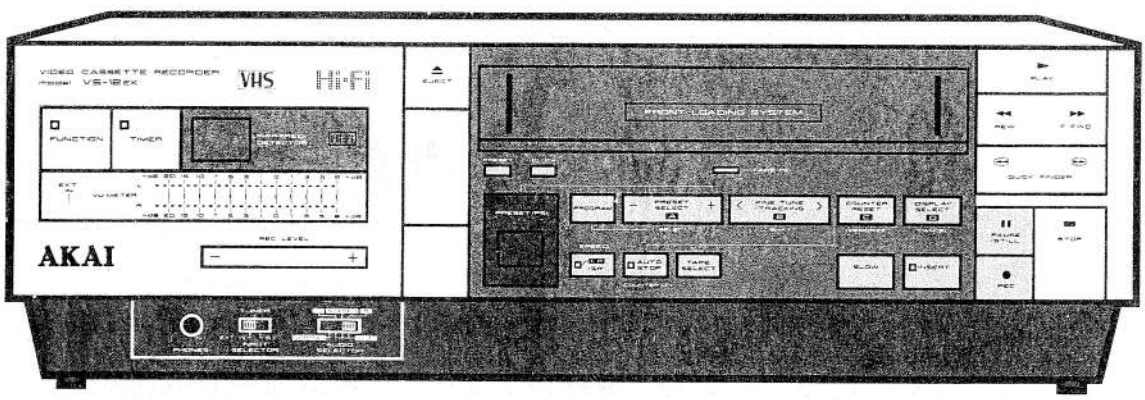
AKAI SERVICE MANUAL

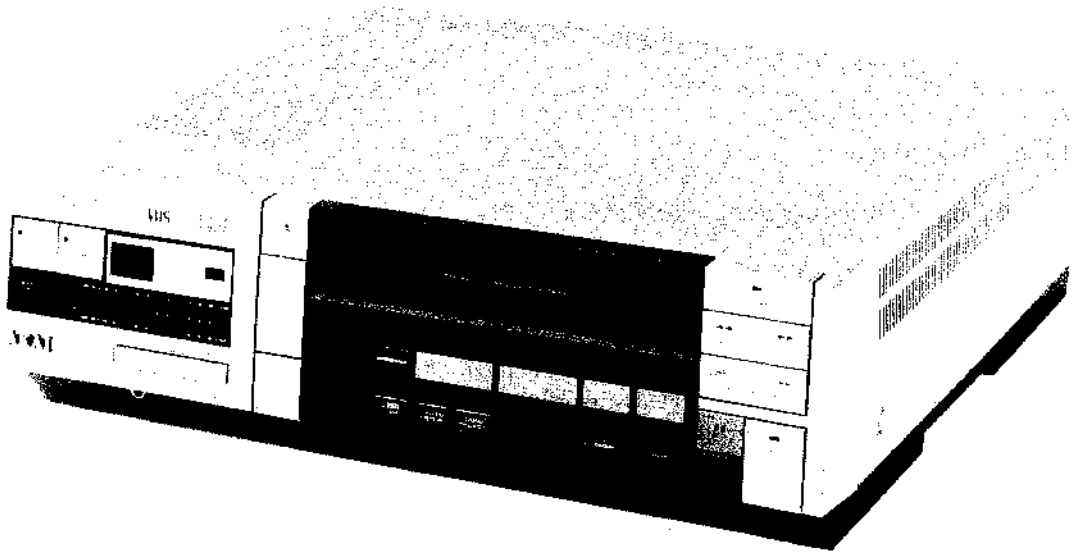


HIFI VIDEO CASSETTE RECORDER

MODEL **VS-12** EG/EK

ABBREVIATIONS FOR SERVICE MANUAL
MODEL VS-12EG/EK

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
AC	Alternating Current	LED	Light Emitting Diode
ACC	Auto Color Control	LM	Loading Motor
A/C	Audio and Control	LP	Long Play
ADJ	ADJust (ment)	LPF	Low Pass Filter
AFC	Auto Frequency Control	LSW	Loading SWitch
AFT	Auto Fine Tuning	ME-SECAM	Middle East SECAM
AGC	Auto Gain Control	MI-COM	MIcro COMputer
AH(P)	Audio Head (Play Back)	MM	Mono-stayble Multi
AH(R)	Audio Head (Record)	MRS	Motor ReverSe
AL	ALI	NG	Noise Gate
ALC	Auto Level Control	NON-LIN	NON-LINear
ANT	ANTenna	N.T.S.C.	National Television System Comittee
APC	Automatic Phase Control	O MUTE	Output MUTE
ASSY	ASSemblY	OSC	OSCillator
BAL	BALance	PAL	Phase Alternation Line
B/C	Buzz and Charactor	PB	Play Back
B DOWN	Break DOWN	P-COM	Phase-COMparator
BGP	Burst Gate Pulse	PG	Pulse Generator
BLK	BLacK or BLock	PL, PLG	PLunger (PLunGer)
BM	Balanced Modulator	PRG	PRoGram
BPF	Band Pass Filter	P & S	Power supply & System control
BS	Band Select	PWR	PoWeR
BU	Back Up	Q	Quality factor
B/W	Black and White	RC	Rotary Control
CCIR	Comité Consultatif International des Radio Communications	REC	RECord
		REF	REFerence
CH (Ch.)	CHannel (Channel)	REF-V	REFerence Vertical signal
CK	Color Killer	REG	REGulator
CLK	CLocK	REV(REVW)	REView (REVieW)
CLP	CLiP	REW	REWind
CM	Capstan Motor	RFB	Radio Frequency Booster
CN	CoNnector	RM	Reel Motor
COMP	COMParator	RM PWR	Reel Motor PoWeR
Comp	Comparison	RSSW	Record Safety SWitch
C or R	Cue or Review	RST (RES)	ReSeT (RESet)
CSW	Cassette SWitch	S	Sensor, Shield
CTL	ConTroL	S CLK	Serial CLocK
CUE	CUE	S & A	Servo & Audio
CW	Carrier Wave	SECAM	Séquentiel à Memoire
