supply in other models.
25	I	Lo	PAL(Lo)	Internal mode setting input. This is grounded in PAL models and connected to the 3.5V power supply in NTSC models.
26	–	–	–	Not used. Open
27	–	–	–	Not used. Open
28	–	–	–	Not used. Open
29	–	–	B+(5V)	5V power supply input

Pin No.	I/O	Active Level	Abbreviation	Function
30	I	0V-5V	MOVE[(HORIZ.(A/D)]	Horizontal/vertical camera shaking detection inputs. Supplied from IC1511 [MOVE (HORIZ.)] and IC1411 [MOVE (VERT.)].
31	I	0V-5V	MOVE[VERT.(A/D)]	
32	I	0V-5V	F.DET(A/D)	F value detection input. Receives the F.DET voltage detected by IC1202 (F.DET) and compares it with the reference voltage stored in IC1106 (EEPROM) to determine the F value.
33	O	0V-5V	PLL ADJ.	Checks the PLL used in the IC1103 (DSP).
34	I	0V-5V	CAMERA KEY(A/D)	Camera switch detection inputs.
35	I	0V-5V	CAMERA KEYY2(A/D)	
36	O	0V-5V	HALL ADJ.0(D/A)	Controls the bias voltage of the Hall device..
37	O	0V-5V	HALL ADJ.1(D/A)	Controls the offset voltage of the IC1202 (F.DET).
38	–	–	GND(A)	Ground
39	–	–	–	Not used. Open
40	–	–	–	
41	–	–	–	
43	–	–	–	
44	–	–	–	
45	O	(Pulse)	IRIS DRIVE(PWM)	Iris motor drive output. Smoothed by an integrating circuit and then supplied to the digital autofocus circuit.
46	O	0V-5V	XTAL ADJ.(A/D)	Not used. Open
47	–	–	B+(3.5V)	3.5V power supply input
48	–	–	–	Not used. Open
49	–	–	–	
50	–	–	–	
51	–	–	–	
52	–	–	–	
53	–	–	–	
54	–	–	–	
55	–	–	–	
56	–	–	GND	Ground
57	O	Lo	POWER SAVE(Lo)	Outputs "Lo" in modes other than camera recording to prevent non-essential circuits from operating, thus reducing power consumption.
58	O	(Pulse)	REC LED	Drives the recording indicator.
59	–	–	–	Not used. Open
60	–	–	–	
61	O	Hi	H.GYRO-RST	Output signals to reset IC1504 [RESET (HORIZ.)] and IC1404 [RESET (VERT.)].
62	O	Hi	V.GYRO-RST	

Pin No.	I/O	Active Level	Abbreviation	Function
63	O	Hi	HALL GAIN1	Control the gain of IC1202 (F.DET) (gain of Hall devices).
64	O	Hi	HALL GAIN2	
65	-	—	—	Not used. Open
66	-	—	—	
67	-	—	—	
68	-	—	—	
69	O	(Pulse)	LOAD(D-DZ)	Outputs pulses to latch the data transferred to IC1103 (DSP) and IC1104 (DIGITAL ZOOM).
70	O	(Pulse)	LOAD(D-VD)	Outputs pulses to latch the data transferred to IC1110 (VERT. DRIVE).
71	O	(Pulse)	CLOCK(D-CDS)	Output the data transferred to IC1101 (CDS/AGC).
72	O	(Pulse)	DATA(D-CDS)	
73	-	—	GND	Ground
74	O	(Pulse)	CS[Lo(D-ROM)]	Activates data communications with IC1106 (EEPROM).
75	O	(Pulse)	CS[Lo-D-AF)]	Activates data communications with IC1301 (AF-μP).
76	O	(Pulse	CS[Lo(D-S)]	Not used. Open
77	O	(Pulse)	CS[Lo(D-CONT)]	Controls data communications with IC903 (LEVEL SHIFT).
78	O	(Pulse)	DATA(D-S/DSP/VD/DZ/ ROM/AF)	Communicate data with IC901 (S-μP), IC1103 (DSP), IC1110 (VERT. DRIVE), IC1104 (DIGITAL ZOOM), IC1106 (EEPROM) and IC1301 (AF-μP).
79	I	(Pulse)	DATA(S/DSP/ROM/AF-D)	
80	I/O	(Pulse)	CLOCK(D/AF-S/DSP/ VD/DZ/ROM)	

2-2. System Control Microprocessor (IC901: S-μP)

Pin No.	I/O	Active Level	Abbreviation	Function
1	O	Lo	CH4 REC(Lo)	Not used. Open
2	O	Lo	CH3 REC(Lo)	
3	O	Lo	CH2 REC(Lo)	Signal outputs to select the recording video heads. Output "Lo" during the recording channel periods
4	O	Lo	CH1 REC(Lo)	
5	O	(Pulse)	SW12.5/15Hz	Not used. Open
6	O	(Pulse)	SW25/30Hz	Head switching pulse output
7	O	Hi	CS(CG)	Chip select signal to control the character generator (IC904). Serial data is read at the rise of this signal.
8	O	Lo	PB(Lo)	Video signal processor circuit mode control output. Goes "Lo" during playback.
9	O	Hi	POWER CONT.	Not used. Open
10	O	Hi	RESET(CG)	Outputs "Hi" when the power is turned on and "Lo" when the power is turned off to initialize the character generator (IC904).
11	O	(Pulse)	END LED	End LED drive output. Outputs pulses with a frequency of approx. 5OHz when the power is turned on.
12	O	Hi	CYL.START	Cylinder motor start auxiliary output. Outputs "Hi" for 50 ms when the cylinder is started in the forward direction.
13	O	Lo	RESET[Lo(CAMERA)]	Camera block power control output. Outputs "Hi" when the power is turned on and "Lo" when the power is turned off to initialize the vertical drive circuit (IC1110), digital signal processor circuit (IC1103), digital microprocessor (IC1105) and autofocus microprocessor (IC1301) in the camera block.
14	O	Hi	VCR ON	Power control output. Outputs "Hi" when the power is turned on.
15	I	Lo	CAMERA SW(Lo)	Power switch detection input. "Lo" is input in the camera mode.
16	I	Lo	VCR SW(Lo)	Power switch control input. "Lo" is input in the VCR mode.
17	I	Lo	EJECT SW(Lo)	Eject switch detection input. When "Lo" is input, the eject operation is done even if the power is turned off (standby release input).
18	I	Lo	CASSETTE SW(Lo)	Cassette holder open/close detection input. "Lo" is input when the cassette holder is closed.
19	I	Hi/Lo	ME/MP(Lo)	Input to detect the type of the tape. Hi: ME (metal evaporated) tape, Lo: MP (metal powder) tape
20	I	Lo	WAKEUP(Lo)	Standby release input. When a 6V battery is connected, "Lo" is input and the standby mode is released. IC901 detects the inputs of each switch to start operation.
21	I	Lo	REC SW(Lo)	Recording start/stop switch detection input. When "Lo" is input, the unit enters the record mode (standby release input) even if the power is off.
22	O	-	TEST	Not used. Grounded.
23	I	Hi	PB HB	Playback mode detection input. Receives the playback mode detection signal detected by the video signal processor circuit (IC201) and supplies it to the character generator (IC904) which generates a character signal for display. Also transfers the operation mode to IC201. This is grounded in models for use exclusively with normal tape. Hi: Hi-8 tape played back, Lo: Normal tape played back
24	I	Hi	TEST PROG.	Test programme start detection input. When "Hi" is input, the test program is started.

Pin No.	I/O	Active Level	Abbreviation	Function
25	I	Hi	Hi-8 SW	Hi-8 auto discrimination recording detection input. Recording with Hi-8 or normal tape is switched automatically according to the tape inserted.
26	I	Hi/Lo	W-B EVF/C.EVF(Lo)	Black-and-white/colour EVF selection input. Connected to "Hi" in models with a black-and-white EVF and to "Lo" in models with a colour EVF.
27	O	Hi	MUTE	Audio muting output. Outputs "Hi" to mute the audio signal.
28	O	Hi	PB	Video signal processor circuit mode control output. Goes "Hi" during playback.
29	O	Hi/Lo	SYNC.EDIT	Table-top VCR mode control output. Remote controls the operation mode of the VCR connected to JK200 (AV IN/OUT) using a pause switch. Outputs "Hi" to set the VCR to the pause mode and "Lo" to release the pause mode (set to the record mode).
30	O	Hi	TRICK PLAY	Controls the operation mode of the video signal processor circuit. Outputs "Hi" during trick play.
31	-	-	-	Not used. Open
32	-	-	-	
33	O	Hi/Lo	CAMERA/AV IN(Lo)	Input signal select output. Outputs "Hi" during camera recording and "Lo" when external video and audio signals are input and during playback.
34	O	Hi	REC MUTE	Not used. Open
35	O	Hi/Lo	SP/LP(Lo)	Tape speed output. Outputs "Hi" in the SP mode and "Lo" in the LP mode. Open for models that can be used only in the SP mode.
36	O	Hi	CYL REVERSE	Cylinder motor rotation direction control output. Goes "Hi" when turning the cylinder motor in reverse (when a small amount of condensation is detected).
37	O	Hi	DC LIGHT	DC camera light attachment shoe power control output. Outputs "Hi" when the power supply to the shoe is turned on.
38	O	Hi	CAPST.ON	Capstan motor power control output
39	-	-	GND	Grounded
40	I	Lo	RESET(Lo)	"Lo" input initializes the microprocessor.
41	-	-	GND	Grounded
42	O	(Pulse)	CLOCK OUT	Generates 12MHz main clock pulses.
43	I	(Pulse)	CLOCK IN	
44	I	Lo	CS(S)(Lo)	Communicate 64-bit data with the digital microprocessor (IC1105) in a period of approx. 17 ms.
45	I	(Pulse)	DATA(D-S)	
46	O	(Pulse)	DATA(S-D)	
47	I	(Pulse)	CLOCK(D-S)	
48	I	0V-5V	INT.MODE(A/D)	Input to select the internal mode such as the destination, etc.
49	I	0V-5V	VCR KEY 2(A/D)	VCR operation key detection inputs
58	I	0V-5V	VCR KEY 1(A/D)	
50	I	Lo	AV IN(Lo)	Input to detect whether or not external AV signals are input. When an AV input cable is plugged into the AV input/output connector (JK200: AV IN/OUT), "Lo" is input.

Pin No.	I/O	Active Level	Abbreviation	Function
51	I	0V-5V	M.STATE SW(A/D)	Mechanism state switch detection input
52	-	-	GND(A/D)	Ground of A/D converted input circuit. Grounded
53	-	-	V.REF.(A/D)	Reference voltage input of A/D converted input circuit
54	-	-	B+(A/D)	Power input of A/D converted input circuit. Connected to the 5V power supply.
55	I	0V-5V	TAPE SW(A/D)	Hi-8 MP tape/erase prevention tab detection input
56	I	0V-5V	BATT./SHORT.(A/D)	Input to detect the battery remaining level/short-circuit in the power supply circuit
57	I	0V-5V	DEW(A/D)	Not used. Grounded.
59	I	0V-5V	SWP ADJ.(A/D)	Not used. Grounded
60	I	0V-5V	REW END(A/D)	Take-up/supply tape end detection inputs. When the amplitude is 2.0Vp-p or more, it is determined that the end of tape is reached.
61	I	0V-5V	FWD END(A/D)	
62	I	0V-5V	ATF ERROR(A/D)	Receives the ATF error signal from the ATF control circuit (IC601) to control the capstan phase.
63	I	(Pulse)	S.REEL	Supply/take-up reel sensor inputs. Used to calculate the tape remaining and detect the reel lock.
64	I	(Pulse)	T.REEL	
65	I	Hi/Lo	Hi-8/NORM.(Lo)	Internal mode select input. Hi: Models with Hi-8 ICs, Lo: Models with Nor-8 ICsmal tape
66	I	(Pulse)	C.SYNC	Composite sync signal input. The 1/2V.SYNC pulse is created by dividing the separated vertical sync signal into two to control the cylinder speed during recording (reference signal).
67	I	(Pulse)	PG (TACH)	Not used. Grounded
68	I	(Pulse)	PG (TACH)	Tach pulse input. Comparison signal that controls the cylinder phase during recording.
69	I	(Pulse)	CYL.FG	Cylinder FG (CYL.FG) pulse input. Controls the cylinder speed during recording and playback.
70	I	(Pulse)	CAPST.FG	Capstan FG (CAPST.FG) pulse input. Controls the capstan phase during recording and the capstan speed during recording and playback.
71	O	Hi	LOAD	Loading motor drive outputs
72	O	Hi	UNLOAD	
73	O	Hi	LM SLOW	Not used. Open
74	O	Hi	CAPST.ACCL	
75	O	PWM	CYL.SERVO(PWM)	Cylinder motor/capstan motor servo control outputs
76	O	PWM	CAPST.SERVO(PWM)	
77	I	(Pulse)	CAPST.FG	Capstan FG (CAPST.FG) pulse input. Used for counting of the linear time counter and phase matching control.
78	I	Lo	BACKUP(Lo)	Input to detect whether or not a battery is connected. When the battery is removed, "Lo" is input and the unit engages the backup mode in which the data is saved.

Pin No.	I/O	Active Level	Abbreviation	Function
79	O	Hi	CS(ATF)	Activates the data communication circuit with the ATF control circuit (IC601).
80	O	(Pulse)	DATA(S-Y/C/A/ATF/CG)	Communicates data with the video signal processor circuit (IC201), audio signal processor circuit (IC401), ATF control circuit (IC601) and character generator (IC904).
81	O	(Pulse)	CLOCK(S-Y/C/A/ATF/CG)	
82	I	-	-	Not used. Grounded.
83	I	Lo	Hi-8 REC(Lo)	Internal mode select input. "Lo" is input in Hi-8 models and "Hi" is input in models using only normal tape. However, this input is effective only when "Hi" is input to pin 65 [Hi-8/NORM.(Lo)].
84	O	Hi	TRIG.FADE	Rapid audio fading output. Outputs "Hi" when fading is started and fades the audio signal in rapidly, synchronized with the video signal.
85	I	(Pulse)	IR REMOTE	Infrared remote detection input
86	O	(Pulse)	OSC OUT	Generate 32kHz sub-clock pulses.
87	I	-	OSC IN	
88	-	-	GND	Ground pin. Grounded
89	-	-	B+(5V/3V)	Supply voltage (5V/3V) input
90	-	-	-	Vacant pin. Connected to 5V power supply.
91	-	-	-	Not used. Open
92	O	Lo	CAPST.REVERSE	Capstan motor reverse control output
93	O	Hi	REC	Record mode control output of video signal processor circuit
94	O	Hi	SQUELCH	Playback muting (squelch) control output of video signal processor circuit
95	O	Hi	FLE ON	Flying erase head oscillation control output
96	O	Hi	PREAMP ON	Preamp activation signal. Outputs "Hi" during playback to activate the preamp.
97	O	(Pulse)	ARTI.H.SYNC	Horizontal/vertical artificial sync signal outputs
98	O	(Pulse)	ARTI.V.SYNC	
99	O	Hi/Lo	PILOT SEL.1	ATF pilot signal select outputs
100	O	Hi/Lo	PILOT SEL.2	

CHAPTER 5

SCHEMATIC & CIRCUIT BOARD DIAGRAMS

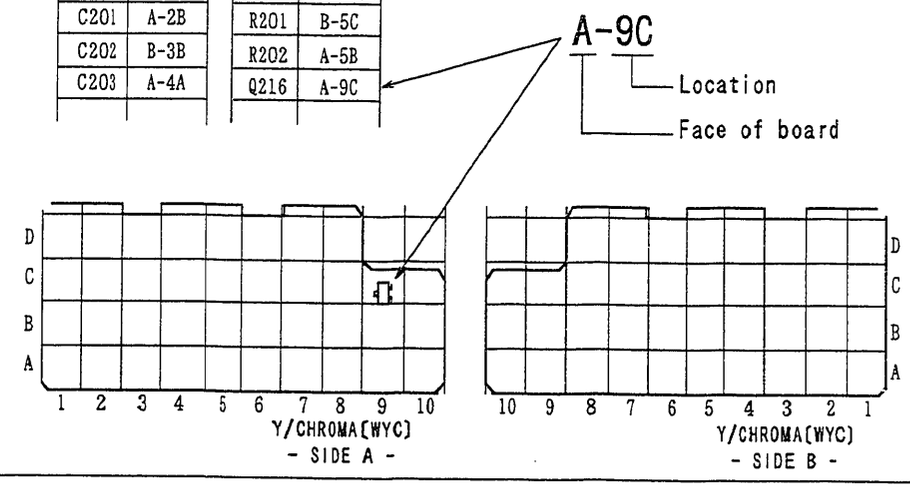
[Parts Location Indexing Tables]

This service manual shows the parts location indexing tables beside the major circuit board diagrams. These tables indicate the locations of each part on the circuit boards. Use the tables to locate the parts on the circuit boards.

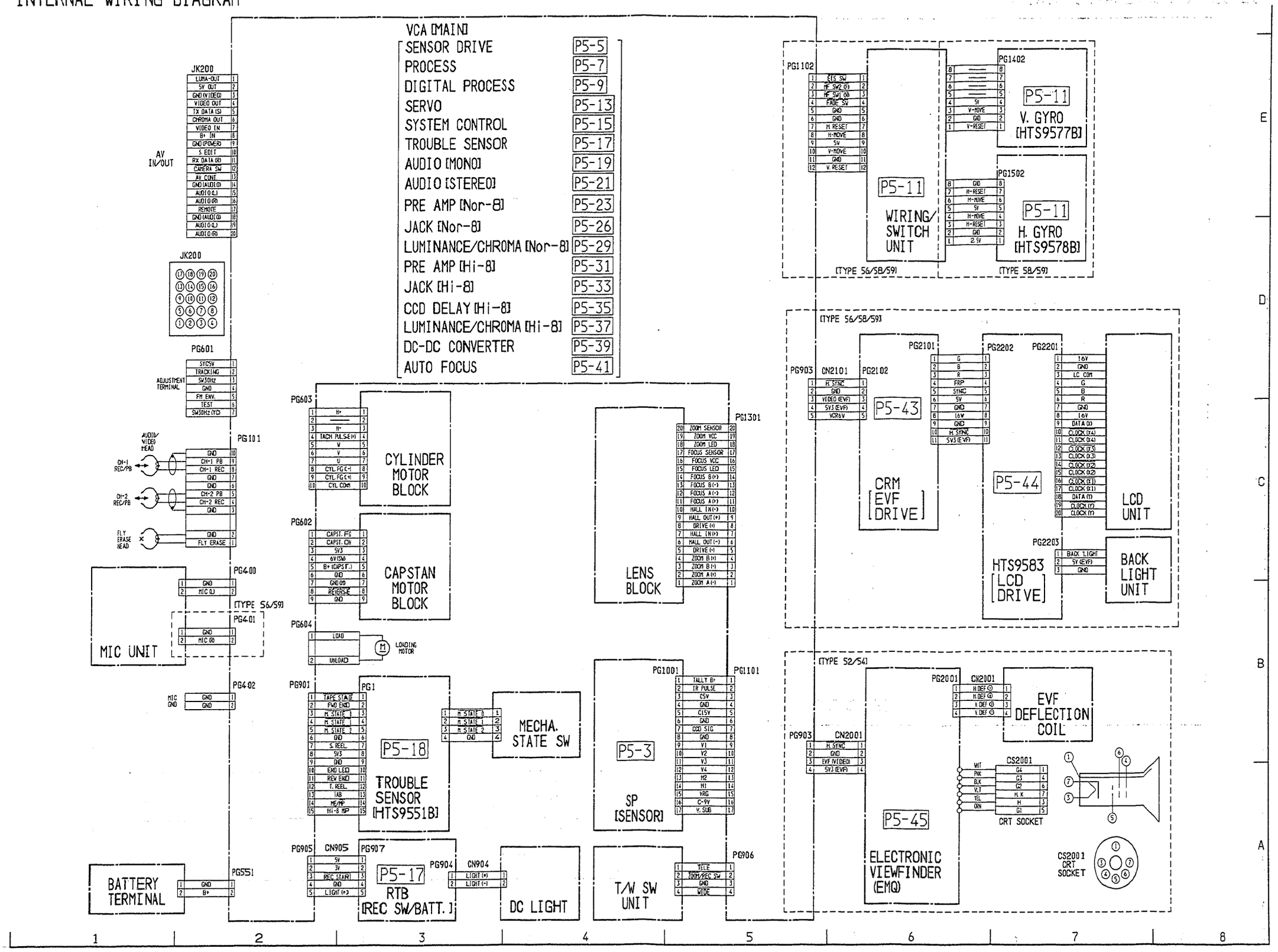
IDENTIFICATION OF PARTS LOCATION

Symbol No.	Parts Location
C201	A-2B
C202	B-3B
C203	A-4A

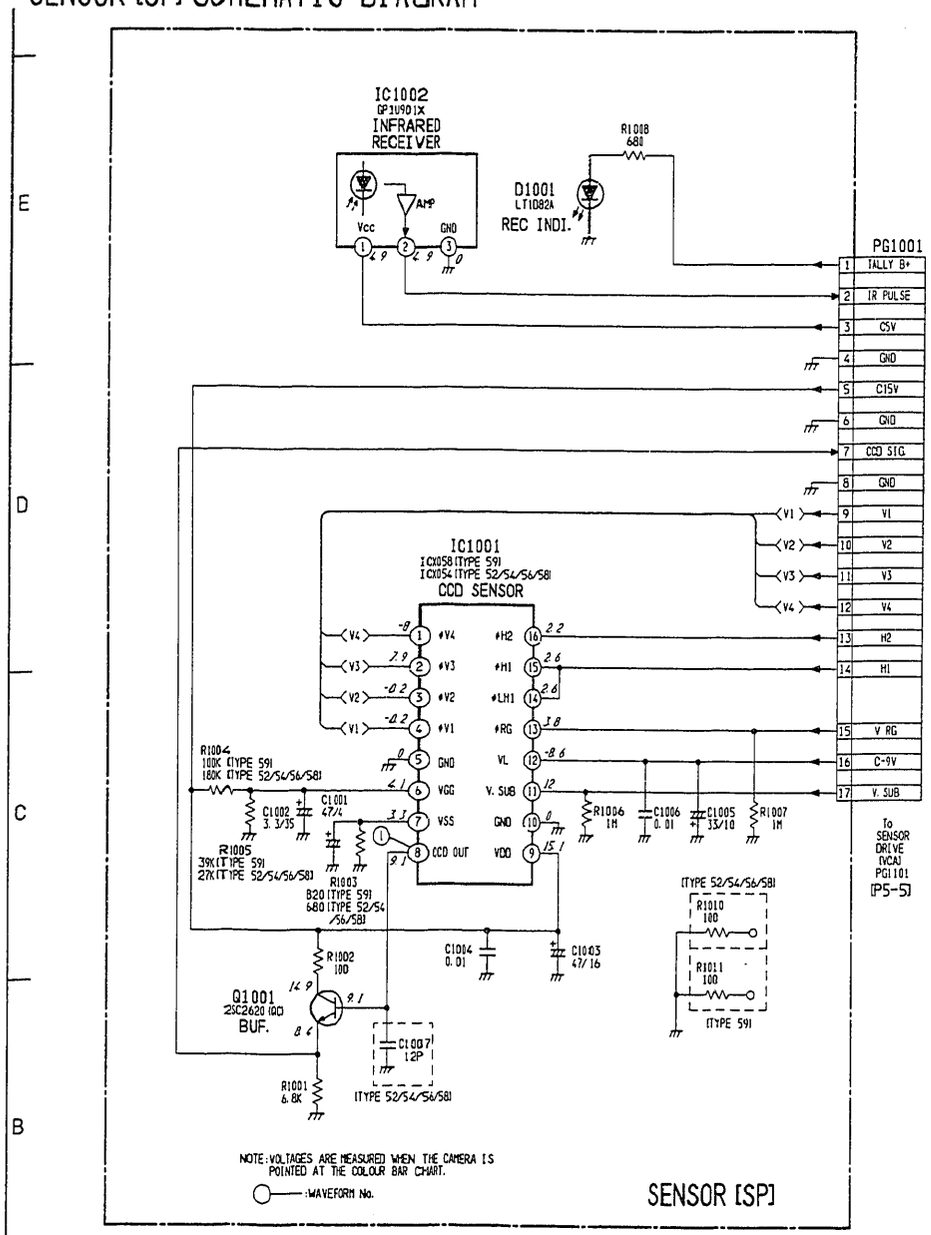
Symbol No.	Parts Location
R201	B-5C
R202	A-5B
Q216	A-9C



INTERNAL WIRING DIAGRAM



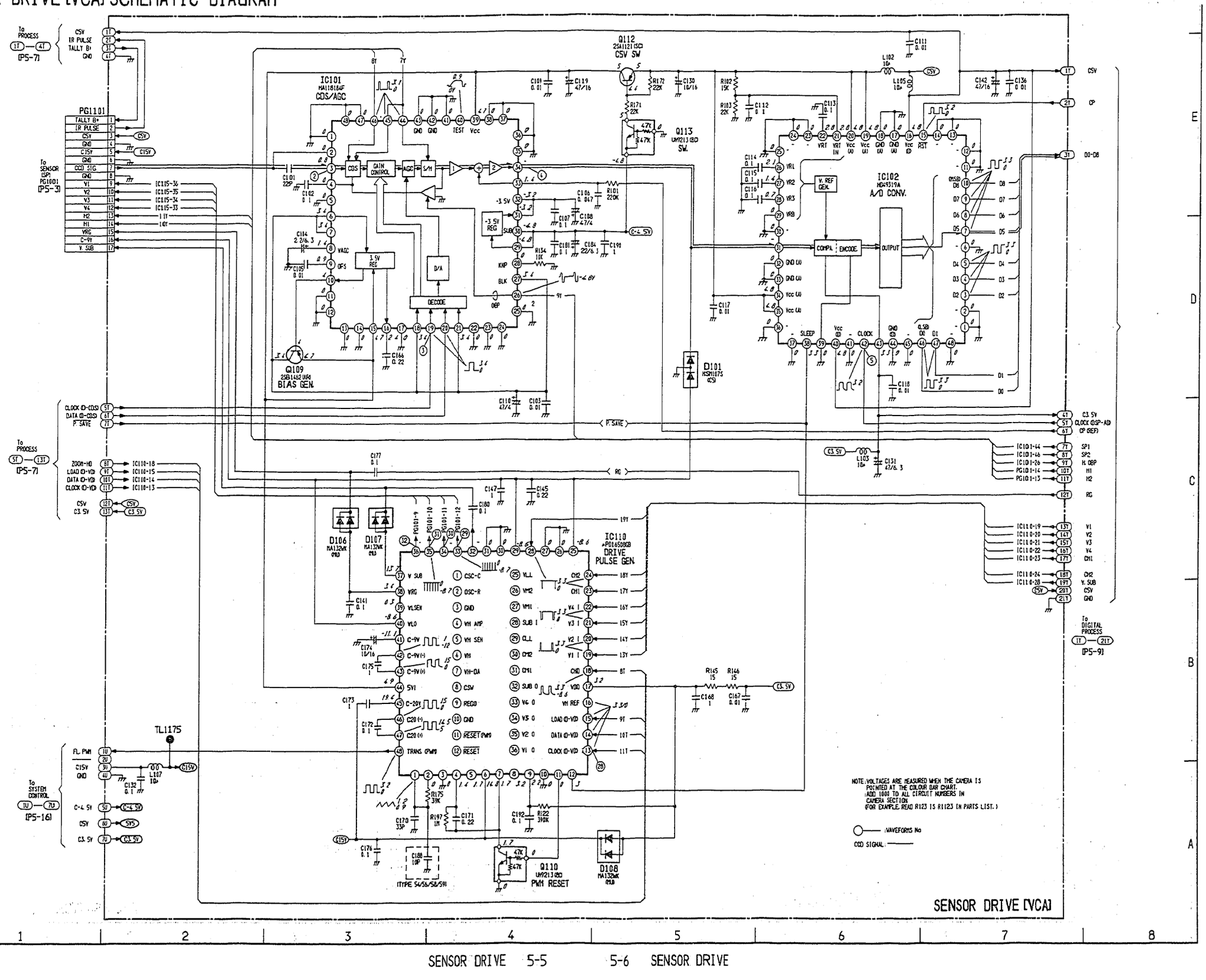
SENSOR [SP] SCHEMATIC DIAGRAM



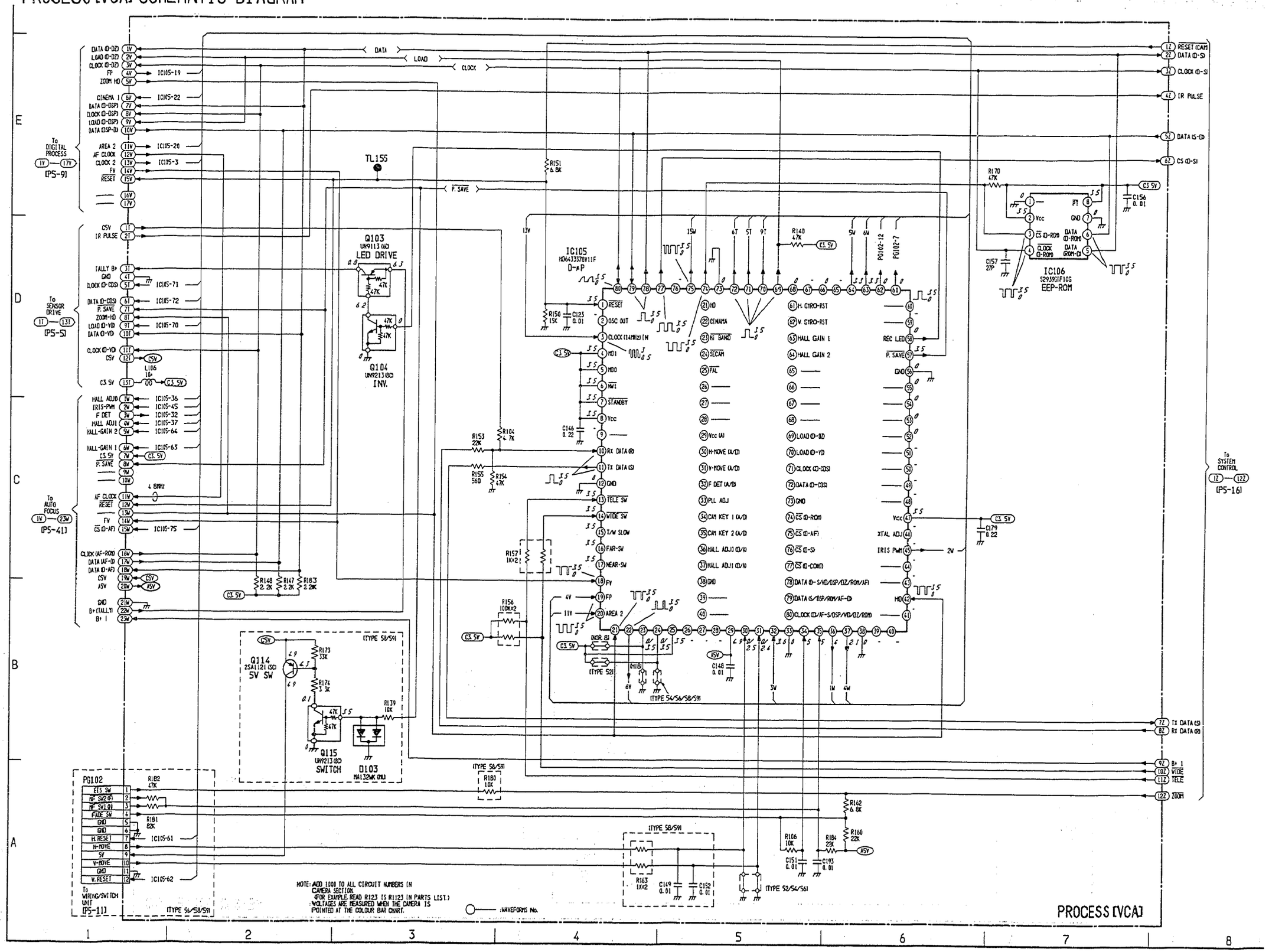
SENSOR/PROCESS WAVEFORMS

1-A IC1001-8 800mVp-p 0.2V/20.0 μ sec.cm COLOR CHRAT	9-A IC1103-16 3.5Vp-p 1V/5.0Msec.cm COLOR CHRAT	17-A IC1103-107 3.8Vp-p 1V/50.0nsec.cm COLOR CHRAT	25-A IC1103-117 3.5Vp-p 1V/20.0 μ sec.cm COLOR CHRAT
2-A IC1101-3 700mVp-p 0.2V/20.0 μ sec.cm COLOR CHRAT	10-A IC1103-19 3.5Vp-p 1V/20.0 μ sec.cm COLOR CHRAT	18-A IC1103-108 3.5Vp-p 1V/20.0 μ sec.cm COLOR CHRAT	26-A IC1103-118 3.5Vp-p 1V/5.0msec.cm COLOR CHRAT
3-A IC1101-19 3.5Vp-p 1V/10.0msec.cm COLOR CHRAT	11-A IC1103-27 2.0Vp-p 0.5V/50.0nsec.cm COLOR CHRAT	19-A IC1103-110 5.2Vp-p 1V/5.0msec.cm COLOR CHRAT	27-A IC1103-119 3.5Vp-p 1V/5.0msec.cm COLOR CHRAT
4-A IC1101-34 1.5Vp-p 0.5V/20.0 μ sec.cm COLOR CHRAT	12-A IC1103-35 2.0Vp-P 0.5V/50.0nsec.cm COLOR CHART [PAL ONLY]	20-A IC1103-111 5.2Vp-p 1V/5.0msec.cm COLOR CHRAT	28-A IC1110-13 3.5Vp-p 1V/10.0msec.cm COLOR CHRAT
5-A IC1102-2 3.5Vp-p 1V/50.0nsec.cm COLOR CHRAT	13-A IC1103-42 600mVp-p 0.2V/20.0 μ sec.cm COLOR CHRAT	21-A IC1103-112 5.5Vp-p 1V/5.0nsec.cm COLOR CHRAT	29-A IC1110-33 9.2Vp-p 2V/20.0 μ sec.cm COLOR CHRAT
6-A IC1103-10 3.5Vp-p 1V/5.0msec.cm COLOR CHRAT	14-A IC1103-46 1.0Vp-p 0.2V/20.0 μ sec.cm COLOR CHRAT	22-A IC1103-114 3.5Vp-p 1V/20.0 μ sec.cm COLOR CHRAT	30-A IC1110-34 9.2Vp-p 2V/20.0 μ sec.cm COLOR CHRAT
7-A IC1103-11 3.5Vp-p 1V/5.0msec.cm COLOR CHRAT	15-A IC1103-90 3.5Vp-p 1V/20.0 μ sec.cm COLOR CHRAT	23-A IC1103-115 3.5Vp-p 1V/20.0 μ sec.cm COLOR CHRAT	31-A IC1110-35 9.0Vp-p 2V/20.0 μ sec.cm COLOR CHRAT
8-A IC1103-13 4.0Vp-p 1V/50.0nsec.cm COLOR CHRAT	16-A IC1103-116 3.8Vp-p 1V/50.0nsec.cm COLOR CHRAT	24-A IC1103-116 3.5Vp-p 1V/20.0 μ sec.cm COLOR CHRAT	32-A IC1110-36 9.0Vp-p 2V/20.0 μ sec.cm COLOR CHRAT

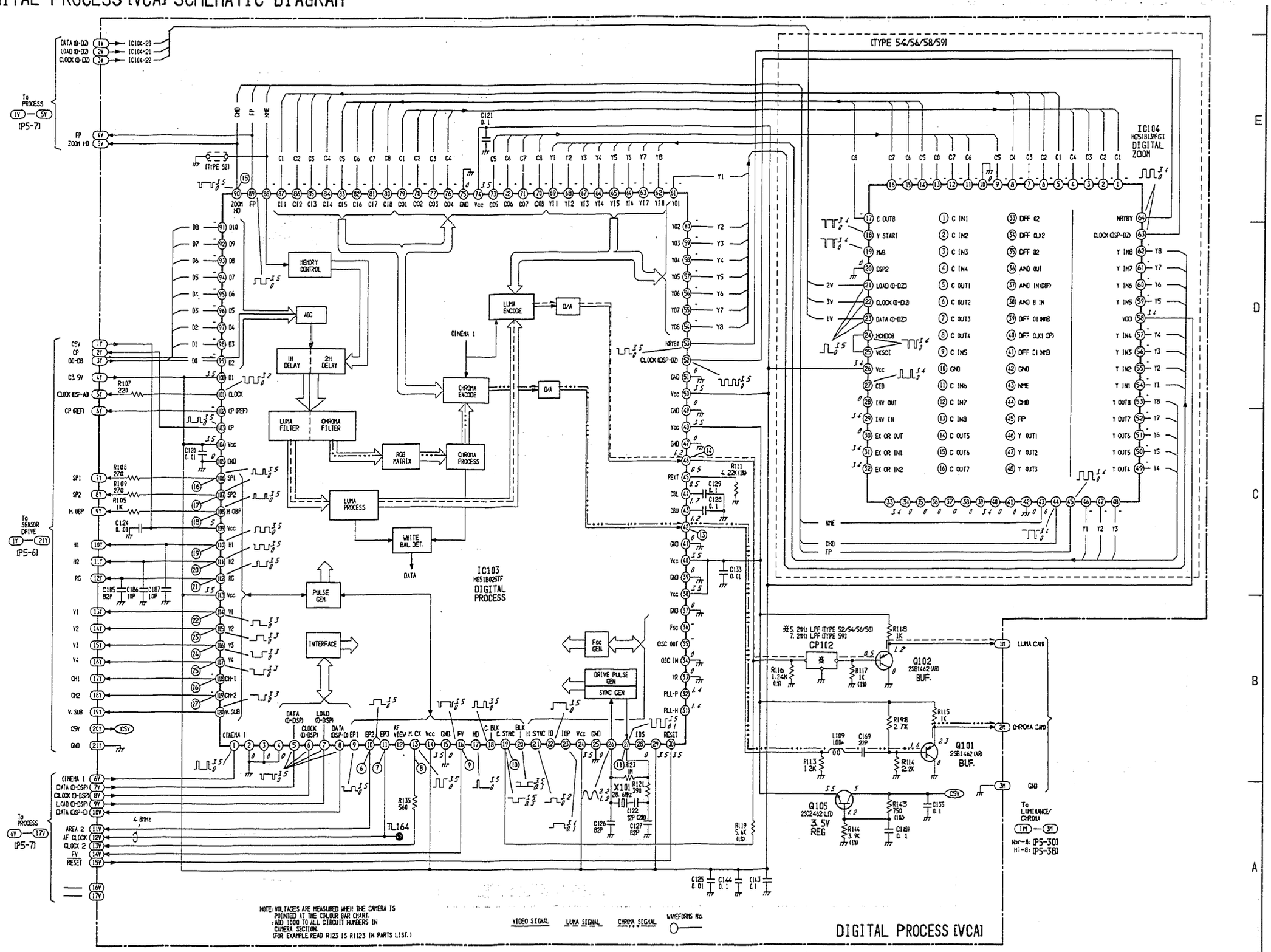
SENSOR DRIVE [VCA] SCHEMATIC DIAGRAM



PROCESS [VCA] SCHEMATIC DIAGRAM



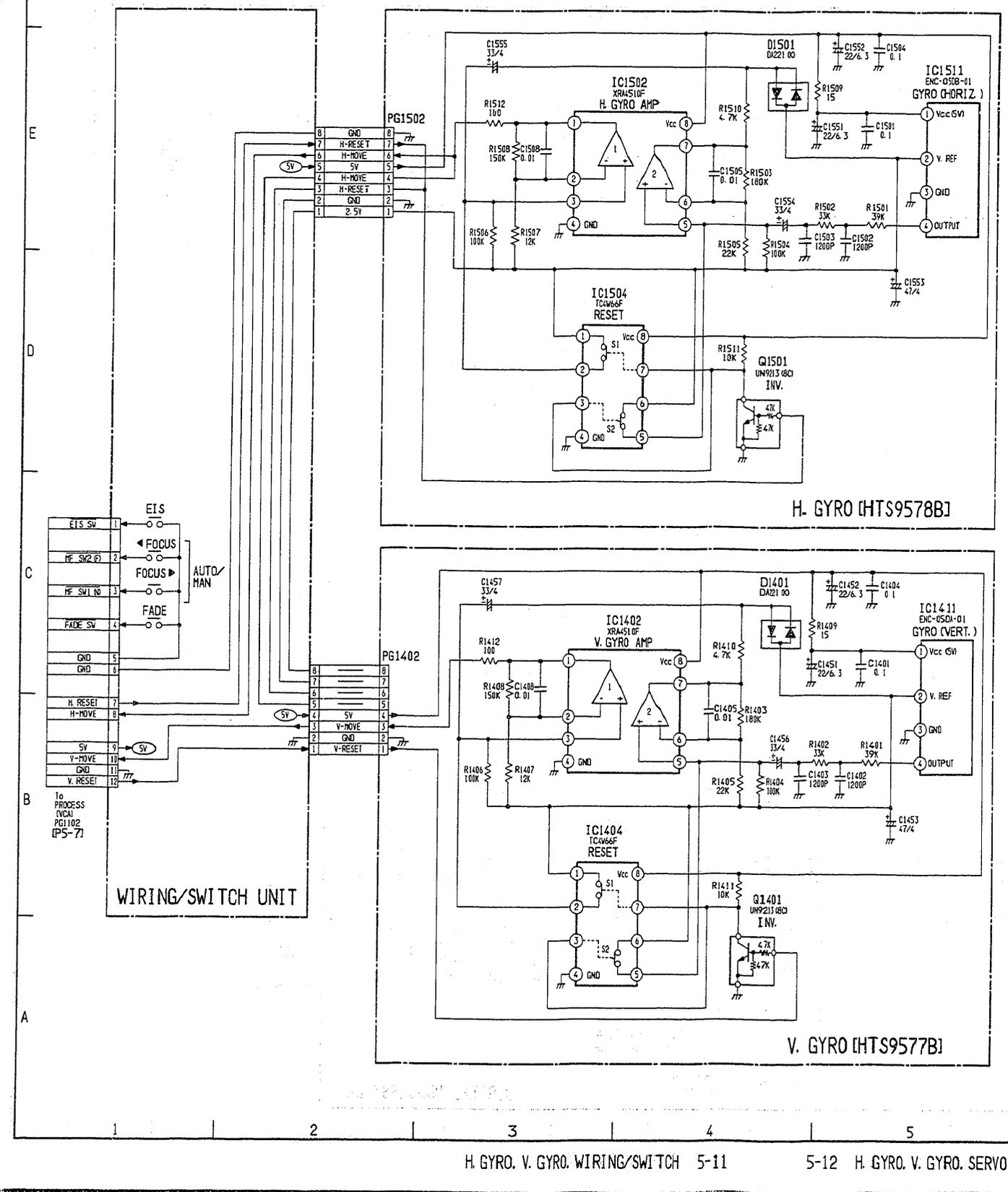
DIGITAL PROCESS [VCA] SCHEMATIC DIAGRAM



NOTE: VOLTAGES ARE MEASURED WHEN THE CAMERA IS POINTED AT THE COLOUR BAR CHART.
: ADD 1000 TO ALL CIRCUIT NUMBERS IN CAMERA SECTION.
(FOR EXAMPLE READ R123 IS R1123 IN PARTS LIST.)

