SERVICE MANUAL

AUDIO VIDEO PROCESSOR

SANSUI AV-77

CAUTION

1. Parts identified by the ⚠ symbol on the schematic diagram and the parts list are critical for safety. Use only replacement parts that have critical characteristics recommended by the manufacturer.
2. Make leakage-current or resistance measurements to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

Sansui

SANSUI ELECTRIC CO., LTD.

•SPECIFICATIONS

Video section

VIDEO INPUT sensitivity/Impedance
..... 1.0 Vp-p/75 ohms
VIDEO OUTPUT level/Impedance
..... 1.0 Vp-p/75 ohms
Signal-to-noise ratio (video signal)
VCR A, VCR B, VDP → VIDEO OUTPUT ..... 62 dB
Frequency response (video signal)
..... 6.5 Hz~10 MHz—3 dB
AUDIO INPUT sensitivity/Impedance
..... —6 dBs/47 kohms
AUDIO OUTPUT level/Impedance
..... —6 dBs/47 kohms
Signal-to-noise ratio (IHF-A)
VCR B, VDP → VCR A OUTPUT
..... Better than 80 dB
VCR A, VCR B, VDP → AUDIO OUTPUT ..... Better than 80 dB
Frequency response
VCR B, VDP → VCR A OUTPUT
..... 20 Hz~100 kHz —3dB
VCR A, VCR B, VDP → AUDIO OUTPUT ..... 20 Hz~100 kHz —3 dB
VHF OUT signal ..... 3 ch or 4 ch

Audio section

Input sensitivity/Impedance
AUDIO INPUT, TAPE PLAY
..... 150 mV/47 kohms
MIC ..... 0.5 mV/10 kohms
Signal-to-noise ratio
AUDIO INPUT, TAPE PLAY → AUDIO OUTPUT... Better than 80 dB
MIC → AUDIO OUTPUT
..... Better than 50 dB
Frequency response
AUDIO INPUT, TAPE PLAY → AUDIO OUTPUT... 10 Hz~ 100 kHz —3 dB
Output level/Impedance.. 150 mV/2.2 kohms
Maximum output level 1V
Total harmonic distortion
AUDIO INPUT, TAPE PLAY → AUDIO OUTPUT... Less than 0.08% at 1 kHz
dbx noise reduction effect —30 dB at 1 kHz
NOISE FILTER..... 3 kHz —6 dB/oct

Others

Power requirements ..... 120/220/240V 50/60 Hz
For U.S.A. and Canada
..... 120V (60 Hz)
Power consumption ..... 33 watts (with camera)
Dimensions ..... 430 mm (16-15/16″)W
76 mm (3″)H
265 mm (10-7/16″)D
Weight ..... 3.7 kg (8.2 lbs) net
4.6 kg (10.1 lbs) packed

* Design and specifications subject to changes without notice for improvements.
* In order to simplify the explanation illustrations may sometimes differ from the originals.

CAUTION

1. The symbols, UL, CSA, SA, BS, UK, EU, AS and XX (EXPORT) on the parts list and the schematic diagram mean followings respectively.

   UL..... Manufactured for U.S.A market.
   (Underwriters Laboratories approved model.)
   CSA..... Manufactured for Canadian market.
   SA..... Manufactured for South African market.
   BS, UK ..... Manufactured for United Kingdom market.
   EU ..... Manufactured for European market.
   AS..... Manufactured for Australian market.
   XX (EXPORT) ..... Standard Version.
   NON MARK ..... Common Parts.

2. Some printed circuit boards are not supplied as the assembled. To separate these in this service manual, the stock No's are not indicated at the ends of the board names. However, the individual parts on the circuit boards are provided by orders.

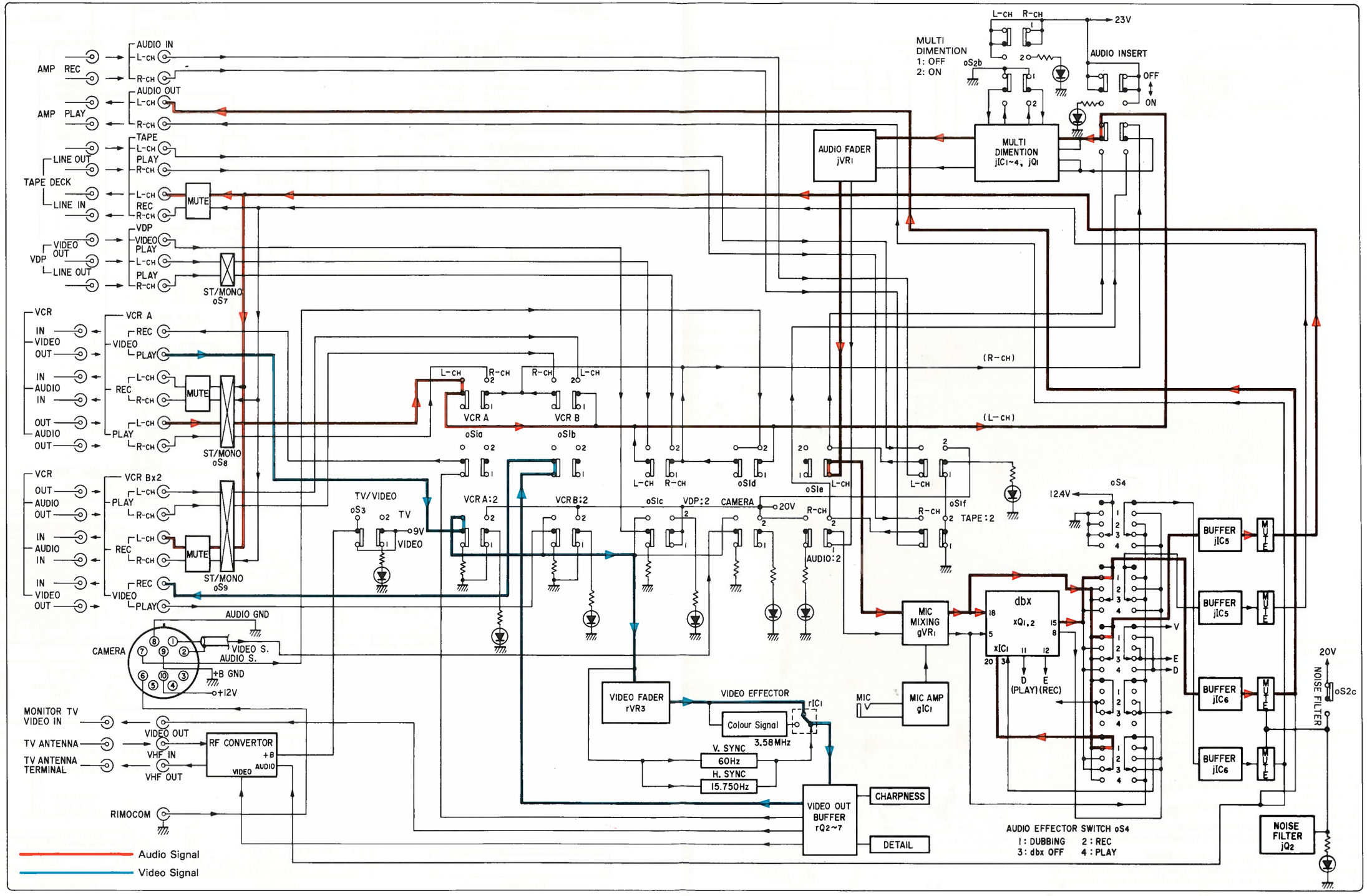
3. Since some of capacitors and resistors are omitted from parts lists in this service manual, refer to the Common Parts List for capacitors & resistors, which was issued on February 1983.