DAC	Digital to Analog Converter	SEP (SEPA)	SEParator (SEPArator)
DC	Direct Current	SFP	Sync Front Pulse
DEMOD	DEMODulator	S & H	Sample and Hold
DET	DETect (DETector)	SP	Standard Play
DL	Delay Line	SPD	SPeeD
DM	Drum Motor	SRP	Supply Reel Pulse
DOC	Drop Out Compensator	SRV	SeRVo
EE	Electronic to Electronic	SW	SWitch
EF	Emitter Follower	SW'NG	SWitchiNG
EM	Eject Motor	SWP	SWitching Pulse
EMPHA	EMPHAsis	SYNC	SYNChronize
ENV IN	ENVelope INput	TPZ (TRAPE)	TraPeZoid (TRAPEzoid)
ESW	Eject SWitch	TRK	TRacKing
EQ	EQualizer	TRP	Take up Reel Pulse
FE	Full track Erase	T/U	Take Up
FF	Flip-Flop	TV	TeleVision
FG	Frequency Genelator	UHF	Ultra High Frequency
Fig.	Figure	UNR	UNRegulated
FM	Frequency Modulation	V	Vertical
Fo	resonance Frequency	VCO	Voltage Controlled Oscillator
FREQ	FREQuency	VF	Voltage for Fine tuning
FSI	Field Start Inhibit	VHF	Very High Frequency
FST		VHS	Video Home System
GND	GrouND	VID	VIDeo
H	Horizontal	VIDEO-J	VIDEO Judge
HP	Horizontal (sync) Pulse	VIF	Video Intermediate Frequency
HPF	High Pass Filter	VJ	Video Judge
HT	HeaTer	VM	Voltage for Memory
IC	Integrated Circuit	VOB	Video On Blank
ID	IDentification	VOW	Video On Word
IDL	IDLe (Voltage)	VP	Vertical (sync) Pulse
INS	INSert	VT	Voltage for Tuning
INV	INVerter	WHT	WHiTe



HIFI VIDEO CASSETTE RECORDER

MODEL VS-12 EG / EK

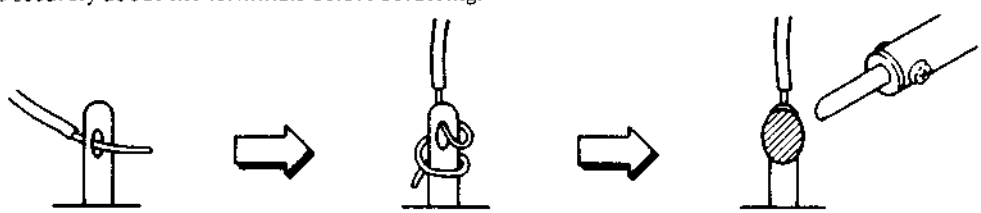
SAFETY INSTRUCTIONS

SAFETY CHECK AFTER SERVICING

Confirm the specified insulation resistance between power cord plug prongs and externally exposed parts of the set is greater than 10 Mohms, but for equipment with external antenna terminals (tuner, receiver, etc.) and is intended for [C] or [A], specified insulation resistance should be more than 2.2 Mohms (ground terminals, microphone jacks, headphone jacks, line-in out jacks etc.).