VIDEO SIGNAL — LUMA SIGNAL — CHROMA SIGNAL — WAVEFORMS No.

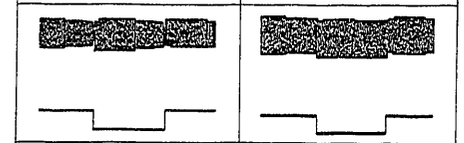
H. GYRO. V. GYRO. WIRING/SWITCH UNIT



SERVO WAVEFORMS

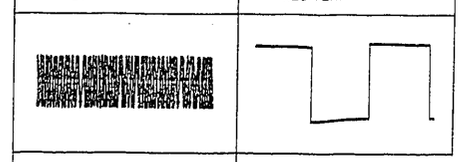
1-B IC601-2 350mVp-p
0.2V/5.0msec.cm
PLAY

8-B PG601-5 400mVp-p
0.2V/5.0msec.cm
PLAY

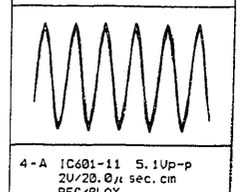


2-A IC601-5 2.7Vp-p
1V/20.0μsec.cm
REC

9-A PG601-7 4.2Vp-p
1V/5.0msec.cm
REC/PLAY

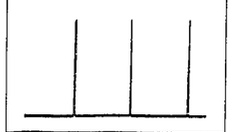


3-A IC601-8 750mVp-p
0.2V/50.0nsec.cm
REC/PLAY

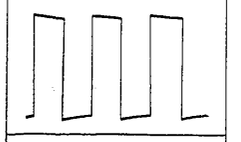


4-A IC601-11 5.1Vp-p
2V/20.0μsec.cm
REC/PLAY

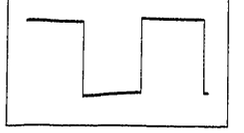
5-A IC602-17 5.0Vp-p
1V/10.0msec.cm
REC/PLAY



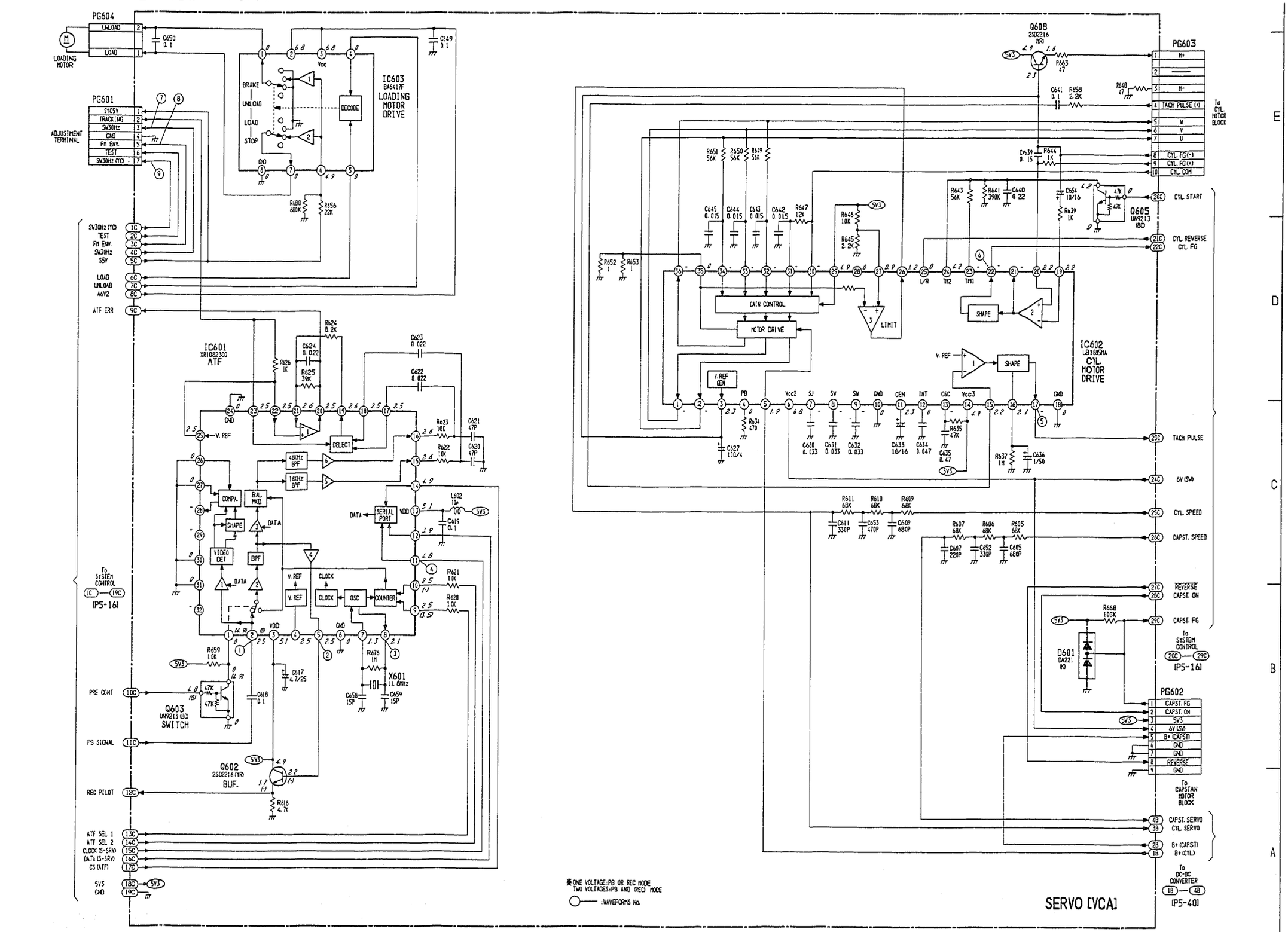
6-A IC602-22 5.0Vp-p
1V/1.0msec.cm
REC/PLAY



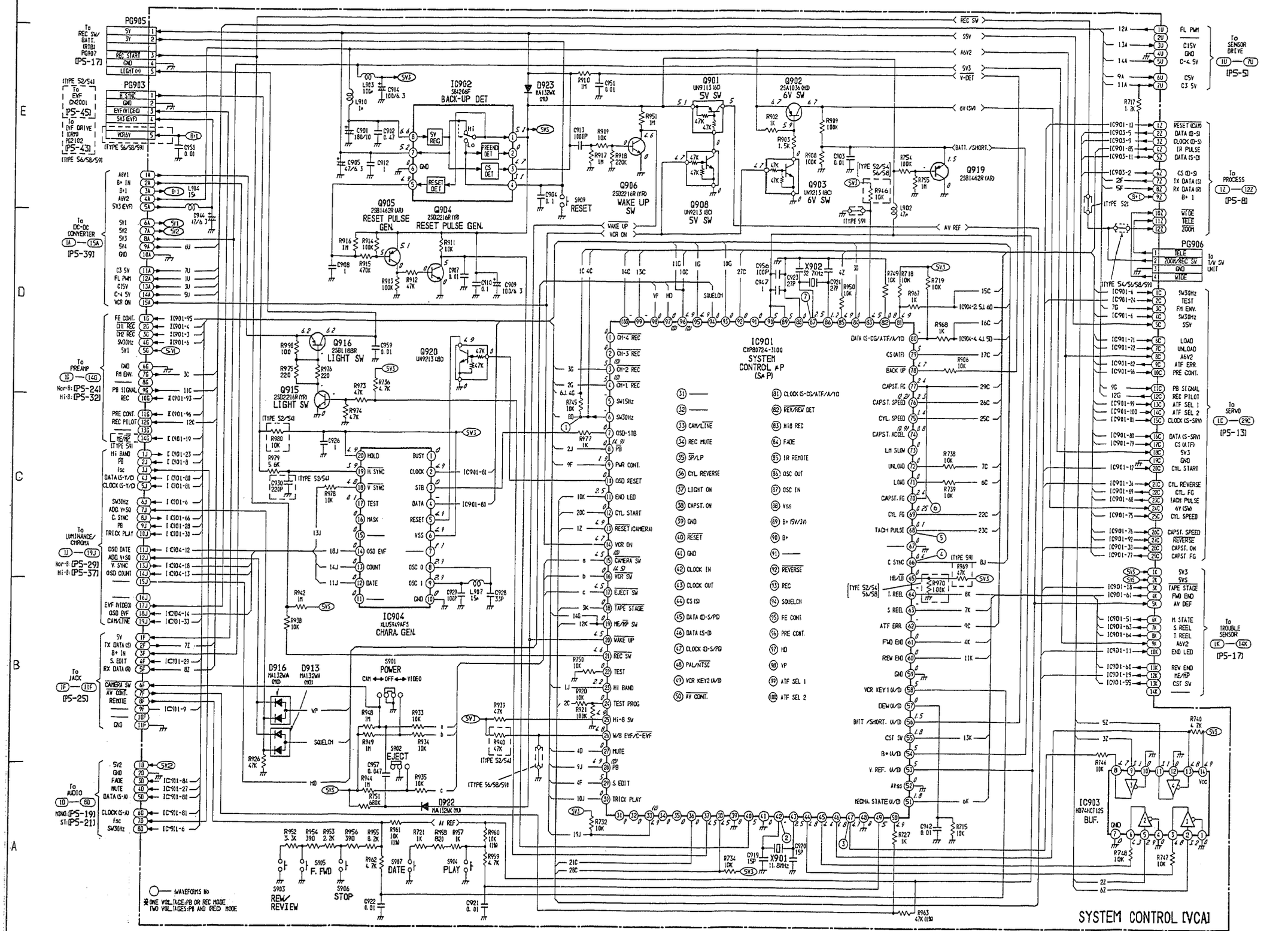
7-A PG601-3 5.1Vp-p
1V/5.0msec.cm
REC/PLAY



SERVO [VCA] SCHEMATIC DIAGRAM

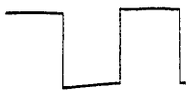


SYSTEM CONTROL [VCA] SCHEMATIC DIAGRAM

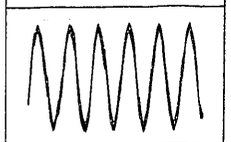


SYSTEM CONTROL WAVEFORMS

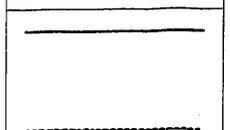
1-A IC901-6 4.2Vp-p
1V/5.0msec.cm
REC/PLAY



2-A IC901-42 4.7Vp-p
1V/50.0nsec.cm
REC/PLAY



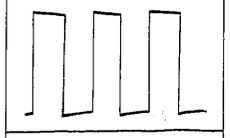
3-A IC901-47 5.0Vp-p
1V/20.0μ sec.cm
REC/PLAY



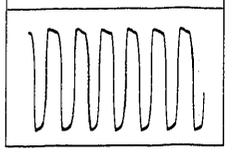
4-A IC901-66 5.0Vp-p
1V/20.0μ sec.cm
REC/PLAY

5-A IC901-68 5.0Vp-p
1V/10.0msec.cm
REC/PLAY

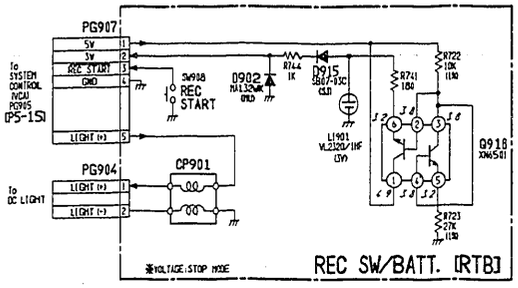
6-A IC901-70 5.0Vp-p
1V/200μ sec.cm
REC/PLAY



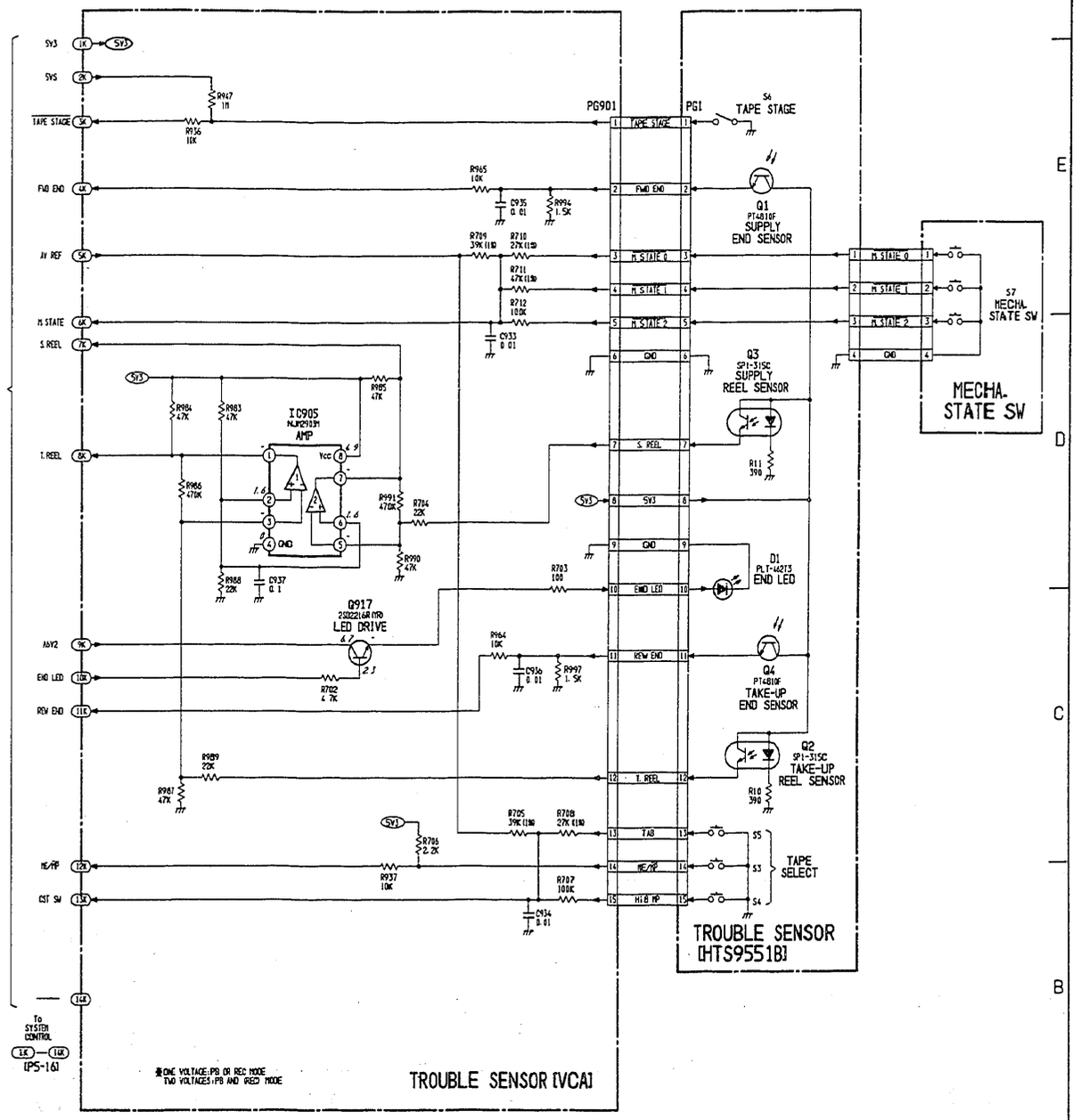
7-A IC901-87 5.3Vp-p
1V/20.0μ sec.cm
REC/PLAY



REC SW/BATT. [RTB] SCHEMATIC DIAGRAM

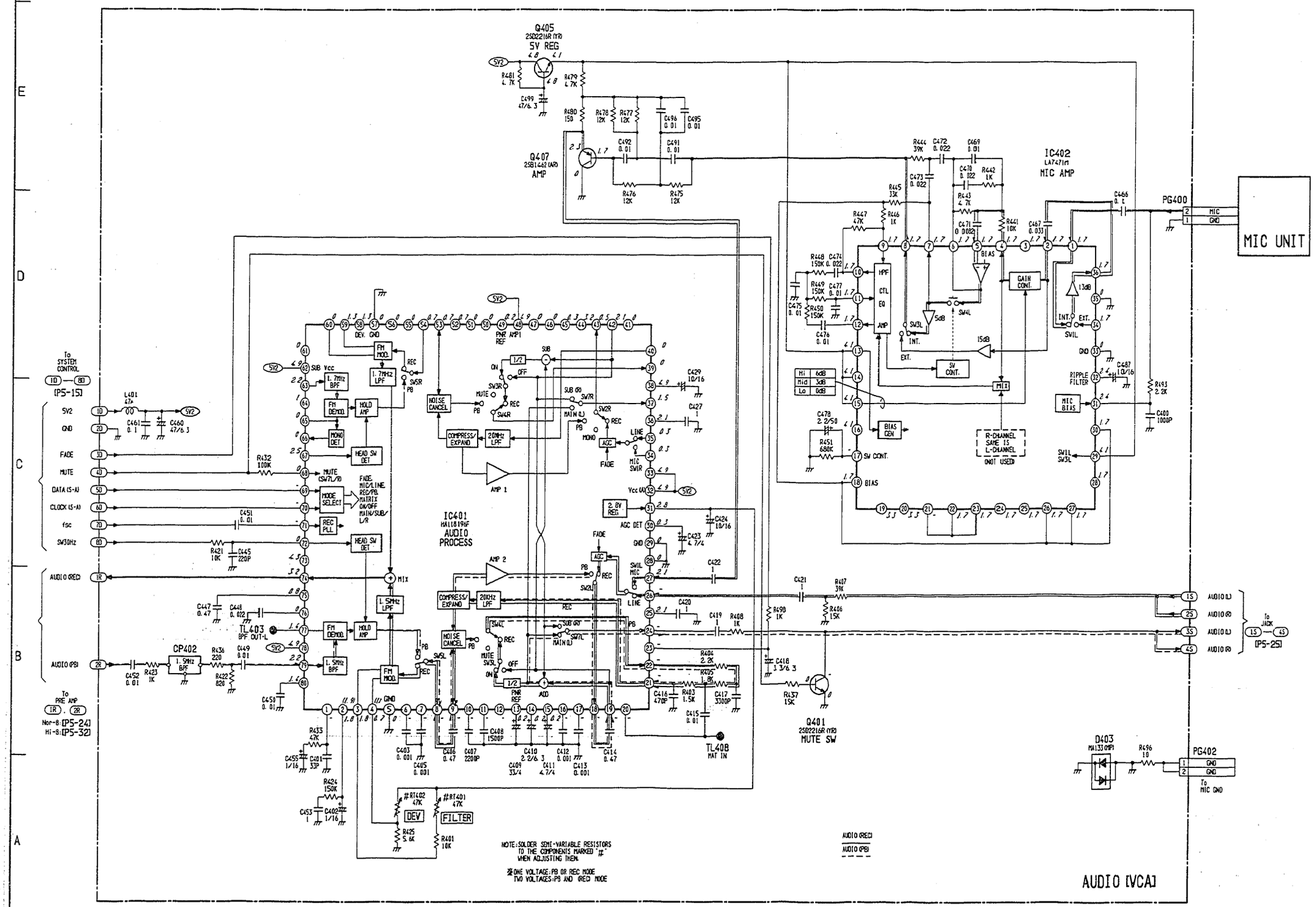


TROUBLE SENSOR [VCA] SCHEMATIC DIAGRAM

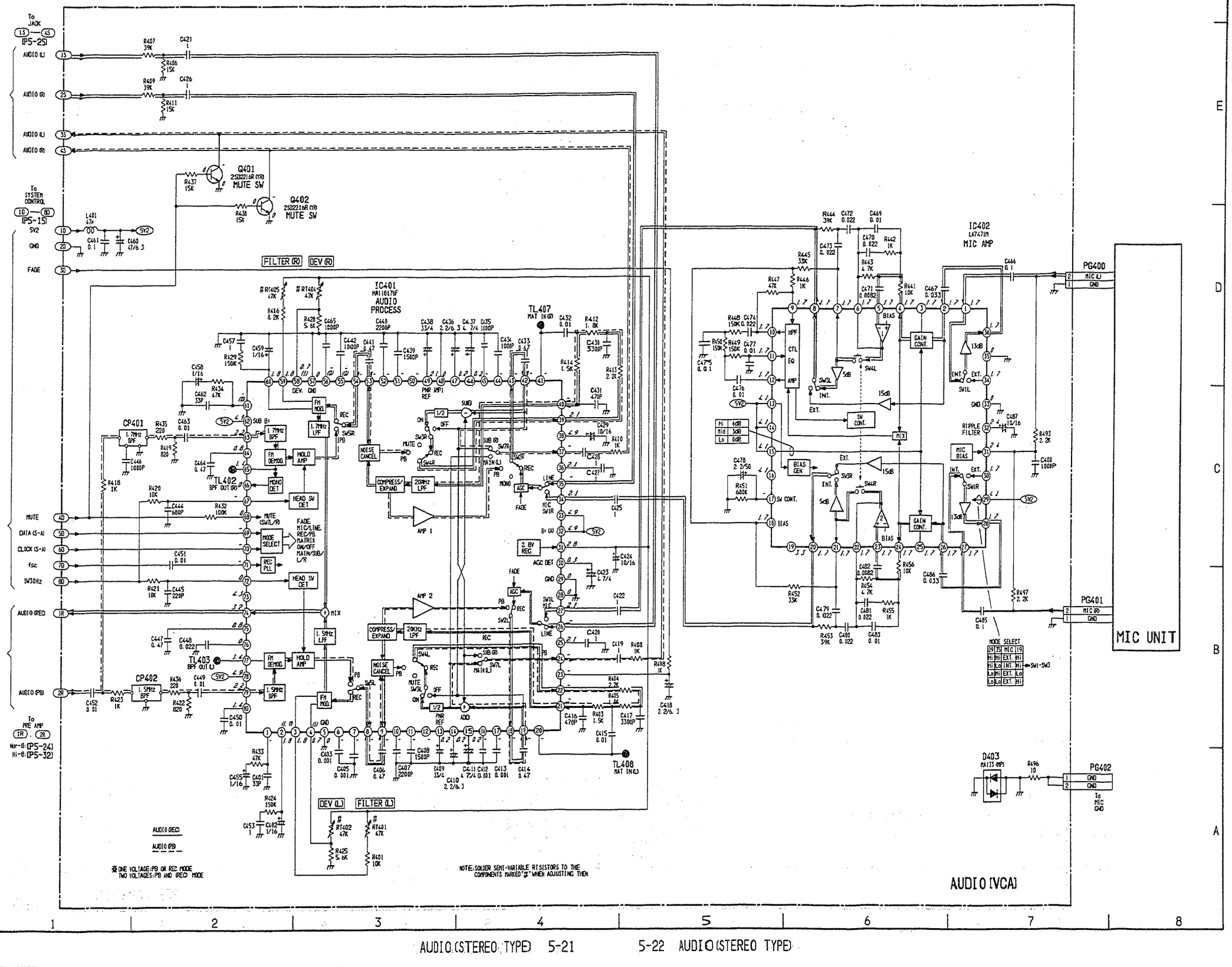


SYSTEM CONTROL WAVEFORMS. REC SW/BATT. 5-17 5-18 TROUBLE SENSOR

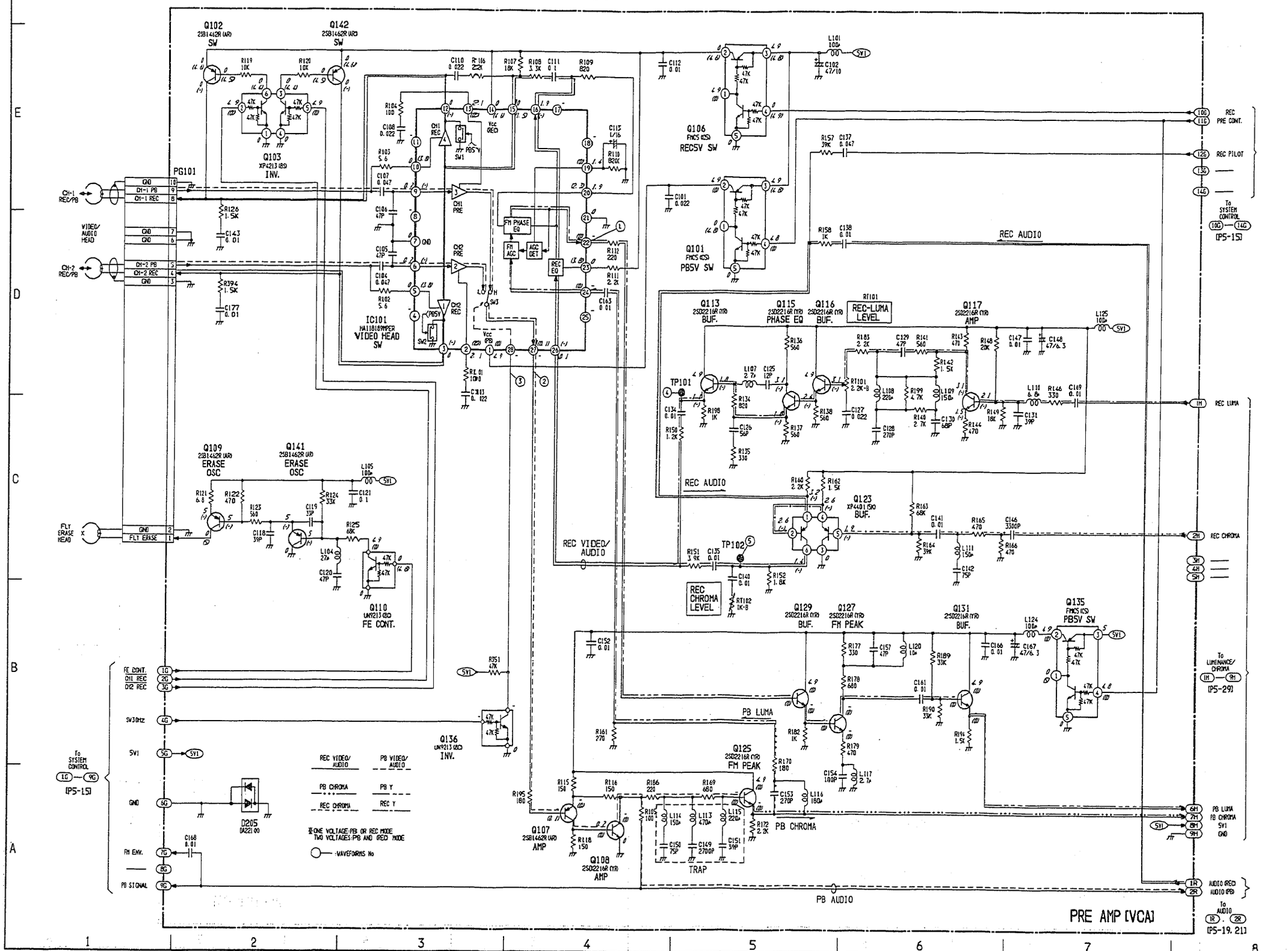
AUDIO [VCA] SCHEMATIC DIAGRAM (MONAURAL TYPE) -TYPE 52, 54, 58-



AUDIO (VCA) SCHEMATIC DIAGRAM (STEREO TYPE) -TYPE 56, 59-

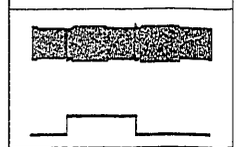


PRE AMP [VCA] SCHEMATIC DIAGRAM (Nor-8 TYPE) -TYPE 52. 54. 56. 58-

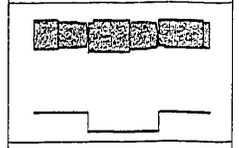


PRE AMP WAVEFORMS

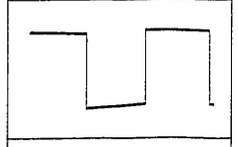
1-B IC101-22 350mVp-p
0.2V/5.0msec.cm
PLAY



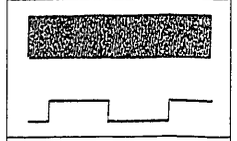
2-B IC101-27 200mVp-p
0.1V/5.0msec.cm
PLAY



3-A IC101-28 2.2Vp-p
0.5V/5.0msec.cm
REC/PLAY

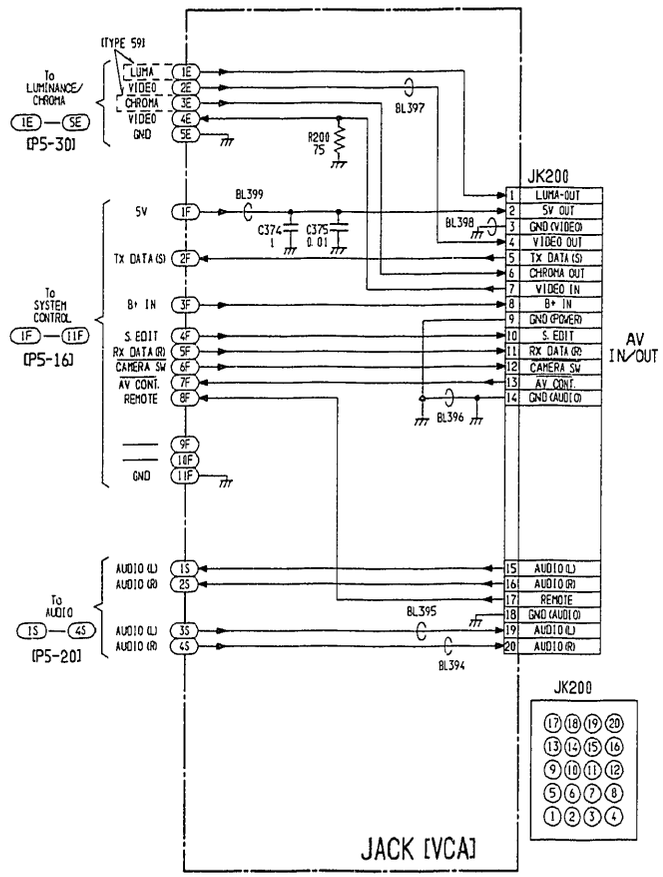


4-A TP101 210mVp-p
0.1V/5.0msec.cm
REC



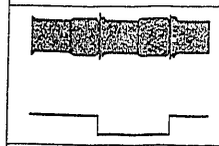
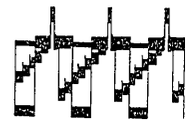
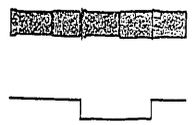
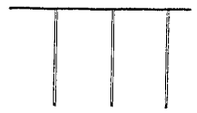
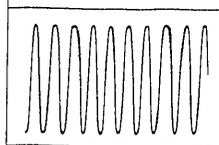
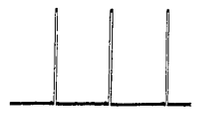
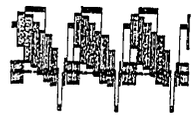
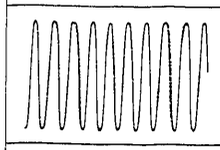
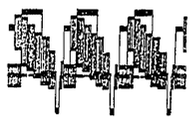
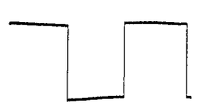
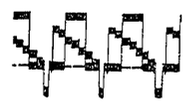
5-A TP102 140mVp-p
50mV/20.0μsec.cm
REC