4. Abbreviations in this service manual are as follows.

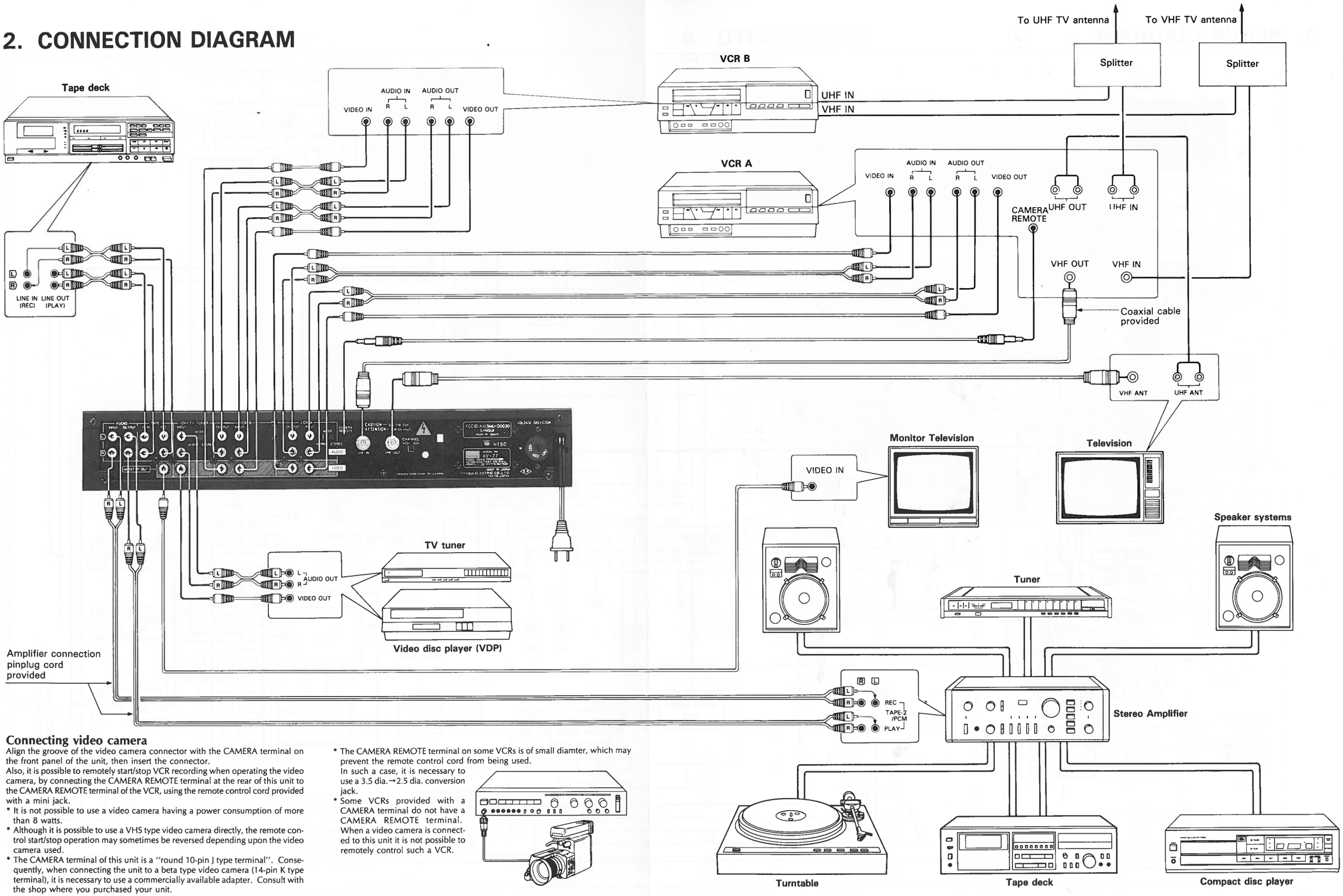
•Abbreviations List

C.R. : Carbon Resistor
S.R. : Solid Resistor
Ce.R. : Cement Resistor
M.R. : Metal Film Resistor
F.R. : Fusing Resistor
N.I.R. : Non-Inflammable Resistor
A.R. : Array Resistor
C.C. : Ceramic Capacitor
C.T. : Ceramic Capacitor, Temperature Compensation
E.C. : Electrolytic Capacitor
E.L. : Low Leak Electrolytic Capacitor
E.B. : Bi-Polar Electrolytic Capacitor
E.B.L. : Low Leak Bi-Polar Electrolytic Capacitor
Ta.C. : Tantalum Capacitor
F.C. : Film Capacitor
M.P. : Metalized Paper Capacitor
P.C. : Polystyrene Capacitor
G.C. : Gimmic Capacitor
A.C. : Array Capacitor
V.R. : Variable Resistor
S.V.R. : Semi Variable Resistor
SW. : Switch
Chip R. : Chip Resistor
Chip C. : Chip Capacitor

1. BLOCK DIAGRAM



2. CONNECTION DIAGRAM



Connecting video camera

Align the groove of the video camera connector with the CAMERA terminal on the front panel of the unit, then insert the connector.
Also, it is possible to remotely start/stop VCR recording when operating the video camera, by connecting the CAMERA REMOTE terminal at the rear of this unit to the CAMERA REMOTE terminal of the VCR, using the remote control cord provided with a mini jack.

* It is not possible to use a video camera having a power consumption of more than 8 watts.
* Although it is possible to use a VHS type video camera directly, the remote control start/stop operation may sometimes be reversed depending upon the video camera used.
* The CAMERA terminal of this unit is a "round 10-pin J type terminal". Consequently, when connecting the unit to a beta type video camera (14-pin K type terminal), it is necessary to use a commercially available adapter. Consult with the shop where you purchased your unit.
* The CAMERA REMOTE terminal on some VCRs is of small diamter, which may prevent the remote control cord from being used. In such a case, it is necessary to use a 3.5 dia.→2.5 dia. conversion jack.
* Some VCRs provided with a CAMERA terminal do not have a CAMERA REMOTE terminal. When a video camera is connected to this unit it is not possible to remotely control such a VCR.

3. OPERATION

A. dbx System Operation

•Configuration and Principle

The dbx system accurately compresses signals to be recorded to half in logarithmic value before the signals are inputted to a recording system and expands the compressed signals to double when the signals are played back. For instance, in the case where a program source has a dynamic range of 100 dB, the source is compressed to 50 dB in recording, as shown in Fig. 3-1. Therefore, if the dynamic range of a cassette deck is 60 dB, it is possible to record the abovementioned program source perfectly. On the other hand, the recorded signals are returned to music signals having a dynamic range of 100 dB when played back. The system serves to reduced noise. That is, since the recording level is raised beyond hiss noise level generated in recording, it is possible to improve the noise level as much as about 30 dB or more throughout the total frequency bandwidth.
The system is configured as shown in Fig. 3-2.

•Each section operation

1) Pre-emphasis and De-emphasis circuits
The pre-emphasis operation is to raise high-frequency signals in order to reduce noise modulation effect (noise breathing) of high-frequency signals in recording. On the other hand, the de-emphasis operation is to lower the raised high-frequency signals in order to return the frequency characteristics to the flat state in playing back, therefore the characteristics of de-emphasis being complementary to those of pre-emphasis.

2) VCA (voltage controlled amplifier or attenator)
In this amplifier, the amplification degree changes lenearly and logarimically according to a dc control voltage applied externally. Therefore, it is possible to compressor expand an input signal dynamic range within a wide range in dependence upon the characteristics of the voltage controlled amplifier.

3) Waiting network
This network is provided at the front stage of a level sensor in order to prevent tape recording saturation. In the network, the gain of encoder VCA is reduced with respect to high-frequency input signals.

4) Root Mean Square Value (RMS) level sensor
This sensor detects the effective value of input signal and outputs a dc control voltage proportional to the detected level in order to control the gain of VCA according to the level of the input signal.

Fig. 3-1

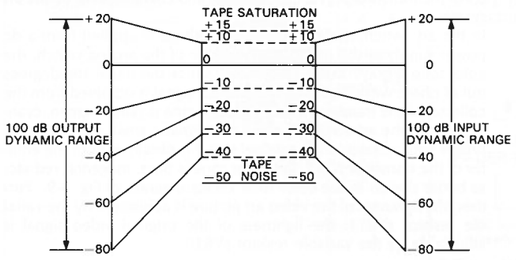
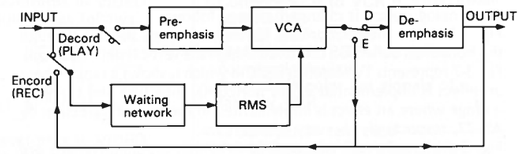


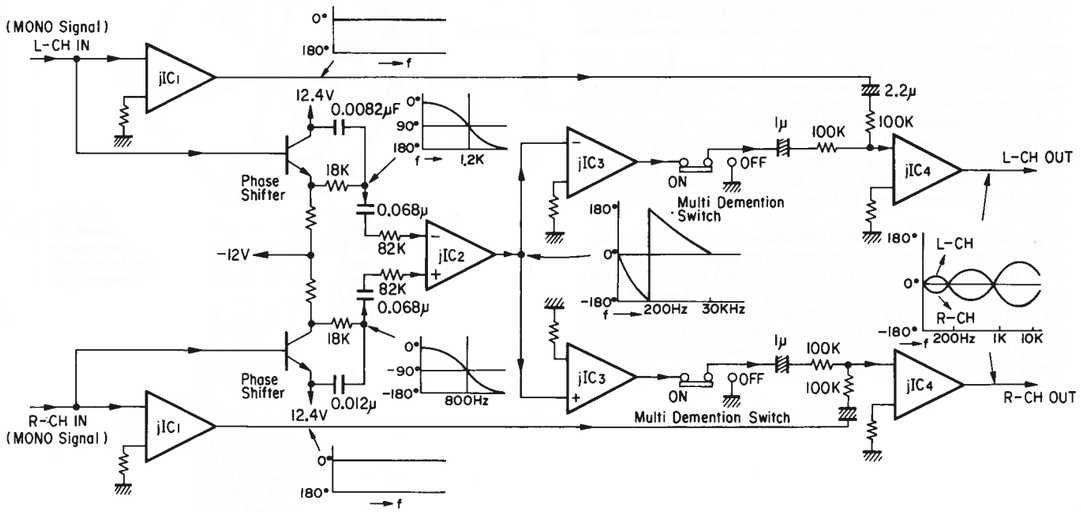
Fig. 3-2



"dbx" is a trademark of DBX Incorporated. DBX noise reduction system manufactured under license from DBX Incorporated.