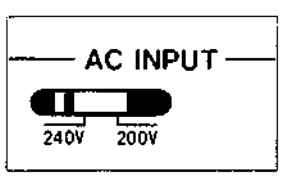
PRECAUTIONS DURING SERVICING

1. Parts identified by the ⚠ symbol parts are critical for safety.
   Replace only with parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (Insulating Barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing microswitch (especially in turntable)
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap ends of wires securely about the terminals before soldering.

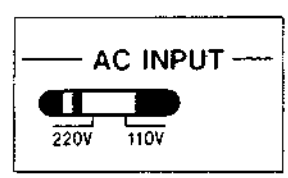


6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Use care that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

VOLTAGE CONVERSION



VS-12EK



VS-12EG

Power requirements for electrical equipment differ from area to area.
The operation voltage of each model is preset according to its destination as indicated below.
VS-12EK ..... 240V (ENGLAND), 200V (HONGKONG)
VS-12EG 220V
Before connecting, check that the AC INPUT selector on the rear panel is set to the voltage for your area:
If the AC INPUT is not set for your area:
1) Confirm that the POWER Switch on the rear panel is set to OFF. (The POWER Switch Knob is out.)
2) Confirm that the POWER Cord is disconnected.
3) Move the AC INPUT selector with a screwdriver so that the marker is above the voltage for your area.

CYCLE CONVERSION

With DC MOTOR, CYCLE CONVERSION is not necessary.

SECTION 1

OPERATING MANUAL

TABLE OF CONTENTS

Let's get acquainted with the Akai VS-12 with the

Tells you the AUDIO SELECTOR is set to HI-Fi
Hi-Fi indicator

For visually monitoring adjustments to the Hi-Fi recording volume
VU bar meter. See p.23

To stand by for automatic recording.
(TIMER button) See p.29

To turn on and off the Akai VS-12.
(FUNCTION button) See p.9

On the warning buzzer
The Akai VS-12 is equipped with a warning buzzer which sounds under the following situations:

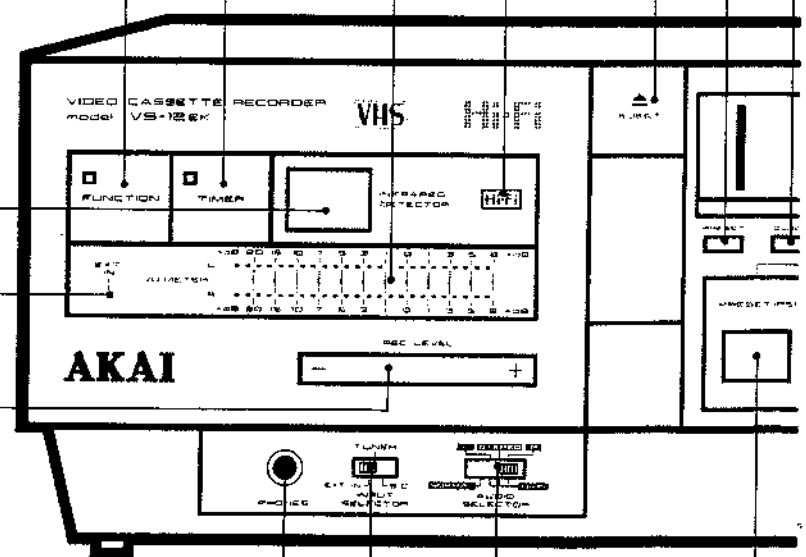
- When the VS-12 is plugged in or the POWER button is turned on;
- When any of the operating buttons is depressed while there is no video cassette tape inside;
- At the end of the tape; or right before the rewind operation ends.
- When the tape stops at "0000" (AUTO STOP);
- When a video cassette tape with its recording defeat tab broken is inserted and the REC (●), or INSERT buttons are depressed.

Note: The built-in tuner of the Akai VS-12 is a conventional and not a Stereo/Bilingual type.