JACK [VCA] SCHEMATIC DIAGRAM

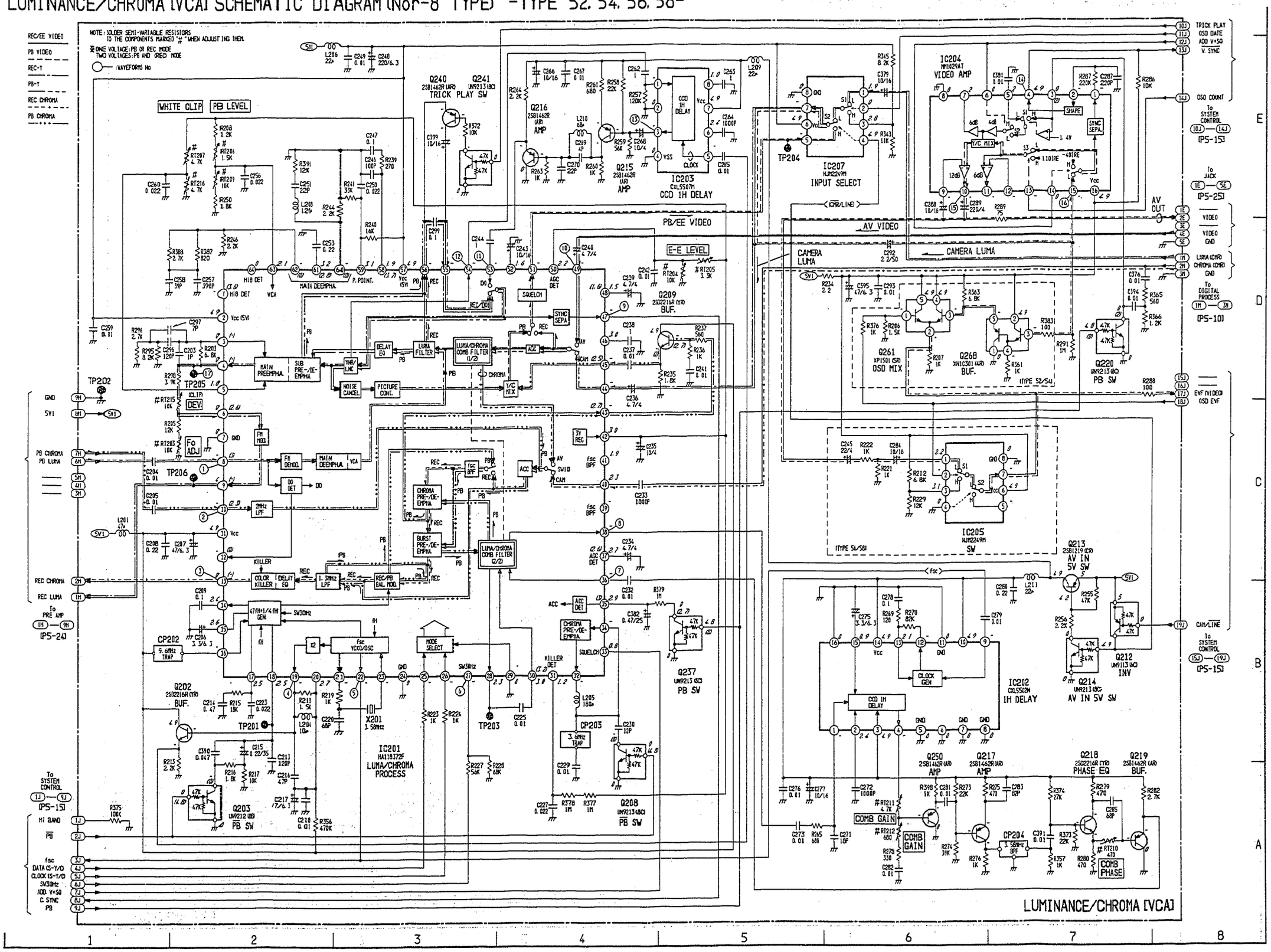


MEMO

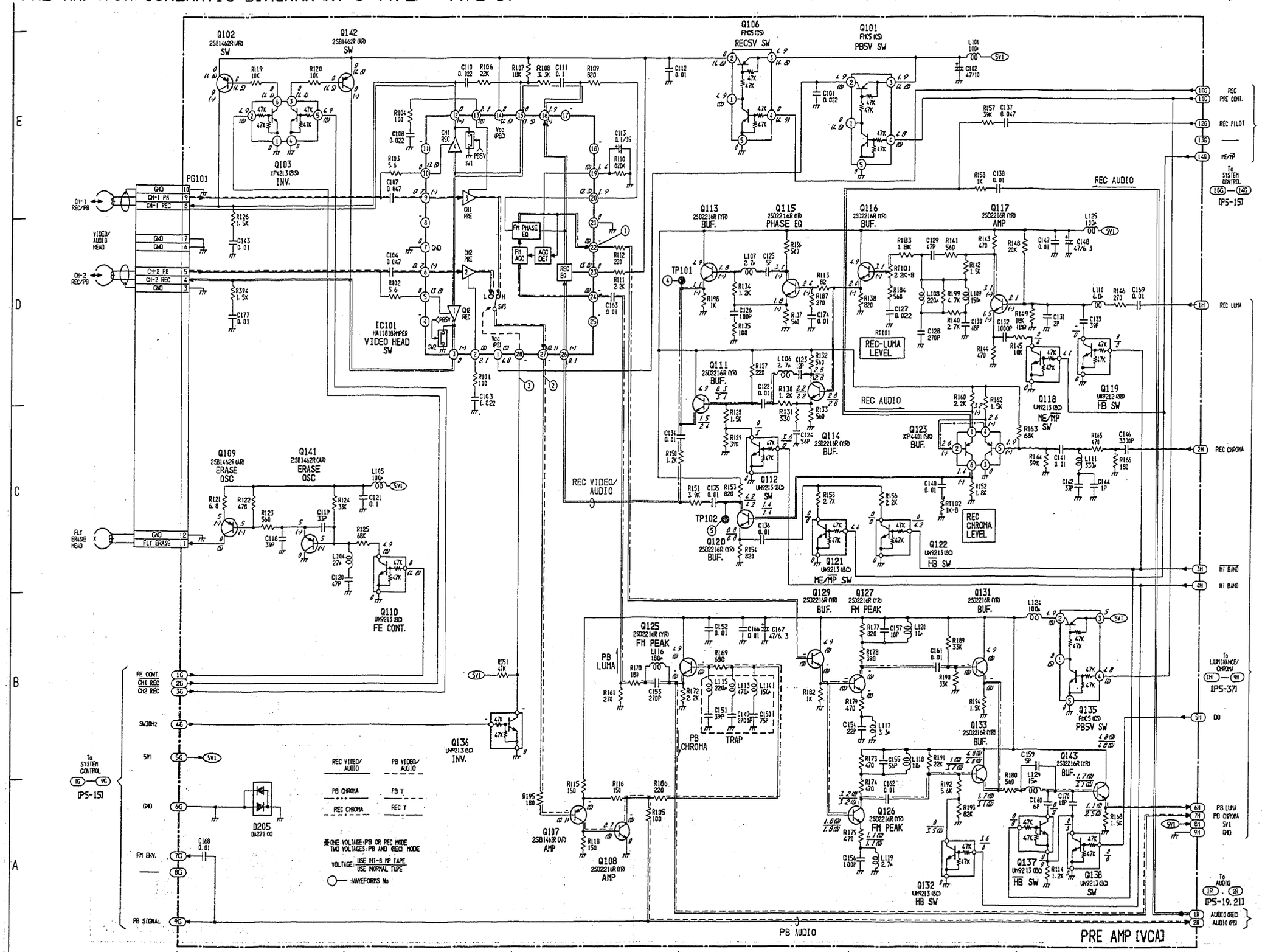
LUMINANCE/CHROMA WAVEFORMS

1-B IC201-8 400mVp-p 0.2V/5.0msec.cm PLAY	7-B IC201-36 180mVp-p 50mV/20.0μsec.cm PLAY	13-A IC203-3 550mVp-p 0.1V/20.0μsec.cm REC/PLAY
		
2-B IC201-10 300mVp-p 0.2V/5.0msec.cm PLAY	8-A IC201-38 160mVp-p 50mV/20.0μsec.cm REC	14-A IC204-4 5.0Vp-p 1V/5.0msec.cm REC/PLAY
		
3-A IC201-13 300mVp-p 0.1V/20.0μsec.cm REC	8-B IC201-38 300mVp-p 0.1V/20.0μsec.cm PLAY	15-A IC204-10 1.9Vp-p 0.5V/20.0μsec.cm REC/PLAY
		
4-A IC201-19 330mVp-p 0.1V/100nsec.cm REC/PLAY	9-A IC201-47 5.0Vp-p 1V/20.0μsec.cm REC/PLAY	16-A IC204-15 970mVp-p 0.2V/20.0μsec.cm REC/PLAY
		
5-A IC201-22 420mVp-p 0.1V/200nsec.cm REC/PLAY	10-A IC201-49 1Vp-p 0.2V/20.0μsec.cm REC	17-A TP205 310mVp-p 0.1V/20.0μsec.cm REC
		
6-A IC201-27 2.0Vp-p 0.5V/5.0msec.cm REC/PLAY	11-A IC201-53 300mVp-p 0.1V/20.0μsec.cm REC/PLAY	
		
7-A IC201-36 100mVp-p 50mV/20.0μsec.cm REC	12-A IC201-54 550mVp-p 0.1V/20.0μsec.cm REC/PLAY	
		

LUMINANCE/CHROMA [VCA] SCHEMATIC DIAGRAM (Nor-8 TYPE) -TYPE 52, 54, 56, 58-

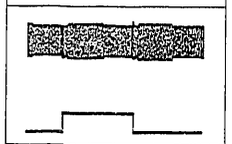


PRE AMP [VCA] SCHEMATIC DIAGRAM (Hi-8 TYPE) -TYPE 59-

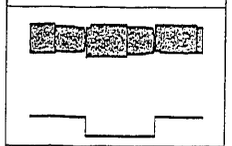


PRE AMP WAVEFORMS

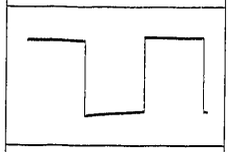
1-B IC101-22 350mVp-p
0.2V/5.0msec.cm
PLAY



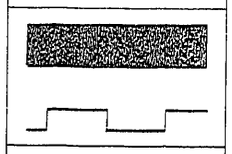
2-B IC101-27 200mVp-p
0.1V/5.0msec.cm
PLAY



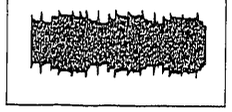
3-A IC101-28 2.2Vp-p
0.5V/5.0msec.cm
REC/PLAY



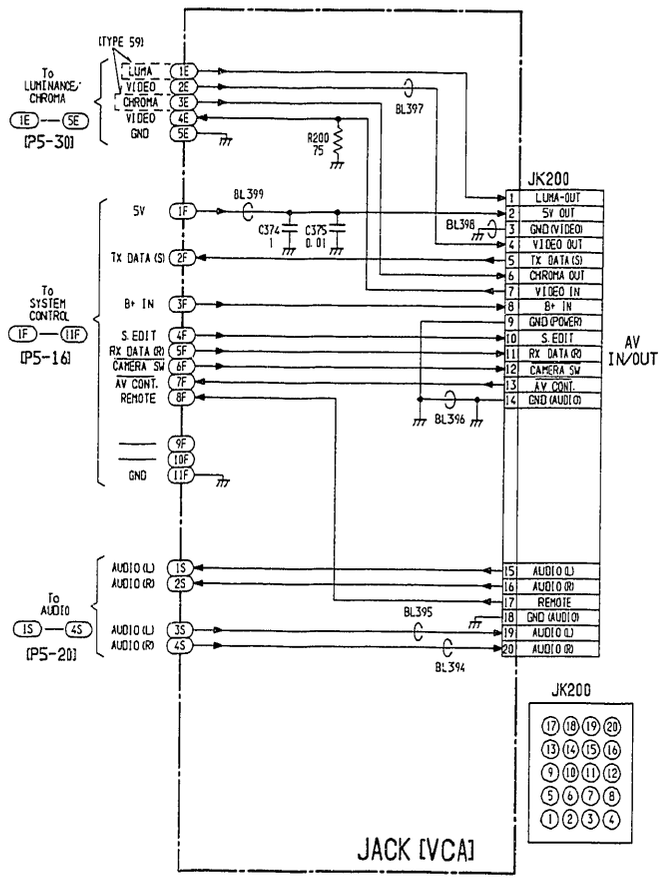
4-A TP101 210mVp-p
0.1V/5.0msec.cm
REC



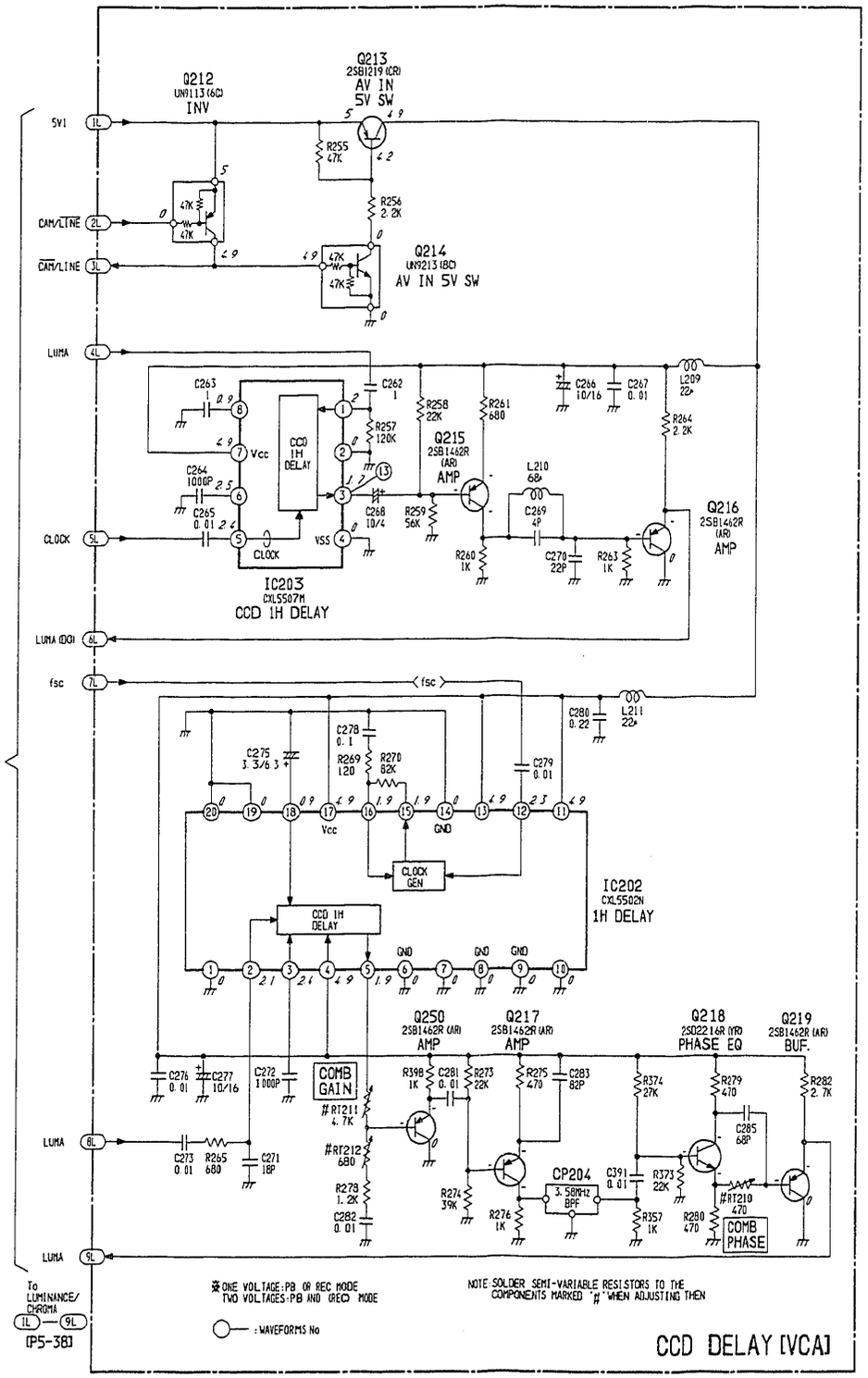
5-A TP102 140mVp-p
50mV/20.0μ sec.cm
REC



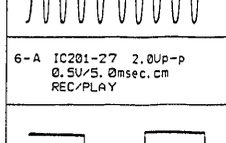
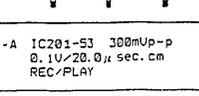
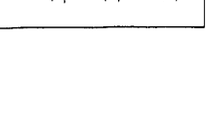
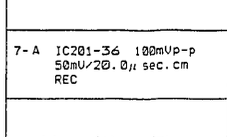
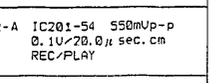
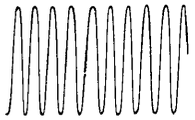
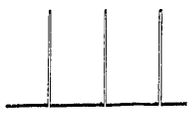
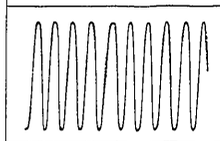
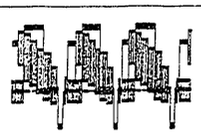
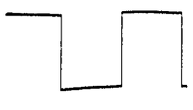
JACK [VCA] SCHEMATIC DIAGRAM



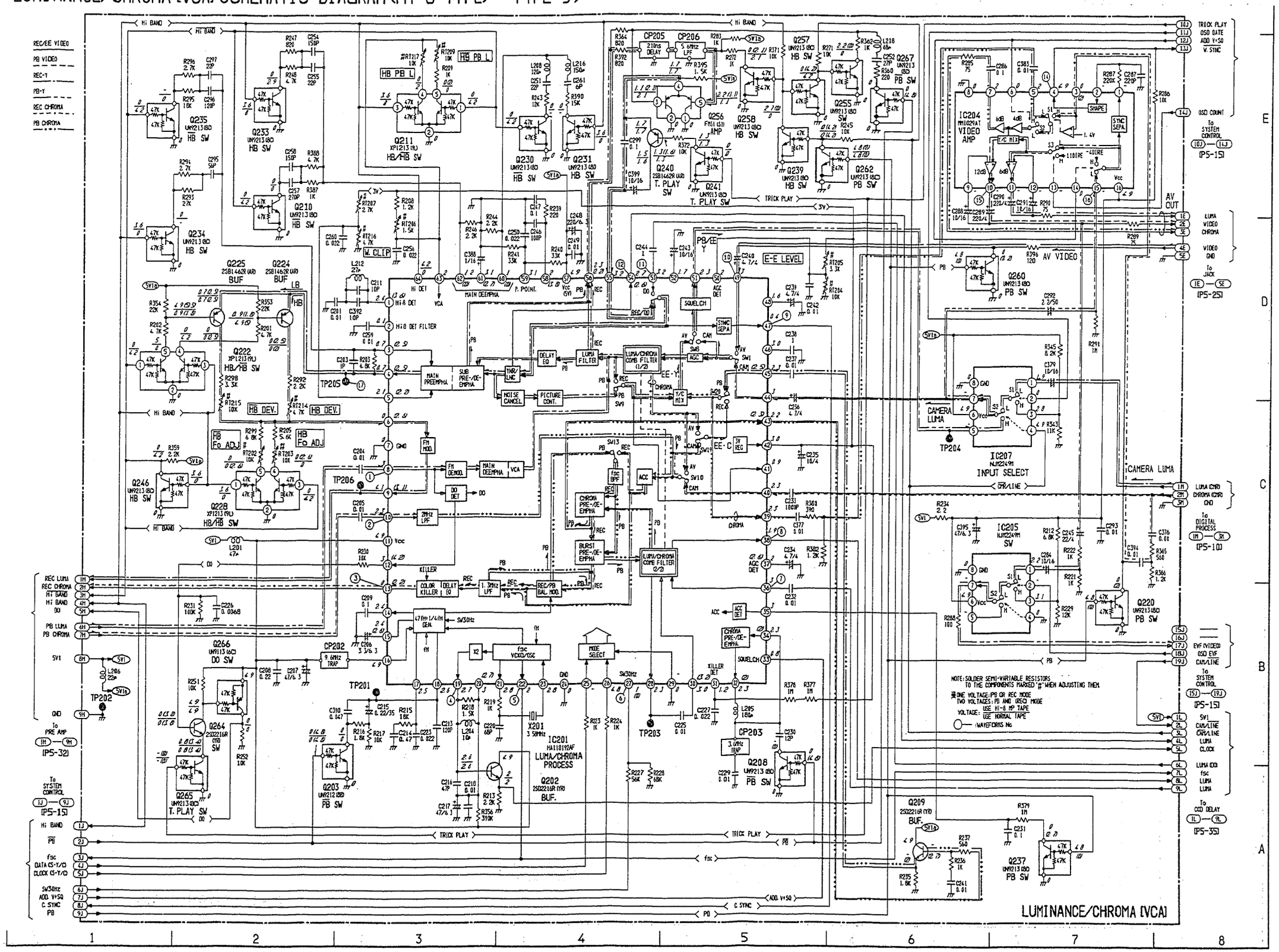
CCD DELAY [VCA] SCHEMATIC DIAGRAM (Hi-8 TYPE)



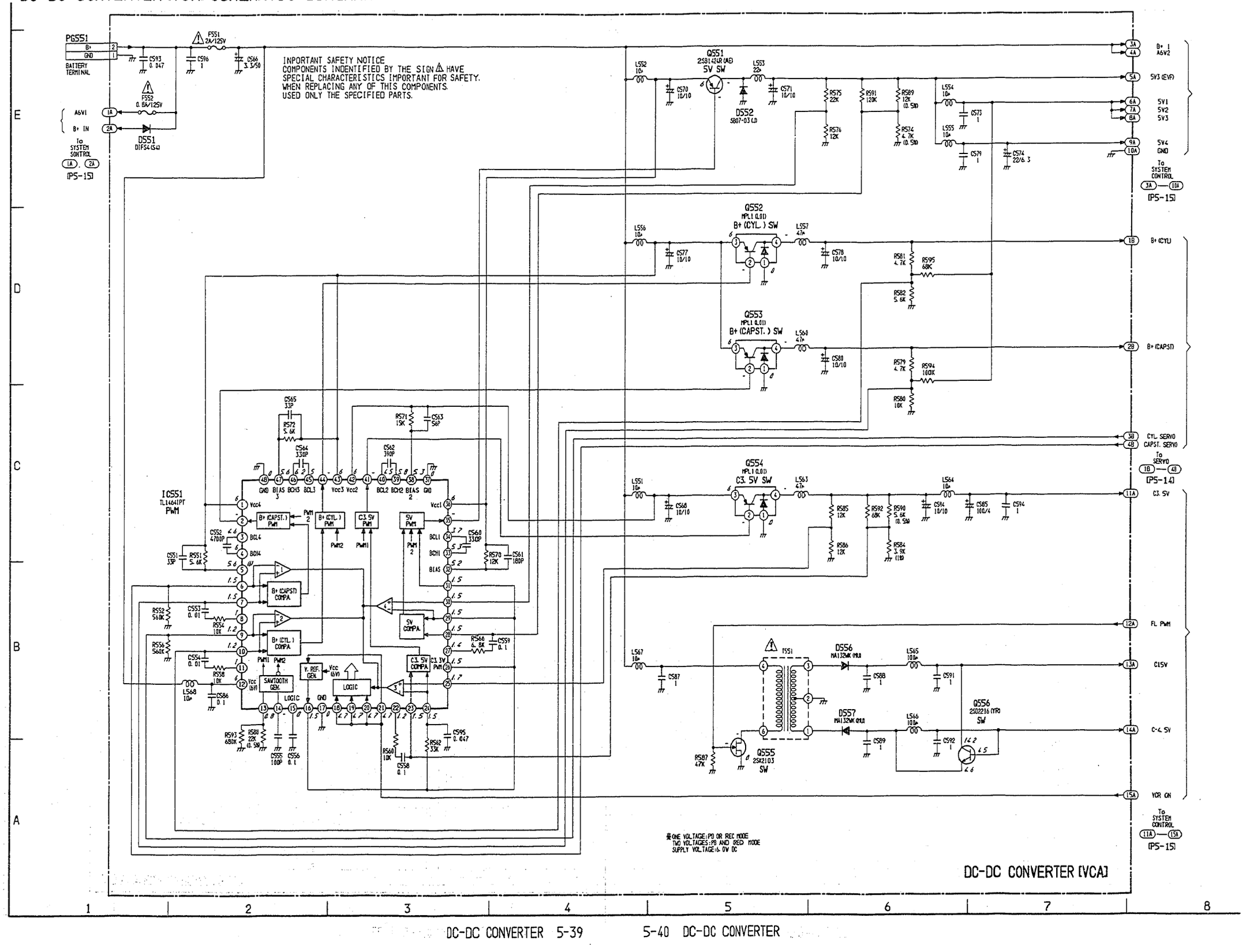
LUMINANCE/CHROMA WAVEFORMS

1-B IC201-8 400mVp-p 0.2V/5.0msec.cm PLAY	7-B IC201-36 180mVp-p 50mV/20.0μ sec.cm PLAY	13-A IC203-3 550mVp-p 0.1V/20.0μ sec.cm REC/PLAY
		
2-B IC201-10 300mVp-p 0.2V/5.0msec.cm PLAY	8-A IC201-38 160mVp-p 50mV/20.0μ sec.cm REC	14-A IC204-4 5.0Vp-p 1V/5.0msec.cm REC/PLAY
		
3-A IC201-13 300mVp-p 0.1V/20.0μ sec.cm REC	8-B IC201-38 300mVp-p 0.1V/20.0μ sec.cm PLAY	15-A IC204-10 1.9Vp-p 0.5V/20.0μ sec.cm REC/PLAY
4-A IC201-19 330mVp-p 0.1V/100nsec.cm REC/PLAY	9-A IC201-47 5.0Vp-p 1V/20.0μ sec.cm REC/PLAY	16-A IC204-15 970mVp-p 0.2V/20.0μ sec.cm REC/PLAY
		
5-A IC201-22 420mVp-p 0.1V/200nsec.cm REC/PLAY	10-A IC201-49 1Vp-p 0.2V/20.0μ sec.cm REC	17-A TP205 310mVp-p 0.1V/20.0μ sec.cm REC
		
6-A IC201-27 2.0Vp-p 0.5V/5.0msec.cm REC/PLAY	11-A IC201-53 300mVp-p 0.1V/20.0μ sec.cm REC/PLAY	
		
7-A IC201-36 100mVp-p 50mV/20.0μ sec.cm REC	12-A IC201-54 550mVp-p 0.1V/20.0μ sec.cm REC/PLAY	
		

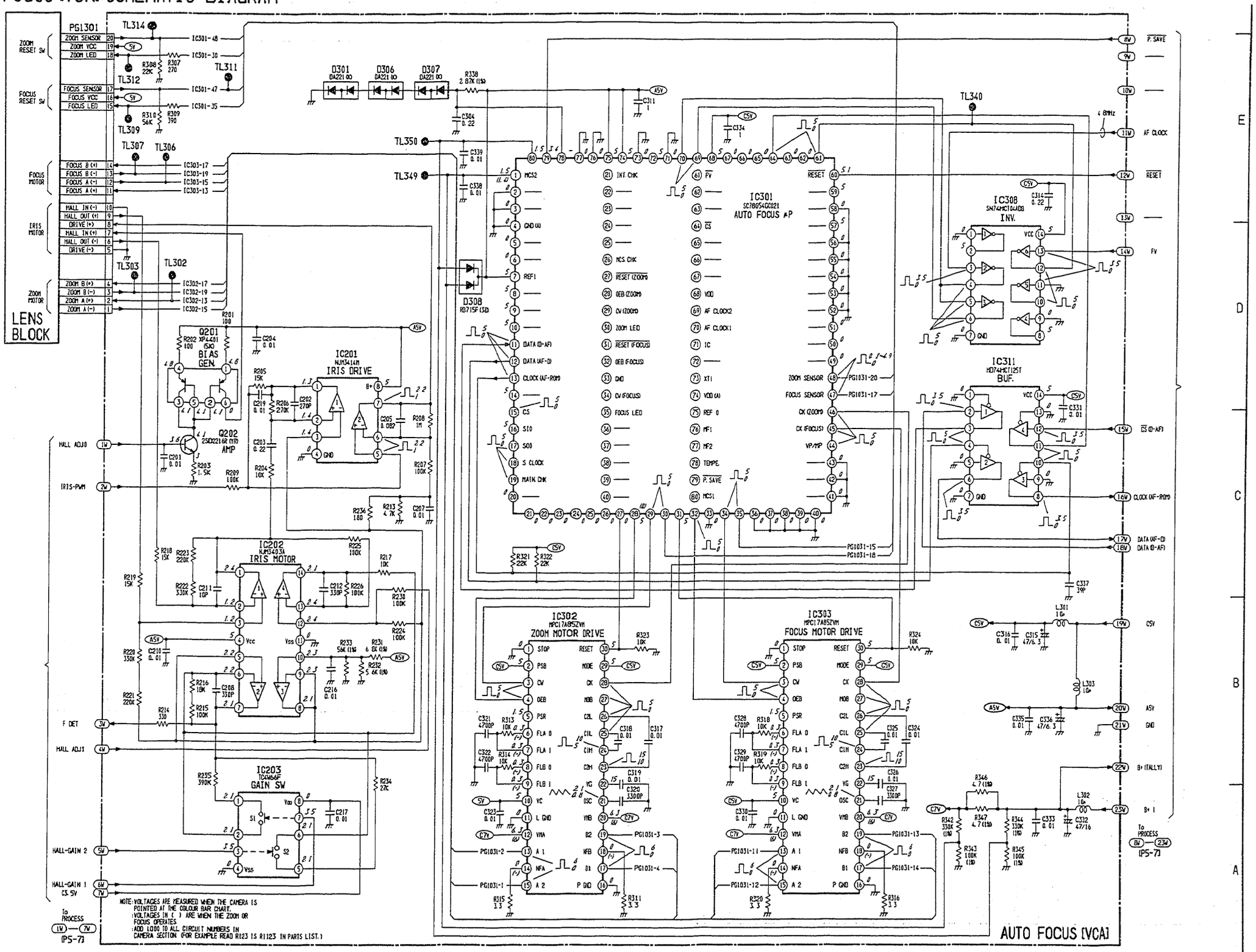
LUMINANCE/CHROMA (VCA) SCHEMATIC DIAGRAM (Hi-8 TYPE) -TYPE 59-



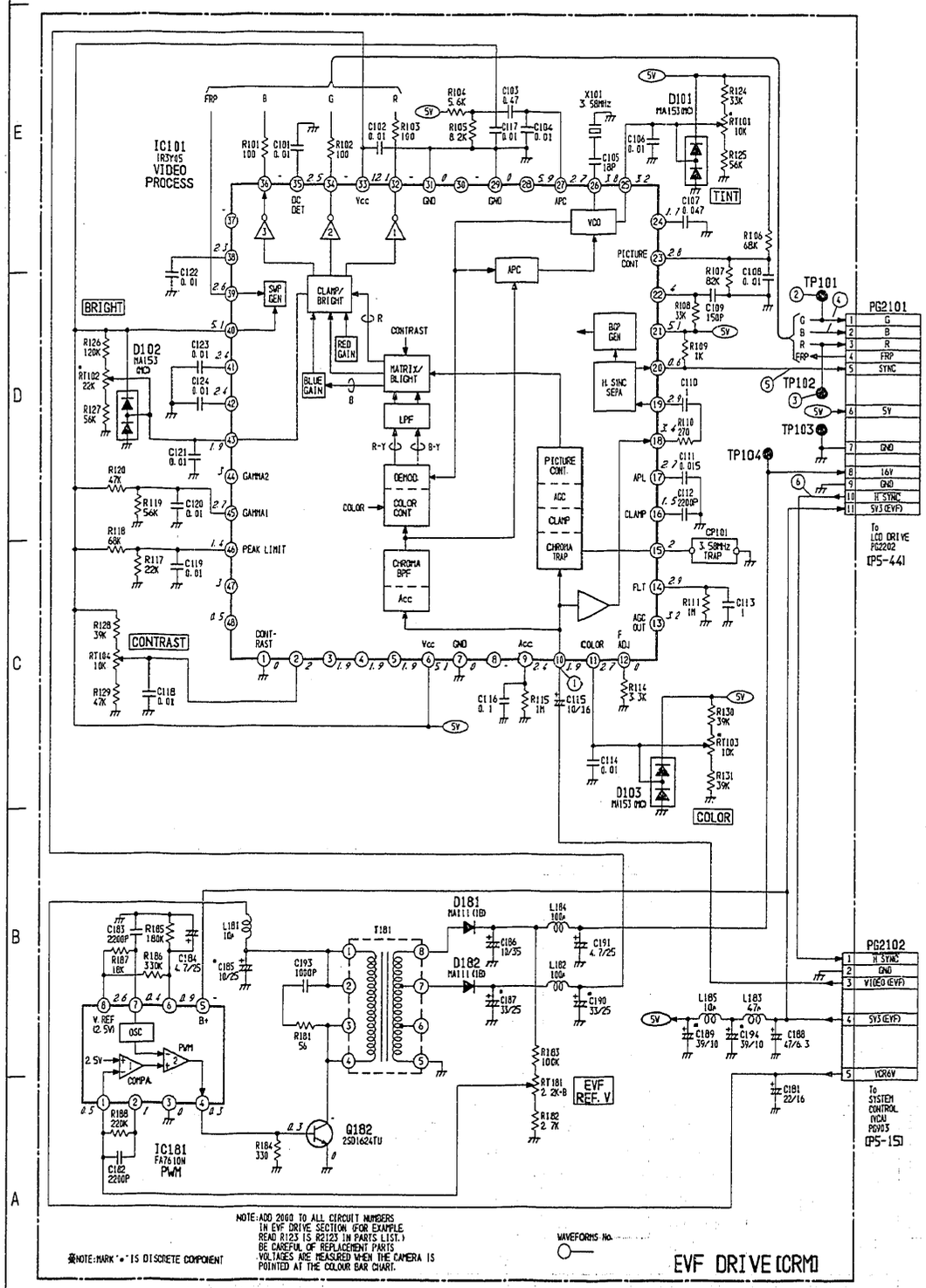
DC-DC CONVERTER [VCA] SCHEMATIC DIAGRAM



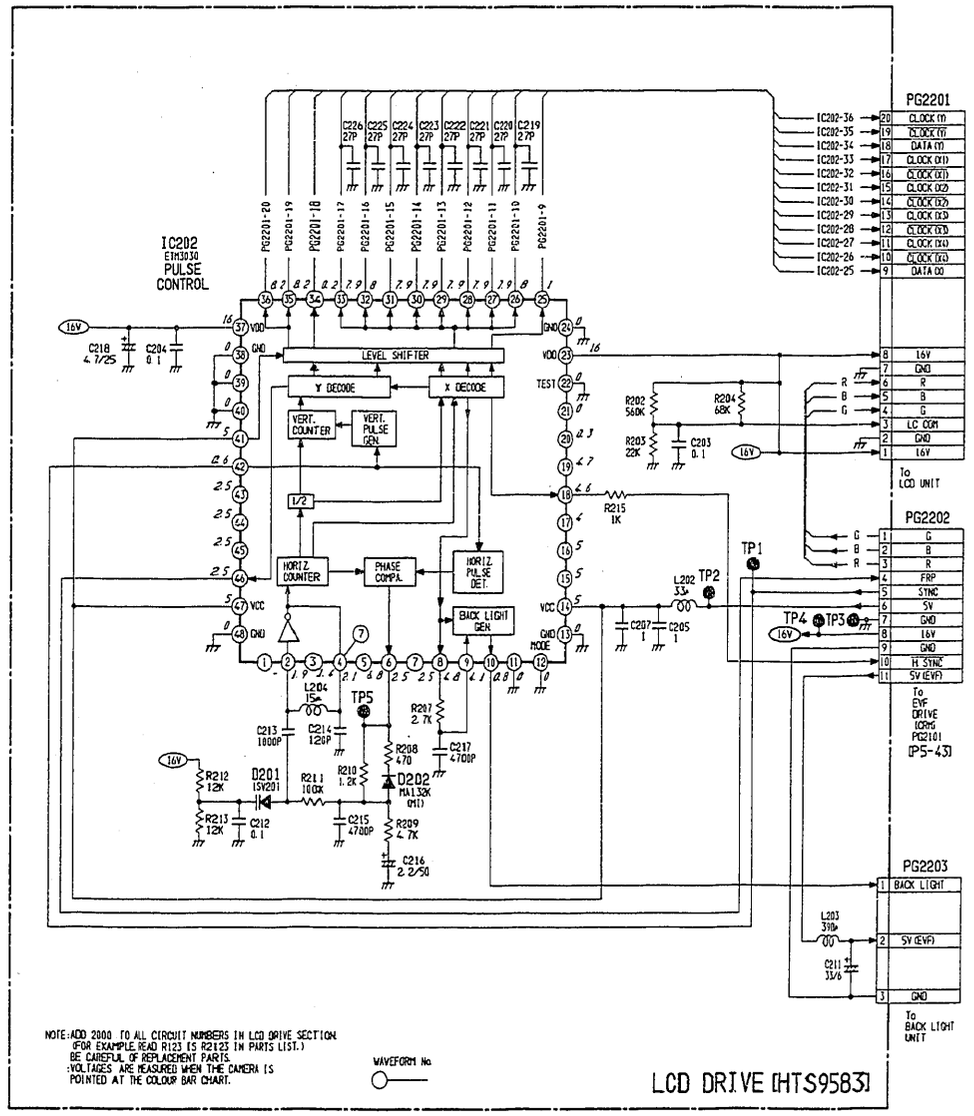
AUTO FOCUS [VCA] SCHEMATIC DIAGRAM



EVF DRIVE [CRM] SCHEMATIC DIAGRAM (C-EVF TYPE)
-TYPE 56. 58. 59-



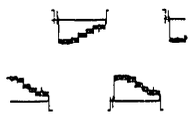
LCD DRIVE [HTS9583] SCHEMATIC DIAGRAM (C-EVF TYPE)
-TYPE 56. 58. 59-



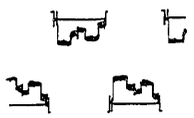
EVF DRIVE/LCD DRIVE WAVEFORMS

1-A IC2101-10 1.3Vp-p
0.5V/20.0μ sec.cm
COLOR CHART

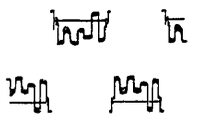
2-A TP2101 11Vp-p
2V/20.0μ sec.cm
COLOR CHART



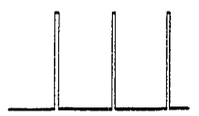
3-A TP2102 11Vp-p
2V/20.0μ sec.cm
COLOR CHART



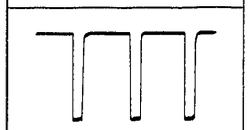
4-A PG2101-2 11Vp-p
2V/20.0μ sec.cm
COLOR CHART



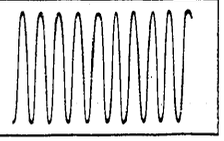
5-A PG2101-5 5.3Vp-p
1V/20.0μ sec.cm
COLOR CHART