B. Phase Response of Multi Dimention Circuit

Fig. 3-3

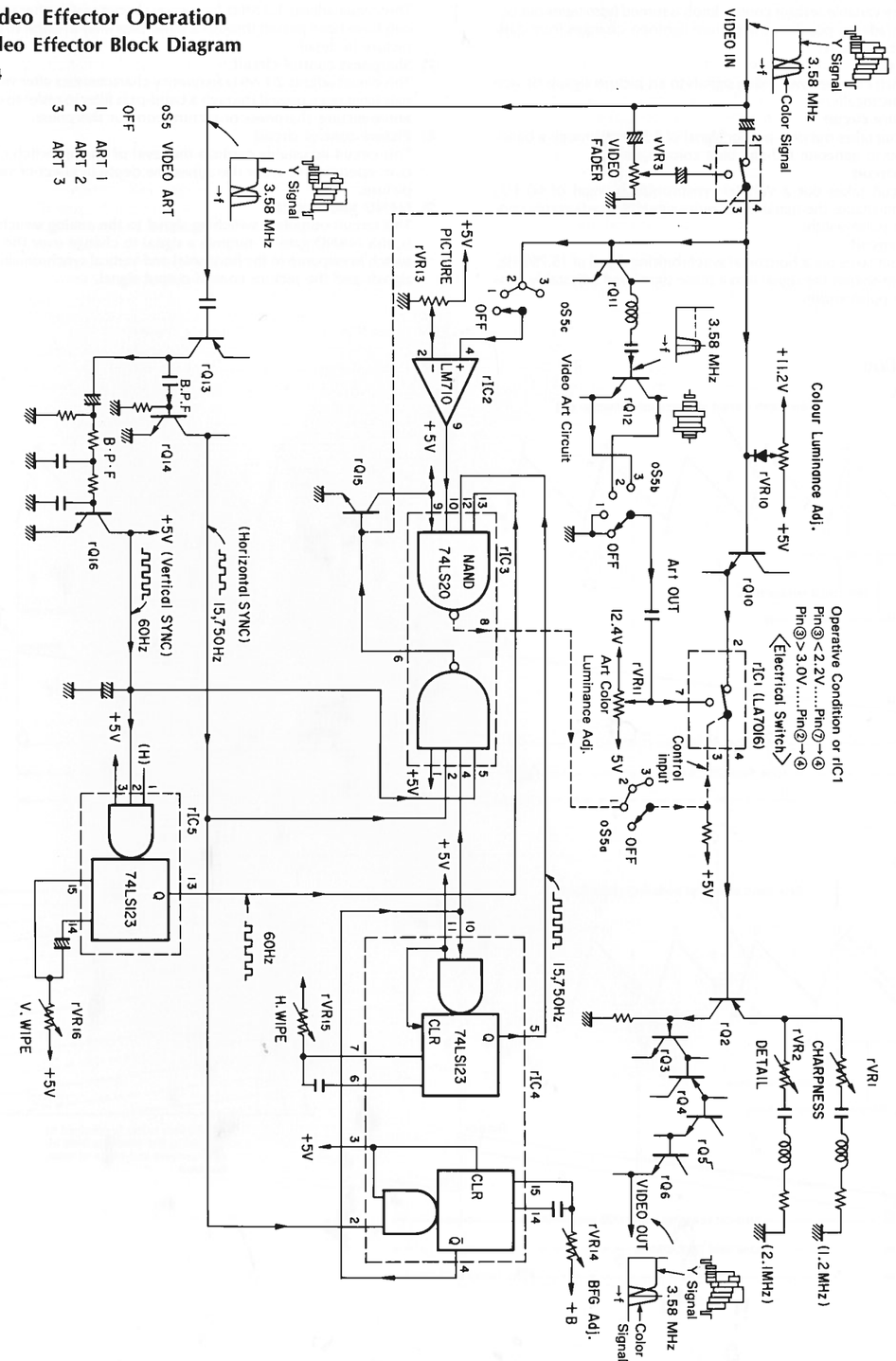


•When used on stereo programs, speads sound even more than normal with mono programs, create a lated stereo effect.

C. Video Effector Operation

1. Video Effector Block Diagram

Fig. 3-4



2. Circuit Configuration (See Fig. 3-4)

1) **Fader control**
When the variable resistor control knob is turned from fader-out position to fader-in position, the picture lightness changes from dark to bright gradually.
2) **Analog switch**
This switch changes over video signals to art picture signals or vice versa, electrically.
3) **Art picture circuit**
This circuit takes out only a color signal of 3.58 Hz through a band-pass filter to generate red-and-blue color signals.
4) **V-hold circuit**
This circuit takes out a vertical synchronizing singal of 60 Hz, waveform-shapes the signal into a pulse signal, and adjustably controls the pulse width.
5) **H-hold circuit**
This circuit takes out a horizontal synchronizing signal of 15.750 Hz, waveform-shapes the signal into a pulse signal and adjustably controls the pulse width.
6) **Detail control circuit**
This circuit adjusts 1.2 MHz frequency characteristics after video signals have been passed through a band-pass filter in order to control picture in detail.
7) **Sharpness control circuit**
This circuit adjusts 2.1 MHz frequency characteristics after video signals have been passed through a band-pass filter in order to control entire-picture sharpness or picture contour sharpness.
8) **Picture control circuit**
This circuit adjustably controls the level of analog-switch changeover operation in order the adjust the depth in effect of video art picture.
9) **NAND gate circuit**
This circuit outputs a switching signal to the analog switch. That is, this NAND gate IC outputs a signal to change over the analog switch in response to the horizontal-and-vertical synchronizing pulse signals and the picture control output signal.

3. Operation

Fig. 3-5

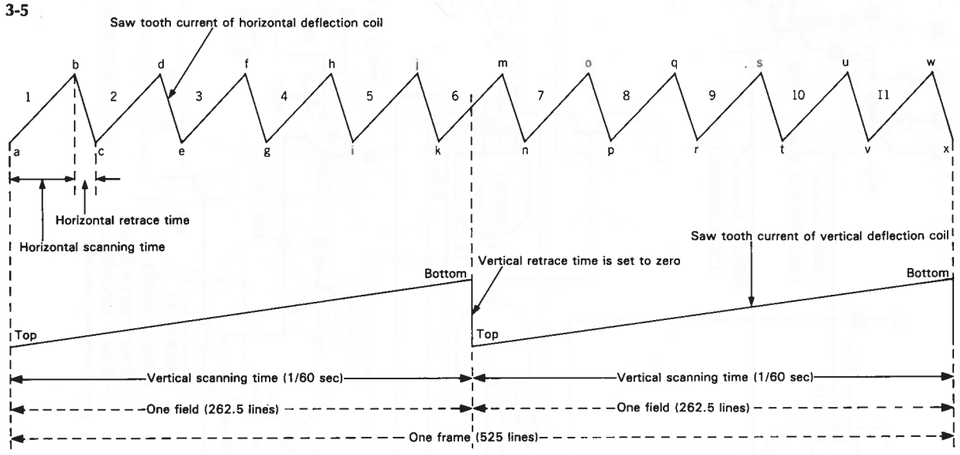


Fig. 3-6

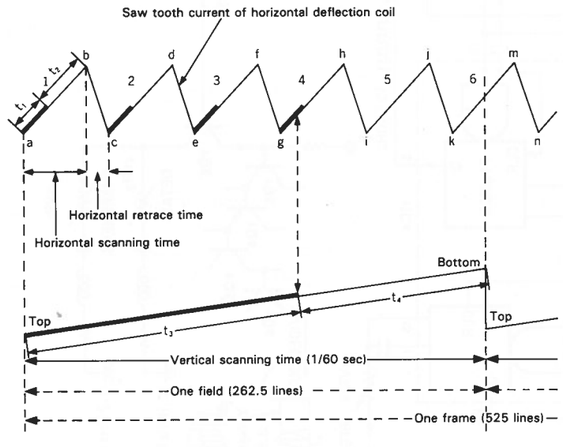
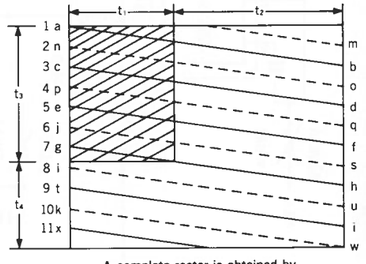
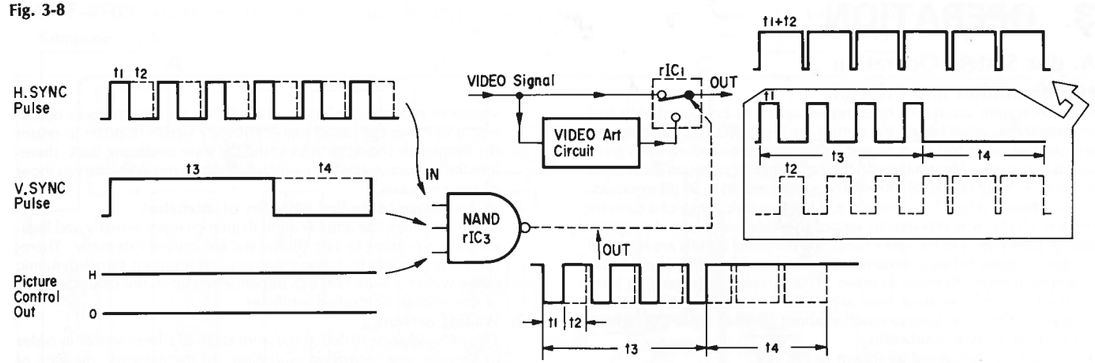


Fig. 3-7



A complete raster is obtained by combining the scanning lines of odd numbers and those of even numbers

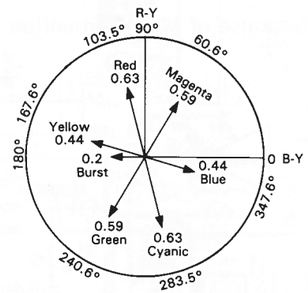
Fig. 3-8



1) **How to Determine Video-art Effect Range**
In Fig. 3-4, the analog switch rIC1 is connected to the video art circuit in response to a L-level NAND gate control signal and to the original video signals in response to a H-level NAND gate control signal.
This analog switch is changed over as follows:
Fig. 3-5 shows the relationship between currents flowing through the horizontal deflection coil and through the vertical deflection coil. Fig. 3-7 represents TV scanning lines, in which t_1 shows a range where art effect is implemented in the horizontal direction and t_3 shows a range where art effect is implemented in the vertical direction by AV-77, respectively, by way of example.
Fig. 3-6 shows a part of Fig. 3-5, in which art-effect ranges are represented by t_1 and t_3 and no art-effect ranges are represented by t_2 and t_4.
As depicted by Figs. 3-4 and 3-8, the analog switch control signal is outputted from pin No.8 of the NAND gate rIC3. The signals applied to the input terminals of the NAND gate are three of a horizontal synchronizing pulse signal (15.750 Hz), the pulse width of wich is adjustable by the H-WIPE control knob; a vertical synchronizing pulse signal (60 Hz), the pulse width of which is adjustable by the V-WIPE control knob; and picture signals. The NAND gate outputs a L-level signal only when three input signals are all at a H-level, respectively, as shown in Fig. 3-8. In other words, the NAND gate rIC3 outputs a L-level signal when the horizontal synchronizing signal lies within the range t_1; the vertical sychronizing signal lies within the range t_3; and the picture signal is at a H-level.
Once the control switch is changed over in response to the output signal from the NAND gate, as shown by Operating Timing Chart of the analog-switch output signals of Fig. 3-8, the picture in the horizontal direction is determined by the art picture range t_1 (where art effect is implemented and by the original video signal range t_2 (where no art effect is implemented); and the picture in the vertical direction is also determined by the art picture range t_3 and by the original video signal range t_4, thus the entire picture being constructed.
In the picture control circuit, the comparator rIC2 compares the original video signal with a variable dc input, and applies the output signal to the analog switch rIC1 through the NAND gate rIC3 in order to adjust the operating level of the analog switch. Therefore, if the variable dc input is fixed to a constant level in the control circuit, the video art is effective to the picture, only when the brightness level of the original video signal exceeds a predetermined level even within the above-mentioned ranges determined by t_1 and t_3.