To receive the remote control signal from the Akai Wireless Remote Control Unit RC-T12
Keep this window clean for remote control operation. See p.14

Indicates the Audio selector is set to EXT IN.

To control the volume of the recording being made by the VS-12.
REC LEVEL control. See p.23



To connect headphones
PHONES jack

To select the EXT IN, TUNER, or S.C. audio input
INPUT SELECTOR See p.23

To select NORMAL (mono), STEREO Hi-Fi, or seperate channel recording and playback
AUDIO SELECTOR See p.23

Preset channel number display.
(PRESET Display)

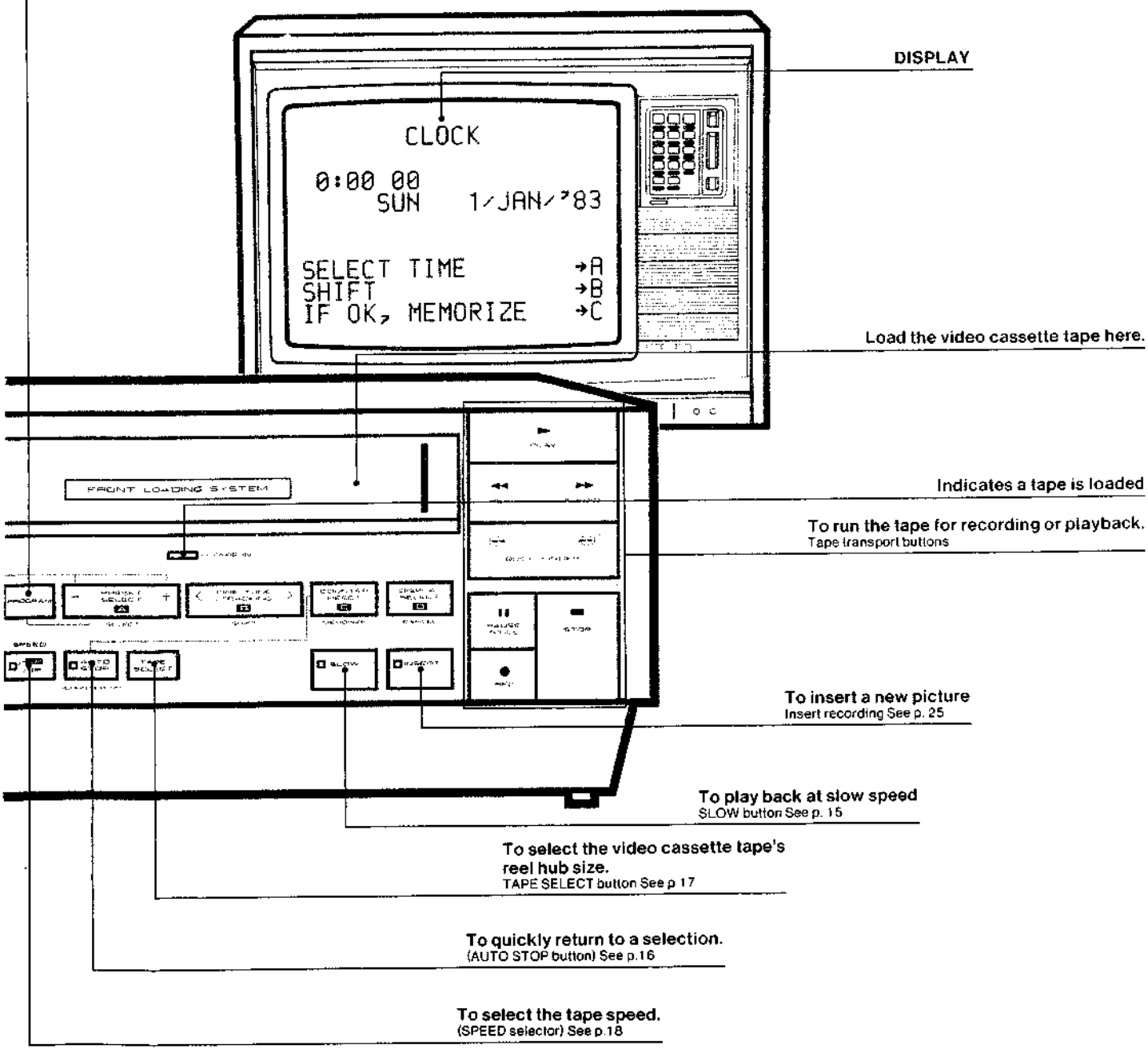
Interactive Monitor System

To eject the video cassette tape.
(EJECT button) See p.16

To tune in TV stations.
(PRESET button) See p.18

To set the actual time and date.
(CLOCK button) See p.11-12

To automatically record a TV program.
(PROGRAM, A, B, C, and D buttons) See p.26



DISPLAY

Load the video cassette tape here.