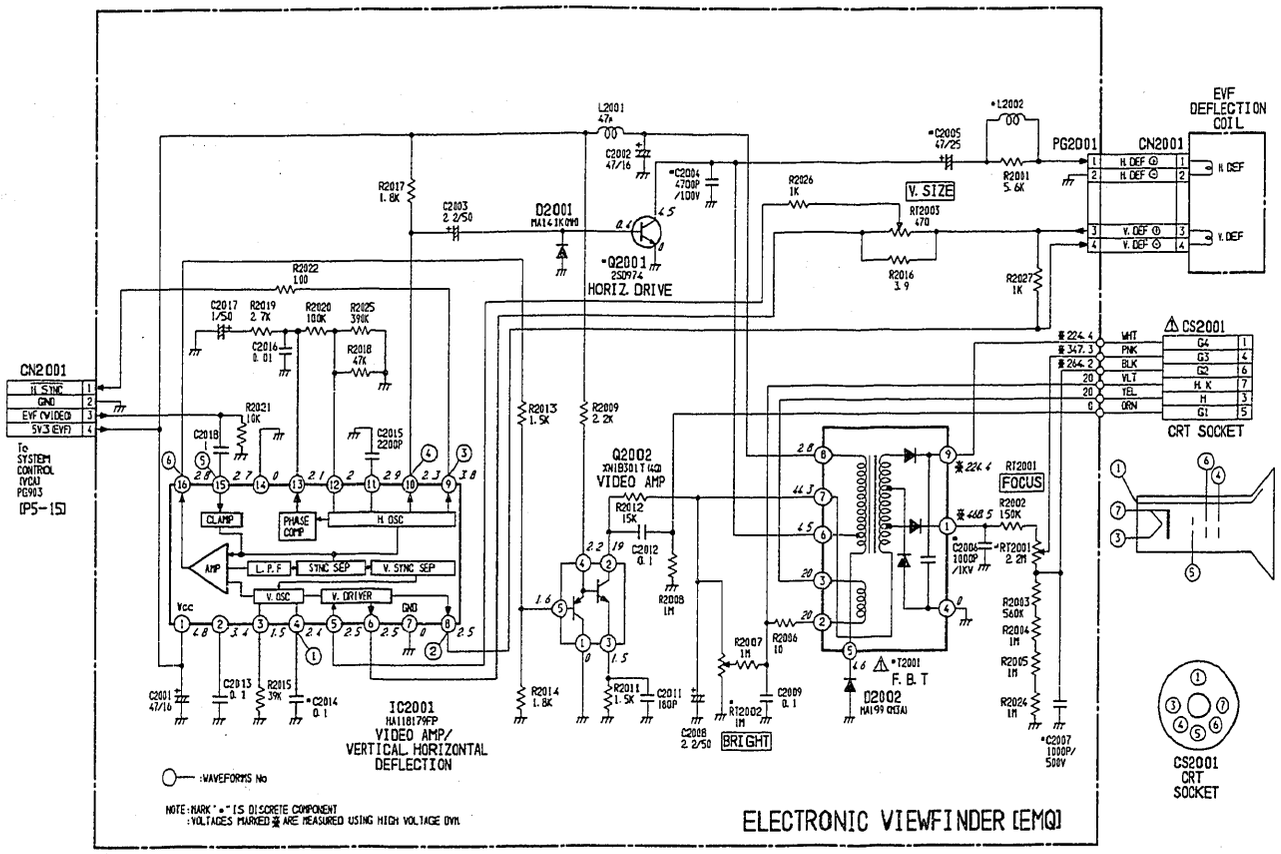
6-A PG2101-10 4.9Vp-p
1V/20.0μ sec.cm
COLOR CHART



7-A IC2202-4 1.9Vp-p
0.5V/100nsec.cm
COLOR CHART



ELECTRONIC VIEWFINDER [EMQ] SCHEMATIC DIAGRAM (W/B EVF TYPE) -TYPE 52.54-

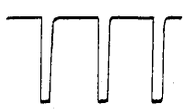


ELECTRONIC VIEWFINDER WAVEFORMS

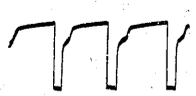
1-A IC2001-4 950mVp-p
0.2V/5.0msec.cm
COLOR CHART

2-A IC2001-8 2.3Vp-p
0.5V/5.0msec.cm
COLOR CHART

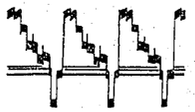
3-A IC2001-9 5.0Vp-p
1V/20.0 μ sec.cm
COLOR CHART



4-A IC2001-10 1.7Vp-p
0.5V/20.0 μ sec.cm
COLOR CHART

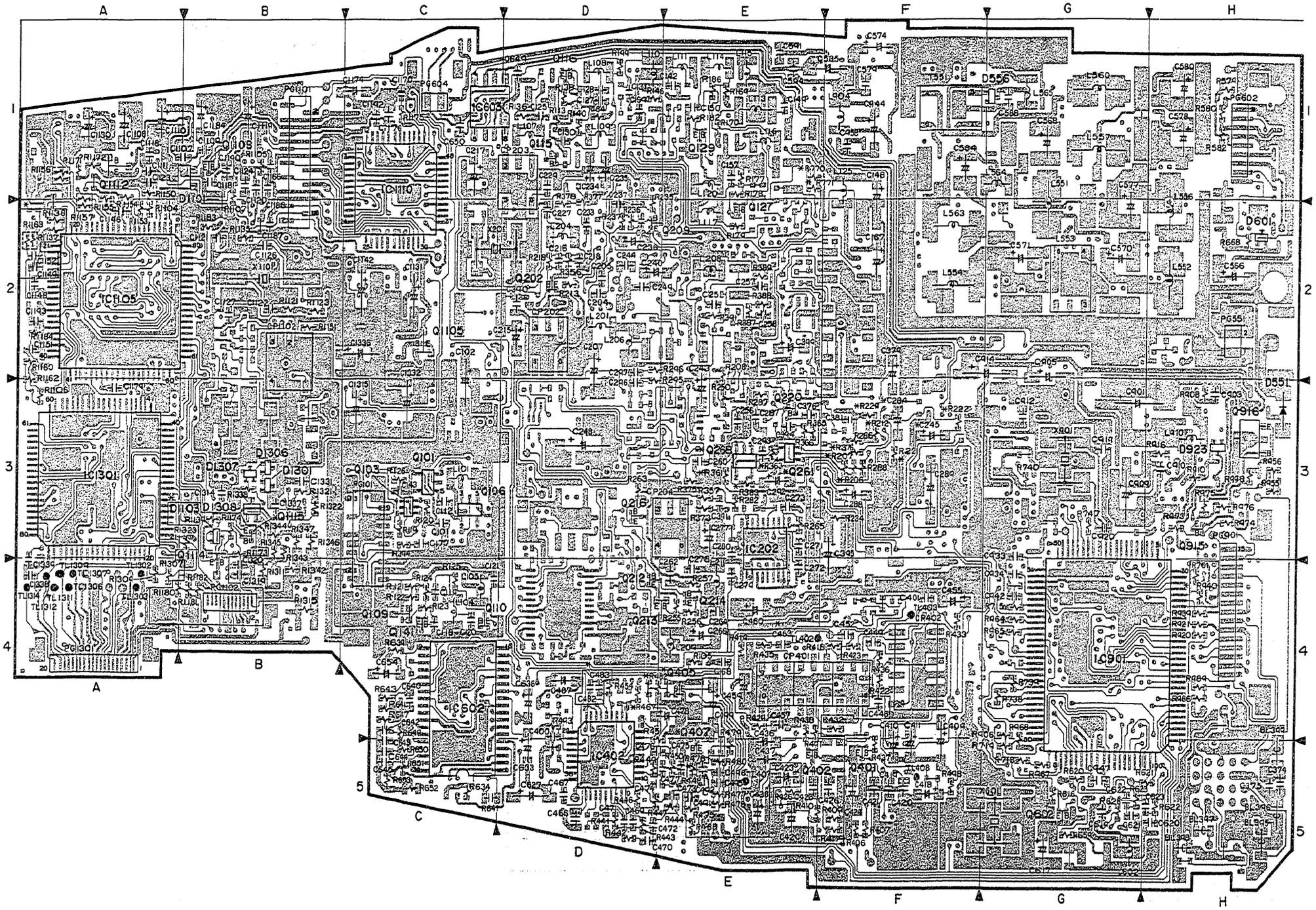


5-A IC2001-15 900mVp-p
0.2V/20.0 μ sec.cm
COLOR CHART



6-A IC2001-16 2.8Vp-p
1V/20.0 μ sec.cm
COLOR CHART

VCA CIRCUIT BOARD [SIDE-A] (Nor-8 TYPE) -TYPE 52. 54. 56. 58-



VCA (MAIN) — SIDE A —
(PATTERN No. JA1032-6)

DIFFERENCE TABLE

VCA – SIDE A –

SYMBOL-No.	TYPE52	TYPE54	TYPE56	TYPE58
C245	×	×	○	○
C284	×	×	○	○
C426	×	×	○	×
C428	×	×	○	×
C436	×	×	○	×
C437	×	×	○	×
C438	×	×	○	×
C446	×	×	○	×
C457	×	×	○	×
C459	×	×	○	×
C463	×	×	○	×
C482	×	×	○	×
C483	×	×	○	×
C491	○	○	×	○
C492	○	○	×	○
C495	○	○	×	○
C496	○	○	×	○
C499	○	○	×	○
C1149	×	×	×	○
C1152	×	×	×	○
CP401	×	×	○	×
D1103	×	×	×	○
PG1102	×	×	○	○
Q261	○	○	×	×
Q268	○	○	×	×
Q402	×	×	○	×
Q405	○	○	×	○
Q407	○	○	×	○
Q1114	×	×	×	○
Q1115	×	×	×	○
R206	○	○	×	×
R207	○	○	×	×
R212	×	×	○	○
R221	×	×	○	○
R222	×	×	○	○
R229	×	×	○	○
R361	○	○	×	×
R363	○	○	×	×
R376	○	○	×	×
R383	○	○	×	×
R409	×	×	○	×
R410	×	×	○	×
R411	×	×	○	×
R418	×	×	○	×
R419	×	×	○	×
R426	○	○	×	○
R429	×	×	○	×
R435	×	×	○	×
R438	×	×	○	×
R467	×	×	○	×
R468	×	×	○	×
R475	○	○	×	○
R476	○	○	×	○
R477	○	○	×	○
R478	○	○	×	○

SYMBOL-No.	TYPE52	TYPE54	TYPE56	TYPE58
R479	○	○	×	○
R480	○	○	×	○
R482	×	×	○	×
R491	×	×	○	×
R761	×	×	○	○
R770	×	○	○	○
R771	○	×	×	×
R940	○	○	×	×
R1137	×	○	×	×
R1138	○	×	○	○
R1139	×	×	×	○
R1163	×	×	×	○
R1173	×	×	×	○
R1174	×	×	×	○
R1180	×	×	×	○
R1181	×	×	○	○
R1182	×	×	○	○

IDENTIFICATION OF PARTS LOCATION

VCA (MAIN) [Nor-8 TYPE] 1/2

Symbol No.	Parts Location
BL	
BL394	B-5A
BL395	A-5H
BL396	A-5H
BL397	A-5H
BL398	A-5H
BL399	A-4H
C	
C101	A-3C
C102	A-2C
C103	B-4F
C104	B-4F
C105	B-3F
C106	B-3F
C107	B-3F
C108	B-3F
C110	B-3F
C111	B-3F
C112	A-3C
C113	B-3F
C118	A-4C
C119	A-4C
C120	A-4C
C121	A-4C
C125	A-1D
C126	B-1E
C127	A-1D
C128	A-1D
C129	B-1E
C130	A-1D
C131	A-1D
C134	B-1F
C135	B-1F
C137	B-1D
C138	B-1E
C140	B-1D
C141	B-1D
C142	A-1E
C143	A-3C
C146	B-1D
C147	B-1E
C148	A-1F
C149	A-1E
C150	A-1E
C151	B-1D
C152	B-2F
C153	B-1D
C154	B-1D
C157	A-1E
C161	B-2D
C163	B-4F
C166	B-2C
C167	A-2F
C168	A-4E
C169	A-1D
C170	A-1E
C177	A-3C
C203	B-2E
C204	A-2D
C205	A-2D
C206	B-2E
C207	A-2D
C208	B-2E
C209	B-2E
C213	B-2E
C214	B-2E
C215	A-2D
C216	A-2D
C217	A-1C
C218	A-2D
C220	B-2E
C223	B-2E
C225	B-2E
C227	A-2D
C229	A-1D
C230	B-1F
C232	B-2E
C233	A-2D
C234	A-1D
C235	A-1D
C236	A-2D
C237	A-2D
C238	B-1E
C239	B-2E
C240	A-2D
C241	A-2D
C242	B-2D
C243	A-3E
C244	A-2D
C245	A-3F
C246	B-2D
C248	A-3D
C249	A-2D
C250	B-2D
C251	A-2E
C253	B-2D
C256	A-3E
C257	A-2E
C258	A-2E
C259	B-2E
C260	A-3E
C262	A-4E
C263	B-4D
C264	A-4E
C265	B-4D
C266	A-4E
C267	B-4D
C268	B-3D
C269	B-3E
C270	B-3D
C271	A-3E
C272	A-4E
C273	A-3E
C275	B-4D
C276	A-4E
C277	A-3E
C278	B-4D
C279	A-4E
C280	A-3E
C281	B-3D
C282	B-4C
C283	B-3D
C284	A-3F
C285	B-3D
C287	A-3E
C288	A-3F
C289	A-3F
C292	A-3E
C293	A-3E
C296	A-3D
C297	A-2D
C299	B-2D
C374	A-5H
C375	A-5H
C376	A-3E
C379	A-2F
C381	A-3F
C382	B-1E
C390	A-2D
C391	A-3E
C394	A-3E
C395	A-3F
C399	A-2E
C400	A-4D
C401	A-4F
C402	B-4C
C403	B-4C
C405	B-4C
C406	B-4C
C407	B-4C
C408	B-4C
C409	A-4F
C410	A-4F
C411	A-4F
C412	B-4C
C413	B-5C
C414	B-5C
C415	B-5C
C416	B-5C
C417	B-5C
C418	A-5F
C419	A-5F
C420	A-5F
C421	A-5F
C422	B-5C
C423	A-5E
C424	A-5F
C425	B-5D
C426	A-5F
C427	B-5D
C428	A-5E
C429	A-5E
C430	B-5D
C431	B-5D
C432	B-5D
C433	B-5D
C434	B-4D
C435	B-4D
C436	A-5E
C437	A-5E
C438	A-5E
C439	B-4D
C440	B-4D
C441	B-4D
C442	B-4D
C444	B-4D
C445	B-4C
C446	A-4F
C447	B-4C
C448	B-4C
C449	A-4F
C450	B-4C
C451	B-4C
C452	A-4F
C453	B-4C
C455	A-4F
C457	A-4E
C458	B-4D
C459	A-4E
C460	A-4E
C461	B-4D
C462	B-4D
C463	A-4E
C464	B-4D
C465	B-4D
C466	A-5D
C467	A-5D
C469	A-4D
C470	A-4D
C471	A-5D
C472	A-5D
C473	A-5E
C474	A-5D
C475	A-5E
C476	A-5D
C477	A-5E
C478	A-4E
C479	B-5E
C480	B-4E
C481	B-4E
C482	A-4D
C483	A-4D
C485	B-4E
C486	B-4E
C487	A-4D
C491	A-5E
C492	A-5E
C495	A-5E
C496	A-5E
C499	A-4E
C551	B-1B
C552	B-2B
C553	B-1A
C554	B-2A
C555	B-2B
C556	B-2B
C558	B-2B
C559	B-2C
C560	B-2B
C561	B-2B
C562	B-1B
C563	B-1B
C564	B-1B
C565	B-1B
C566	A-2H
C568	A-1G
C570	A-2G
C571	A-2G
C573	B-3C
C574	A-1F
C577	A-2G
C578	A-1H
C579	A-1F
C580	A-1H
C584	A-1F
C585	A-1F
C586	B-2B
C587	B-1B
C588	A-1G
C589	B-1C
C591	A-1E
C592	B-1C
C593	B-2A
C594	A-1E
C595	B-2B
C596	B-2A
C605	B-5B
C607	B-5B
C609	B-5B
C611	B-5B
C617	A-5G
C618	B-5B
C619	A-5G
C620	A-5H
C621	A-5G
C622	A-5G
C623	A-5H
C624	B-5A
C627	A-5D
C630	B-5E
C631	B-5E
C632	B-4E
C633	A-5D
C634	B-4E
C635	B-4E
C636	A-4D
C639	B-4F
C640	A-4C
C641	A-5C
C642	A-4C
C643	A-5C
C644	A-5C
C645	A-5C
C649	A-1D
C650	A-1C
C652	B-5B
C653	B-5B
C654	A-4C
C658	B-5B
C659	B-5B
C901	A-3G
C902	B-3A
C903	A-3H
C904	B-3A
C905	A-2G
C907	B-3B
C908	B-3B
C909	A-3G
C910	A-3H
C912	A-3G
C913	B-4B
C914	A-2G
C919	A-3G
C920	A-3G
C921	B-4B
C922	B-4B
C923	B-4B
C924	B-5B
C926	B-3B
C928	B-3B
C929	B-3B
C930	B-2B
C933	A-4G
C934	A-4G
C935	B-4B
C936	B-4B
C937	B-4A
C942	A-4G
C944	A-1F
C947	A-5G
C951	B-3A
C956	B-5B
C957	B-4A
C958	A-1F
C959	B-3C
C1101	B-1G
C1102	B-1G
C1103	B-1G
C1104	B-1G
C1105	B-1G
C1106	B-1G
C1107	A-1B
C1108	A-1A
C1109	A-1B
C1110	A-1A
C1111	A-1A
C1112	B-2H
C1113	B-2H
C1114	B-1H
C1115	B-1H
C1116	B-1H
C1117	B-1H
C1118	A-1A
C1119	A-1B
C1120	A-1B
C1121	A-2B
C1122	A-2B
C1123	A-1A
C1124	A-1B
C1125	B-2F
C1126	A-2B
C1127	A-2B
C1128	B-2G
C1129	B-2G
C1130	A-1A
C1131	A-2C
C1132	B-1F
C1133	B-2G
C1135	B-1F
C1136	B-2F
C1141	B-2F
C1142	A-2C
C1143	B-2H
C1144	B-2H
C1145	B-2F
C1146	A-2A
C1147	B-2F
C1148	A-2A
C1149	A-2A
C1151	A-2A
C1152	A-2A
C1156	B-2F
C1157	B-2F
C1166	A-1B
C1167	B-1F
C1168	B-1F
C1169	B-3G
C1170	A-1C
C1171	B-1F
C1172	B-1F
C1173	B-1F
C1174	A-1C
C1175	B-1F
C1176	A-1C
C1177	B-2F
C1179	A-3A
C1180	B-2F
C1181	A-1B
C1185	B-1G
C1186	A-1B
C1187	A-2B
C1188	B-1F
C1189	B-2F
C1190	A-1B
C1192	A-1C
C1193	A-2A
C1201	B-4H
C1202	B-3H
C1203	B-3H
C1204	B-3H
C1205	B-3H
C1207	B-3H
C1208	B-3H
C1210	B-3H
C1211	B-3H
C1212	B-3H
C1216	B-3H
C1217	B-3G
C1219	B-3H
C1304	B-4H
C1311	B-3H
C1314	A-3B
C1315	A-3C
C1316	B-2F
C1317	B-4G
C1318	B-4G
C1319	A-4B
C1320	A-4B
C1321	B-4G
C1322	B-4G
C1323	B-4G
C1324	B-4H
C1325	B-4H
C1326	B-4H
C1327	B-4H
C1328	B-4G
C1329	B-4G
C1330	B-4H
C1331	A-3B
C1332	A-3C
C1333	B-3F
C1334	B-3H
C1335	B-2F
C1336	A-2C
C1337	A-3B
C1338	A-4A
C1339	A-4A
CP	
CP202	A-2D
CP203	A-1D
CP204	A-3E
CP401	A-4E
CP402	A-4F
CP1102	A-2B
D	
D205	B-1E
D403	B-5D
D551	A-3H
D552	B-2A
D556	A-1G
D557	B-1C
D601	A-2H
D913	B-4B
D916	B-4C
D922	B-4B
D923	A-3H
D1101	A-1B
D1103	A-3B
D1106	B-2F
D1107	B-2F
D1108	B-1F
D1301	A-3B
D1306	A-3B
D1307	A-3B
D1308	A-3B
F	
F551	B-2A
F552	B-2A
IC	
IC101	B-3F
IC201	B-2E
IC202	A-3E
IC203	B-4D
IC204	B-3D
IC205	B-3C
IC207	B-2C
IC401	B-4C
IC402	A-5D
IC551	B-2B
IC601	B-5B
IC602	A-4C
IC603	A-1C
IC901	A-4G
IC902	B-3A

IDENTIFICATION OF PARTS LOCATION

VCA (MAIN) [Nor-8 TYPE] 2/2

Symbol No.	Parts Location
IC903	B-3B
IC904	B-3B
IC905	B-4A
IC1101	B-1G
IC1102	B-1H
IC1103	B-2G
IC1104	B-2H
IC1105	A-2A
IC1106	B-2F
IC1110	A-1C
IC1201	B-3H
IC1202	B-3H
IC1203	B-3G
IC1301	A-3A
IC1302	B-4G
IC1303	B-4H
IC1308	B-3G
IC1311	B-3G
JK	
JK200	B-5A
L	
L101	A-3C
L104	A-4C
L105	A-4C
L107	A-1D
L108	A-1D
L109	A-1D
L110	A-1D
L111	A-1E
L113	A-1E
L114	A-1E
L115	A-1E
L116	A-1E
L117	A-2E
L119	A-1E
L120	A-1E
L124	B-2C
L125	A-1F
L201	A-2D
L204	A-2D
L205	B-1E
L206	A-2D
L208	A-2E
L209	A-4E
L210	B-3E
L211	A-4E
L401	B-4D
L551	A-1G
L552	A-2H
L553	A-2G
L554	A-2F
L555	B-2C
L556	A-2H
L557	A-1G
L560	A-1G

Symbol No.	Parts Location
L563	A-2F
L564	A-1G
L565	A-1G
L566	B-1C
L567	B-1B
L568	B-2A
L602	A-5G
L902	B-3B
L903	B-2C
L904	A-1F
L907	B-3B
L910	A-3H
L1102	B-2F
L1103	B-2F
L1105	B-2F
L1106	B-1H
L1107	B-1F
L1109	B-2G
L1301	B-3F
L1302	B-3F
L1303	B-2F
PG	
PG101	A-3C
PG400	B-4E
PG401	B-4E
PG402	B-4D
PG551	A-2H
PG601	B-5C
PG602	A-1H
PG603	B-4F
PG604	A-1C
PG901	A-3H
PG903	B-1C
PG905	B-3C
PG906	B-1D
PG1101	A-1B
PG1102	A-4B
PG1301	A-4A
Q	
Q101	A-3C
Q102	B-3F
Q103	A-3C
Q106	A-3C
Q107	B-3F
Q108	B-3E
Q109	A-4C
Q110	A-4C
Q113	B-1E
Q115	A-1D
Q116	A-1D
Q117	B-1E
Q123	B-1D
Q125	B-1D
Q127	A-2E
Q129	A-1E

Symbol No.	Parts Location
Q131	B-2D
Q135	B-2C
Q136	B-3E
Q141	A-4C
Q142	B-4G
Q202	A-2D
Q203	B-2E
Q208	B-1F
Q209	A-2D
Q212	A-4D
Q213	A-4D
Q214	A-4E
Q215	B-3E
Q216	A-3D
Q217	B-3D
Q218	B-3D
Q219	B-3D
Q220	A-3E
Q237	B-2E
Q240	B-2D
Q241	B-2D
Q250	B-3D
Q261	A-3E
Q268	A-3E
Q401	A-5F
Q402	A-5E
Q405	A-4E
Q407	A-5E
Q551	B-2A
Q552	B-1A
Q553	B-1A
Q554	B-2C
Q555	B-1B
Q556	B-1C
Q602	A-5G
Q603	B-5B
Q605	B-4B
Q608	B-4F
Q901	B-3B
Q902	B-2A
Q903	B-3A
Q904	B-3A
Q905	B-3B
Q906	B-4B
Q908	B-2B
Q915	A-3H
Q916	A-3H
Q917	B-4A
Q919	B-2A
Q920	B-4B
Q1101	B-3F
Q1102	B-3G
Q1103	B-2G
Q1104	B-3F
Q1105	A-2C

Symbol No.	Parts Location
Q1109	A-1B
Q1110	B-1F
Q1112	A-1A
Q1113	B-1H
Q1114	A-3B
Q1115	A-3B
Q1201	B-4H
Q1202	B-4H
R	
R101	B-4F
R102	B-4F
R103	B-3F
R104	B-3F
R105	A-4E
R106	B-3F
R107	B-3F
R108	B-3F
R109	B-3F
R110	B-3F
R111	B-3F
R112	B-2E
R113	A-1D
R115	B-2F
R116	B-2F
R118	B-2E
R119	A-3C
R120	A-3C
R122	A-4C
R123	A-4C
R124	A-4C
R125	A-4C
R126	A-3C
R134	B-1E
R135	B-1E
R136	A-1D
R137	B-1E
R138	A-1D
R140	A-1D
R141	B-1E
R142	B-1E
R143	B-1E
R144	B-1E
R146	A-1D
R148	B-1E
R149	B-1E
R150	B-1F
R151	B-1F
R152	B-1D
R157	B-1E
R158	B-1E
R160	B-1E
R161	B-1D
R162	B-1D
R163	B-1E
R164	B-1D

Symbol No.	Parts Location
R165	B-1D
R166	B-1D
R169	A-1E
R170	A-1E
R172	B-1D
R177	A-1E
R178	A-1E
R179	A-2E
R181	B-2D
R182	A-1E
R183	B-1E
R184	A-1D
R186	A-1E
R189	B-2D
R190	B-2D
R194	B-2D
R195	B-3F
R198	B-1E
R199	A-1D
R203	B-2E
R204	A-3D
R205	B-3E
R206	A-3F
R207	A-3F
R208	A-2E
R212	A-3F
R213	A-2D
R215	B-2E
R216	B-2E
R217	B-2E
R218	A-2D
R219	B-2E
R221	A-3F
R222	A-3F
R223	B-2F
R224	B-2E
R227	B-2F
R228	B-2F
R229	A-3F
R234	A-3F
R235	A-2D
R236	A-2D
R237	A-2D
R239	B-2D
R240	B-2D
R241	B-2D
R244	B-2D
R246	B-2D
R247	B-2D
R249	B-2E
R250	A-3E
R255	A-4E
R256	A-4E
R257	A-4E
R258	B-3D

Symbol No.	Parts Location
R259	B-3D
R260	B-3D
R261	B-3E
R263	A-3D
R264	B-3D
R265	A-3E
R269	B-4D
R270	B-4D
R273	B-3D
R274	B-3D
R275	B-3D
R276	B-3D
R278	B-4D
R279	B-3D
R280	B-3D
R282	A-3E
R286	A-3F
R287	A-3E
R288	A-3F
R289	B-3C
R291	B-3D
R295	A-3D
R296	A-2D
R297	A-3E
R298	B-3D
R343	B-2C
R345	B-2C
R351	B-2E
R352	A-1D
R356	A-2D
R357	A-3E
R361	A-3E
R363	A-3E
R365	A-3E
R366	A-3E
R372	B-2D
R373	A-3E
R374	B-3D
R375	A-3E
R376	A-3F
R377	A-2D
R378	A-2D
R379	B-1E
R383	A-3E
R386	B-3E
R387	A-2E
R388	A-2E
R389	A-2E
R391	A-2E
R393	B-2D
R394	A-3C
R396	B-3C
R398	B-3D
R401	B-4C
R403	B-5C

Symbol No.	Parts Location
R404	B-5C
R405	B-5C
R406	A-5F
R407	A-5F
R408	B-5C
R409	A-5F
R410	A-5E
R411	A-5F
R412	B-5D
R413	B-5D
R414	B-5D
R418	A-4F
R419	A-4E
R420	B-4D
R421	B-4C
R422	A-4F
R423	A-4F
R424	B-4C
R425	B-4C
R426	A-5E
R428	B-4D
R429	A-4E
R430	B-5C
R431	B-5C
R432	A-4F
R433	A-4F
R434	B-4D
R435	A-4E
R436	A-4F
R437	A-5F
R438	A-4E
R441	A-4D
R442	A-4D
R443	A-4D
R444	A-5E
R445	B-5E
R446	A-5D
R447	A-4D
R448	A-5E
R449	A-5D
R450	A-5E
R451	A-5D
R452	B-5E
R453	B-5E
R454	A-4D
R455	B-4E
R456	B-4E
R467	A-4D
R468	A-5E
R475	A-5E
R476	A-5E
R477	A-5E
R478	A-5E
R479	A-5E
R480	A-5E

Symbol No.	Parts Location
R481	A-4E
R482	A-4E
R483	B-4D
R485	B-4E
R486	B-4E
R487	B-4E
R491	A-4E
R493	A-4D
R495	B-5D
R496	B-5D
R497	B-4E
R498	A-5F
R551	B-1B
R552	B-1B
R554	B-1A
R556	B-1A
R558	B-2A
R560	B-2B
R562	B-2B
R566	B-2B
R570	B-2B
R571	B-1B
R572	B-1B
R574	B-2B
R575	B-2C
R576	B-2C
R579	A-1H
R580	A-1H
R581	B-1A
R582	A-1H
R584	B-1B
R585	B-1B
R586	B-1B
R587	B-1B
R588	B-2B
R589	B-2C
R590	B-1C
R591	B-2C
R592	B-1C
R593	B-2B
R594	B-1A
R595	B-1A
R605	B-4B
R606	B-4B
R607	B-5B
R609	B-5B
R610	B-5B
R611	B-5B
R616	A-5G
R620	A-5G
R621	A-5H
R622	A-5H
R623	A-5G
R624	B-5A
R625	B-5A

Symbol No.	Parts Location
R626	A-5G
R634	A-5C
R635	B-4F
R637	B-4E
R639	A-4C
R641	A-4C
R643	A-4C
R644	B-4F
R645	B-5F
R646	B-4F
R647	A-4C
R648	B-5F
R649	A-4C
R650	A-5C
R651	A-5C
R652	A-5C
R653	A-5C
R656	B-1F
R658	B-5F
R659	A-5G
R663	B-4F
R668	A-2H
R676	B-5B
R680	B-1F
R702	B-4A
R703	B-4A
R704	B-4A
R705	B-4A
R706	B-4A
R707	B-3A
R708	B-3A
R709	B-4A
R710	B-4A
R711	B-4A
R712	B-4A
R715	A-4G
R717	B-2F
R718	A-5G
R719	A-5G
R721	B-4A
R727	B-3B
R732	B-3B
R734	B-3B
R736	B-3B
R738	A-4G
R739	A-4G
R740	A-3G
R745	B-4C
R746	B-3B
R747	A-3G
R748	B-3B
R749	B-5B
R750	B-4A
R751	B-4B
R754	B-3A

Symbol No.	Parts Location
R755	B-3A
R761	A-4H
R762	B-1C
R770	A-1E
R771	A-1E
R902	B-2A
R903	B-2A
R906	A-4G
R908	A-3H
R909	B-3A
R910	A-3H
R911	B-3A
R912	B-3B
R913	B-3B
R914	B-3B
R915	B-3B
R916	A-3H
R917	B-4B
R918	B-4B
R919	B-4B
R920	A-4H
R921	A-4H
R926	B-4C
R933	B-3A
R934	B-3A
R935	B-3A
R936	B-4B
R937	B-4B
R938	B-4B
R939	A-4H
R940	A-4H
R942	B-4B
R944	B-4A
R946	B-4B
R947	B-4B
R948	B-3A
R949	B-4A
R950	B-3B
R951	B-4B
R952	B-2A
R953	B-3A
R954	B-3A
R955	A-3H
R956	A-3H
R957	B-3A
R958	B-4A
R959	B-4B
R960	B-4B
R961	B-4B
R962	B-4B
R963	B-4B
R964	A-4G
R965	A-4G
R967	A-5G
R968	A-4G

Symbol No.	Parts Location
R970	B-4B
R973	A-3H
R974	A-3H
R975	A-3H
R976	A-3H
R977	B-4A
R978	B-3B
R979	B-2B
R980	B-2B
R983	B-4A
R984	B-4A
R985	B-4A
R986	A-4H
R987	B-4A
R988	B-4A
R989	A-4H
R990	B-4A
R991	B-4A
R994	B-4A
R997	B-4A
R998	A-3H
R1101	B-1G
R1102	B-2H
R1103	B-2H
R1104	A-2A
R1105	A-1B
R1106	A-3A
R1107	A-1B
R1108	B-1G
R1109	B-1G
R1111	B-3G
R1113	B-2G
R1114	B-3G
R1115	B-3G
R1116	B-2G
R1117	B-3G
R1118	B-3G
R1119	B-3G
R1121	A-2B
R1122	B-1F
R1123	A-2B
R1133	B-2H
R1134	B-1G
R1135	A-2B
R1136	B-2H
R1137	A-1A
R1138	A-1A
R1139	A-3B
R1140	B-2H
R1141	B-2G
R1143	B-2F
R1144	B-2F
R1145	B-1F
R1146	B-1F
R1147	B-3H

Symbol No.	Parts Location
R1148	B-3H
R1150	A-1A
R1151	A-2B
R1153	A-2A
R1154	A-1A
R1155	A-2A
R1156	A-1A
R1157	A-2A
R1160	A-2A
R1162	A-3A
R1163	A-2A
R1170	B-2F
R1171	A-1A
R1172	A-1A
R1173	A-3B
R1174	A-3B
R1175	A-1C
R1180	A-4A
R1181	A-4B
R1182	A-4B
R1183	A-2B
R1184	A-2A
R1197	B-1F
R1198	B-3G
R1201	B-4H
R1202	B-4H
R1203	B-4H
R1204	B-3H
R1205	B-3H
R1206	B-3H
R1207	B-3H
R1208	B-3H
R1209	B-3H
R1213	B-3H
R1214	B-3H
R1215	B-3H
R1216	B-3H
R1217	B-3G
R1218	B-3H
R1219	B-3H
R1220	B-3H
R1221	B-3H
R1222	B-3H
R1223	B-3H
R1224	B-3H
R1225	B-3H
R1226	B-3G
R1230	B-3H
R1231	B-3G
R1232	B-3G
R1233	B-3G
R1234	B-3G
R1235	B-3G
R1236	B-3H
R1307	A-4A

Symbol No.	Parts Location
R1308	B-3H
R1309	A-4A
R1310	B-3H
R1311	A-4B
R1313	B-3G
R1314	B-4G
R1315	A-4B
R1316	B-4H
R1318	B-4H
R1319	B-4G
R1320	B-4G
R1321	A-3B
R1322	A-3B
R1323	A-3B
R1324	B-3H
R1338	A-3B
R1342	A-4B
R1343	A-3B
R1344	A-3B
R1345	A-3B
R1346	A-3B
R1347	A-3B
RT	
RT101	B-1E
RT102	B-1D
RT203	B-3E
RT204	B-2D
RT205	B-2D
RT206	B-2D
RT207	B-3D
RT209	B-2D
RT210	B-3D
RT211	B-3D
RT212	B-3D
RT215	B-3E
RT216	B-3D
RT401	B-4C
RT402	B-4B
RT404	B-5D
RT405	B-4D
S	
S901	B-1B
S902	B-1A
S903	B-3A
S904	B-2A
S905	B-2A
S906	B-3A
S907	B-4A
S909	B-1A
T	
T551	A-1F
TP	
TP101	B-1F
TP102	B-1F
TP201	B-2E

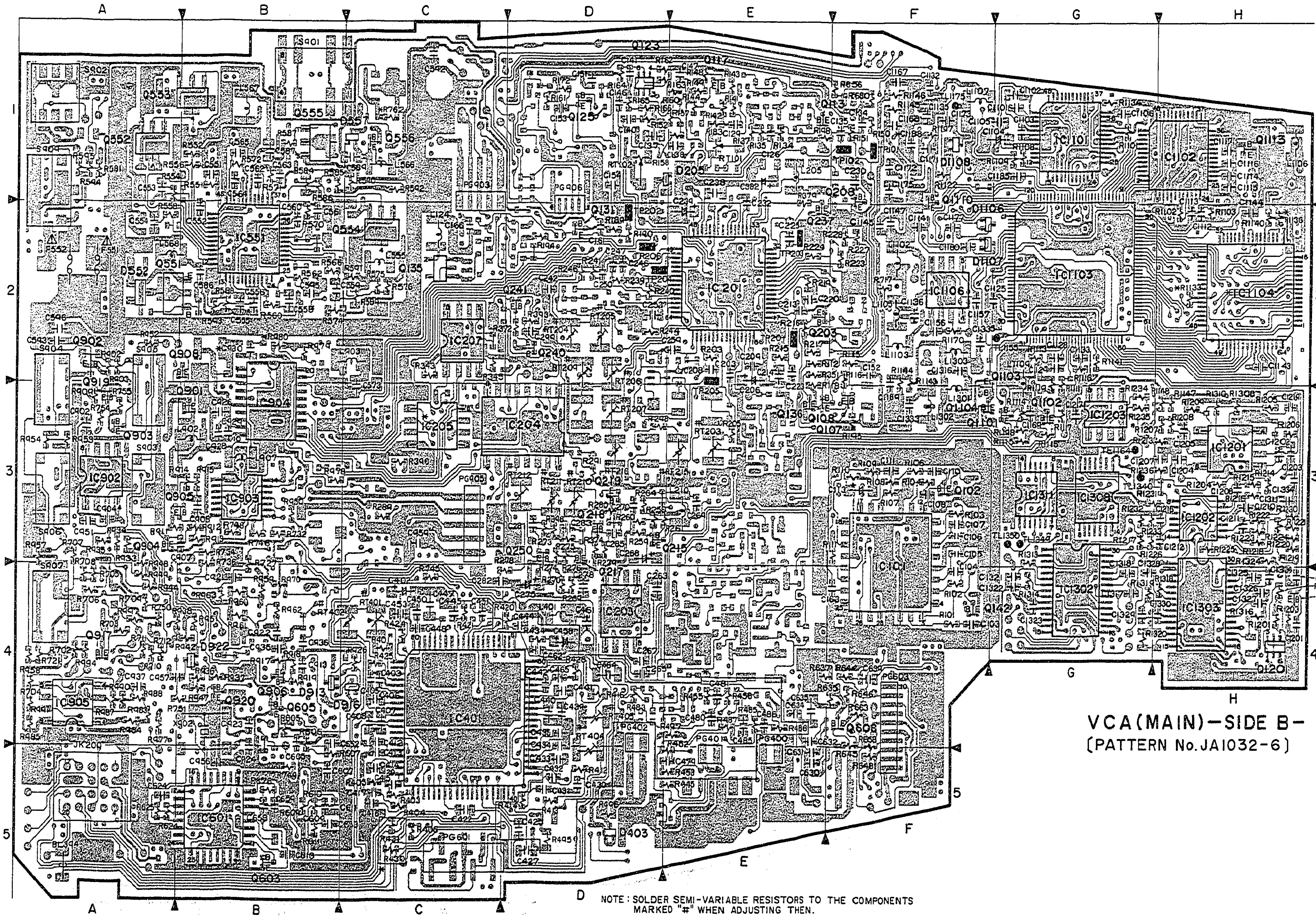
Symbol No.	Parts Location
TP202	B-2D
TP203	B-2E
TP204	B-2D
TP205	B-2E
TP206	B-2D
TL	
TL402	A-4E
TL403	A-4F
TL407	A-5E
TL408	A-4F
TL1135	B-3G
TL1155	B-2G
TL1164	B-3G
TL1175	B-1F
TL1302	A-4A
TL1303	A-4A
TL1306	A-4A
TL1307	A-4A
TL1309	A-4A
TL1311	A-4A
TL1312	A-4A
TL1314	A-4A
TL1340	B-3G
TL1349	B-3G
X	
X201	A-2C
X601	A-5G
X901	A-3G
X902	B-4B
X1101	A-2B