2) **Video Art Circuit Operation**
In the video circuit shown in Fig. 3-4, the color signal is taken out from the original video signal through a band-pass filter of 3.58 MHz. Then, the color signal is taken out from the collector and the emitter of the transistor rQ12, respectively, and changed over by the art switch.
In the art switch 1, since a constant voltage is applied from a dc power supply to the art video signal side of the analog switch, the color tone is gray. In the art switch 2, since the signal 180 degrees out of phase with respect to the original signal is obtained from the collector of the transistor rQ12, the color tone is yellow, green, cyanic, etc. In the art switch 3, since the signal a small degree out of phasw with respect to the original signal is obtained from the emitter of the transistor rQ12, the color tone is blue, magenta, red etc, as better shwon in the color tone vector diagram of Fig. 3-9. Further, the lightness of the video art picture is adjustable by the variable resistor rVR11; the lightness of the original video signal is adjustable by the variable resistor rVR10.

Fig. 3-9



4. ADJUSTMENT

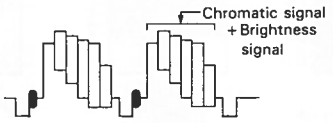
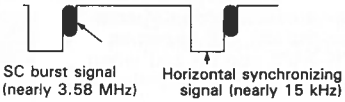
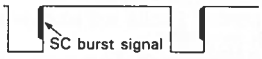
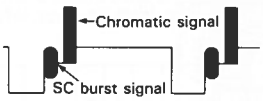
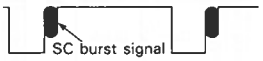
A. dbx Time Constant Adjustment

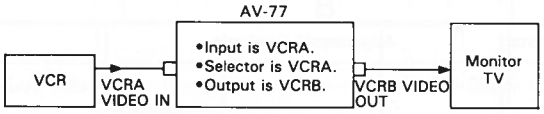
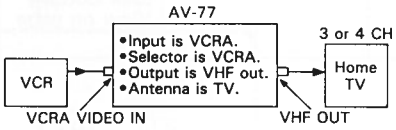
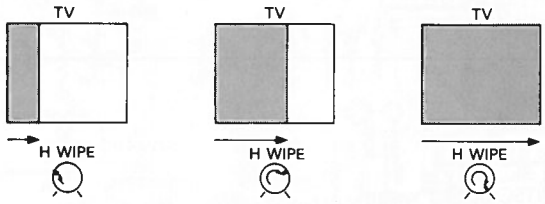
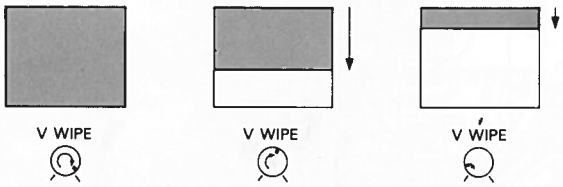
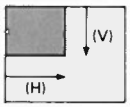
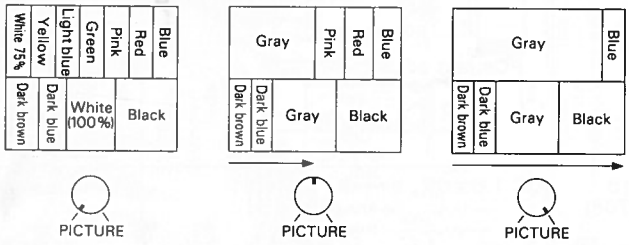
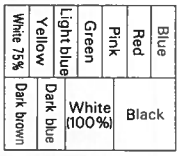
	Adjustment Procedure	Checked Position	Adjusted Parts	Adjustment Contents	Adjusting Conditions
1	dbx time constant adjustment	Connect a DC voltmeter across time constant test pin (points a and b) of board F-4709. (See Bottom View on page 13.)	xVR1 (F-4709) (See Bottom View on page 13.)	DC 15±0 mV	dbx switch ..... REC

B. Video Effector Adjustment

•Required Test Equipments

1. VHS Type Video Cassette Recorder (VCR) for NTSC or PAL system
2. Test Tape MH-1 or MH-2
3. Monitor TV (or Home TV with RF Tuner)

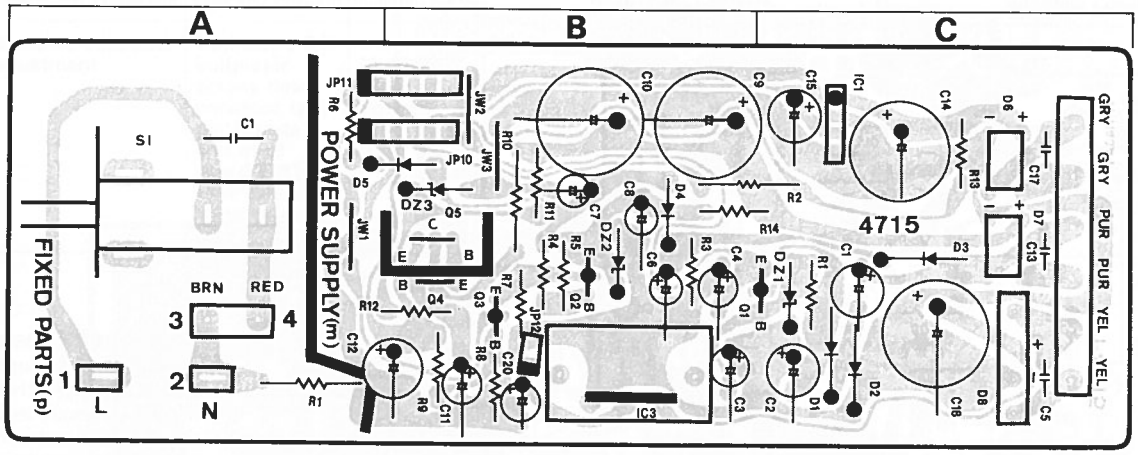
	Adjustment Procedure	Checked Position	Adjusted Parts	Adjustment Contents	Adjusting Conditions
1	Burst Flag Gate (BFG) adjustment	Connect an oscilloscope to video monitor terminal. (The output terminal is at 75 ohms at its end.)	rVR14 (F-4706) See Bottom View on page 13.	1.Check that waveforms in VIDEO FADER-IN should be as follows:  2.Check that waveforms in VIDEO FADER-OUT should be as follows:  3.Turn rVR14 to adjust SC burst signal as shown. •Maladjustment (Excessive turning of rVR14 clockwise)  (Excessive turning of rVR14 counterclockwise)  •Correct adjustment 	1.Connect VCR to VCR A VIDEO IN terminal. 2.VIDEO ART ..... OFF 3.SHARPNESS, DETAIL ..... Full counterclockwise 4.Reproduce color bar signals of a test tape by VCR. •NTSC System test tape—— MH-1 (Standard Play) Stock No. 36805000 Segment / Playback Time / Video Signal / Audio Signal 1 / 10 minutes / Stairstep / 7 kHz 2 / 5 minutes / (none) / 3 kHz 3 / 10 minutes / Color bar / 1 kHz 4 / 3 minutes / RF sweep / (none) •PAL System test tape—— MH-2 Stock No. 36809300 Segment / Playback Time / Video Signal / Audio Signal 1 / 10 minutes / Stairstep / 6 kHz 2 / 5 minutes / (none) / 3 kHz 3 / 10 minutes / Color bar / 1 kHz 0 dB 4 / 3 minutes / RF sweep / (none)
2	DC level adjustment (Picture effect adjustment)	Connect a DC voltmeter between rD10 anode (point c) and +5V (point d) of F-4706. See Bottom View on page 13.	rVR10 (F-4706) See Bottom View on page 13.	DC 1.6±0V	Power switch ..... ON
3	WHITE level adjustment (ART-1 brightness adjustment)	Connect a DC voltmeter between rVR11 (point e) and +5V (point d) of F-4706. See Bottom View on page 13.	rVR11 (F-4706) See Bottom View on page 13.	DC 750±10mV	Power switch ..... ON

	Adjustment Procedure	Adjustment Contents	Adjusting Conditions
4	V-WIPE, H-WIPE, PICTURE operation check	Connect VCR and monitor TV as shown below: 	1.Connect VCR to VCR A VIDEO IN terminal. 2.Reproduce color bar signals of a test tape by VCR. (See Adjust condition of BFB Adjustment of Item 1.) 3.VIDEO ART switch ..... Art 1 4.PICTURE control knob ..... Full clockwise 5.FADER ..... IN 6.If no monitor TV is prepared, use home TV with RF tuner as follows. 
(1)	H-WIPE operation check	1.Rotate V-WIPE control knob full clockwise. 2.Check that a gray surface on TV picture increases gradually from left to right when the knob is rotated clockwise and that the TV picture is gray entirely when the knob is rotated full clockwise. 	
(2)	V-WIPE operation check	1.Rotate H-WIPE control knob full clockwise. 2.Check that a gray surface decreases gradually from bottom to top when the knob is rotated counterclockwise and that the gray surface disappears when the knob is rotated full counterclockwise. 	
(3)	H-and-V WIPE combined operation check	Check that the gray surface is on a quarter of TV picture when the left half becomes gray by adjusting H-WIPE control and when the upper half becomes gray by adjusting V-WIPE control. 	
(4)	PICTURE and ART 1 operation check	1.Rotate V-and-H WIPE control knobs full counterclockwise. 2.Set VIDEO ART to OFF. 3.Rotate PICTURE full counterclockwise. 4.Check hues of test parttern color mode. 5.Rotate V-and-H WIPE control knobs full clockwise. 6.Set VIDEO ART switch to ART-1. 7.Check that pattern hue changes to gray from white, sometimes yellow color of the left side TV picture and also the upper right end of TV picture changes from blue to gray when PICTURE is gradually rotated clockwise. 	•Hues of test pattern color mode  Note: The hue of Test Pattern differs depend on Monitor TV.
(5)	PICTURE and ART 2 operation check	1.Perform above procedure 1 to 5 under Item (4) PICTURE and ART 1 operation check. 2.Set VIDEO ART switch to ART-2. 3.Check that pattern hue changes from white, sometimes yellow color of the left side TV picture and also blue on the left end of TV picture changes to a hue different from the original hue when PICTURE is gradually rotated clockwise.	
(6)	PICTURE and ART 3 operation check	1.Perform above procedure 1 to 5 under Item (4) PICTURE and ART 1 operation check. 2.Set VIDEO ART switch to ART-3. 3.Check that pattern hue changes from white, sometimes yellow color of the left side TV picture and also blue on the left end of TV picture changes to a hue different from the original hue when PICTURE is gradually rotated clockwise.	