DIFFERENCE TABLE

VCA – SIDE B –

SYMBOL-No.	TYPE52	TYPE54	TYPE56	TYPE58
C425	×	×	○	×
C430	×	×	○	×
C431	×	×	○	×
C432	×	×	○	×
C433	×	×	○	×
C434	×	×	○	×
C435	×	×	○	×
C439	×	×	○	×
C440	×	×	○	×
C441	×	×	○	×
C442	×	×	○	×
C444	×	×	○	×
C458	×	×	○	×
C462	×	×	○	×
C464	×	×	○	×
C465	×	×	○	×
C479	×	×	○	×
C480	×	×	○	×
C481	×	×	○	×
C485	×	×	○	×
C486	×	×	○	×
C930	○	○	×	×
C1188	×	○	○	○
IC205	×	×	○	○
IC1104	×	○	○	○
PG401	×	×	○	×
R412	×	×	○	×
R413	×	×	○	×
R414	×	×	○	×
R420	×	×	○	×
R428	×	×	○	×
R430	○	○	×	○
R431	○	○	×	○
R434	×	×	○	×
R452	×	×	○	×
R453	×	×	○	×
R455	×	×	○	×
R456	×	×	○	×
R483	×	×	○	×
R485	○	○	×	○
R486	○	○	×	○
R487	○	○	×	○
R495	×	×	○	×
R497	×	×	○	×
R762	×	×	○	○
R980	○	○	×	×
R1133	○	×	×	×
R1136	×	○	○	○
RT404	×	×	○	×
RT405	×	×	○	×

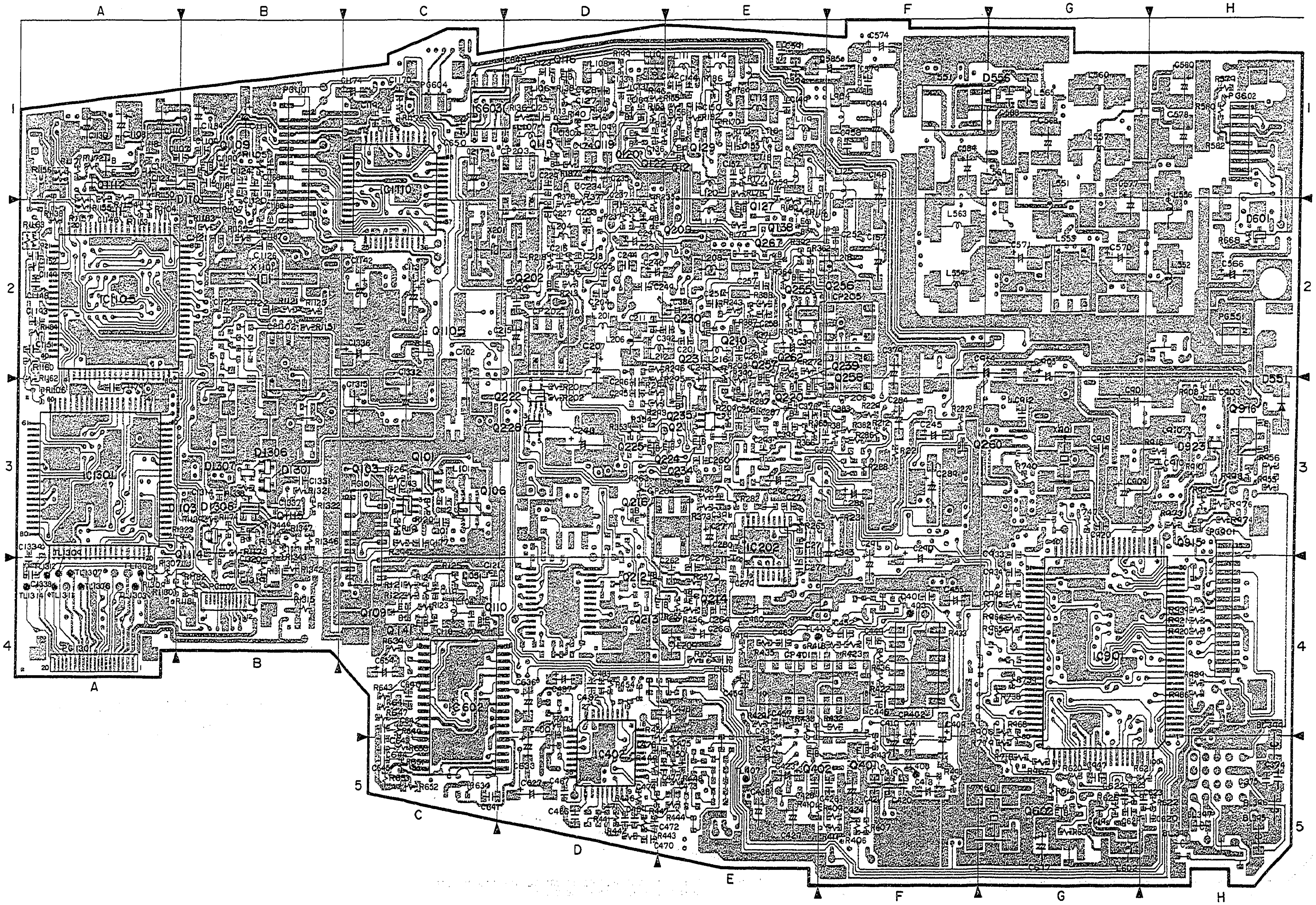
VCA CIRCUIT BOARD [SIDE-B] (Nor-8 TYPE) -TYPE 52. 54. 56. 58-



VCA(MAIN)-SIDE B-
(PATTERN No.JA1032-6)

NOTE: SOLDER SEMI-VARIABLE RESISTORS TO THE COMPONENTS MARKED "#" WHEN ADJUSTING THEN.

VCA CIRCUIT BOARD [SIDE-A] (Hi-8 TYPE) -TYPE 59-



VCA (MAIN) — SIDE A —
[PATTERN No. JA1032-6]

IDENTIFICATION OF PARTS LOCATION

VCA (MAIN) [Hi-8 TYPE] 1/3

Symbol No.	Parts Location
BL	
BL394	B-5A
BL395	A-5H
BL396	A-5H
BL397	A-5H
BL398	A-5H
BL399	A-4H
C	
C101	A-3C
C102	A-2C
C103	B-4F
C104	B-4F
C107	B-3F
C108	B-3F
C110	B-3F
C111	B-3F
C112	A-3C
C113	B-3F
C118	A-4C
C119	A-4C
C120	A-4C
C121	A-4C
C122	B-1E
C123	A-1D
C124	B-1E
C125	A-1D
C126	B-1E
C127	A-1D
C128	A-1D
C129	B-1E
C130	A-1D
C131	A-1D
C132	B-1E
C133	A-1D
C134	B-1F
C135	B-1F
C136	A-1D
C137	B-1D
C138	B-1E
C140	B-1D
C141	B-1D
C142	A-1E
C143	A-3C
C144	A-1E
C146	B-1D
C147	B-1E
C148	A-1F
C149	A-1E
C150	A-1E
C151	B-1D
C152	B-2F
C153	B-1D
C154	B-1D
C155	A-1E
C156	B-1D
C157	A-1E
C159	A-1E
C160	B-2D
C161	B-2D
C162	B-2C
C163	B-4F
C166	B-2C
C167	A-2F
C168	A-4E
C169	A-1D
C170	A-2E
C174	A-1D
C177	A-3C
C201	A-2E
C203	B-2E
C204	A-2D
C205	A-2D
C206	B-2E
C207	A-2D
C208	B-2E
C209	B-2E
C211	A-2D
C213	B-2E
C214	B-2E
C215	A-2D
C216	A-2D
C217	A-1C
C218	A-2D
C220	B-2E
C223	B-2E
C225	B-2E
C226	B-3E
C227	A-2D
C229	A-1D
C230	B-1F
C231	B-1E
C232	B-2E
C233	A-2D
C234	A-1D
C235	A-1D
C236	A-2D
C237	A-2D
C238	B-1E
C239	B-2E
C240	A-2D
C241	A-2D
C242	B-2D
C243	A-3E
C244	A-2D
C245	A-3F
C246	B-2D
C247	B-2D
C248	A-3D
C249	A-2D
C250	B-2D
C251	A-2E
C252	A-2F
C254	B-2D
C255	B-2D
C256	A-3E
C257	A-2E
C258	A-2E
C259	B-2E
C260	A-3E
C261	A-2E
C262	A-4E
C263	B-4D
C264	A-4E
C265	B-4D
C266	A-4E
C267	B-4D
C268	B-3D
C269	B-3E
C270	B-3D
C271	A-3E
C272	A-4E
C273	A-3E
C275	B-4D
C276	A-4E
C277	A-3E
C278	B-4D
C279	A-4E
C280	A-3E
C281	B-3D
C282	B-4C
C283	B-3D
C284	A-3F
C285	B-3D
C286	B-2C
C287	A-3E
C288	A-3F
C289	A-3F
C290	A-4F
C291	A-4F
C292	A-3E
C293	A-3E
C295	A-3D
C296	A-3D
C299	B-2D
C374	A-5H
C375	A-5H
C376	A-3E
C377	A-3F
C379	A-2F
C382	B-1E
C383	A-3F
C388	A-2E
C390	A-2D
C391	A-3E
C392	A-2E
C394	A-3E
C395	A-3F
C399	A-2E
C400	A-4D
C401	A-4F
C402	B-4C
C403	B-4C
C405	B-4C
C406	B-4C
C407	B-4C
C408	B-4C
C409	A-4F
C410	A-4F
C411	A-4F
C412	B-4C
C413	B-5C
C414	B-5C
C415	B-5C
C416	B-5C
C417	B-5C
C418	A-5F
C419	A-5F
C420	A-5F
C421	A-5F
C422	B-5C
C423	A-5E
C424	A-5F
C425	B-5D
C426	A-5F
C427	B-5D
C428	A-5E
C429	A-5E
C430	B-5D
C431	B-5D
C432	B-5D
C433	B-5D
C434	B-4D
C435	B-4D
C436	A-5E
C437	A-5E
C438	A-5E
C439	B-4D
C440	B-4D
C441	B-4D
C442	B-4D
C444	B-4D
C445	B-4C
C446	A-4F
C447	B-4C
C448	B-4C
C449	A-4F
C450	B-4C
C451	B-4C
C452	A-4F
C453	B-4C
C455	A-4F
C457	A-4E
C458	B-4D
C459	A-4E
C460	A-4E
C461	B-4D
C462	B-4D
C463	A-4E
C464	B-4D
C465	B-4D
C466	A-5D
C467	A-5D
C469	A-4D
C470	A-4D
C471	A-5D
C472	A-5D
C473	A-5E
C474	A-5D
C476	A-5D
C477	A-5E
C478	A-4E
C479	B-5E
C480	B-4E
C481	B-4E
C482	A-4D
C483	A-4D
C487	A-4D
C551	B-1B
C552	B-2B
C553	B-1A
C554	B-2A
C555	B-2B
C556	B-2B
C558	B-2B
C559	B-2C
C560	B-2B
C561	B-2B
C562	B-1B
C563	B-1B
C564	B-1B
C565	B-1B
C566	A-2H
C568	A-1G
C570	A-2G
C571	A-2G
C573	B-3C
C574	A-1F
C577	A-2G
C578	A-1H
C579	A-1F
C580	A-1H
C584	A-1F
C585	A-1F
C586	B-2B
C587	B-1B
C588	A-1G
C589	B-1C
C591	A-1E
C592	B-1C
C593	B-2A
C594	A-1E
C595	B-2B
C596	B-2A
C605	B-5B
C607	B-5B
C609	B-5B
C611	B-5B
C617	A-5G
C618	B-5B
C619	A-5G
C620	A-5H
C621	A-5G
C622	A-5G
C623	A-5H
C624	B-5A
C627	A-5D
C630	B-5E
C631	B-5E
C632	B-4E
C633	A-5D
C634	B-4E
C635	B-4E
C636	A-4D
C639	B-4F
C640	A-4C
C641	A-5C
C642	A-4C
C643	A-5C
C644	A-5C
C645	A-5C
C649	A-1D
C650	A-1C
C652	B-5B
C653	B-5B
C654	A-4C
C658	B-5B
C659	B-5B
C901	A-3G
C902	B-3A
C903	A-3H
C904	B-3A
C905	A-2G
C907	B-3B
C908	B-3B
C909	A-3G
C910	A-3H
C912	A-3G
C913	B-4B
C914	A-2G
C919	A-3G
C920	A-3G
C921	B-4B
C922	B-4B
C923	B-4B
C924	B-5B
C926	B-3B
C928	B-3B
C929	B-3B
C933	A-4G
C934	A-4G
C935	B-4B
C936	B-4B
C937	B-4A
C942	A-4G
C944	A-1F
C947	A-5G
C951	B-3A
C956	B-5B
C957	B-4A
C958	A-1F
C959	B-3C
C1101	B-1G
C1102	B-1G
C1103	B-1G
C1104	B-1G
C1105	B-1G
C1106	B-1G
C1107	A-1B
C1108	A-1A
C1109	A-1B
C1110	A-1A
C1111	A-1A
C1112	B-2H
C1113	B-2H
C1114	B-1H
C1115	B-1H
C1116	B-1H
C1117	B-1H
C1118	A-1A
C1119	A-1B
C1120	A-1B
C1121	A-2B
C1122	A-2B
C1123	A-1A
C1124	A-1B
C1125	B-2F
C1126	A-2B
C1127	A-2B
C1128	B-2G
C1129	B-2G
C1130	A-1A
C1131	A-2C
C1132	B-1F
C1133	B-2G
C1135	B-1F
C1136	B-2F
C1141	B-2F
C1142	A-2C
C1143	B-2H
C1144	B-2H
C1145	B-2F
C1146	A-2A
C1147	B-2F
C1148	A-2A
C1149	A-2A
C1151	A-2A
C1152	A-2A
C1156	B-2F
C1157	B-2F
C1166	A-1B
C1167	B-1F
C1168	B-1F
C1169	B-3G
C1170	A-1C
C1171	B-1F
C1172	B-1F
C1173	B-1F
C1174	A-1C
C1175	B-1F
C1176	A-1C
C1177	B-2F
C1179	A-3A
C1180	B-2F
C1181	A-1B
C1184	A-1B
C1185	B-1G
C1186	A-1B
C1187	A-2B
C1188	B-1F
C1189	B-2F
C1190	A-1B
C1192	A-1C
C1193	A-2A
C1201	B-4H
C1202	B-3H
C1203	B-3H
C1204	B-3H
C1205	B-3H
C1207	B-3H
C1208	B-3H
C1210	B-3H
C1211	B-3H
C1212	B-3H
C1216	B-3H
C1217	B-3G
C1219	B-3H
C1304	B-4H
C1311	B-3H
C1314	A-3B
C1315	A-3C
C1316	B-2F
C1317	B-4G
C1318	B-4G
C1319	A-4B
C1320	A-4B
C1321	B-4G
C1322	B-4G
C1323	B-4G
C1324	B-4H
C1325	B-4H
C1326	B-4H
C1327	B-4H
C1328	B-4G
C1329	B-4G
C1330	B-4H
C1331	A-3B
C1332	A-3C
C1333	B-3F
C1334	B-3H
C1335	B-2F
C1336	A-2C
C1337	A-3B
C1338	A-4A
C1339	A-4A
CP	
CP202	A-2D
CP203	A-1D
CP204	A-3E
CP205	A-2F
CP206	A-3F
CP401	A-4E
CP402	A-4F
CP1102	A-2B
D	
D205	B-1E
D403	B-5D
D551	A-3H
D552	B-2A
D556	A-1G
D557	B-1C
D601	A-2H
D913	B-4B
D916	B-4C
D922	B-4B
D923	A-3H
D1101	A-1B
D1103	A-3B
D1106	B-2F
D1107	B-2F
D1106	B-1F
D1301	A-3B
D1306	A-3B
D1307	A-3B
D1308	A-3B
F	

IDENTIFICATION OF PARTS LOCATION

VCA (MAIN) [Hi-8 TYPE] 2/3

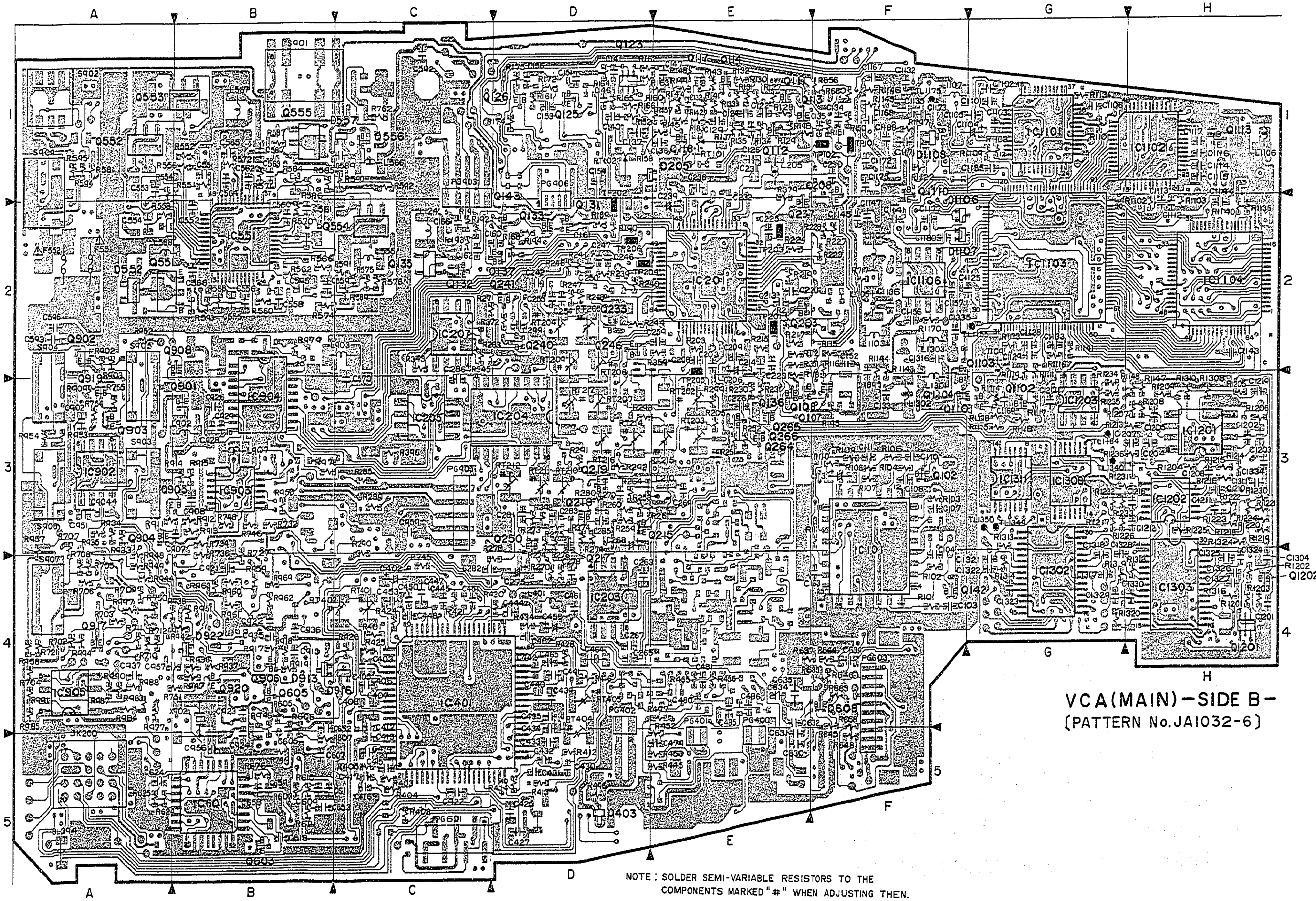
Symbol No.	Parts Location
F551	B-2A
F552	B-2A
IC	
IC101	B-3F
IC201	B-2E
IC202	A-3E
IC203	B-4D
IC204	B-3D
IC205	B-3C
IC207	B-2C
IC401	B-4C
IC402	A-5D
IC551	B-2B
IC601	B-5B
IC602	A-4C
IC603	A-1C
IC901	A-4G
IC902	B-3A
IC903	B-3B
IC904	B-3B
IC905	B-4A
IC1101	B-1G
IC1102	B-1H
IC1103	B-2G
IC1104	B-2H
IC1105	A-2A
IC1106	B-2F
IC1110	A-1C
IC1201	B-3H
IC1202	B-3H
IC1203	B-3G
IC1301	A-3A
IC1302	B-4G
IC1303	B-4H
IC1308	B-3G
IC1311	B-3G
JK	
JK200	B-5A
L	
L101	A-3C
L104	A-4C
L105	A-4C
L106	A-1D
L107	A-1D
L108	A-1D
L109	A-1D
L110	A-1D
L111	A-1E
L113	A-1E
L114	A-1E
L115	A-1E
L116	A-1E
L117	A-2E
L118	A-1E
L119	A-1E
L120	A-1E
L124	B-2C
L125	A-1F
L129	A-1E
L201	A-2D
L204	A-2D
L205	B-1E
L206	A-2D
L208	A-2E
L209	A-4E
L210	B-3E
L211	A-4E
L212	A-2D
L216	A-2E
L218	A-2F
L401	B-4D
L551	A-1G
L552	A-2H
L553	A-2G
L554	A-2F
L555	B-2C
L556	A-2H
L557	A-1G
L560	A-1G
L563	A-2F
L564	A-1G
L565	A-1G
L566	B-1C
L567	B-1B
L568	B-2A
L602	A-5G
L902	B-3B
L903	B-2C
L904	A-1F
L907	B-3B
L910	A-3H
L1102	B-2F
L1103	B-2F
L1105	B-2F
L1106	B-1H
L1107	B-1F
L1109	B-2G
L1301	B-3F
L1302	B-3F
L1303	B-2F
PG	
PG101	A-3C
PG400	B-4E
PG401	B-4E
PG402	B-4D
PG551	A-2H
PG601	B-5C
PG602	A-1H
PG603	B-4F
PG604	A-1C
PG901	A-3H
PG903	B-1C
PG905	B-3C
PG906	B-1D
PG1101	A-1B
PG1102	A-4B
PG1301	A-4A
Q	
Q101	A-3C
Q102	B-3F
Q103	A-3C
Q106	A-3C
Q107	B-3F
Q108	B-3E
Q109	A-4C
Q110	A-4C
Q111	B-1E
Q112	B-1E
Q113	B-1E
Q114	B-1E
Q115	A-1D
Q116	A-1D
Q117	B-1E
Q118	B-1E
Q119	A-1D
Q120	A-1D
Q121	A-1E
Q122	A-1E
Q123	B-1D
Q125	B-1D
Q126	B-1D
Q127	A-2E
Q129	A-1E
Q131	B-2D
Q132	B-2C
Q133	B-2D
Q135	B-2C
Q136	B-3E
Q137	B-2D
Q138	A-2E
Q141	A-4C
Q142	B-4G
Q143	B-2D
Q202	A-2D
Q203	B-2E
Q208	B-1F
Q209	A-2D
Q210	A-2E
Q211	A-3E
Q212	A-4D
Q213	A-4D
Q214	A-4E
Q215	B-3E
Q216	A-3D
Q217	B-3D
Q218	B-3D
Q219	B-3D
Q220	A-3E
Q222	A-3D
Q224	A-3E
Q225	A-3D
Q228	A-3D
Q230	A-2E
Q231	A-3E
Q233	B-2D
Q234	A-3E
Q235	A-3E
Q237	B-2E
Q239	A-3E
Q240	B-2D
Q241	B-2D
Q246	B-2D
Q250	B-3D
Q255	A-2E
Q256	A-2E
Q257	A-2E
Q258	A-3E
Q260	A-3F
Q262	A-3E
Q264	B-3E
Q265	B-3E
Q266	B-3E
Q267	A-2E
Q401	A-5F
Q402	A-5E
Q551	B-2A
Q552	B-1A
Q553	B-1A
Q554	B-2C
Q555	B-1B
Q556	B-1C
Q602	A-5G
Q603	B-5B
Q605	B-4B
Q608	B-4F
Q901	B-3B
Q902	B-2A
Q903	B-3A
Q904	B-3A
Q905	B-3B
Q906	B-4B
Q908	B-2B
Q915	A-3H
Q916	A-3H
Q917	B-4A
Q919	B-2A
Q920	B-4B
Q1101	B-3F
Q1102	B-3G
Q1103	B-2G
Q1104	B-3F
Q1105	A-2C
Q1109	A-1B
Q1110	B-1F
Q1112	A-1A
Q1113	B-1H
Q1114	A-3B
Q1115	A-3B
Q1201	B-4H
Q1202	B-4H
R	
R101	B-4F
R102	B-4F
R103	B-3F
R104	B-3F
R105	A-4E
R106	B-3F
R107	B-3F
R108	B-3F
R109	B-3F
R110	B-3F
R111	B-3F
R112	B-2E
R113	A-1D
R114	A-2E
R115	B-2F
R116	B-2F
R118	B-2E
R119	A-3C
R120	A-3C
R122	A-4C
R123	A-4C
R124	A-4C
R125	A-4C
R126	A-3C
R127	B-1E
R128	B-1E
R129	B-1E
R130	B-1E
R131	B-1E
R132	B-1E
R133	B-1E
R134	B-1E
R135	B-1E
R136	A-1D
R137	B-1E
R138	A-1D
R140	A-1D
R141	B-1E
R142	B-1E
R143	B-1E
R144	B-1E
R145	B-1E
R146	A-1D
R148	B-1E
R149	B-1E
R150	B-1F
R151	B-1F
R152	B-1D
R153	A-1D
R154	A-1D
R155	A-1E
R156	A-1E
R157	B-1E
R158	B-1E
R160	B-1E
R161	B-1D
R162	B-1D
R163	B-1E
R164	B-1D
R165	B-1D
R166	B-1D
R168	B-2D
R169	A-1E
R170	A-1E
R172	B-1D
R173	A-1E
R174	B-1D
R175	B-1D
R177	A-1E
R178	A-1E
R179	A-2E
R180	A-1E
R182	A-1E
R183	B-1E
R184	A-1D
R186	A-1E
R187	A-1D
R189	B-2D
R190	B-2D
R191	B-2C
R192	B-2C
R193	B-2C
R194	B-2D
R195	B-3F
R198	B-1E
R199	A-1D
R201	A-3D
R202	A-3D
R203	B-2E
R205	B-3E
R208	A-2E
R209	A-3E
R210	A-3E
R212	A-3F
R213	A-2D
R215	B-2E
R216	B-2E
R217	B-2E
R218	A-2D
R219	B-2E
R221	A-3F
R222	A-3F
R223	B-2F
R224	B-2E
R225	A-2E
R227	B-2F
R228	B-2F
R229	A-3F
R230	B-3E
R231	B-3E
R234	A-3F
R235	A-2D
R236	A-2D
R237	A-2D
R239	B-2D
R240	B-2D
R241	B-2D
R243	A-2E
R244	B-2D
R245	A-2E
R246	B-2D
R247	B-2D
R248	B-2D
R251	B-3E
R252	B-3E
R255	A-4E
R256	A-4E
R257	A-4E
R258	B-3D
R259	B-3D
R260	B-3D
R261	B-3E
R263	A-3D
R264	B-3D
R265	A-3E
R269	B-4D
R270	B-4D
R271	B-2C
R272	A-2E
R273	B-3D
R274	B-3D
R275	B-3D
R276	B-3D
R278	B-4D
R279	B-3D
R280	B-3D
R282	A-3E
R285	B-3C
R286	A-3F
R287	A-3E
R288	A-3F
R289	B-3C
R290	B-3C
R291	B-3D
R292	B-3D
R293	A-3D
R294	A-3D
R295	A-3D
R296	A-2D
R298	B-3D
R299	B-3E
R343	B-2C
R345	B-2C
R351	B-2E
R352	A-1D
R353	A-3D
R354	A-3D
R356	A-2D
R357	A-3E
R359	B-2E
R362	A-2E
R363	A-3E
R364	A-2E
R365	A-3E
R366	A-3E
R371	A-2E
R372	B-2D
R373	A-3E
R374	B-3D
R377	A-2D
R378	A-2D
R379	B-1E
R381	A-3F
R382	A-3F
R387	A-2E
R388	A-2E
R390	A-2E
R392	A-2E
R394	A-3C
R395	A-2E
R396	B-3C
R398	B-3D
R401	B-4C
R403	B-5C
R404	B-5C
R405	B-5C
R406	A-5F
R407	A-5F
R408	B-5C
R409	A-5F
R410	A-5E
R411	A-5F
R412	B-5D
R413	B-5D
R414	B-5D
R416	B-4D
R418	A-4F
R419	A-4E
R420	B-4D
R421	B-4C
R422	A-4F
R423	A-4F
R424	B-4C
R425	B-4C
R428	B-4D
R429	A-4E
R432	A-4F
R433	A-4F
R434	B-4D
R435	A-4E
R436	A-4F
R437	A-5F
R438	A-4E
R441	A-4D
R442	A-4D
R443	A-4D
R444	A-5E
R445	B-5E
R446	A-5D
R447	A-4D
R448	A-5E
R449	A-5D
R450	A-5E
R451	A-5D
R452	B-5E
R453	B-5E
R454	A-4D
R455	B-4E
R456	B-4E
R467	A-4D
R468	A-5E
R475	A-5E
R481	A-4E
R482	A-4E
R483	B-4D
R485	B-4E
R486	B-4E
R491	A-4E
R493	A-4D
R495	B-5D
R496	B-5D
R497	B-4E
R498	A-5F
R551	B-1B
R552	B-1B
R554	B-1A
R556	B-1A
R558	B-2A
R560	B-2B
R562	B-2B
R566	B-2B
R570	B-2B
R571	B-2B

IDENTIFICATION OF PARTS LOCATION

VCA (MAIN) [Hi-8 TYPE] 3/3

Symbol No.	Parts Location
R572	B-1B
R574	B-2B
R575	B-2C
R576	B-2C
R579	A-1H
R580	A-1H
R581	B-1A
R582	A-1H
R584	B-1B
R585	B-1B
R586	B-1B
R587	B-1B
R588	B-2B
R589	B-2C
R590	B-1C
R591	B-2C
R592	B-1C
R593	B-2B
R594	B-1A
R595	B-1A
R605	B-4B
R606	B-4B
R607	B-5B
R609	B-5B
R610	B-5B
R611	B-5B
R616	A-5G
R620	A-5G
R621	A-5H
R622	A-5H
R623	A-5G
R624	B-5A
R625	B-5A
R626	A-5G
R634	A-5C
R635	B-4F
R637	B-4E
R639	A-4C
R641	A-4C
R641	A-5C
R643	A-4C
R644	B-4F
R645	B-5F
R646	B-4F
R647	A-4C
R648	B-5F
R649	A-4C
R650	A-5C
R651	A-5C
R652	A-5C
R653	A-5C
R656	B-1F
R658	B-5F
R659	A-5G
R663	B-4F
R668	A-2H
R676	B-5B
R680	B-1F
R702	B-4A
R703	B-4A
R704	B-4A
R705	B-4A
R706	B-4A
R707	B-3A
R708	B-3A
R709	B-4A
R710	B-4A
R711	B-4A
R712	B-4A
R715	A-4G
R717	B-2F
R718	A-5G
R719	A-5G
R721	B-4A
R727	B-3B
R732	B-3B
R734	B-3B
R736	B-3B
R738	A-4G
R739	A-4G
R740	A-3G
R745	B-4C
R746	B-3B
R747	A-3G
R748	B-3B
R749	B-5B
R750	B-4A
R751	B-4B
R754	B-3A
R755	B-3A
R761	A-4H
R762	B-1C
R770	A-1E
R771	A-1E
R902	B-2A
R903	B-2A
R906	A-4G
R908	A-3H
R909	B-3A
R910	A-3H
R911	B-3A
R912	B-3B
R913	B-3B
R914	B-3B
R915	B-3B
R916	A-3H
R917	B-4B
R918	B-4B
R919	B-4B
R920	A-4H
R921	A-4H
R926	B-4C
R933	B-3A
R934	B-3A
R935	B-3A
R936	B-4B
R937	B-4B
R938	B-4B
R939	A-4H
R942	B-4B
R944	B-4A
R945	B-5B
R947	B-4B
R948	B-3A
R949	B-4A
R950	B-3B
R951	B-4B
R952	B-2A
R953	B-3A
R954	B-3A
R955	A-3H
R956	A-3H
R957	B-3A
R958	B-4A
R959	B-4B
R960	B-4B
R961	B-4B
R962	B-4B
R963	B-4B
R964	A-4G
R965	A-4G
R967	A-5G
R968	A-4G
R969	B-4B
R973	A-3H
R974	A-3H
R975	A-3H
R976	A-3H
R977	B-4A
R978	B-3B
R979	B-2B
R983	B-4A
R984	B-4A
R985	B-4A
R986	A-4H
R987	B-4A
R988	B-4A
R989	A-4H
R990	B-4A
R991	B-4A
R994	B-4A
R997	B-4A
R998	A-3H
R1101	B-1G
R1102	B-2H
R1103	B-2H
R1104	A-2A
R1105	A-1B
R1106	A-3A
R1107	A-1B
R1108	B-1G
R1109	B-1G
R1111	B-3G
R1113	B-2G
R1114	B-3G
R1115	B-3G
R1116	B-2G
R1117	B-3G
R1118	B-3G
R1119	B-3G
R1121	A-2B
R1122	B-1F
R1123	A-2B
R1134	B-1G
R1135	A-2B
R1136	B-2H
R1138	A-1A
R1139	A-3B
R1140	B-2H
R1141	B-2G
R1143	B-2F
R1144	B-2F
R1145	B-1F
R1146	B-1F
R1147	B-3H
R1148	B-3H
R1150	A-1A
R1151	A-2B
R1153	A-2A
R1154	A-1A
R1155	A-2A
R1156	A-1A
R1157	A-2A
R1160	A-2A
R1162	A-3A
R1163	A-2A
R1170	B-2F
R1171	A-1A
R1172	A-1A
R1173	A-3B
R1174	A-3B
R1175	A-1C
R1180	A-4A
R1181	A-4B
R1182	A-4B
R1183	A-2B
R1184	A-2A
R1197	B-1F
R1198	B-3G
R1201	B-4H
R1202	B-4H
R1203	B-4H
R1204	B-3H
R1205	B-3H
R1206	B-3H
R1207	B-3H
R1208	B-3H
R1209	B-3H
R1213	B-3H
R1214	B-3H
R1215	B-3H
R1216	B-3H
R1217	B-3G
R1218	B-3H
R1219	B-3H
R1220	B-3H
R1221	B-3H
R1222	B-3H
R1223	B-3H
R1224	B-3H
R1225	B-3H
R1226	B-3G
R1230	B-3H
R1231	B-3G
R1232	B-3G
R1233	B-3G
R1234	B-3G
R1235	B-3G
R1236	B-3H
R1307	A-4A
R1308	B-3H
R1309	A-4A
R1310	B-3H
R1311	A-4B
R1313	B-3G
R1314	B-4G
R1315	A-4B
R1316	B-4H
R1318	B-4H
R1319	B-4G
R1320	B-4G
R1321	A-3B
R1322	A-3B
R1323	A-3B
R1324	B-3H
R1338	A-3B
R1342	A-4B
R1343	A-3B
R1344	A-3B
R1345	A-3B
R1346	A-3B
R1347	A-3B
RT	
RT101	B-1E
RT102	B-1D
RT202	B-3E
RT203	B-3E
RT204	B-2D
RT205	B-2D
RT206	B-2D
RT207	B-3D
RT209	B-2D
RT210	B-3D
RT211	B-3D
RT212	B-3D
RT214	B-3D
RT215	B-3E
RT216	B-3D
RT217	B-3D
RT401	B-4C
RT402	B-4B
RT404	B-5D
RT405	B-4D
S	
S901	B-1B
S902	B-1A
S903	B-3A
S904	B-2A
S905	B-2A
S906	B-3A
S907	B-4A
S909	B-1A
T	
T551	A-1F
TP	
TP101	B-1F
TP102	B-1F
TP201	B-2E
TP202	B-2D
TP203	B-2E
TP204	B-2D
TP205	B-3E
TP206	B-2D
TL	
TL402	A-4E
TL403	A-4F
TL407	A-5E
TL408	A-5F
TL1155	B-2G
TL1164	B-3G
TL1175	B-1F
TL1303	A-4A
TL1306	A-4A
TL1307	A-4A
TL1309	A-4A
TL1311	A-4A
TL1312	A-4A
TL1314	A-4A
TL1340	B-3G
TL1349	B-3G
TL1350	B-3G
X	
X201	A-2C
X601	A-5G
X901	A-3G
X902	B-4B
X1101	A-2B

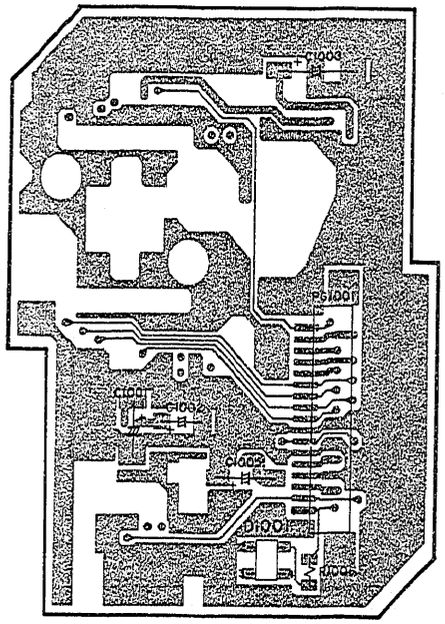
VCA CIRCUIT BOARD [SIDE-B] (Hi-8 TYPE) -TYPE 59-



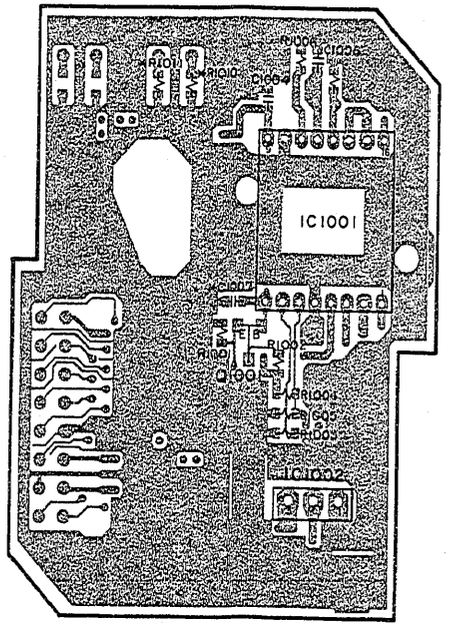
VCA(MAIN)-SIDE B-
(PATTERN No.JA1032-6)

NOTE : SOLDER SEMI-VARIABLE RESISTORS TO THE COMPONENTS MARKED "#" WHEN ADJUSTING THEN.