5. PARTS LOCATION & PARTS LIST

5-1. F-4715 Power Supply Circuit Board (Stock No. 00825901) <XX, UL, EU, BS>/(Stock No. 00825903) <CSA>

Component Side

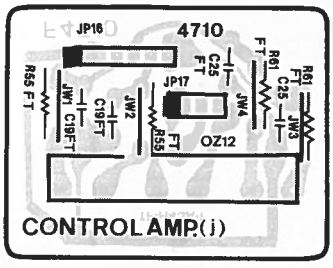


Parts List

Parts No.	Stock No.	Description
•Transistor		
⚠mQ1	48000801	2SA934
⚠mQ2	46392001	2SA1175
⚠mQ3	46392001	2SA1175
⚠mQ4	46391901	2SC2785
⚠mQ5	03083901	2SD313
	or 46546701	2SD880
•IC		
⚠mIC1	46499800	L78N09
⚠mIC3	48116100	SI-3122V
•Diode		
⚠mD1	03117700	10E-2
⚠mD2	03117700	10E-2
⚠mD3	03117700	10E-2
mD4	03117600	1S2473T77
mD5	03117600	1S2473T77
⚠mD6	46273600	DBB10-B
⚠mD7	46273600	DBB10-B
⚠mD8	03117000	RB152-LFF
•Zener Diode		
mDZ1	46103900	05Z13-X
mDZ2	46103100	05Z10-Y
mDZ3	46103900	05Z13-X
⚠mR13	00137100	82Ω 1/2W N.I.R.
⚠mR14	00135400	470Ω 1/2W N.I.R.
pC1	46425800	0.01μF 400V C.C.
pS1	46360300	Push SW., POWER <XX, UL, EU, BS>
	48065000	Push SW., POWER <CSA>

5-2. F-4710 Audio Terminal Circuit Board

Component Side

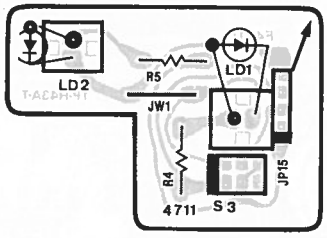


Parts List

	Stock No.	Description
	48115400	6P Audio/TAPE Terminal

5-3. F-4711 Antenna Switch Circuit Board

Component Side

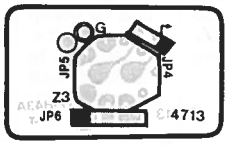


Parts List

Parts No.	Stock No.	Description
nLD1	48076200	SEL2913K
nLD2	46169300	SEL1210S
oS3	46463300	Push SW., ANTENNA

5-4. F-4713 Video Camera Socket Circuit Board

Component Side

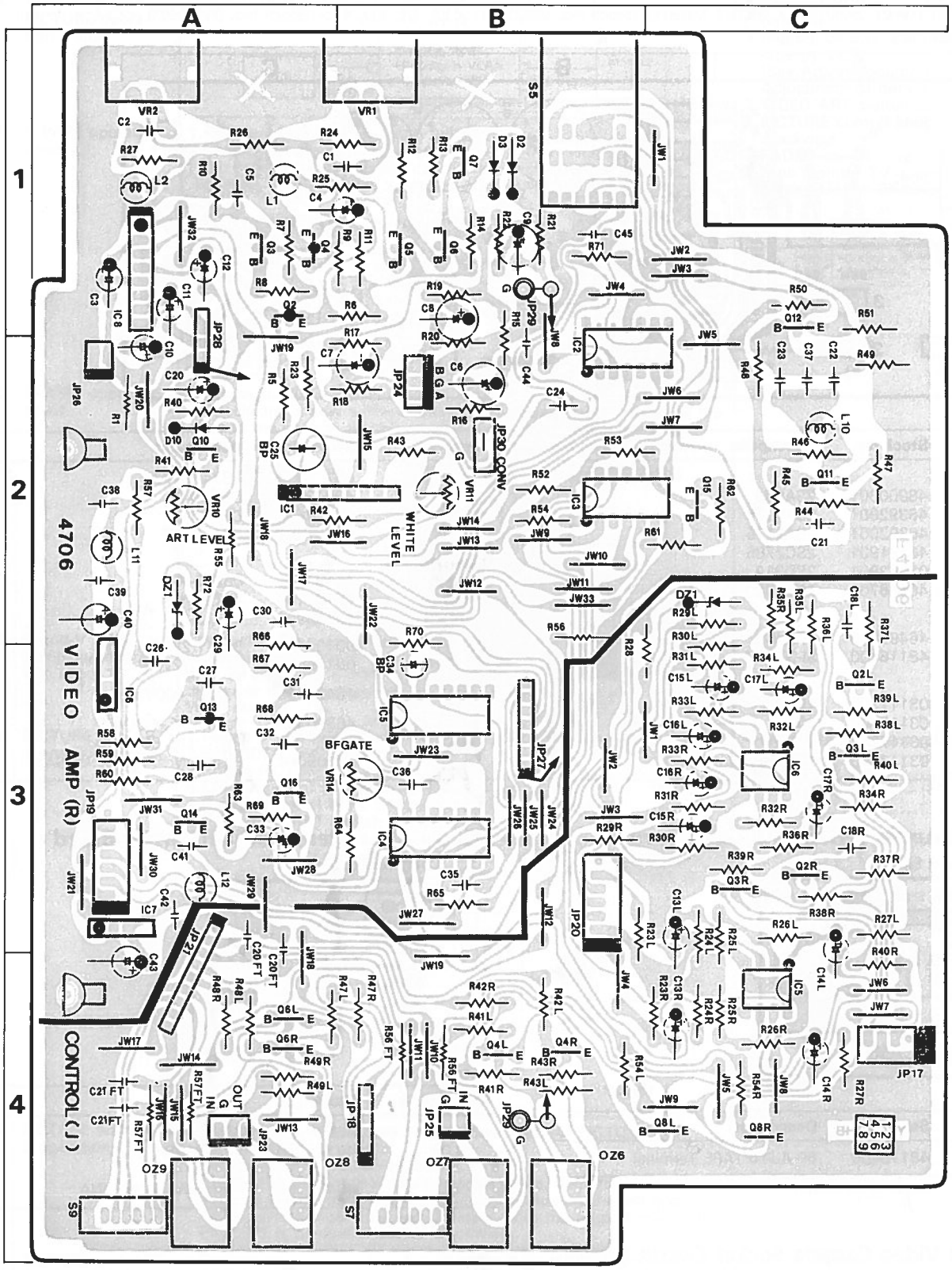


Parts List

Parts No.	Stock No.	Description
oZ3	48114800	Video Camera Socket

5-5. F-4706 Video Effector Circuit Board (Stock No. 00824901)

Component Side

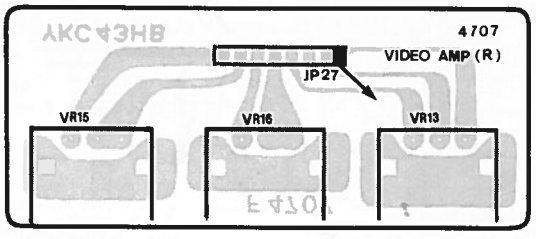


Parts List <F-4706>

Parts No.	Stock No.	Description
•Transistor		
jQ2	46604301	2SC3327
	or 48055901	2SD1468
jQ3	46604301	2SC3327
	or 48055901	2SD1468
jQ4	46604301	2SC3327
	or 48055901	2SD1468
jQ6	46604301	2SC3327
	or 48055901	2SD1468
jQ8	46604301	2SC3327
	or 48055901	2SD1468
•IC		
jIC5	07208900	NJM4558D-X
	or 46580100	M5218P
jIC6	07208900	NJM4558D-X
	or 46580100	M5218P
•Zener Diode		
jDZ1	46111700	05Z6.2-X
jC18	46696400	0.33μF 50V F.C.
oS5	48114200	Rotary SW., VIDEO ART
oS7	46177200	Slide SW., MONO/ST
•Transistor		
rQ2	46367001	2SA1115
rQ3	46392401	2SC2668
rQ4	46367001	2SA1115
rQ5	46392401	2SC2668
rQ6	03063001	2SC1360
rQ7	46725801	2SC1627A
rQ10	46367101	2SC2603
rQ11	46393201	2SC2786
rQ12	46367101	2SC2603
rQ13	46367001	2SA1115
rQ14	46367101	2SC2603
rQ15	46367101	2SC2603
rQ16	46367101	2SC2603
•IC		
rIC1	48116000	LA7016
rIC2	48115900	LM710
rIC3	48115600	HD74LS20P
	or 48115700	MB74LS20
	or 48115800	M74LS20P
rIC4	46429800	MB74LS123M
	or 46720800	M74LS123P
	or 48114600	HD74LS123P
rIC5	46429800	MB74LS123M
	or 46720800	M74LS123P
	or 48114600	HD74LS123P
rIC6	46361500	L78N12
rIC7	46359400	L78N05
rIC8	48116000	LA7016
•Diode		
rD2	03117600	1S2473T77
rD3	03117600	1S2473T77
rD10	03117600	1S2473T77
•Zener Diode		
rDZ1	46111700	05Z6.2-X
rC25	08450700	33μF 10V E.B.
rC26	46697600	0.1μF 50V F.C.
rC28	46692800	1000pF 50V F.C.
rC30	46692800	1000pF 50V F.C.
rC31	46695200	0.01μF 50V F.C.
rC32	46695200	0.01μF 50V F.C.
rC34	08451700	1μF 50V F.B.
rC35	46695200	0.01μF 50V F.C.
rC36	46692800	1000pF 50V F.C.
rL1	46204900	Inductor 47μH
rL2	46204900	Inductor 47μH
rL10	46204900	Inductor 47μH
rL11	46204100	Inductor 2.2μH
rL12	46204100	Inductor 2.2μH
rVR1	48113500	10kΩ (B) V.R., SHARPNESS
rVR2	48113500	10kΩ (B) V.R., DETAIL
rVR10	46633700	1kΩ(B) S.V.R., DC Level
rVR11	46633700	1kΩ(B) S.V.R., Video Art Luminance
rVR14	46634300	10kΩ S.V.R., B.F.G Adjust

5-6. F-4707 Video Effector Volume Circuit Board

Component Side

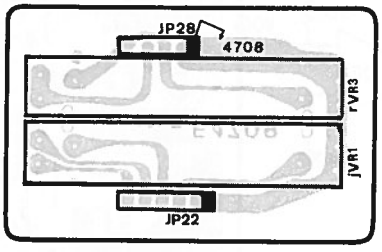


Parts List

Parts No.	Stock No.	Description
rVR13	48113800	1kΩ (B) V.R., PICTURE
rVR15	48113600	20kΩ (B) V.R., H. WIPE
rVR16	48113700	100kΩ (B) V.R., V. WIPE

5-7. F-4708 Video Fader Circuit Board

Component Side

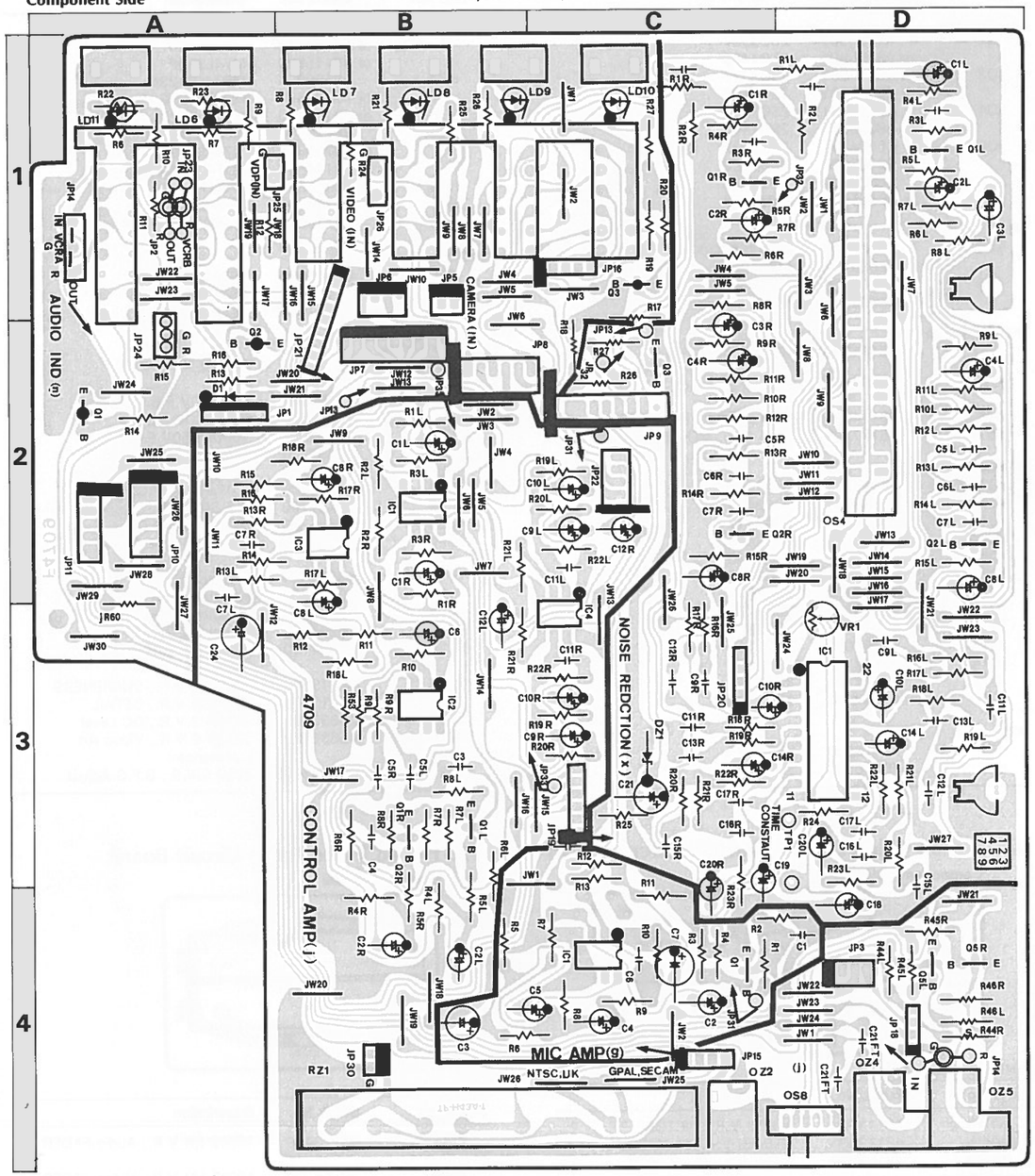


Parts List

Parts No.	Stock No.	Description
jVR1	48113400	100kΩ (B) V.R., Audio FADER
rVR3	48145700	100kΩ (A) V.R., Video FADER

5-8. F-4709 Noise Reduction Circuit Board (Stock No. 00825301 = NTSC System) <XX, UL, CSA>/(Stock No. 00832601 = PAL System) <XX, EU>/(Stock No. 00832606 = PAL System) <BS>

Component Side



3. OPERATION

A. dbx System Operation

•Configuration and Principle

The dbx system accurately compresses signals to be recorded to half in logarithmic value before the signals are inputted to a recording system and expands the compressed signals to double when the signals are played back. For instance, in the case where a program source has a dynamic range of 100 dB, the source is compressed to 50 dB in recording, as shown in Fig. 3-1. Therefore, if the dynamic range of a cassette deck is 60 dB, it is possible to record the abovementioned program source perfectly. On the other hand, the recorded signals are returned to music signals having a dynamic range of 100 dB when played back. The system serves to reduced noise. That is, since the recording level is raised beyond hiss noise level generated in recording, it is possible to improve the noise level as much as about 30 dB or more throughout the total frequency bandwidth.
The system is configured as shown in Fig. 3-2.

•Each section operation

1) **Pre-emphasis and De-emphasis circuits**
The pre-emphasis operation is to raise high-frequency signals in order to reduce noise modulation effect (noise breathing) of high-frequency signals in recording. On the other hand, the de-emphasis operation is to lower the raised high-frequency signals in order to return the frequency characteristics to the flat state in playing back, therefore the characteristics of de-emphasis being complementary to those of pre-emphasis.
2) **VCA (voltage controlled amplifier or attenator)**
In this amplifier, the amplification degree changes lenearly and logarimically according to a dc control voltage applied externally. Therefore, it is possible to compressor expand an input signal dynamic range within a wide range in dependence upon the characteristics of the voltage controlled amplifier.
3) **Waiting network**
This network is provided at the front stage of a level sensor in order to prevent tape recording saturation. In the network, the gain of encoder VCA is reduced with respect to high-frequency input signals.
4) **Root Mean Square Value (RMS) level sensor**
This sensor detects the effective value of input signal and outputs a dc control voltage proportional to the detected level in order to control the gain of VCA according to the level of the input signal.

Fig. 3-1

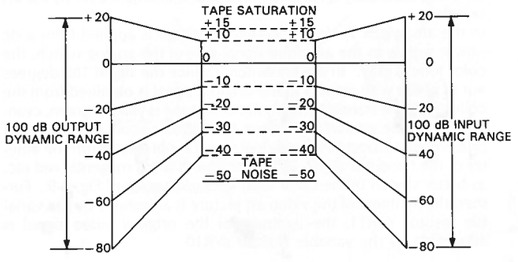
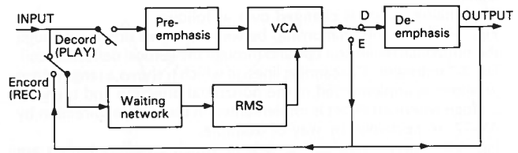


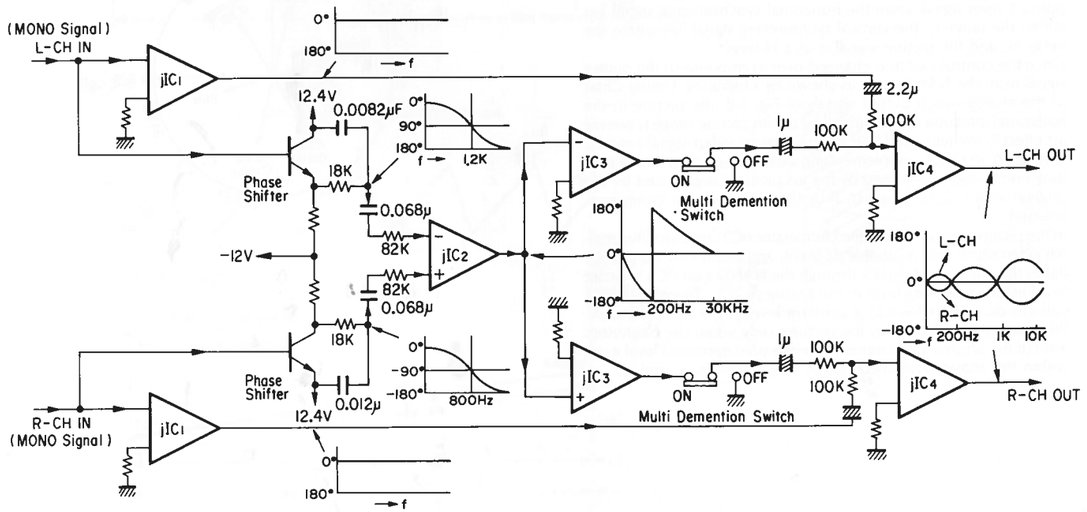
Fig. 3-2



"dbx" is a trademark of DBX Incorporated. DBX noise reduction system manufactured under license from DBX Incorporated.