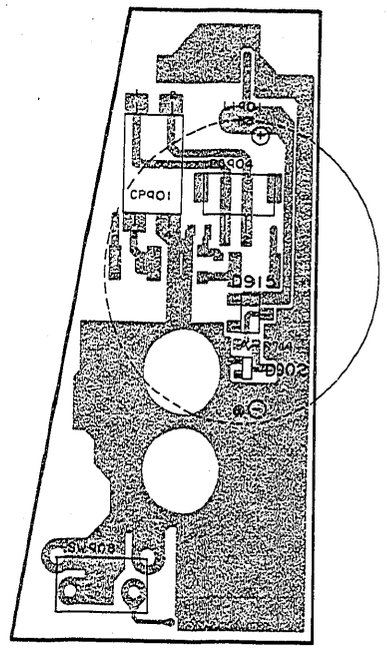
SP. HTS9551B. RTB CIRCUIT BOARDS

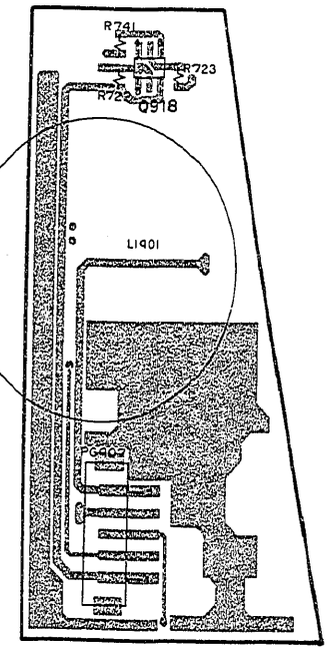


SP (SENSOR) – SIDE A –
[PATTERN No. JA1032-6]



SP (SENSOR) – SIDE B –



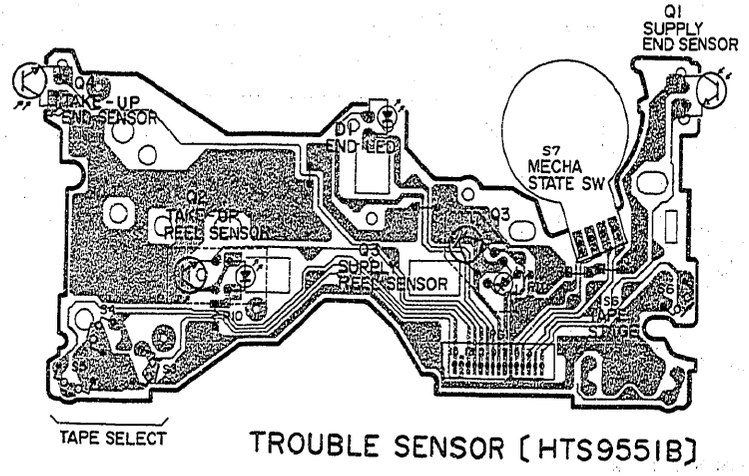


RTB (REC SW/BATT.) – SIDE A – RTB (REC SW/ BATT.) – SIDE B –
[PATTERN No. JA1032-6]

DIFFERENCE TABLE

SP(SENSOR)

SYMBOL-No.	TYPE 59	TYPE 52/54/ 56/58
C1007	×	○
R1010	×	○
R1011	○	×



TROUBLE SENSOR [HTS9551B]

MEMO

IDENTIFICATION OF PARTS LOCATION

EMQ

Symbol No.	Parts Location
C	
C2001	B-1B
C2002	B-2A
C2003	B-2A
C2004	A-3A
C2005	A-4A
C2006	A-3B
C2007	A-3B
C2008	B-2A
C2009	A-4A
C2011	A-3A
C2012	A-3A
C2013	A-1A
C2014	A-1A
C2015	A-2B
C2016	A-2A
C2017	B-1A
C2018	B-1A
CS	
CS2001	A-3B
D	
D2001	B-3A
D2002	A-4B
IC	
IC2001	A-1B
L	
L2001	B-3A
L2002	A-4A
PG	
PG2001	A-2A
PG2002	A-1B
Q	
Q2001	A-3A
Q2002	A-2A
R	
R2001	A-4A
R2002	A-3B
R2003	A-3A
R2004	A-3A
R2005	A-3A
R2006	A-4B
R2007	A-3B
R2008	A-3A
R2009	A-2A
R2011	A-3A
R2012	A-2A
R2013	A-2A
R2014	A-2A
R2015	A-1A
R2016	B-1A
R2017	A-2A
R2018	A-2A
R2019	A-2A
R2020	A-1A
R2021	B-1A

Symbol No.	Parts Location
R2022	A-1B
R2024	A-3A
R2025	A-2B
R2026	B-1A
R2027	B-1A
RT	
RT2001	A-2B
RT2002	A-2B
RT2003	B-1A
T	
T2001	A-4A

CRM

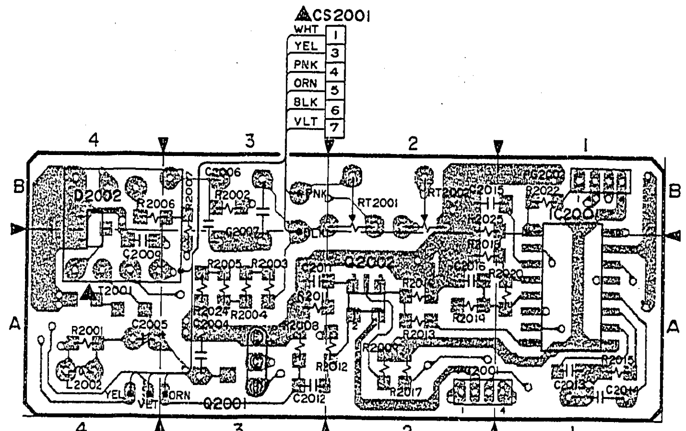
Symbol No.	Parts Location
C	
C2101	A-6A
C2102	A-6A
C2103	B-5A
C2104	B-5A
C2105	A-6B
C2106	B-5B
C2107	B-5B
C2108	B-5B
C2109	B-5B
C2110	A-4B
C2111	A-4B
C2112	A-4B
C2113	B-4B
C2114	A-4B
C2115	B-4A
C2116	A-4A
C2117	B-5B
C2118	A-4A
C2119	B-5A
C2120	B-5A
C2121	B-5A
C2122	B-5A
C2123	A-4A
C2124	A-4A
C2181	B-4A
C2182	A-3A
C2183	B-3A
C2184	B-3A
C2185	A-2A
C2186	B-3B
C2187	A-3A
C2188	B-4B
C2189	A-4B
C2190	A-3A
C2191	B-4A
C2193	A-2A
C2194	A-2B
CP	
CP2101	B-4B
D	
D2101	B-2B
D2102	B-1B
D2103	A-1B
D2181	B-3B
D2182	B-3B
IC	
IC2101	A-5A
IC2181	A-3A
L	
L2181	A-3A
L2182	A-3B
L2183	A-2B
L2184	A-3B
L2185	A-2B

Symbol No.	Parts Location
PG	
PG2101	A-5A
PG2102	A-5A
Q	
Q2182	A-2A
R	
R2101	A-6A
R2102	A-6A
R2103	B-6A
R2104	B-5A
R2105	B-5B
R2106	B-5A
R2107	B-5B
R2108	B-5A
R2109	B-5A
R2110	A-4B
R2111	B-5B
R2114	A-4B
R2115	A-4A
R2117	B-5A
R2118	B-5A
R2119	B-4A
R2120	B-5A
R2124	A-2B
R2125	A-2B
R2126	A-1B
R2127	A-1A
R2128	A-2B
R2129	A-2B
R2130	A-2B
R2131	A-1A
R2181	A-2A
R2182	A-2A
R2183	A-2B
R2184	A-3A
R2185	B-3A
R2186	B-3A
R2187	A-3A
R2188	A-3A
RT	
RT2101	A-2B
RT2102	A-1B
RT2103	A-1B
RT2104	B-2B
RT2181	B-2A
T	
T2181	B-3A
TP	
TP2101	A-6A
TP2102	A-6A
TP2103	A-4A
TP2104	A-4A
X	
X2101	A-6A

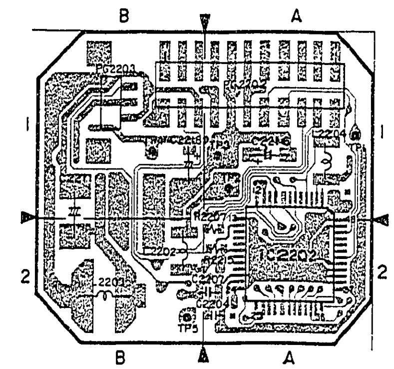
LCD

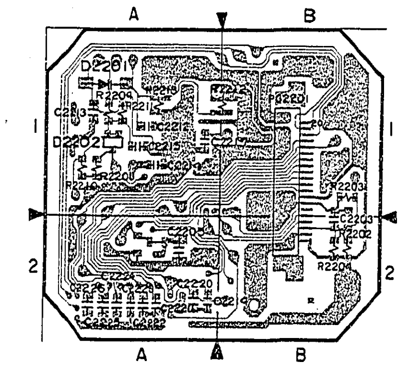
Symbol No.	Parts Location
C	
C2203	B-2B
C2204	A-2A
C2205	B-2A
C2207	A-2A
C2211	A-1B
C2212	B-1A
C2213	B-1A
C2214	B-1A
C2215	B-1A
C2216	A-1A
C2217	B-1A
C2218	A-1B
C2219	B-2A
C2220	B-2A
C2221	B-2A
C2222	B-2A
C2223	B-2A
C2224	B-2A
C2225	B-2A
C2226	B-2A
CN	
CN2204	A-2B
D	
D2201	B-1A
D2202	B-1A
IC	
IC2202	A-2A
L	
L2202	A-2B
L2203	A-2B
L2204	A-1A
PG	
PG2201	B-1B
PG2202	A-1A
PG2203	A-1B
R	
R2202	B-2B
R2203	B-1B
R2204	B-2B
R2207	A-2A
R2208	B-1A
R2209	B-1A
R2210	B-1A
R2211	B-1A
R2212	B-1B
R2213	B-1A
R2215	A-2A
TP	
TP1	A-1A
TP2	A-1A
TP3	A-1A
TP4	A-1B
TP5	A-2B

EMQ. HTS9583. CRM CIRCUIT BOARDS

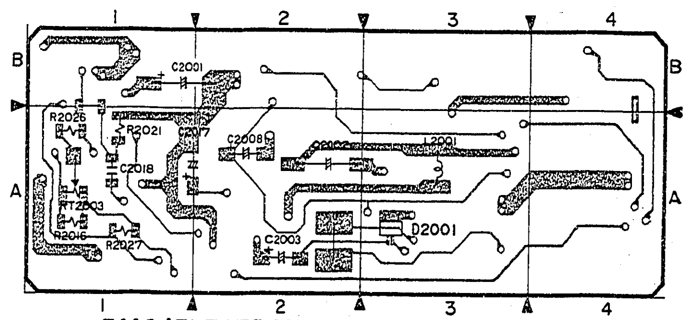


EMQ (ELECTRONIC VIEWFINDER) — SIDE A —
(PATTERN No.152035-1)

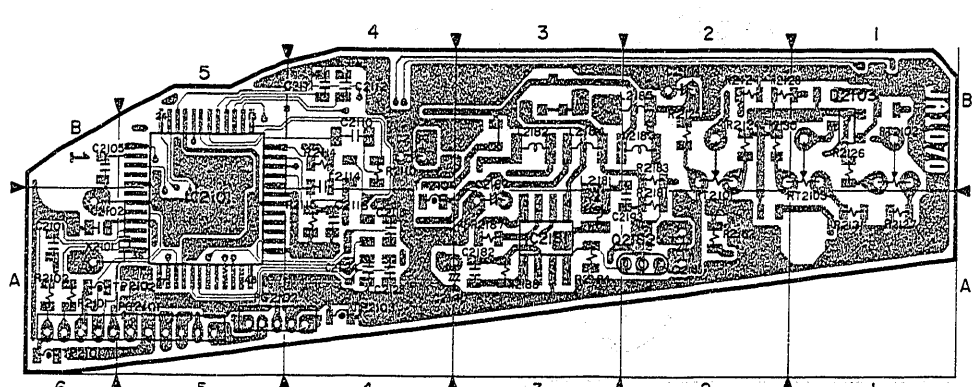




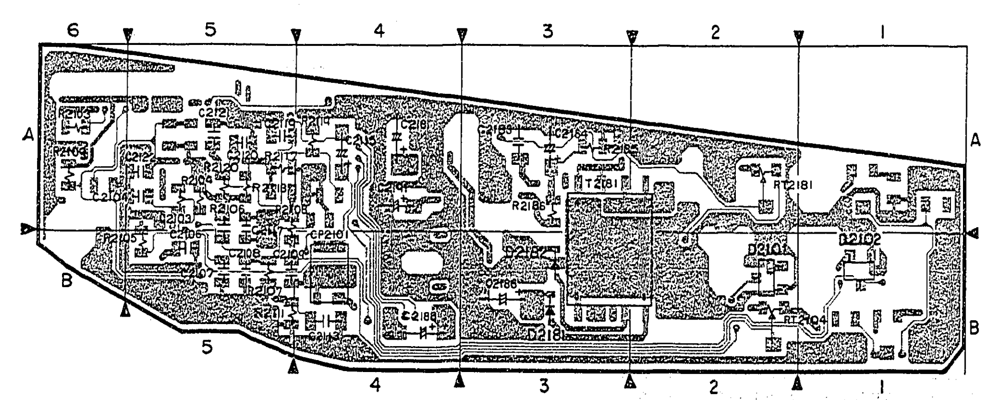
LCD DRIVE [HTS9583] — SIDE A — LCD DRIVE [HTS9583] — SIDE B —
(PATTERN No. JA1098-1)



EMQ (ELECTRONIC VIEWFINDER) — SIDE B —
(PATTERN No.152035-1)



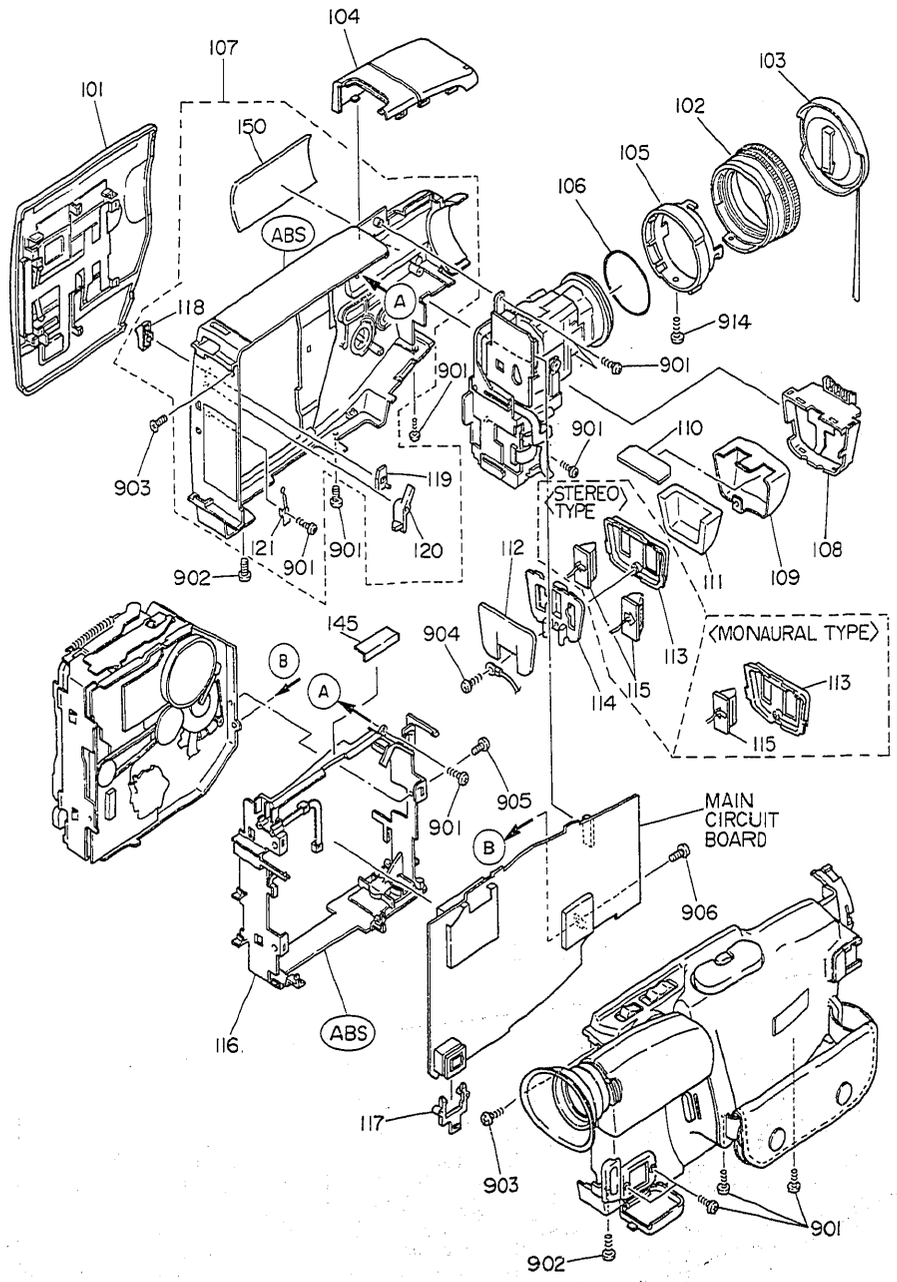
CRM (EVF DRIVE) — SIDE A —
(PATTERN No.JA1070-1)



CRM (EVF DRIVE) — SIDE B —
(PATTERN No.JA1070-1)

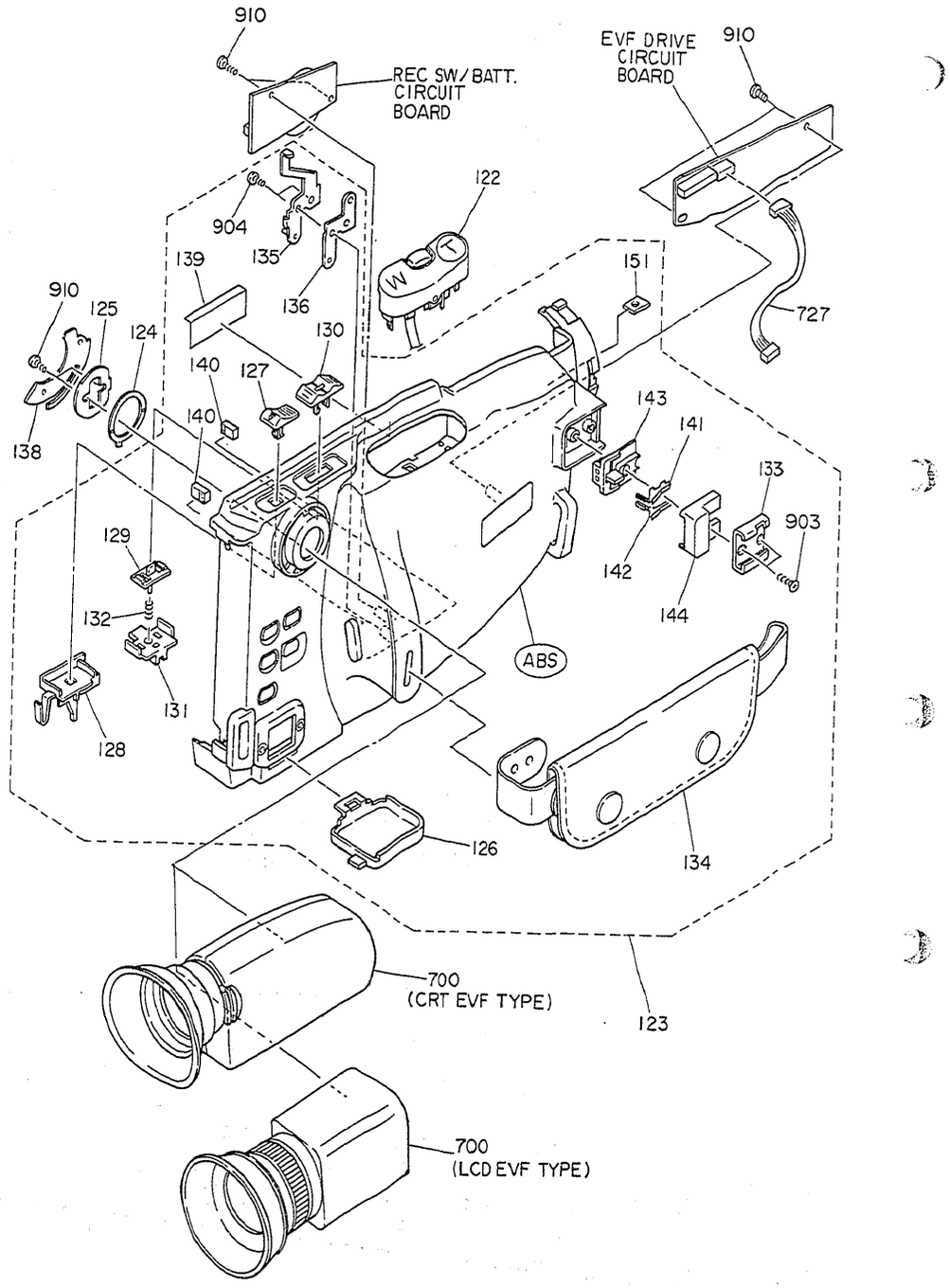
EXPLODED VIEWS

1. CABINET SECTION (I)



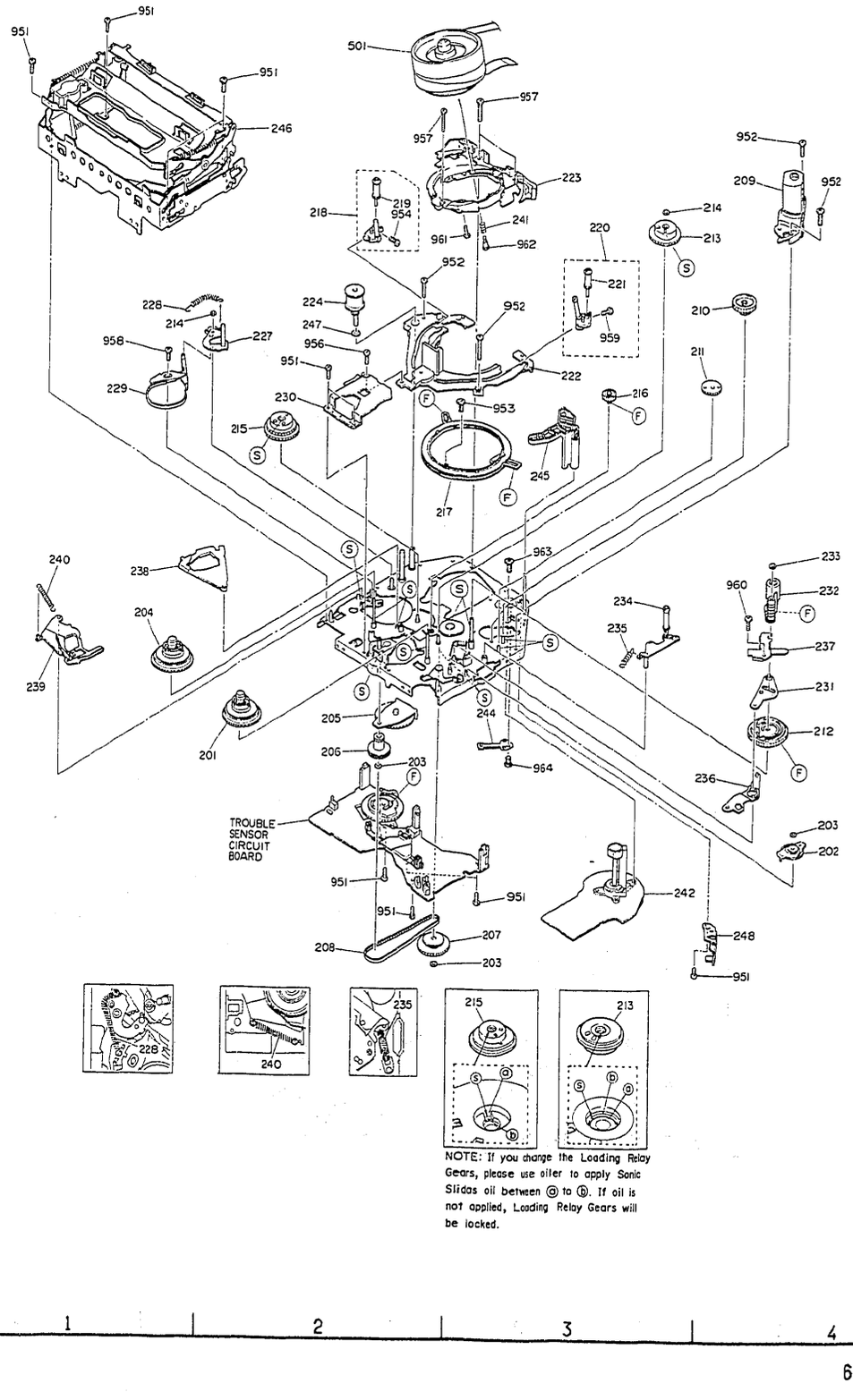
NOTE : THE SYNTHETIC RESIN MEMBERS THAT CAN BE DISMANTLED ARE SHOWN BY ABBREVIATIONS USING LETTERS.

2. CABINET SECTION (II)

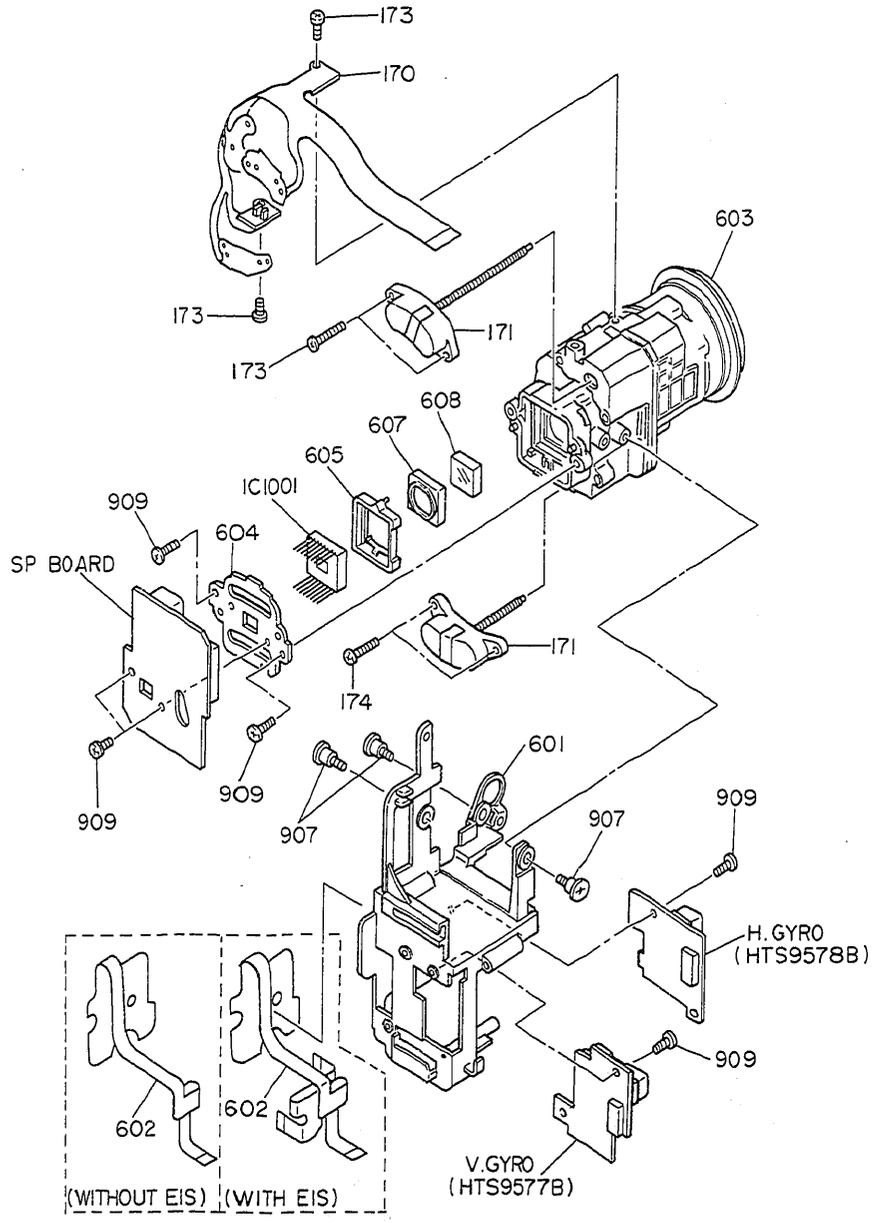


NOTE : THE SYNTHETIC RESIN MEMBERS THAT CAN BE DISMANTLED ARE SHOWN BY ABBREVIATIONS USING LETTERS.

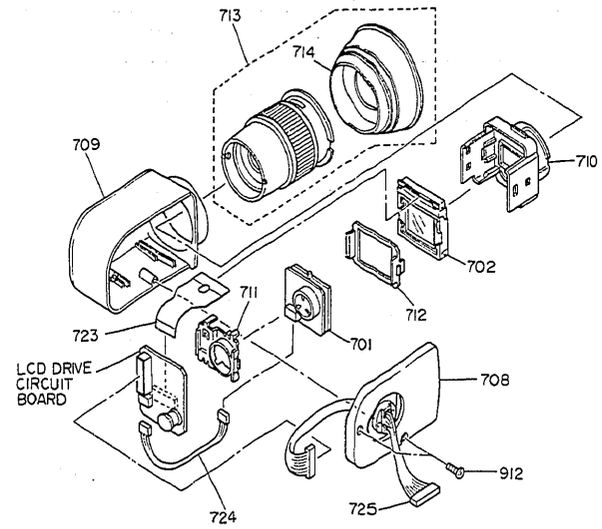
3. CHASSIS SECTION



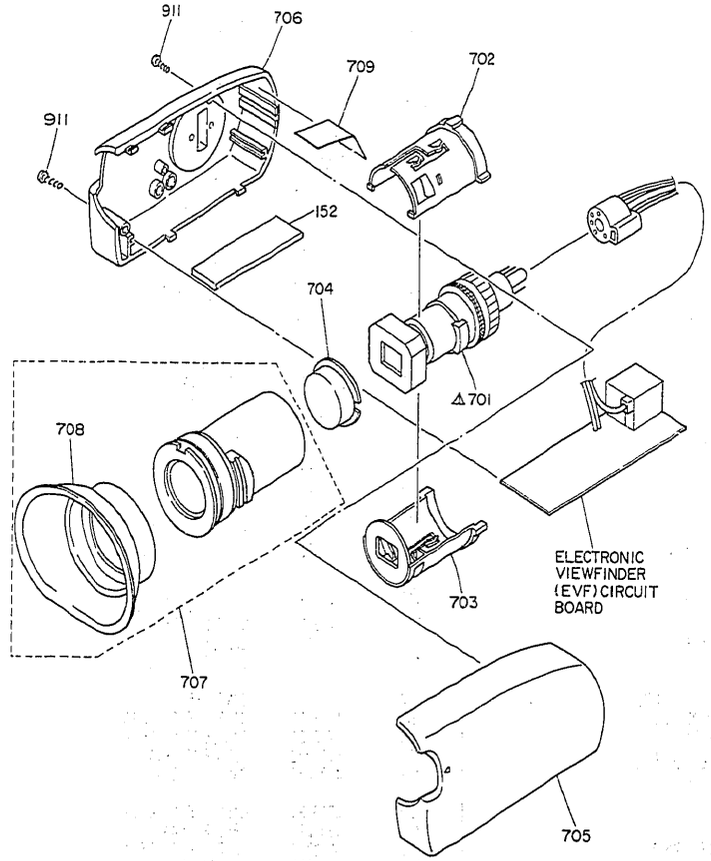
4. CAMERA BLOCK SECTION



5. ELECTRONIC VIEWFINDER (LCD EVF) SECTION



6. ELECTRONIC VIEWFINDER (CRT EVF) SECTION



REPLACEMENT PARTS LIST

Note : This replacement parts list applies to the following model.
Applicable model: VM-E54A/VM-E58A

SYMBOL-NO	P-NO	DESCRIPTION
		MECHANISM SECTION
101	QD10662	LID, CASSETTE[E54A]
101	QD10664	LID, CASSETTE[E58A]
102	QX10253	RING, LENS
103	QX10191	CAP, FOOD
104	QD10711	WINDOW, IR
105	QX10271	RING, LENS(B)
106	4592537	RING
107	QD10622	CASE, SIDE(L) [E54A]
107	QD10624	CASE, SIDE(L) [E58A]
108	4716962	CASE, MICROPHONE
109	6680221	METAL
110	6568341	CUSHION
111	4345051	CUSHION
112	6568311	CUSHION
113	6408542	HOLDER, MICROPHONE
114	6408551	HOLDER, MICROPHONE
115	5422703	MICROPHONE
116	6186492	FRAME, MECHANISM
117	6408603	HOLDER
118	4750433	KNOB, EJECT
119	6408592	HOLDER
120	6443182	LEVER, EJECT
121	6529111	SPRING
122	5604851	SWITCH, T/W
123	QD10691	CASE, SIDE(R) [E54A]
123	QD10693	CASE, SIDE(R) [E58A]
124	4899872	SPRING
125	4826123	STOPPER
126	4725552	COVER, CONNECTOR
127	4752075	KNOB, EJECT
128	6408571	HOLDER
129	4750451	KNOB, POWER
130	4752263	HOLDER, POWER KNOB
131	6408582	HOLDER
132	6305733	SPRING
133	7797471	SHOE
134	PV10141	STRAP, HAND
135	4826111	PLATE, STRAP
136	4344712	SHEET
138	4345032	SHEET, EVF
139	4391831	SHEET[E58A]
139	MN10581	SHEET[E54A]
140	4592441	SPACER
141	4590292	TERMINAL L
142	4590302	TERMINAL R
143	4590282	HOLDER
144	4714821	COVER, TERMINAL
145	4345142	SPACER
150	QD10651	COVER, SIDE
151	NA10221	NUT
152	MN10461	SHEET[E54A]
170	KQ10191	FLEXIBLE
171	KQ10192	MOTOR, AUTO FOCUS
172	KQ10193	MOTOR, POWER ZOOM
173	KQ10194	SCREW(1.7X4.5)
174	KQ10195	SCREW(1.7X7.0)
201	6404061	REEL DISK, TAKE-UP
202	6406114	GEAR
203	7787733	WASHER
204	6404072	REEL DISK SUPPLY
205	6401644	GEAR, IDLER
206	6406211	GEAR
207	6406034	GEAR, PULLEY
208	6358471	BELT
209	4589113	LOADING MOTOR BLOCK
210	6376311	GEAR
211	6406081	GEAR
212	6406242	GEAR
213	6405832	GEAR[E58A]
213	6405833	GEAR[E54A]
214	7787731	WASHER
215	6405823	GEAR
216	6406131	GEAR
217	4588464	RING, LOADING
218	4589354	BAS. GUIDE ROLLER(I)
219	KX10171	GUIDE ROLLER
220	4589364	BAS. GUIDE ROLLER(O)
221	4588907	GUIDE ROLLER
222	4587795	PLATE, GUIDE
223	4589005	BASE, CYLINDER
224	6406155	ROLLER, IMPEDANCE
227	4589011	ARM, TENSION
228	6554231	SPRING
229	4588553	BAND, TENSION
230	6408831	COVER, IDLER
231	NA10601	PLATE
232	4588294	ARM, PRESSURE ROLLER
233	7787571	WASHER
234	4588701	ARM, PULL OUT
235	6554201	SPRING
236	4588233	LEVER
237	4588531	PLATE
238	4588428	PLATE
239	4588352	BRAKE
240	6554221	SPRING
241	6554214	SPRING
242	5579651	MOTOR, CAPSTAN
244	5794021	BRUSH
245	4588994	COVER, TAPE
246	4589094	CASSETTE HOLDER ASSY
247	7789314	WASHER
248	4827261	BRACKET
501	5435741	CYLINDER ASSY (CY-53C)
601	NT10142	FRAME. LENS
602	FC10111	SWITCH[E58A]
603	KQ10161	LENS ZOOM ASSY
604	4827371	BRACKET
605	6409181	HOLDER, SENSOR
607	4592621	RUBBER
608	5783253	FILTER
700	UX10161	EVF ASSY[E54A]
700	UX10171	EVF ASSY[E58A]
△701	5319061	CRT[E54A]
701	DT10121	BACK LIGHT[E58A]
702	4715252	CASE, CRT[E54A]
702	DB10161	LCD[E58A]
703	4715241	CASE, CRT(B) [E54A]
704	4592241	COVER[E54A]
705	4717316	CASE, EVF(R) [E54A]
706	4715866	CASE, EVF(L) [E54A]
707	4715333	LENS, EVF[E54A]
708	4798482	CAP, EYE[E54A]
708	QD10731	CASE, EVF(L) [E58A]
709	4344291	SPACER[E54A]
709	QD10741	CASE, EVF(R) [E58A]
710	QD10581	HOLDER, LCD[E58A]
711	QD10571	HOLDER[E58A]
712	QD10611	PIECE[E58A]
713	4717041	LENS, EVF[E58A]
714	4798771	CAP, EYE[E58A]
723	JD10161	FLEXIBLE[E58A]
724	5846771	CONNECTOR[E58A]
725	5842123	CONNECTOR[E58A]
727	5844973	CONNECTOR[E58A]
901	7775946	SCREW (2X6)
902	7775963	SCREW(2X3)
903	8639106	SCREW
904	8691106	SCREW (2X6)
905	7773891	SCREW
906	8650103	SCREW(2X3)
907	MJ10221	SCREW
909	8691105	SCREW(2X5)
910	7775945	SCREW(2X5)
912	8619003	SCREW 1.7X5
914	7775966	SCREW(2X6)
951	8712024	PAN HEAD SCREW-1.4MMDX3MM
952	8700272	SCREW(1.7X5)
953	7775921	SCREW(1.4X2)
954	8714004	SCREW(1.4X2.5)
955	8712024	PAN HEAD SCREW-1.4MMDX3MM
956	8619065	SCREW(1.7X6)
957	8700976	SCREW(1.7X8.0)
958	7770791	SCREW
959	8712904	SCREW(1.4X2.0)
960	8619063	SCREW(1.7X3)
961	MJ10201	SCREW(2X5)
962	7785886	SCREW
963	8700264	1.7X2 SCREW
964	8741103	SCREW(2X3)
		FOR ACCESSARIE
△802	TS10961	AC ADAPTOR(VM-AC83A)
803	5861832	POWER CONNECTOR
804	5860783	AUDIO/VIDEO OUTPUT CABLE
805	5616582	REMOTE HAND SET(VM-RM70A)
806	4135998	STRAP, SHOLDER[E54A]
807	4135998	STRAP, SHOLDER[E58A]

ACCESSORIES

AC ADAPTER/CHARGER <VM-AC91A>	AC ADAPTER/CHARGER <VM-AC83A>	EXTERNAL POWER ADAPTER	AV OUTPUT CORD (For Hi-8 MODEL)	AV OUTPUT CORD (For STEREO MODEL)
AV OUTPUT CORD (For MONAURAL MODEL)	REMOTE CONTROLLER <VM-RM70A>	SHOULDER STRAP	⚠	
⚠ +	WARNING: Keep this battery away from children. If swallowed, consult a physician immediately for emergency treatment.			