B. Phase Response of Multi Dimention Circuit

Fig. 3-3



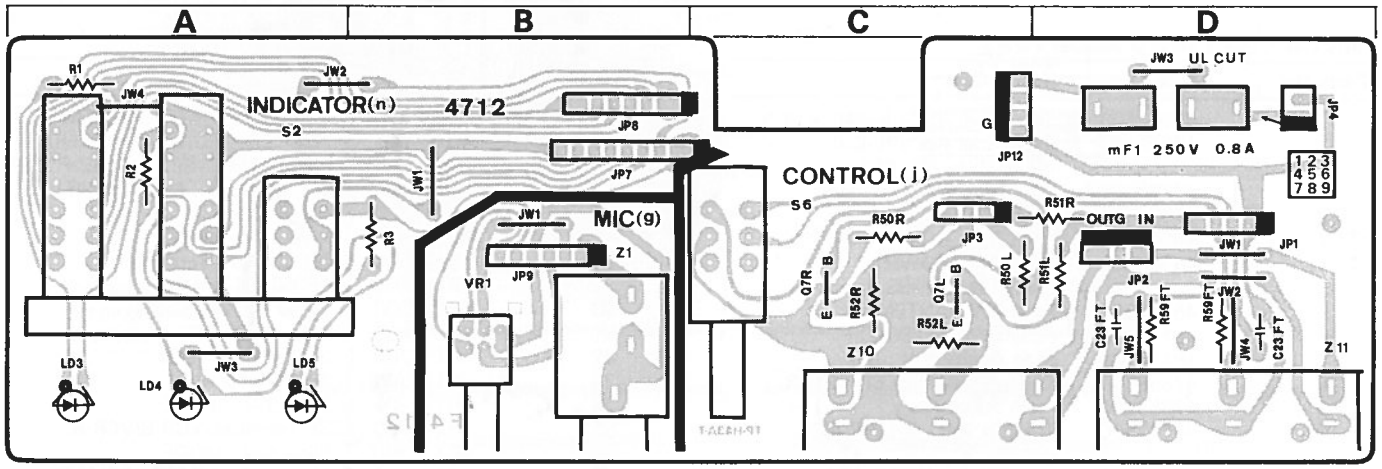
•When used on stereo programs, speads sound even more than normal with mono programs, create a lated stereo effect.

Parts List <F-4709>

Parts No.	Stock No.	Description
•Transistor		
gQ1	46604301	2SC3327
	or 48055901	2SD1468
•Transistor		
jQ1	46367101	2SC2603
jQ5	46604301	2SC3327
	or 48055901	2SD1468S
•IC		
gIC1	07208900	NJM4558D-X
	or 46580100	M5218P
•IC		
jIC1	07208900	NJM4558D-X
	or 46580100	M5218P
jIC2	07208900	NJM4558D-X
	or 46580100	M5218P
jIC3	07208900	NJM4558D-X
	or 46580100	M5218P
jIC4	07208900	NJM4558D-X
	or 46580100	M5218P
jC3	46695000	8200pF 50V F.C.
jC4	46695400	0.012μF 50V F.C.
jC5	46697200	0.068μF 50V F.C.
jC7	46697200	0.068μF 50V F.C.
⚠ jR60	00133200	22Ω 1/2W N.I.R.
•Transistor		
nQ1	46367001	2SA1115
nQ2	46367001	2SA1115
nQ3	46367001	2SA1115
•Diode		
nD1	03117600	1S2473T77
•LED		
nLD6	48111700	SEL2413E
nLD7	48111700	SEL2413E
nLD8	48111700	SEL2413E
nLD9	48111700	SEL2413E
nLD10	48111700	SEL2413E
nLD11	48111700	SEL2413E
oS1	48114100	Push SW., SELECTOR
oS4	48114300	Slide Rotary Switch, dbx
oS8	46177200	Slide SW., MONO/ST
oZ2	46411800	Mini Jack, CAMERA REMOTE
rZ1	48114900	MCB1-VU, RF Converter Unit ≪NTSC≫ <XX, UL, CSA>
	48115300	MCB1-UG, RF Converter Unit ≪PAL≫ <BS>
	48115200	MCB1-VG3601 RF Converter Unit ≪PAL≫ <XX, EU>
•Transistor		
xQ1	46367101	2SC2603
xQ2	46367101	2SC2603
xQ3	46367101	2SC2603
•IC		
xIC1	48111900	AN6291
•Zener Diode		
xDZ1	46111200	05Z5.1-Y
xC5	46694000	3300pF 50V F.C.
xC6	46694000	3300pF 50V F.C.
xC9	46696400	0.33μF 50V F.C.
xC12	46696000	0.22μF 50V F.C.
xC13	46286400	0.68μF 63V F.C.
xC15	46694400	4700pF 50V F.C.
xC17	46696000	0.22μF 50V F.C.
xVR1	46633900	2.2kΩ S.V.R., Time Constant

5-9. F-4712 MIC Mixing Level Volume Circuit Board

Component Side

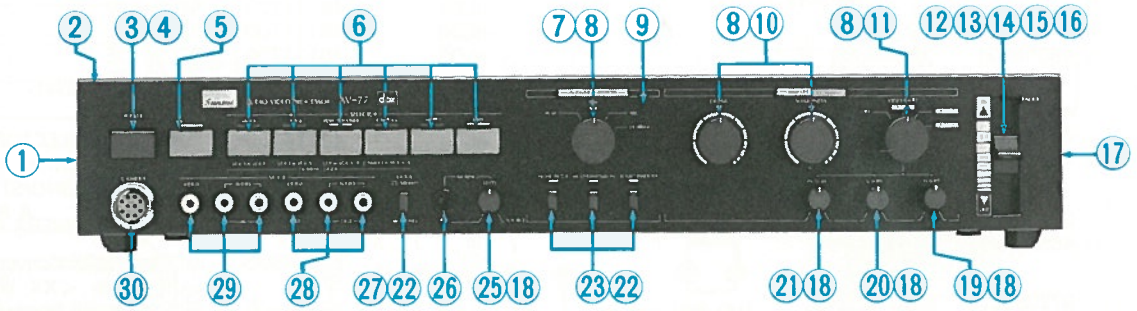


Parts List

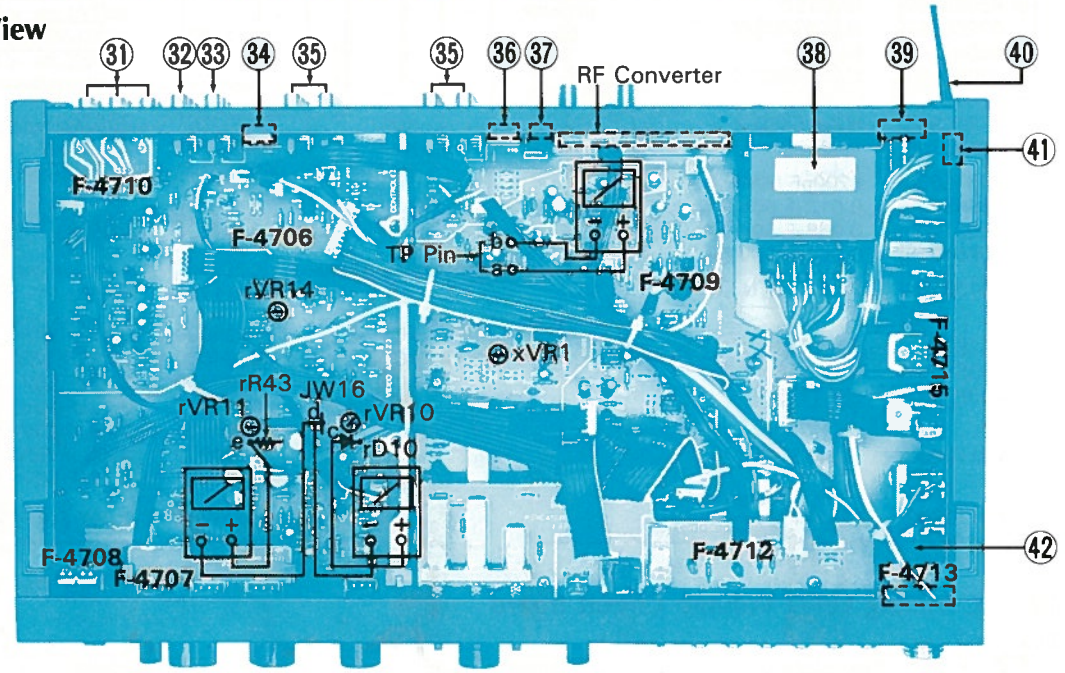
Parts No.	Stock No.	Description
gVR1	48113900	50kΩ (B) V.R., MIC MIXING
•Transistor		
jQ7	48055901	2SD1468S
	or 46604301	2SC3327
•LED		
nLD3	48111500	SEL2210S
nLD4	48111500	SEL2210S
nLD5	48111500	SEL2210S
oS2	48114500	Push SW., AUDIO INSERT/MULTI DEMENTION
oS6	46164900	Push SW., MONO/ST
oZ1	46085000	Mic Jack
	46201400	800mA Fuse <UL>