SYMBOL-NO	P-NO	DESCRIPTION
		CAMERA & VCR CECTION
C0101	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0102	0206593	ELECTROLYTIC 47UF 10V
C0103	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0104	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0105	0893122	CERAMIC CHIP 47PF+-5% 50V
C0106	0893122	CERAMIC CHIP 47PF+-5% 50V
C0107	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0108	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0110	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0111	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0112	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0113	0806011	ELECTROLYTIC 1.0UF 16V
C0118	0893121	CERAMIC CHIP 39PF+-5% 50V
C0119	0893119	CERAMIC CHIP 33PF+-5% 50V
C0120	0893122	CERAMIC CHIP 47PF+-5% 50V
C0121	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0125	0893149	CERAMIC CHIP 12PF+-5% 50V
C0126	0893158	CERAMIC CHIP 56PF+-5% 50V
C0127	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0128	0893167	CERAMIC CHIP 270PF+-5% 50V
C0129	0893122	CERAMIC CHIP 47PF+-5% 50V
C0130	0893159	CERAMIC CHIP 68PF+-5% 50V
C0131	0893121	CERAMIC CHIP 39PF+-5% 50V
C0134	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0135	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0137	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C0138	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0140	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0141	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0142	0202158	CERAMIC CHIP 75PF+-5% 50V
C0143	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0146	0893215	CERAMIC CHIP 3300PF+-10% 50V
C0147	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0148	0806168	ELECTROLYTIC 47UF 6.3V
C0149	0893214	CERAMIC CHIP 2700PF+-10% 50V
C0150	0202158	CERAMIC CHIP 75PF+-5% 50V
C0151	0893121	CERAMIC CHIP 39PF+-5% 50V
C0152	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0153	0893167	CERAMIC CHIP 270PF+-5% 50V
C0154	0893162	CERAMIC CHIP 100PF+-5% 50V
C0157	0893122	CERAMIC CHIP 47PF+-5% 50V
C0161	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0163	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0166	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0167	0806168	ELECTROLYTIC 47UF 6.3V
C0168	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0169	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0177	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0203	0893102	CERAMIC CHIP 1.0PF+-0.25% 50V
C0204	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0205	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0206	0806024	ELECTROLYTIC 3.3UF 6.3V
C0207	0806168	ELECTROLYTIC 47UF 6.3V
C0208	0893227	CERAMIC CHIP 0.22UF+80-20% 16V
C0209	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0213	0893163	CERAMIC CHIP 120PF+-5% 50V
C0214	0893059	CERAMIC CHIP 0.47UF+80-20% 16V
C0215	0806003	ELECTROLYTIC 0.22UF 35V
C0216	0893122	CERAMIC CHIP 47PF+-5% 50V
C0217	0806168	ELECTROLYTIC 47UF 6.3V
C0218	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0220	0893124	CHIP CERAMIC 68PF+-5% 50V

SYMBOL-NO	P-NO	DESCRIPTION
C0223	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0225	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0227	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0229	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0230	0893114	CERAMIC CHIP 12PF+-5% 50V
C0232	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0233	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0234	0806027	ELECTROLYTIC 4.7UF 4V
C0235	0806124	ELECTROLYTIC 10UF 4V
C0236	0806027	ELECTROLYTIC 4.7UF 4V
C0237	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0238	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0239	0806027	ELECTROLYTIC 4.7UF 4V
C0240	0806027	ELECTROLYTIC 4.7UF 4V
C0241	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0242	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0243	0806153	ELECTROLYTIC 10UF 16V
C0244	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0245	0806156	ELECTROLYTIC 22UF 4V[E58A]
C0246	0893162	CERAMIC CHIP 100PF+-5% 50V
C0247	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0248	0806186	ELECTROLYTIC 220UF 6.3V
C0249	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0250	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0251	0893117	CERAMIC CHIP 22PF+-5% 50V
C0253	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0256	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0258	0893121	CERAMIC CHIP 39PF+-5% 50V
C0259	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0260	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0262	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0263	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0264	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0265	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0266	0806153	ELECTROLYTIC 10UF 16V
C0267	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0268	0806124	ELECTROLYTIC 10UF 4V
C0269	0893106	CERAMIC CHIP 4.0PF+-0.25% 50V
C0270	0893117	CERAMIC CHIP 22PF+-5% 50V
C0271	0893152	CERAMIC CHIP 18PF+-5% 50V
C0272	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0273	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0275	0806024	ELECTROLYTIC 3.3UF 6.3V
C0276	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0277	0806153	ELECTROLYTIC 10UF 16V
C0278	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C0279	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0280	0893227	CERAMIC CHIP 0.22UF+80-20% 16V
C0281	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0282	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0283	0893161	CERAMIC CHIP 82PF+-5% 50V
C0284	0806153	ELECTROLYTIC 10UF 16V[E58A]
C0285	0893159	CERAMIC CHIP 68PF+-5% 50V
C0287	0893166	CERAMIC CHIP 220PF+-5% 50V
C0288	0806153	ELECTROLYTIC 10UF 16V
C0289	0806178	ELECTROLYTIC 220UF 4V
C0292	0806146	ELECTROLYTIC 2.2UF 50V
C0293	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0296	0893163	CERAMIC CHIP 120PF+-5% 50V
C0297	0893109	CERAMIC CHIP 7.0PF 50V
C0299	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0374	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0375	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C0376	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0379	0806153	ELECTROLYTIC 10UF 16V

SYMBOL-NO	P-NO	DESCRIPTION
C0381	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C0382	0806005	ELECTROLYTIC 0.47UF 25V
C0390	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C0391	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0394	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0395	0806168	ELECTROLYTIC 47UF 6.3V
C0399	0806153	ELECTROLYTIC 10UF 16V
C0400	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0401	0893119	CERAMIC CHIP 33PF+-5% 50V
C0402	0806011	ELECTROLYTIC 1.0UF 16V
C0403	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0405	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0406	0893059	CERAMIC CHIP 0.47UF+80-20% 16V
C0407	0893035	CERAMIC CHIP 2200PF+-10% 50V
C0408	0893033	CERAMIC CHIP 1500PF+-10% 50V
C0409	0806162	ELECTROLYTIC 33UF 4V
C0410	0806018	ELECTROLYTIC 2.2UF 6.3V
C0411	0806027	ELECTROLYTIC 4.7UF 4V
C0412	0893175	CERAMIC CHIP 10000PF+-5% 50V
C0413	0893175	CERAMIC CHIP 10000PF+-5% 50V
C0414	0893059	CERAMIC CHIP 0.47UF+80-20% 16V
C0415	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0416	0893171	CERAMIC CHIP 470PF+-5% 50V
C0417	0893215	CERAMIC CHIP 3300PF+-10% 50V
C0418	0806024	ELECTROLYTIC 3.3UF 6V
C0419	0202328	CERAMIC CHIP 1.0UF+80-20% 16V
C0420	0202328	CERAMIC CHIP 1.0UF+80-20% 16V
C0421	0202328	CERAMIC CHIP 1.0UF+80-20% 16V
C0422	0202328	CERAMIC CHIP 1.0UF+80-20% 16V
C0423	0806027	ELECTROLYTIC 4.7UF 4V
C0424	0806153	ELECTROLYTIC 10UF 16V
C0427	0202328	CERAMIC CHIP 1.0UF+80-20% 16V
C0429	0806153	ELECTROLYTIC 10UF 16V
C0445	0893166	CERAMIC CHIP 220PF+-5% 50V
C0447	0202326	CERAMIC CHIP 0.47UF+-10% 16V
C0448	0893197	CERAMIC CHIP 0.022UF+-10% 25V
C0449	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0450	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C0451	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C0452	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C0453	0202328	CERAMIC CHIP 1.0UF+80-20% 16V
C0455	0806011	ELECTROLYTIC 1.0UF 16V
C0460	0806168	ELECTROLYTIC 47UF 6.3V
C0461	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0466	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C0467	0893186	CERAMIC CHIP 0.033UF+-10% 16V
C0469	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0470	0893184	CERAMIC CHIP 0.022UF+-10% 16V
C0471	0893192	CERAMIC CHIP 8200PF+-10% 25V
C0472	0893184	CERAMIC CHIP 0.022UF+-10% 16V
C0473	0893184	CERAMIC CHIP 0.022UF+-10% 16V
C0474	0893242	CERAMIC CHIP 0.022UF+80-20% 50V
C0475	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0476	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0477	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0478	0806146	ELECTROLYTIC 2.2UF 50V
C0487	0806153	ELECTROLYTIC 10UF 16V
C0491	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0492	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0495	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0496	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0499	0806168	ELECTROLYTIC 47UF 6.3V
C0551	0893155	CERAMIC CHIP 33PF+-5% 50V
C0552	0893217	CERAMIC CHIP 4700PF+-10% 50V
C0553	0893014	CERAMIC CHIP 0.01UF+-10% 25V

SYMBOL-NO	P-NO	DESCRIPTION
C0554	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C0555	0209942	CERAMIC CHIP 10OPF+-5% 50V
C0556	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C0558	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C0559	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C0560	0893202	CERAMIC CHIP 330PF+-10% 50V
C0561	0893165	CERAMIC CHIP 180PF+-5% 50V
C0562	0893203	CERAMIC CHIP 390PF+-10% 50V
C0563	0893158	CERAMIC CHIP 56PF+-5% 50V
C0564	0893202	CERAMIC CHIP 330PF+-10% 50V
C0565	0893155	CERAMIC CHIP 33PF+-5% 50V
C0566	0806148	ELECTROLYTIC 3.3UF 50V
C0568	0206671	ELECTROLYTIC 10UF 10V
C0570	0206671	ELECTROLYTIC 10UF 10V
C0571	0206671	ELECTROLYTIC 10UF 10V
C0573	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0574	0806157	ELECTROLYTIC 22UF 6.3V
C0577	0206671	ELECTROLYTIC 10UF 10V
C0578	0206671	ELECTROLYTIC 10UF 10V
C0579	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0580	0206671	ELECTROLYTIC 10UF 10V
C0584	0206671	ELECTROLYTIC 10UF 10V
C0585	0806173	ELECTROLYTIC 100UF 4V
C0586	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0587	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0588	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0589	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0591	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0592	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0593	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0594	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0595	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0596	0893062	CERAMIC CHIP 1UF+80-20% 16V[E54A]
C0605	0893206	CERAMIC CHIP 680PF+-10% 50V
C0607	0893199	CERAMIC CHIP 220PF+-10% 50V
C0609	0893206	CERAMIC CHIP 680PF+-10% 50V
C0611	0893202	CERAMIC CHIP 330PF+-10% 50V
C0617	0806149	ELECTROLYTIC 4.7UF 25V
C0618	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0619	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0620	0893122	CERAMIC CHIP 47PF+-5% 50V
C0621	0893122	CERAMIC CHIP 47PF+-5% 50V
C0622	0893184	CERAMIC CHIP 0.022UF+-10% 16V
C0623	0893184	CERAMIC CHIP 0.022UF+-10% 16V
C0624	0893184	CERAMIC CHIP 0.022UF+-10% 16V
C0627	0806173	ELECTROLYTIC 100UF 4V
C0630	0893186	CERAMIC CHIP 0.033UF+-10% 16V
C0631	0893186	CERAMIC CHIP 0.033UF+-10% 16V
C0632	0893186	CERAMIC CHIP 0.033UF+-10% 16V
C0633	0806153	ELECTROLYTIC 10UF 16V
C0634	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0635	0202326	CERAMIC CHIP 0.47UF+-10% 16V
C0636	0806145	ELECTROLYTIC 1UF 50V
C0639	0893011	CERAMIC CHIP 0.15UF+-10% 16V
C0640	0202327	CERAMIC CHIP 0.22UF+-10% 16V
C0641	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C0642	0893182	CERAMIC CHIP 0.015UF+-10% 16V
C0643	0893182	CERAMIC CHIP 0.015UF+-10% 16V
C0644	0893182	CERAMIC CHIP 0.015UF+-10% 16V
C0645	0893182	CERAMIC CHIP 0.015UF+-10% 16V
C0649	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0650	0893055	CERAMIC CHIP 0.1UF+80-20% 16V
C0652	0893202	CERAMIC CHIP 330PF+-10% 50V
C0653	0893204	CERAMIC CHIP 470PF+-10% 50V
C0654	0806153	ELECTROLYTIC 10UF 16V

SYMBOL-NO	P-NO	DESCRIPTION
C0658	0893115	CERAMIC CHIP 15PF+-5% 50V
C0659	0893115	CERAMIC CHIP 15PF+-5% 50V
C0901	0206595	ELECTROLYTIC,CHIP 180UF 10V
C0902	0893059	CERAMIC CHIP 0.47UF+80-20% 16V
C0903	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0904	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0905	0806168	ELECTROLYTIC 47UF 6.3V
C0907	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C0908	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0909	0806174	ELECTROLYTIC 100UF 6.3V
C0910	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0912	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0913	0893208	CERAMIC CHIP 1000PF+-10% 50V
C0914	0806174	ELECTROLYTIC 100UF 6.3V
C0919	0893115	CERAMIC CHIP 15PF+-5% 50V
C0920	0893115	CERAMIC CHIP 15PF+-5% 50V
C0921	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0922	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0923	0893118	CERAMIC CHIP 27PF+-5% 50V
C0924	0893118	CERAMIC CHIP 27PF+-5% 50V
C0926	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0928	0893119	CERAMIC CHIP 33PF+-5% 50V
C0929	0893126	CERAMIC CHIP 100PF+-5% 50V
C0930	0893131	CERAMIC CHIP 220PF+-5% 50V[E54A]
C0933	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0934	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0935	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0936	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0937	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C0942	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C0944	0806168	ELECTROLYTIC 47UF 6.3V
C0947	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0951	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C0956	0893162	CERAMIC CHIP 100PF+-5% 50V
C0957	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C0958	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C0959	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1001	0806095	ELECTROLYTIC 47UF
C1002	0806147	ELECTROLYTIC 3.3UF 35V
C1003	0806169	ELECTROLYTIC 47UF 16V
C1004	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1005	0806163	ELECTROLYTIC 33UF 10V
C1006	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1007	0893114	CERAMIC CHIP 12PF+-5% 50V
C1101	0893117	CERAMIC CHIP 22PF+-5% 50V
C1102	0893008	CERAMIC CHIP 0.1UF +-10% 16V
C1103	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1104	0806018	ELECTROLYTIC 2.2UF 6.3V
C1105	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C1106	0893188	CERAMIC CHIP 0.047UF+-10% 16V
C1107	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1108	0806167	ELECTROLYTIC 47UF 4V
C1109	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1110	0806167	ELECTROLYTIC 47UF 4V
C1111	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1112	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1113	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1114	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1115	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1116	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1117	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1118	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1119	0806169	ELECTROLYTIC 47UF 16V
C1120	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1121	0893225	CERAMIC CHIP 0.1UF+80-20% 16V

SYMBOL-NO	P-NO	DESCRIPTION
C1122	0202319	CERAMIC CHIP 22PF+-2% 50V
C1123	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1124	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C1125	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1126	0893125	CERAMIC CHIP 82PF+-5% 50V
C1127	0893125	CERAMIC CHIP 82PF+-5% 50V
C1128	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1129	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1130	0806153	ELECTROLYTIC 10UF 16V
C1131	0806168	ELECTROLYTIC 47UF 6.3V
C1132	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1133	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1135	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1136	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1141	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1142	0806169	ELECTROLYTIC 47UF 16V
C1143	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1144	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1145	0893227	CERAMIC CHIP 0.22UF+80-20% 16V
C1146	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C1147	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1148	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1149	0893239	CERAMIC CHIP 0.01UF+80-20% 50V[E58A]
C1151	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1152	0893239	CERAMIC CHIP 0.01UF+80-20% 50V[E58A]
C1156	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1157	0893118	CERAMIC CHIP 27PF+-5% 50V
C1166	0893227	CERAMIC CHIP 0.22UF+80-20% 16V
C1167	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1168	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1169	0893117	CERAMIC CHIP 22PF+-5% 50V
C1170	0893119	CERAMIC CHIP 33PF+-5% 50V
C1171	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C1172	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1173	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1174	0806153	ELECTROLYTIC 10UF 16V
C1175	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1176	0893055	CERAMIC CHIP 0.1UF+80-20% 16V
C1177	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1179	0893227	CERAMIC CHIP 0.22UF+80-20% 16V
C1180	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1181	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1184	0806157	ELECTROLYTIC 22UF 6.3V
C1185	0893125	CERAMIC CHIP 82PF+-5% 50V
C1186	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C1187	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C1188	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C1189	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1190	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1192	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C1193	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1201	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1202	0893132	CERAMIC CHIP 270PF+-5% 50V
C1203	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C1204	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1205	0893007	CERAMIC CHIP 0.082UF+-10% 16V
C1207	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1208	0893133	CERAMIC CHIP 330PF+-5% 50V
C1210	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1211	0893113	CERAMIC CHIP 10PF+-0.5% 50V
C1212	0893133	CERAMIC CHIP 330PF+-5% 50V
C1216	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1217	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1219	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1304	0893227	CERAMIC CHIP 0.22UF+80-20% 16V

SYMBOL-NO	P-NO	DESCRIPTION
C1311	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1314	0893227	CERAMIC CHIP 0.22UF+80-20% 16V
C1315	0806168	ELECTROLYTIC 47UF 6.3V
C1316	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1317	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1318	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1319	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1320	0893215	CERAMIC CHIP 3300PF+-10% 50V
C1321	0893217	CERAMIC CHIP 4700PF+-10% 50V
C1322	0893217	CERAMIC CHIP 4700PF+-10% 50V
C1323	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1324	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1325	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1326	0893193	CERAMIC CHIP 0.01UF+-10% 25V
C1327	0893215	CERAMIC CHIP 3300PF+-10% 50V
C1328	0893217	CERAMIC CHIP 4700PF+-10% 50V
C1329	0893217	CERAMIC CHIP 4700PF+-10% 50V
C1330	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1331	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1332	0806169	ELECTROLYTIC 47UF 16V
C1333	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1334	0893062	CERAMIC CHIP 1UF+80-20% 16V
C1335	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1336	0806168	ELECTROLYTIC 47UF 6.3V
C1337	0893121	CERAMIC CHIP 39PF+-5% 50V
C1338	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
C1339	0893239	CERAMIC CHIP 0.01UF+80-20% 50V
R0101	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R0102	0790007	CHIP RESISTOR 5.6 OHM+-5% 1/16W
R0103	0790007	CHIP RESISTOR 5.6 OHM+-5% 1/16W
R0104	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R0105	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R0106	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0107	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W
R0108	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0109	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0110	0790076	CHIP RESISTOR 820KOHM+-5% 1/16W
R0111	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0112	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R0115	0790026	CHIP RESISTOR 150 OHM+-5% 1/16W
R0116	0790026	CHIP RESISTOR 150 OHM+-5% 1/16W
R0118	0790026	CHIP RESISTOR 150 OHM+-5% 1/16W
R0119	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0120	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0121	0790008	CHIP RESISTOR 6.8 OHM+-5% 1/16W
R0122	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0123	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0124	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0125	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0126	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0134	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0135	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R0136	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0137	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0138	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0140	0790043	CHIP RESISTOR 2.7KOHM+-5% 1/16W
R0141	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0142	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0143	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0144	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0146	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R0148	0104096	CHIP RESISTOR 20KOHM+-5% 1/16W
R0149	0104561	METAL FILM 18KOHM+-1% 1W
R0150	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0151	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W

SYMBOL-NO	P-NO	DESCRIPTION
R0152	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0157	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R0158	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0160	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0161	0790029	CHIP RESISITOR 270 OHM+-5% 1/16W
R0162	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0163	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0164	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R0165	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0166	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0169	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W
R0170	0790027	CHIP RESISTOR 1800HM+-5% 1/16W
R0172	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0177	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R0178	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W
R0179	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0182	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0183	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0186	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R0189	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0190	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0194	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0195	0790027	CHIP RESISTOR 1800HM+-5% 1/16W
R0198	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0199	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0200	0104093	CHIP RESSISTOR 75 OHM+-5% 1/16W
R0203	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R0205	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0206	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W[E54A]
R0207	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W[E54A]
R0208	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0212	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W[E58A]
R0213	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0215	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W
R0216	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0217	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0218	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0219	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0221	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W[E58A]
R0222	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W[E58A]
R0223	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0224	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0227	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R0228	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0229	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W[E58A]
R0234	0790002	CHIP RESISTOR 2.2 OHM+-5% 1/16W
R0235	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0236	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0237	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0239	0790029	CHIP RESISITOR 270 OHM+-5% 1/16W
R0240	0105702	CHIP RESISTOR 16KOHM+-5% 1/16W
R0241	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0244	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0246	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0250	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0255	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0256	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0257	0790065	CHIP RESISTOR 120KOHM+-5% 1/16W
R0258	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0259	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R0260	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0261	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W
R0263	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0264	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0265	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W

SYMBOL-NO	P-NO	DESCRIPTION
R0269	0790025	CHIP RESISTOR 120 OHM+-5% 1/16W
R0270	0790063	CHIP RESISTOR 82KOHM+-5% 1/16W
R0273	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0274	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R0275	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0276	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0278	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R0279	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0280	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0282	0790043	CHIP RESISTOR 2.7KOHM+-5% 1/16W
R0286	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0287	0790068	CHIP RESISTOR 220KOHM+-5% 1/16W
R0288	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R0289	0104093	CHIP RESSISTOR 75 OHM+-5% 1/16W
R0291	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0295	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0296	0790043	CHIP RESISTOR 2.7KOHM+-5% 1/16W
R0298	0790045	CHIP RESISTOR 3.9KOHM+-5% 1/16W
R0343	0104529	CHIP RESISTOR 11KOHM+-1% 1/16W
R0345	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0351	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0356	0790073	CHIP RESISTOR 470KOHM+-5% 1/16W
R0357	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0361	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W[E54A]
R0363	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W[E54A]
R0365	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R0366	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0372	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0373	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0374	0790056	CHIP RESISTOR 27KOHM+-5% 1/16W
R0375	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0376	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W[E54A]
R0377	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0378	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0379	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0383	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W[E54A]
R0387	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0388	0790043	CHIP RESISTOR 2.7KOHM+-5% 1/16W
R0391	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0394	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0398	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0401	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0403	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0404	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0405	0790041	CHIP RESISTOR 1.8KOHM+-5% 1/16W
R0406	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R0407	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R0408	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0421	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0422	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0423	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0424	0790066	CHIP RESISTOR 150KOHM+-5% 1/16W
R0425	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0432	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0433	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0436	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R0437	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R0441	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0442	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0443	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0444	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R0445	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0446	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0447	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0448	0790066	CHIP RESISTOR 150KOHM+-5% 1/16W
R0449	0790066	CHIP RESISTOR 150KOHM+-5% 1/16W
R0450	0790066	CHIP RESISTOR 150KOHM+-5% 1/16W
R0451	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0475	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0476	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0477	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0478	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0479	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0480	0790026	CHIP RESISTOR 150 OHM+-5% 1/16W
R0481	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0493	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0496	0103819	CHIP RESISTOR 10 OHM+-5% 0.1W[E54A]
R0498	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0551	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0552	0790074	CHIP RESISTOR 560KOHM+-5% 1/16W
R0554	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0556	0790074	CHIP RESISTOR 560KOHM+-5% 1/16W
R0558	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0560	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0562	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W
R0566	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R0570	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0571	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R0572	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0574	0104301	CHIP RESISTOR 4.7KOHM+-0.5% 1/16W
R0575	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0576	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0579	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0580	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0581	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0582	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0584	0104115	CHIP RESISTOR 3.9KOHM 1/10W
R0585	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0586	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0587	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0588	0104304	CHIP RESISTOR 22KOHM+-0.5% 1/16W
R0589	0104303	CHIP RESISTOR 12KOHM+-0.5% 1/16W
R0590	0104302	CHIP RESISTOR 5.6KOHM+-0.5% 1/16W
R0591	0790065	CHIP RESISTOR 120KOHM+-5% 1/16W
R0592	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0593	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0594	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0595	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0605	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0606	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0607	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0609	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0610	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0611	0790062	CHIP RESISTOR 68KOHM+-5% 1/16W
R0616	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0620	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0621	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0622	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0623	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0624	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0625	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R0626	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0634	0790033	CHIP RESISTOR 470 OHM+-5% 1/16W
R0635	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0637	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0639	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0641	0790072	CHIP RESISTOR 390KOHM+-5% 1/16W
R0643	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R0644	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0645	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W

SYMBOL-NO	P-NO	DESCRIPTION
R0646	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0647	0790052	CHIP RESISTOR 12KOHM+-5% 1/16W
R0648	0790019	CHIP RESISTOR 47 OHM+-5% 1/16W
R0649	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R0650	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R0651	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R0652	0104246	CHIP RESISTER 1.0 OHM+-5% 1/10W
R0653	0104246	CHIP RESISTER 1.0 OHM+-5% 1/10W
R0656	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0658	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0659	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0663	0790019	CHIP RESISTOR 47 OHM+-5% 1/16W
R0668	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0676	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0680	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0702	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0703	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R0704	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0705	0104562	CHIP RESISTOR 39KOHM+-1% 1/16W
R0706	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0707	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0708	0104503	CHIP RESISTOR 27KOHM+-1% 1/16W
R0709	0104562	CHIP RESISTOR 39KOHM+-1% 1/16W
R0710	0104503	CHIP RESISTOR 27KOHM+-1% 1/16W
R0711	0104563	CHIP RESISTOR 47KOHM+-1% 1/16W
R0712	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0715	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0717	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R0718	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0719	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0721	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0722	0104542	CHIP RESISTOR 10KOHM+-1% 1/16W
R0723	0104503	CHIP RESISTOR 27KOHM+-1% 1/16W
R0727	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0732	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0734	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0736	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0738	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0739	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0740	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0741	0790027	CHIP RESISTOR 180OHM+-5% 1/16W
R0744	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0745	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0746	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0747	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0748	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0749	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0750	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0751	0790075	CHIP RESISTOR 680KOHM+-5% 1/16W
R0754	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0755	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0902	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0903	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0906	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0908	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0909	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0910	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0911	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0912	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0913	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0914	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0915	0790073	CHIP RESISTOR 470KOHM+-5% 1/16W
R0916	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0917	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0918	0790068	CHIP RESISTOR 220KOHM+-5% 1/16W
R0919	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0920	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0921	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0926	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0933	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0934	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0935	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0936	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0937	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0938	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0939	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0940	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W[E54A]
R0942	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0944	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0946	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0947	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0948	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0949	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0950	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0951	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R0952	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W
R0953	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R0954	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R0955	0790049	CHIP RESISTOR 8.2KOHM+-5% 1/16W
R0956	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R0957	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0958	0790036	CHIP RESISTOR 820 OHM+-5% 1/16W
R0959	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0960	0104111	METAL FILM 10KOHM+-1% 1/10W
R0961	0104111	METAL FILM 10KOHM+-1% 1/10W
R0962	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R0963	0104563	CHIP RESISTOR 47KOHM+-1% 1/16W
R0964	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0965	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0967	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0968	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0970	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R0973	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0974	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0975	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0976	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0977	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R0978	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R0979	0790047	CHIP RESISTOR 5.6KOHM+-5% 1/16W
R0980	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W[E54A]
R0983	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0984	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0985	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0986	0790073	CHIP RESISTOR 470KOHM+-5% 1/16W
R0987	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0988	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0989	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R0990	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R0991	0790073	CHIP RESISTOR 470KOHM+-5% 1/16W
R0994	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0997	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R0998	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R1001	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R1002	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R1003	0790035	CHIP RESISTOR 680 OHM+-5% 1/16W
R1004	0790067	CHIP RESISTOR 180KOHM+-5% 1/16W
R1005	0790056	CHIP RESISTOR 27KOHM+-5% 1/16W
R1006	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R1007	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R1008	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W

SYMBOL-NO	P-NO	DESCRIPTION
R1010	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R1101	0790068	CHIP RESISTOR 220KOHM+-5% 1/16W
R1102	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R1103	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1104	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R1105	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1106	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1107	0790028	CHIP RESISTOR 220 OHM+-5% 1/16W
R1108	0790029	CHIP RESISITOR 270 OHM+-5% 1/16W
R1109	0790029	CHIP RESISITOR 270 OHM+-5% 1/16W
R1111	0104547	CHIP RESISTOR 4.22KOHM+-1% 1/16W
R1113	0790038	CHIP RESISTOR 1.2KOHM+-5% 1/16W
R1114	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R1115	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1116	0104545	CHIP RESISTOR 1.24KOHM+-1% 1/16W
R1117	0104554	CHIP RESISTOR 1KOHM+-1% 1/16W
R1118	0790037	CHIP RESISTOR 1KOHM+-5% 1/16W
R1119	0104558	CHIP RESISTOR 5.6KOHM+-1% 1/16W
R1121	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R1122	0790072	CHIP RESISTOR 390KOHM+-5% 1/16W
R1123	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R1134	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1135	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R1139	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W[E58A]
R1140	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R1143	0104501	CHIP RESISTOR 750 OHM+-1% 1/16W
R1144	0104571	CHIP RESISTOR 3.9KOHM+-1% 1/16W
R1145	0103821	CHIP RESISTOR 15 OHM+-5% 0.1W
R1146	0103821	CHIP RESISTOR 15 OHM+-5% 0.1W
R1147	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R1148	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R1150	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R1151	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R1153	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1154	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R1155	0790034	CHIP RESISTOR 560 OHM+-5% 1/16W
R1156	0104585	CHIP RESISTOR 100KOHM+-5% 1/32W
R1157	0104581	CHIP RESISTOR 1KOHM+-5% 1/32W
R1160	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1162	0790048	CHIP RESISTOR 6.8KOHM+-5% 1/16W
R1163	0104581	CHIP RESISTOR 1KOHM+-5% 1/32W[E58A]
R1170	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W
R1171	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1172	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1173	0790057	CHIP RESISTOR 33KOHM+-5% 1/16W[E58A]
R1174	0790044	CHIP RESISTOR 3.3KOHM+-5% 1/16W[E58A]
R1175	0790058	CHIP RESISTOR 39KOHM+-5% 1/16W
R1180	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W[E58A]
R1181	0790063	CHIP RESISTOR 82KOHM+-5% 1/16W[E58A]
R1182	0790059	CHIP RESISTOR 47KOHM+-5% 1/16W[E58A]
R1183	0790042	CHIP RESISTOR 2.2KOHM+-5% 1/16W
R1184	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1197	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R1198	0790043	CHIP RESISTOR 2.7KOHM+-5% 1/16W
R1201	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R1202	0790024	CHIP RESISTOR 100 OHM+-5% 1/16W
R1203	0790039	CHIP RESISTOR 1.5KOHM+-5% 1/16W
R1204	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1205	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R1206	0790069	CHIP RESISTOR 270KOHM+-5% 1/16W
R1207	0790054	CHIP RESISTOR 100KOHM+-5% 1/16W
R1208	0790077	CHIP RESISTOR 1MOHM+-5% 1/16W
R1209	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1213	0790046	CHIP RESISTOR 4.7KOHM+-5% 1/16W
R1214	0790031	CHIP RESISTOR 330 OHM+-5% 1/16W
R1215	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1216	0790054	CHIP RESISTOR 18KOHM+-5% 1/16W
R1217	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1218	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R1219	0790053	CHIP RESISTOR 15KOHM+-5% 1/16W
R1220	0790071	CHIP RESISTOR 330KOHM+-5% 1/16W
R1221	0790068	CHIP RESISTOR 220KOHM+-5% 1/16W
R1222	0790071	CHIP RESISTOR 330KOHM+-5% 1/16W
R1223	0790068	CHIP RESISTOR 220KOHM+-5% 1/16W
R1224	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1225	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1226	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1230	0790064	CHIP RESISTOR 100KOHM+-5% 1/16W
R1231	0104552	CHIP RESISTOR 6.8KOHM+-1% 1/16W
R1232	0104558	CHIP RESISTOR 5.6KOHM+-1% 1/16W
R1233	0104504	CHIP RESISTOR 56K OHM 1/16W
R1234	0790056	CHIP RESISTOR 27KOHM+-5% 1/16W
R1235	0790072	CHIP RESISTOR 390KOHM+-5% 1/16W
R1236	0790027	CHIP RESISTOR 180OHM+-5% 1/16W
R1307	0790029	CHIP RESISITOR 270 OHM+-5% 1/16W
R1308	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1309	0790032	CHIP RESISTOR 390 OHM+-5% 1/16W
R1310	0790061	CHIP RESISTOR 56KOHM+-5% 1/16W
R1311	0103813	CHIP RESISTOR 3.3 OHM+-10% 0.1W
R1313	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1314	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1315	0103813	CHIP RESISTOR 3.3 OHM+-10% 0.1W
R1316	0103813	CHIP RESISTOR 3.3 OHM+-10% 0.1W
R1318	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1319	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1320	0103813	CHIP RESISTOR 3.3 OHM+-10% 0.1W
R1321	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1322	0790055	CHIP RESISTOR 22KOHM+-5% 1/16W
R1323	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1324	0790051	CHIP RESISTOR 10KOHM+-5% 1/16W
R1338	0104518	CHIP RESISTOR 2.87KOHM+-1% 1/16W
R1342	0105685	CHIP RESISTOR 330KOHM+-1% 1/16W
R1343	0105675	CHIP RESISTOR 100KOHM+-1% 1/16W
R1344	0105685	CHIP RESISTOR 330KOHM+-1% 1/16W
R1345	0105675	CHIP RESISTOR 100KOHM+-1% 1/16W
R1346	0105574	CHIP RESISTOR 4.7 OHM+-1% 1/10W
R1347	0105574	CHIP RESISTOR 4.7 OHM+-1% 1/10W
RT0101	5040161	SEMI VARIABLE 2.2KOHM
RT0102	5040166	SEMI VARIABLE
RT0203	5040204	VARIABLE RESISTOR 10KOHM
RT0204	5040204	VARIABLE RESISTOR 10KOHM
RT0205	0104165	CHIP RESISTOR 3.9KOHM+-10% 1/8W
RT0206	0104159	CHIP RESISTER 1.5KOHM+-10% 1/8W
RT0207	0104166	METAL FILM 4.7KOHM+-10% 1/8W
RT0209	5040204	VARIABLE RESISTOR 10KOHM
RT0210	5040201	VARIABLE RESISTOR 470 OHM
RT0211	5040203	VARIABLE RESISTOR 4.7KOHM
RT0212	0104155	CHIP RESISTER 680 OHM+-10% 1/8W
RT0215	5040204	VARIABLE RESISTOR 10KOHM
RT0216	5040205	VARIABLE RESISTOR 4.7KOHM
RT0401	5040208	VARIABLE RESISTOR 47KOHM
RT0402	5040208	VARIABLE RESISTOR 47KOHM
D0001	5382221	LED PLT-462T3
D0205	5337422	DIODE DA221
D0403	5337354	DIODE MA133
D0551	5337391	DIODE D1FS4
D0552	5337371	DIODE S807-03C
D0556	5337351	DIODE MA132WK
D0557	5337351	DIODE MA132WK
D0601	5337422	DIODE DA221