6. OTHER PARTS

6-1. Front View



6-2. Bottom View



Parts List <Front View & Bottom View>

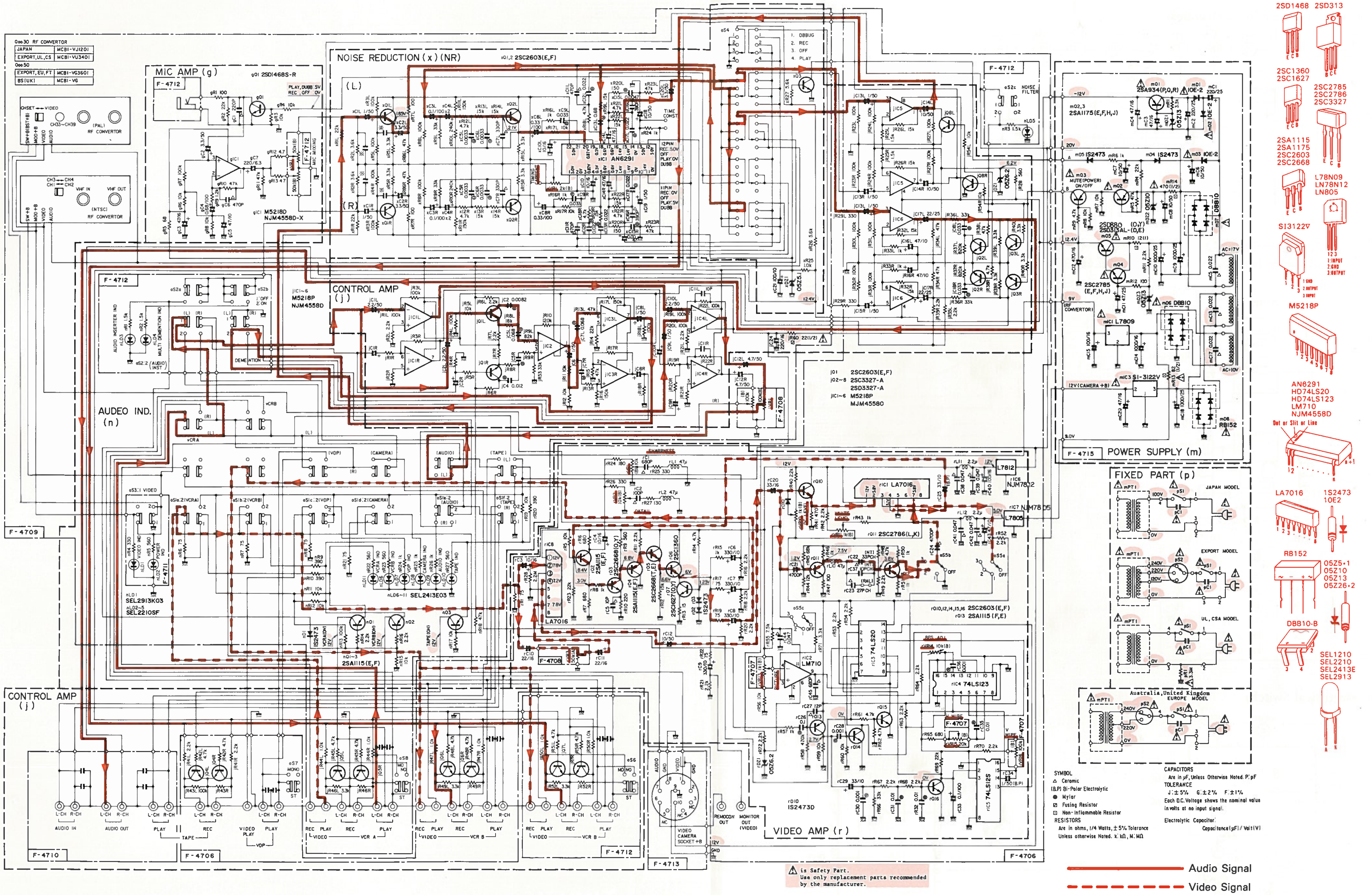
Parts No.	Stock No.	Description
1	47684900	Side Panel Ass'y (L-CH) <UL>
	47315610	Side Panel Ass'y (L-CH) <XX, CSA, EU, BS>
2	47256200	Metal Bonnet
3	47633700	Knob, POWER SW.
⚠ 4	48065000	Push SW., POWER <CSA>
⚠	46360300	Push SW., POWER <XX, UL, EU, BS>
5	46463300	Push SW., ANTENNA
6	48114100	Push SW., SELECTOR
7	48114300	Slide Rotary SW., dbx
8	47658500	Knob, dbx/VIDEO EFFECTOR
9	47659200	Front Panel Ass'y
10	48113500	10kΩ(B) V.R., SHARPNESS/ DETAIL
11	48114200	Rotary SW., VIDEO ART
12	48113400	100kΩ (B) V.R., AUDIO FADER
13	48145700	100kΩ (A) V.R., VIDEO FADER
14	47110000	FADER Volume Knob
15	47111100	FADER Volume Mask
16	47110910	Slide Volume Holder
17	47685000	Side Panel Ass'y (R-CH) <UL>
	47314820	Side Panel Ass'y (R-CH) <XX, CSA, EU, BS>
18	47636100	Knob, PICTURE/H. WIPE/V. WIPE/MIC
19	48113600	20kΩ (B) V.R., H. WIPE
20	48113700	100kΩ (B) V.R., V. WIPE
21	48113800	1kΩ (B) V.R., PICTURE

Parts No.	Stock No.	Description
22	47658900	Knob, MODE/NOISE FILTER/etc.
23	48114500	Push SW., AUDIO INSERTER/ MULTI DIMENSION/NOISE FILTER
25	48113900	50kΩ (B) V.R., MIC MIXING
26	46085000	Mic Jack
27	46164900	Push SW., MODE
28	48115500	3P OUTPUT Terminal
29	48115500	3P INPUT Terminal
30	48114800	Video Camera Socket
31	48115400	6P AUDIO/TAPE Terminal
32	48114700	3P TAPE Terminal
33	48114700	3P VDP Terminal
34	46177200	Slide SW., MODE
35	48114700	3P Terminal, VCR B/VCR A
36	46177200	Slide SW., MODE
37	46411800	Mini Jack, CAMERA REMOTE
⚠ 38	15018401	Power Transformer <XX>
⚠	15018402	Power Transformer <UL, CSA>
⚠	15018505	Power Transformer <EU, BS>
⚠ 39	48069600	Voltage Selector SW. <XX>
⚠	48111800	Voltage Selector SW., <EU, BS>
⚠ 40	46604400	Power Supply Cord <XX, UL, CSA>
⚠	38004500	Power Supply Cord <EU>
⚠	38004300	Power Supply Cord <BS>
41	47157300	AC Cord Cover
42	47637300	Joint Bar

A B C D E F G H

7. SCHEMATIC DIAGRAM

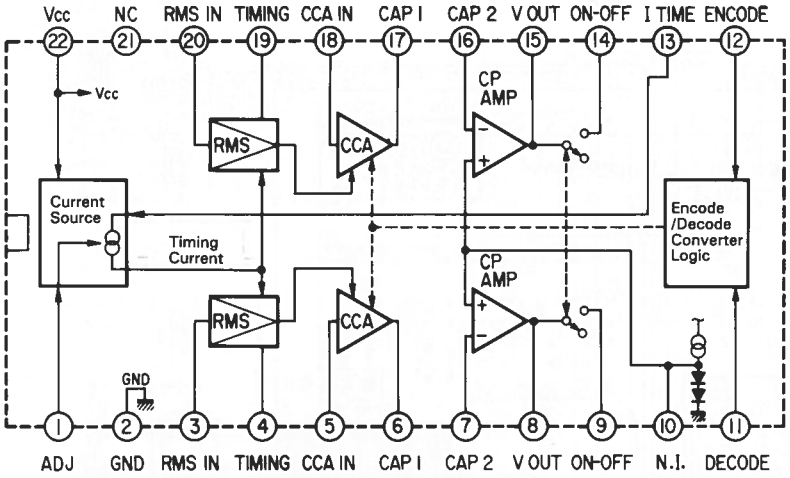
* Design and specifications subject to change without notice for improvement.
* La présention et les spécifications sont susceptibles d'être modifiées sans préavis par suites d'améliorations éventuelles.
* Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.



1 2 3 4 5

8. INTERIOR BLOCK DIAGRAM OF IC

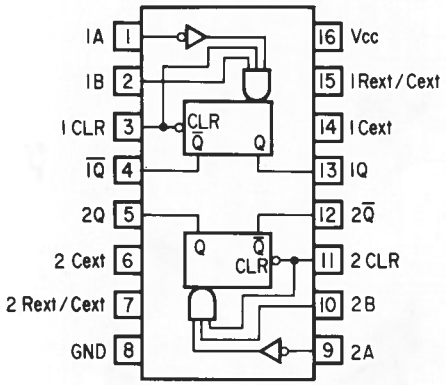
•AN6291 (Dual dbx Encoder & Decoder)



•Encode/Decode Converter Logic Condition

11 Pin	12 Pin	Motion mode
Vcc	Open	Decode
Open	Vcc	Encode
Vcc	Vcc	Bypass

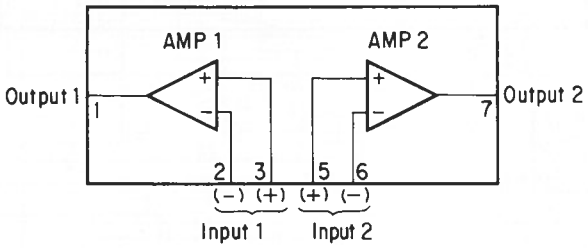
•MB74LS123 (Multiviblator)



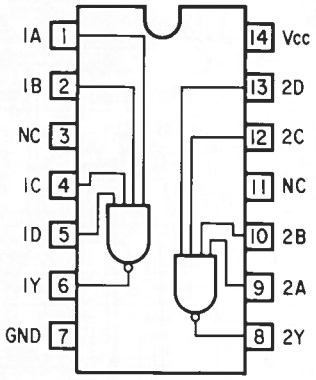
•Function Table <M74LS•123>

INPUT			OUTPUT	
CLEAR	A	B	Q	$\overline{Q}$
L	X	X	L	H
X	H	X	L	X
X	X	L	L	H
H	L	↑	⊓	⊔
H	↓	H	⊓	⊔
↑	L	H	⊓	⊔

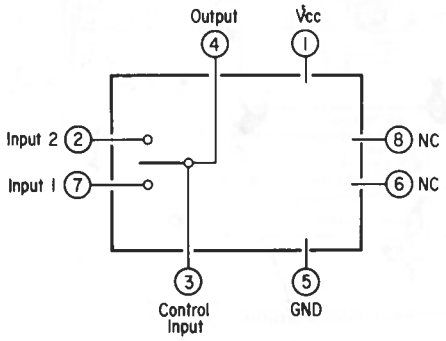
•M5218L/NJM4558D (Dual Operation Amp)



•HD74LS20P (Dual 4-Input-Positive Nand Gate)

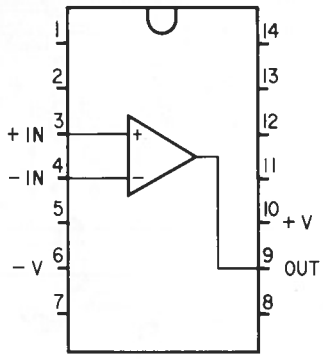


•LA7016 (Electorical Switch)



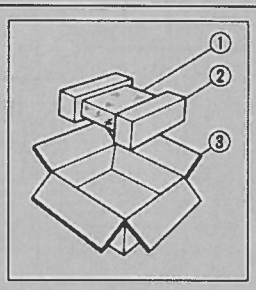
•Operative Condition
Pin③<2.2V.....Pin⑦→④
Pin③>3.0V.....Pin②→④

•LM710 (Voltage Comparator)



9. PACKING LIST

Parts No.	Stock No.	Description
1	07599500	Vinyl Cover
2	07827220	Styrofoam Packing
3	47716100	Carton Case <EU>
	47716200	Carton Case <BS>
	47658200	Carton Case <XX, UL, CSA>



10. ACCESSORY LIST

Stock No.	Description
46958800	Operating Instruction ≪PAL≫
46958700	Operating Instruction ≪NTSC≫
46267300	2P Mini Plug Cord
38103300	PJP Pin Plug Cord
48111100	Antenna Cord ≪NTSC≫
48111200	Antenna Cord ≪PAL≫

Sansui

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(SM1-193) Printed in Japan (840420M) <Stock No. 36510600>