SYMBOL-NO	P-NO	DESCRIPTION
D0902	5337351	DIODE MA132WK
D0913	5337352	DIODE MA132WA
D0915	5337371	DIODE S807-03C
D0916	5337352	DIODE MA132WA
D0922	5337351	DIODE MA132WK
D0923	5337351	DIODE MA132WK
D1001	5382911	DIODE LT1D82A
D1101	5337641	DIODE HSM107S
D1103	5337351	DIODE MA132WK[E58A]
D1106	5337351	DIODE MA132WK
D1107	5337351	DIODE MA132WK
D1108	5337351	DIODE MA132WK
D1301	5337422	DIODE DA221
D1306	5337422	DIODE DA221
D1307	5337422	DIODE DA221
D1308	5337451	DIODE RB715F
IC0101	1366631	IC HA118189MP
IC0201	1366901	IC HA118372
IC0202	1366641	IC CXL5502N
IC0203	1352331	IC CXL5507M
IC0204	1351492	IC MM1029AF
IC0205	1352032	IC NJM2249M[E58A]
IC0207	1352032	IC NJM2249M
IC0401	1366371	IC HA118196F
IC0402	1366601	IC LA7471M
IC0551	1366251	IC TL1464IPT
IC0601	CK10111U	IC XR10823CQ
IC0602	1366391	IC LB1885MA
IC0603	1366651	IC BA6417F
IC0901	CK10671U	IC CXP80724-3100
IC0902	1352582	IC S-84206F
IC0903	1366081	IC HD74HCT125T
IC0904	1366612	IC XLU5949AFS
IC0905	1352385	IC NJM2903M
IC1001	5318461	CCD IMAGE DEVICE ICX054AK-6
IC1002	5317391	LED MODULE
IC1101	1366681	IC HA118184F
IC1102	1365392	IC HD49319AF
IC1103	1366692	IC HG51B025TF
IC1104	CK10211U	IC HG51B139FG1
IC1105	CK10661U	IC HD6433378V11F
IC1106	1366951	IC S-2939GIF10G-TF
IC1110	1366731	IC UPD16508GB-2A5
IC1201	1365191	IC NJM3414M
IC1202	1352651	IC NJM3403AV
IC1203	1359931	IC TC4W66F
IC1301	CK10562U	IC SC78054GC-021-3B9
IC1302	1366802	IC MPC17A85ZVMEL
IC1303	1366802	IC MPC17A85ZVMEL
IC1308	1366061	IC SN74HCT04ADB
IC1311	1366081	IC HD74HCT125T
IC1401	CS10173	PWB ASSY HTS9578B[E58A]
IC1402	CS10163	PWB ASSY HTS9577B[E58A]
Q0001	1322341	TRANSISTOR PT4810F
Q0002	5327521	PHOTO TRANSISTOR SPI-315-C
Q0003	5327521	PHOTO TRANSISTOR SPI-315-C
Q0004	1322341	TRANSISTOR PT4810F
Q0101	1323541	TRANSISTOR FMC5
Q0102	1323231	TRANSISTOR 2SB1462
Q0103	1323181	TRANSISTOR XP4213
Q0106	1323541	TRANSISTOR FMC5
Q0107	1323231	TRANSISTOR 2SB1462
Q0108	1323321	TRANSISTOR 2SD2216
Q0109	5326471	TRANSISTOR 2SB1218 (R)
Q0110	1323171	TRANSISTOR UN9213
Q0113	1323321	TRANSISTOR 2SD2216
Q0115	1323321	TRANSISTOR 2SD2216
Q0116	1323321	TRANSISTOR 2SD2216
Q0117	1323321	TRANSISTOR 2SD2216
Q0123	1323253	TRANSISTOR XP4401
Q0125	1323321	TRANSISTOR 2SD2216
Q0127	1323321	TRANSISTOR 2SD2216
Q0129	1323321	TRANSISTOR 2SD2216
Q0131	1323321	TRANSISTOR 2SD2216
Q0135	1323541	TRANSISTOR FMC5
Q0136	1323171	TRANSISTOR UN9213
Q0141	1323231	TRANSISTOR 2SB1462
Q0142	1323231	TRANSISTOR 2SB1462
Q0202	1323321	TRANSISTOR 2SD2216
Q0203	1323173	TRANSISTOR UN9212
Q0208	1323171	TRANSISTOR UN9213
Q0209	1323321	TRANSISTOR 2SD2216
Q0212	1323172	TRANSISTOR UN9113
Q0213	1323301	TRANSISTOR 2SB1219
Q0214	1323171	TRANSISTOR UN9213
Q0215	1323231	TRANSISTOR 2SB1462
Q0216	1323231	TRANSISTOR 2SB1462
Q0217	1323231	TRANSISTOR 2SB1462
Q0218	1323321	TRANSISTOR 2SD2216
Q0219	1323231	TRANSISTOR 2SB1462
Q0220	1323171	TRANSISTOR UN9213
Q0237	1323171	TRANSISTOR UN9213
Q0240	1323231	TRANSISTOR 2SB1462
Q0241	1323171	TRANSISTOR UN9213
Q0250	1323231	TRANSISTOR 2SB1462
Q0261	1323361	TRANSISTOR XP1501[E54A]
Q0268	5326681	TRANSISTOR XN1C301[E54A]
Q0401	1323321	TRANSISTOR 2SD2216
Q0405	1323321	TRANSISTOR 2SD2216
Q0407	1323231	TRANSISTOR 2SB1462
Q0551	CA10271R	TRANSISTOR 2SB1424
Q0552	1308011	TRANSISTOR MPL1
Q0553	1308011	TRANSISTOR MPL1
Q0554	1308011	TRANSISTOR MPL1
Q0555	CA10131R	TRANSISTOR 2SK2103
Q0556	1323321	TRANSISTOR 2SD2216
Q0602	1323321	TRANSISTOR 2SD2216
Q0603	1323171	TRANSISTOR UN9213
Q0605	1323171	TRANSISTOR UN9213
Q0608	1323321	TRANSISTOR 2SD2216
Q0901	1323172	TRANSISTOR UN9113
Q0902	1323081	TRANSISTOR 2SA1036K
Q0903	1323171	TRANSISTOR UN9213
Q0904	1323321	TRANSISTOR 2SD2216
Q0905	1323231	TRANSISTOR 2SB1462
Q0906	1323321	TRANSISTOR 2SD2216
Q0908	1323171	TRANSISTOR UN9213
Q0915	1323321	TRANSISTOR 2SD2216
Q0916	5326513	TRANSISTOR 2SB1188 (R)
Q0917	1323321	TRANSISTOR 2SD2216
Q0918	1323032	TRANSISTOR XN6501
Q0919	1323231	TRANSISTOR 2SB1462
Q0920	1323171	TRANSISTOR UN9213
Q1001	5328221	TRANSISTOR 2SC2620-QC
Q1101	1323231	TRANSISTOR 2SB1462
Q1102	1323231	TRANSISTOR 2SB1462
Q1103	1323172	TRANSISTOR UN9113
Q1104	1323171	TRANSISTOR UN9213
Q1105	5328192	TRANSISTOR 2SC2462LD
Q1109	1323231	TRANSISTOR 2SB1462

SYMBOL-NO	P-NO	DESCRIPTION
Q1110	1323171	TRANSISTOR UN9213
Q1112	5328211	TRANSISTOR 2SA1121C(SC)
Q1113	1323171	TRANSISTOR UN9213
Q1114	5328211	TRANSISTOR 2SA1121C(SC)[E58A]
Q1115	1323171	TRANSISTOR UN9213[E58A]
Q1201	1323253	TRANSISTOR XP4401
Q1202	1323321	TRANSISTOR 2SD2216
⚠T0551	5148332	TRANSFORMERS
L0101	0773094	CHOKE COIL 100UH+-10%
L0104	0773124	CHOKE COIL 27UH+-5%
L0105	0773094	CHOKE COIL 100UH+-10%
L0107	0773111	CHOKE COIL 2.7 UH
L0108	0773136	CHOKE COIL 220UH+-5%
L0109	0773134	CHOKE COIL 150UH+-5%
L0110	0773116	CHOKE COIL 6.8UH+-10%
L0111	0773134	CHOKE COIL 150UH+-5%
L0113	5159177	COIL 470UH
L0114	0773134	CHOKE COIL 150UH+-5%
L0115	0773136	CHOKE COIL 220UH+-5%
L0116	0773135	CHOKE COIL 180UH+-5%
L0117	0773111	CHOKE COIL 2.7 UH
L0120	0773118	CHOKE COIL 10UH+-5%
L0124	0773094	CHOKE COIL 100UH+-10%
L0125	0773094	CHOKE COIL 100UH+-10%
L0201	0773092	CHOKE COIL 47UH+-10%
L0204	0773118	CHOKE COIL 10UH+-5%
L0205	0773135	CHOKE COIL 180UH+-5%
L0206	0773089	COIL CHOKE 22UH
L0208	0773133	CHOKE COIL 120UH+-5%
L0209	0773089	COIL CHOKE 22UH
L0210	0773129	CHOKE COIL 68UH+-5%
L0211	0773089	COIL CHOKE 22UH
L0401	0773092	CHOKE COIL 47UH+-10%
L0551	BA10122R	COIL
L0552	BA10122R	COIL
L0553	5129322	CHOKE COIL
L0554	BA10122R	COIL
L0555	0773087	CHOKE COIL 10UH+-10%
L0556	BA10122R	COIL
L0557	BA10124R	COIL
L0560	BA10124R	COIL
L0563	BA10124R	COIL
L0564	0773087	CHOKE COIL 10UH+-10%
L0565	0773094	CHOKE COIL 100UH+-10%
L0566	0773094	CHOKE COIL 100UH+-10%
L0567	0773087	CHOKE COIL 10UH+-10%
L0568	0773087	CHOKE COIL 10UH+-10%
L0602	0773087	CHOKE COIL 10UH+-10%
L0902	0773092	CHOKE COIL 47UH+-10%
L0903	0773094	CHOKE COIL 100UH+-10%
L0904	0773088	CHOKE COIL 15UH
L0907	0773121	CHOKE COIL 15UH+-5%
L0910	0773081	COIL,CHOKE 1UH
L1102	0773087	CHOKE COIL 10UH+-10%
L1103	0773087	CHOKE COIL 10UH+-10%
L1105	0773087	CHOKE COIL 10UH+-10%
L1106	0773087	CHOKE COIL 10UH+-10%
L1107	0773087	CHOKE COIL 10UH+-10%
L1109	0773094	CHOKE COIL 100UH+-10%
L1301	0773087	CHOKE COIL 10UH+-10%
L1302	0773087	CHOKE COIL 10UH+-10%
L1303	0773087	CHOKE COIL 10UH+-10%
X0201	1930211	CRYSTAL
X0601	1930171	CRYSTAL
X0901	1930171	CRYSTAL

SYMBOL-NO	P-NO	DESCRIPTION
X0902	1930031	CRYSTAL
X1101	1930094	CRYSTAL
BL0394	5172545	LC FILTER
BL0395	5172545	LC FILTER
BL0396	5172545	LC FILTER
BL0397	5172541	FILTER
BL0399	5172545	LC FILTER
CN0005	1880355	CONNECTOR
CN0904	5847083	CONNECTOR
CN0905	5845859	CONNECTOR
CP0202	5172813	FILTER
CP0203	5172814	FILTER
CP0204	5172624	FILTER,BAND PASS
CP0402	5172424	FILTER
CP0901	BV10151R	COIL
CP1102	BE10112R	FILTER,LOW PASS
⚠F0551	5723232	FUSE
⚠F0552	5723233	FUSE,0.8A
JK0200	5695291	SOCKET
LI0901	5761771	BATTERY,BACK UP
PG0001	5666921	MINI PLUG
PG0101	5668975	PLUG
PG0400	5668671	MINI PLUG
PG0402	5669151	MINI PLUG
PG0551	1830321	PLUG
PG0601	5692362	MINI PLUG
PG0602	5666929	PLUG
PG0603	5668753	MINI PLUG
PG0604	5668671	MINI PLUG
PG0901	5662766	PLUG
PG0903	5669193	MINI PLUG[E54A]
PG0903	5669194	PLUG[E58A]
PG0904	5669031	MINI PLUG
PG0905	5669034	PLUG
PG0906	1830351	PLUG
PG0907	5669034	PLUG
PG1001	1830342	PLUG
PG1101	1830341	PLUG
PG1102	5669102	PLUG[E58A]
PG1301	5669094	PLUG
S0003	5636171	SWITCH
S0004	5636171	SWITCH
S0005	5636171	SWITCH
S0006	5635331	SWITCH
S0007	5613522	MECHANISM STATE SWITCH
S0901	1741063	SWITCH
S0902	1742021	SWITCH
S0903	1742011	SWITCH
S0904	1742011	SWITCH
S0905	1742011	SWITCH
S0906	1742011	SWITCH
S0907	1742011	SWITCH
S0909	1742011	SWITCH
SW0908	5635612	SWITCH

W/B EVF SECTION(E54A)

C2001	0806169	ELECTROLYTIC 47UF 16V
C2002	0806169	ELECTROLYTIC 47UF 16V
C2003	0806146	ELECTROLYTIC 2.2UF 50V
C2004	0268437	POLYPROPYLENE 4700PF+-5%100V
C2005	0256871	ELECTROLYTIC 47UF 25V
C2006	0249655	CERAMIC CHIP 1000PF+-10% 100OV
C2007	0249656	CERAMIC CHIP 1000PF+-10% 500V
C2008	0806146	ELECTROLYTIC 2.2UF 50V

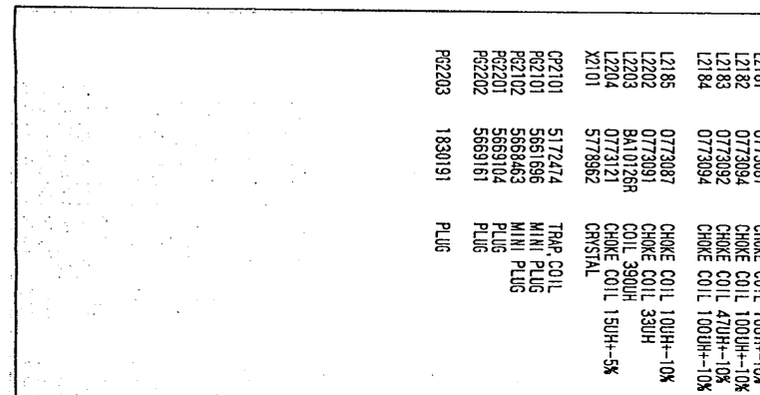
SYMBOL-NO	P-NO	DESCRIPTION
C2009	0893086	CERAMIC CHIP 0.1UF+80-20% 50V
C2011	0209852	CERAMIC CHIP 18OPF+-5% 50V
C2012	0893086	CERAMIC CHIP 0.1UF+80-20% 50V
C2013	0893086	CERAMIC CHIP 0.1UF+80-20% 50V
C2014	0268521	MYLAR 0.1UF+-10% 50V
C2015	0202151	CERAMIC CHIP 2200PF+-5% 50V
C2016	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2017	0806145	ELECTROLYTIC 1UF 50V
C2018	0893062	CERAMIC CHIP 1UF+80-20% 16V
R2001	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R2002	0103869	CHIP RESISTOR 150KOHM+-5% 0.1W
R2003	0103876	CHIP RESISTOR 560KOHM+-5% 0.1W
R2004	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R2005	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R2006	0103819	CHIP RESISTOR 10 OHM+-5% 0.1W
R2007	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R2008	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R2009	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2011	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R2012	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R2013	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R2014	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R2015	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R2016	0103814	CHIP RESISTOR 3.9 OHM+-10% 0.1W
R2017	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R2018	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R2019	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R2020	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R2021	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2022	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R2024	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R2025	0103874	CHIP RESISTOR 390KOHM+-5% 0.1W
R2026	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R2027	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
RT2001	5035204	SEMI VARIABLE 2.2MOHM
RT2002	5030251	SEMI VARIABLE 1MOHM
RT2003	5040103	SEMI VARIABLE 470 OHM
D2001	5337133	DIODE MA141K
D2002	5337321	DIODE MA199
IC2001	1365881	IC HA118179F
Q2001	5323831	TRANSISTOR 2SD974
Q2002	5326682	TRANSISTOR XN1B301
⚠T2001	5240566	TRANSFORMER
L2001	0773003	COIL 47UH
L2002	5244017	COIL
CN2001	5844998	CONNECTOR
⚠CS2001	5887003	SOCKET,CRT
PG2001	5669631	CONNECTOR

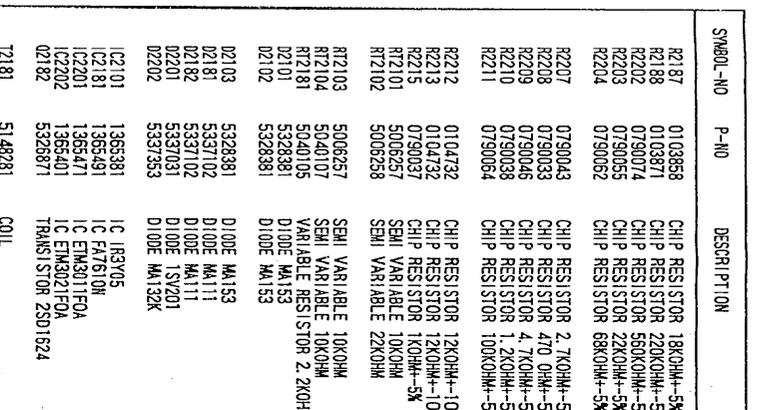
COLOR EVF SECTION(E58A)

C2101	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2102	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2103	0893059	CERAMIC CHIP 0.47UF+80-20% 16V
C2104	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2105	0209892	CERAMIC CHIP 18PF+-5% 50V
C2106	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2107	0893023	CERAMIC CHIP 0.047UF+-10% 25V
C2108	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2109	0209848	CERAMIC DISC 150PF+-5% 50V
C2110	0202181	CERAMIC CHIP 1.0UF+80-20% 16V
C2111	0893016	CERAMIC CHIP 0.015UF+-10% 25V
C2112	0893035	CERAMIC CHIP 2200PF+-10% 50V
C2113	0202181	CERAMIC CHIP 1.0UF+80-20% 16V
C2114	0893014	CERAMIC CHIP 0.01UF+-10% 25V

SYMBOL-NO	P-NO	DESCRIPTION
C2115	0806153	ELECTROLYTIC 10UF 16V
C2116	0893027	CERAMIC CHIP 0.1UF+-10% 25V
C2117	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2118	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2119	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2120	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2121	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2122	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2123	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2124	0893014	CERAMIC CHIP 0.01UF+-10% 25V
C2181	0806158	ELECTROLYTIC 22UF 16V
C2182	0893035	CERAMIC CHIP 2200PF+-10% 50V
C2183	0202151	CERAMIC CHIP 2200PF+-5% 50V
C2184	0806149	ELECTROLYTIC 4.7UF 25V
C2185	0217534	ELECTROLYTIC 10UF 25V
C2186	0806154	ELECTROLYTIC 10UF 35V
C2187	0254411	ELECTROLYTIC 33UF 25V
C2188	0806168	ELECTROLYTIC 47UF 6.3V
C2189	0254412	ELECTROLYTIC 39 UF 10V
C2190	0254411	ELECTROLYTIC 33UF 25V
C2191	0806149	ELECTROLYTIC 4.7UF 25V
C2193	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2194	0254412	ELECTROLYTIC 39 UF 10V
C2203	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C2204	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C2205	0893062	CERAMIC CHIP 1UF+80-20% 16V
C2207	0893062	CERAMIC CHIP 1UF+80-20% 16V
C2212	0893225	CERAMIC CHIP 0.1UF+80-20% 16V
C2213	0893175	CERAMIC CHIP 1000PF+-5% 50V
C2214	0893127	CERAMIC CHIP 120PF+-5% 50V
C2215	0893217	CERAMIC CHIP 4700PF+-10% 50V
C2216	0806146	ELECTROLYTIC 2.2UF 50V
C2217	0893217	CERAMIC CHIP 4700PF+-10% 50V
C2218	0806149	ELECTROLYTIC 4.7UF 25V
R2101	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R2102	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R2103	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R2104	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R2105	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R2106	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R2107	0103866	CHIP RESISTOR 82KOHM+-5% 0.1W
R2108	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R2109	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R2110	0103836	CHIP RESISTOR 270 OHM+-5% 0.1W
R2111	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R2114	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R2115	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R2117	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R2118	0103865	CHIP RESISTOR 68KOHM+-5% 0.1W
R2119	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R2120	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R2124	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R2125	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R2126	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R2127	0103864	CHIP RESISTOR 56KOHM+-5% 0.1W
R2128	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R2129	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R2130	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R2131	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R2181	0103828	CHIP RESISTOR 56 OHM+-5% 0.1W
R2182	0103848	CHIP RESISTOR 2.7KOHM+-5% 0.1W
R2183	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R2184	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R2185	0103870	CHIP RESISTOR 180KOHM+-5% 0.1W
R2186	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W

Identifying Controls





1. Lens
F1.8 (5~60mm) 12:1 power zoom lens with auto focus and auto iris functions.

2. Record Indicator
This indicator lights when the camera/recorder is recording.

3. Infrared Receiver
The area where infrared signals from the wireless remote are received. Aim the remote control to this area for best results.

4. INST. ZOOM (Instant Zoom) Button
Use this button to magnify the image being recorded 1.5 times momentarily.

5. Power Zoom Switch
Use this to zoom automatically ("Using the Power Zoom," p 32).

6. CAMERA/OFF/VIDEO Power Switch
Hold down the red button as you slide the switch to CAMERA or VIDEO. You do not need to hold down the red button to slide the switch to OFF.

7. EJECT Switch
A power source must be connected before cassettes can be inserted or removed though the CAMERA/ OFF/VIDEO switch may be set to OFF ("Inserting and Removing Cassettes,"p17).

8. Microphone (For VM-E58A)

9. EIS (Electronic Image Stabilizer) Button (Only for VM-E58A)
EIS corrects slight shaking of an image ("Using the Electronic Image Stabilizer," p. 34).

10. BATT EJECT (Battery Eject) Switch
Slide this switch to remove the battery, battery case or external power adapter.

11. Cassette Holder Close Button
CAUTION: Be sure to press this button to close the cassette holder. Otherwise, the tape may become slack and may be damaged.

12. Cassette Holder
A power source must be connected to the camera/recorder before a cassette can be inserted or removed.

13. FADE Button
The FADE button features three modes; white fade, wipe fade, and zoom fade ("Using Fade," p. 35).

14. FOCUS Control (AUTO/MAN) Buttons
Press these buttons simultaneously to select manual or automatic focus. For manual focusing ("Using Manual Focus", p. 34), press the ◀ or ▶ buttons to bring the subject into focus. When using manual focus, FOCUS appears in the viewfinder.

15. Stereo Microphone (For VM-E56A)
Sensitive to sounds coming from the direction in which the camera is pointed.

16. PLAY Button
Use to playback recorded tapes.

17. Power Supply Attachment
The battery, battery case and external power adapter connect here ("Loading Batteries," p 14, "Using Alternative Power Sources," p 15).

18. Diopter Control
To use the electronic viewfinder, turn this control for your optimum focus adjustment.

19. F.FWD Button
Use this button to fast forward tapes or for visual search. During visual search the camera/recorder fast forwards at approximately 9 times normal playback speed. Also use this button to set date and time.

20. Camera Light Shoe
Attach the DC camera light here.

21. Viewfinder BRIGHT,COLOR and TINT Controls
Use this controls to adjustment this camera/recorder's "BRIGHT", "COLOR" and "TINT".

22. Hand Strap
Refer to page 24.

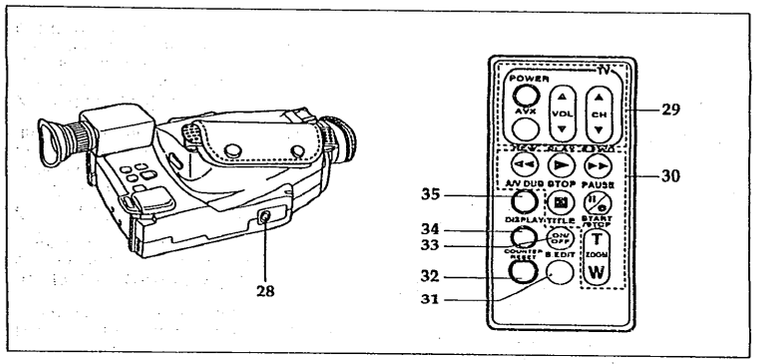
23. Start/Stop Button
When the CAMERA/OFF/VIDEO switch is in CAMERA press this button to start recording. When pressed a second time the camera pauses. During playback use this button to stop the tape temporarily. Pressing a second time resumes normal playback.

24. REW/REVIEW Button
Use this button to fast rewind tapes or for visual search. During visual search the camera/recorder rewinds at approximately 7 times normal playback speed. Also use this button to set date and time. Furthermore, use this button to review the last few seconds of the tape you are recording.

25. AV IN/OUT Jack (Behind the jack cover)
Use this jack to connect the camera/recorder to a VCR or television ("Playing Back Your Recordings," p 27, "Dubbing from the Camera/ Recorder to a VCR," p39 and "Recording Television Programs", P44).

26. DATE Button
Use this button to record the date and time on your tape. Any time that the date and time display is in the viewfinder they are recorded on your tape.

27. STOP Button
Use this button to stop playback, fast forward, or reverse. Also use this button to set date and time.



28. Tripod Mounting Threaded Socket

Use this threaded socket to mount the camera/recorder to a tripod.

29. TV Control Buttons

Used for controlling the TV.

- POWER : Turns the TV on and off.
- AVX : Used for recording picture and sound from an auxiliary input.
- VOLUME: Increase (▲) or decrease (▼) the volume.
- CHANNEL : Top (▲) button switches to the next higher channel, bottom (▼) button switches to the next lower channel. For these to operate, you must have preset your channels.

("Controlling your TV with the Camera/ Recorder's Remote Control" P41)

30. Recorder's Remote Control

The shaded buttons on the remote control have the same functions as the corresponding buttons on the camera/recorder.

31. S.EDIT (Synchro Edit) Button (only on the remote control)

Use this button to activate the synchro edit function for dubbing ("Using Synchro Edit", P40).

32. COUNTER RESET Button (only on the remote control)

Use this button to reset the linear time counter to 0:00:00.

33. TITLE ON/OFF Button (only on the remote control)

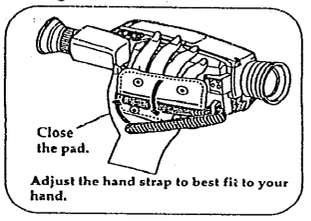
Use this button to create and record titles for your tapes ("Creating and Recording Titles," p 37).

34. DISPLAY Button (only on the remote control)

Use this button to select the viewfinder and TV display ("Using the Display Button," p21).

35. A/V DUB Button (only on the remote control)

Use this button to record new audio and video over existing audio and video.

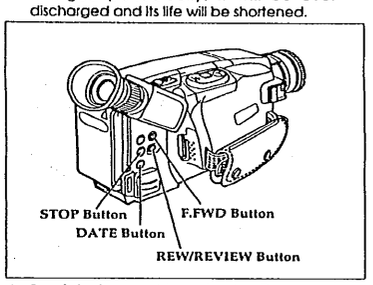


Setting the Date and Time

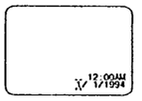
Take the time to set the date and time now: The time backup battery is rechargeable. Charge the backup battery every two months. Set the CAMERA/OFF/VIDEO switch on the camera/recorder to OFF and connect a charged battery or the AC adapter/charger to the camera/recorder for 24 hours. If you record the date and time at the beginning of each recording session they will serve as a handy reminder when viewing tapes at a later date.

Make sure that the current time is displayed correctly before you start filming.

Note: The backup battery should be charged every two months. If it is not charged periodically, it will be over-discharged and its life will be shortened.

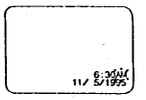


1. Load the battery ("Loading the Batteries: Camera/Recorder battery" p.14). Press the red button on the CAMERA/OFF/VIDEO switch as you slide it to CAMERA.
2. Press the DATE button and look into the viewfinder. The date and time should appear in the lower right with the "1" flashing.



3. Pressing the F.FWD button gives you higher numbers while the REW/REVIEW button gives you lower numbers. Select the right month and press STOP button. Use the F.FWD, REW/REVIEW and STOP buttons to select the proper day, year, hour, minute, and AM or PM .

4. After setting the AM/PM, press the DATE button. The display changes and the internal clock starts.



Note: The date/time graphics will be recorded whenever they appear in the viewfinder.

Correcting the Date and Time

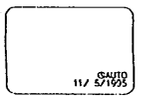
1. Press the DATE button while pressing the STOP button. The flashing cursor appears at the month.
2. Move to where you need to make the correction with the STOP button and use the F.FWD and REW/REVIEW to correct.
3. Press the DATE button to set the corrected date and time.

Automatic Date Recording

This feature records the date automatically once a day. After you begin recording, the date is displayed and recorded automatically for 10 seconds. The same date is recorded again in the following cases; when the cassette is replaced, when " ◷ AUTO" is displayed again after being switched to the date display and when the recording is less than 10 seconds long.

If the date changes while recording continues over 10 seconds, the date is recorded for 10 seconds when recording is restarted after the camera/recorder has been set to the standby once.

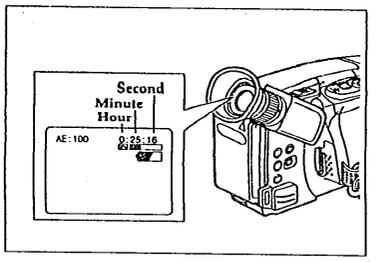
Press the DATE button until " ◷ AUTO" and the date appear at the lower right of the viewfinder before you begin to record. The date will be recorded whenever it appears in the viewfinder.



Using the Linear Time Counter

The linear time counter displays the tape run in hours, minutes, and seconds helping you to keep track of how long you've been filming or time you have left to film before running out of tape.

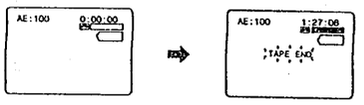
Turn the camera/recorder on to display the linear time counter. The linear time counter keeps track from when you load a cassette into the camera/recorder and clears to 0:00:00 when the cassette is ejected.



Remaining Tape

The tape remaining display shows the remaining tape that can be used for recording and playback, using seven dashes. This feature is handy when recording since it lets you know how long you can record on the loaded tape.

Insert a cassette into the camera/recorder and start recording or playback; 10 seconds later, the remaining tape will be displayed. When the cassette is ejected, the display will disappear. "⊡ - - - - - - -" is displayed for 10 seconds after the tape starts to run.



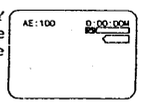
Note: The tape remaining display appears 10 seconds after the tape starts to run.

Note: When the remaining tape time becomes less than about three minutes, TAPE END flashes in the viewfinder.

Using the Display Button

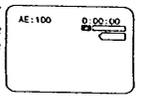
Pressing the DISPLAY button on the remote control allows you to switch the displays in the viewfinder. When the camera/recorder is turned on, the linear time counter appears.

- Pressing the DISPLAY button once displays the linear time counter with the memory feature.



Note: The linear time counter with the memory feature in the viewfinder can also be displayed on the connected television.

- Pressing the DISPLAY button a second time returns to the linear time counter.

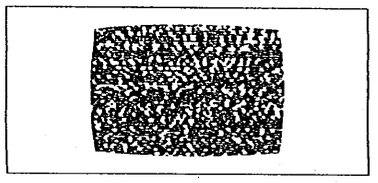


General Maintenance

Cleaning the Camera/Recorder Heads

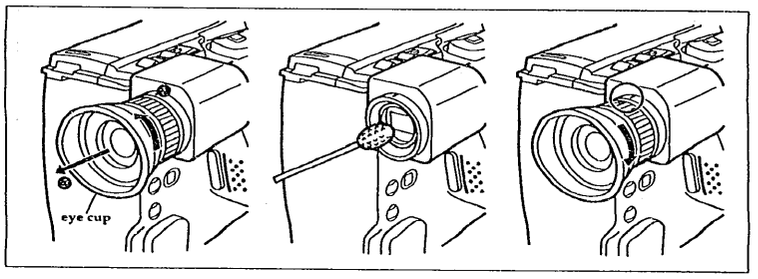
Dirt can accumulate on the video heads on the camera causing the playback picture to become blurred or appear as if video information is lost. This often means that the video heads are dirty. Use a video head cleaner such as Maxell 8M-CLT to clean the heads.

If after cleaning the heads the picture does not clear up consult your nearest dealer or VCR service center for professional head cleaning.



Cleaning the Lens and Picture Tube of the Electronic Viewfinder

The lens of the electronic viewfinder can be user-cleaned if dust, dirt, or other foreign matter adheres to it.



1. Rotate and remove eye cup.
2. Clean the picture tube face and lens.
   To prevent scratching, use a soft non abrasive cloth, swab or lens cleaning paper.
3. Align the reference mark and rotate the eye cup in the direction of arrow.

Periodic Maintenance

A precision electromechanical device, the Hitachi VM-E56A/E58A requires maintenance after a period of normal use. We expect that no other maintenance other than head cleaning will be required during the period of warranty unless the camera/recorder is used either heavily or seldom. Defective parts are covered by the warranty. Normal maintenance is the responsibility of the owner. Consult your dealer or local VCR service center for recommendations regarding normal maintenance based on your use patterns, location, and the age of the camera/recorder.

Troubleshooting

Quality is very important at Hitachi. We inspect and check every camera/recorder carefully at the factory under the most rigid quality control and inspection systems. If problems develop please check the following possible solutions before inquiring about professional service.

INSERTING OR REMOVING THE CASSETTE

Symptom	Check Point & Correction
Cassette holder cannot be opened when you push EJECT switch.	• Connect the power source.
Cassette cannot be inserted into cassette compartment.	• Load cassette in direction indicated by arrow on cassette.
	• Cassette window must be toward outside.

CAMERA RECORDING

Symptom	Check Point & Correction
Picture does not appear in the viewfinder.	• Remove the lens cap.
	• Slide the CAMERA/OFF/VIDEO switch to CAMERA.
	• Disconnect the AV input cord from the camera/recorder.
The camera/recorder cannot go into the recording mode, even when the start/stop button is pressed.	• Check the record-protect tab on the cassette. See page 18 for details.
	• Push the cassette holder embossed PUSH to close it.
	• Slide the CAMERA/OFF/VIDEO switch to CAMERA.
Picture is out of focus. Auto-focus does not operate.	• Make sure that FOCUS does not appear in the viewfinder. If it is displayed, press FOCUS Control (AUTO/MAN) buttons to erase it.
	• Auto-Focus does not operate if a special-effects filter is attached or the objects shown on page 33 are being recorded.

RECORDING TV PROGRAMS OFF THE AIR

Symptom	Check Point & Correction
The camera/recorder cannot be set to the recording mode, even when the Start/Stop button on the camera/recorder is pressed.	• Check the record-protect tab on the cassette. See page 18 for details.
	• Set the CAMERA/OFF/VIDEO switch to CAMERA.
	• Connect the camera/recorder and TV or VCR.

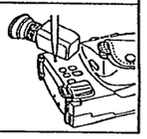
PLAYBACK OF PRE-RECORDED CASSETTE

Symptom	Check Point & Correction
"PLAY" button cannot be engaged.	• Set the CAMERA/OFF/VIDEO switch to "VIDEO" position.
No picture appears on television screen when "PLAY" button is pressed. (TV is connected to the camera/recorder by using RF output adapter.)	• Set the television to the camera/recorder channel (3or4) depending upon the selected channel in the RF channel select switch of RF output adapter.
Interference on playback picture. (TV is connected to the camera/recorder by using RF output adapter.)	• When you see the playback picture on your TV, adjust fine tuning knob on television set to obtain best picture.
Picture bends at the top of TV screen.	• TV receiver is of older type. It needs to be modified to work properly with camera/recorder.
	• Tape is damaged. Try another cassette.
Color of your TV screen is too bright, too faint or change.	• TV set has VIR circuit. Turn it off during playback.

BATTERY CONDITION

Symptom	Check Point & Correction
The ( ) indication in the electronic viewfinder flashes to indicate battery is discharged.	• Try another battery or charge the battery.

NO OPERATION IS ACCEPTED

Symptom	Check Point & Correction
Power is not turned on and no button operations are accepted.	• Remove the power source, and after about one minute, push the reset switch gently using a toothpick, etc. until you feel a click. The display will be reset. Then set the information again. 

TAPE DISPLAY

Symptom	Check Point & Correction
TAPE appears in the viewfinder.	• Have you moved the camera/recorder or cassette from a cold place to a warm place so that its temperature changed abruptly? If the temperature has changed, remove the cassette and set the CAMERA/OFF/VIDEO switch to OFF, then wait for about one hour. • Remove the cassette and then try to reinsert; remove it several times. If the indication is still shown in the viewfinder, use a cleaning tape to clean the heads and replace the cassette.

HITACHI

VM-E52A/E54A
VM-E56A/E58A
VM-H59A

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