Indicates a tape is loaded

To run the tape for recording or playback.
Tape transport buttons

To insert a new picture
Insert recording See p. 25

To play back at slow speed
SLOW button See p. 15

To select the video cassette tape's reel hub size.
TAPE SELECT button See p 17

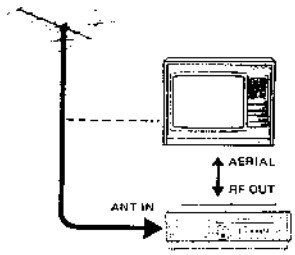
To quickly return to a selection.
(AUTO STOP button) See p.16

To select the tape speed.
(SPEED selector) See p.18

Making the right connections

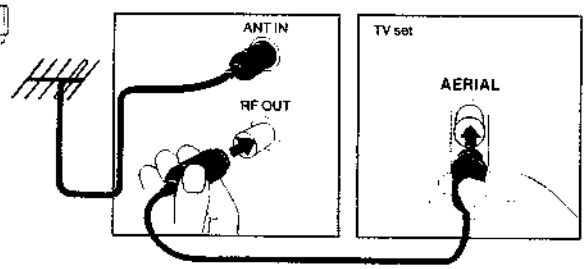
There is a tuner inside your Akai VS-12 for station selection. This tuner is just like the tuner inside your TV. For this reason, your TV antenna must be connected to the Akai VS-12.

* All the connections are made to the jacks at the rear of the Akai VS-12.



1

Unplug the TV antenna cable from your TV and plug it into the antenna input jack (ANT. IN) of the Akai VS-12.



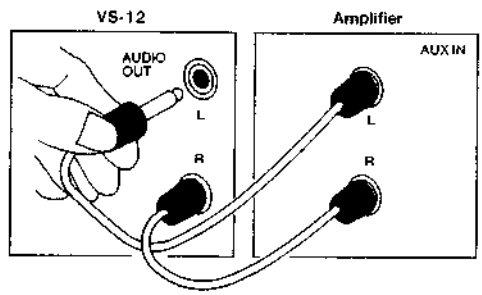
2

Plug one end of the aerial cable supplied into the RF OUT jack of the Akai VS-12 and plug the other end into the aerial jack of your TV.

* The cable can only be connected one way.

To produce Hi-Fi stereo sound:

The VS-12 requires connection to an audio amplifier for playback and recording of Hi-Fi stereo sound.

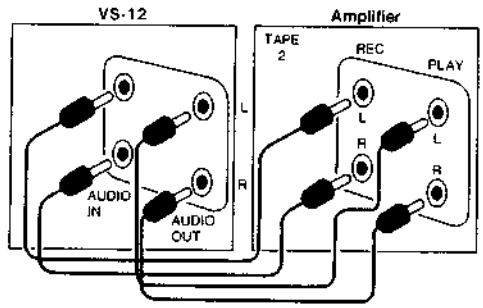


3

Connect the AUDIO OUT jacks of the VS-12 (left and right), to the amplifiers AUX IN jacks (left and right).
This connection allows you to playback Hi-Fi pre-recorded VHS tapes.

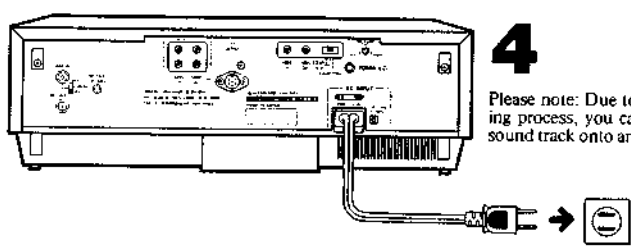
To produce Hi-Fi stereo sound in recording and playback:

If your amplifier is equipped with two sets of tape input and output jacks:



Connect the AUDIO OUT jacks of the VS-12 (left and right), to the amplifiers TAPE 2 PLAY jacks (left and right).
Connect the AUDIO IN jacks of the VS-12 (left and right), to the amplifiers TAPE 2 rec jacks (left and right).

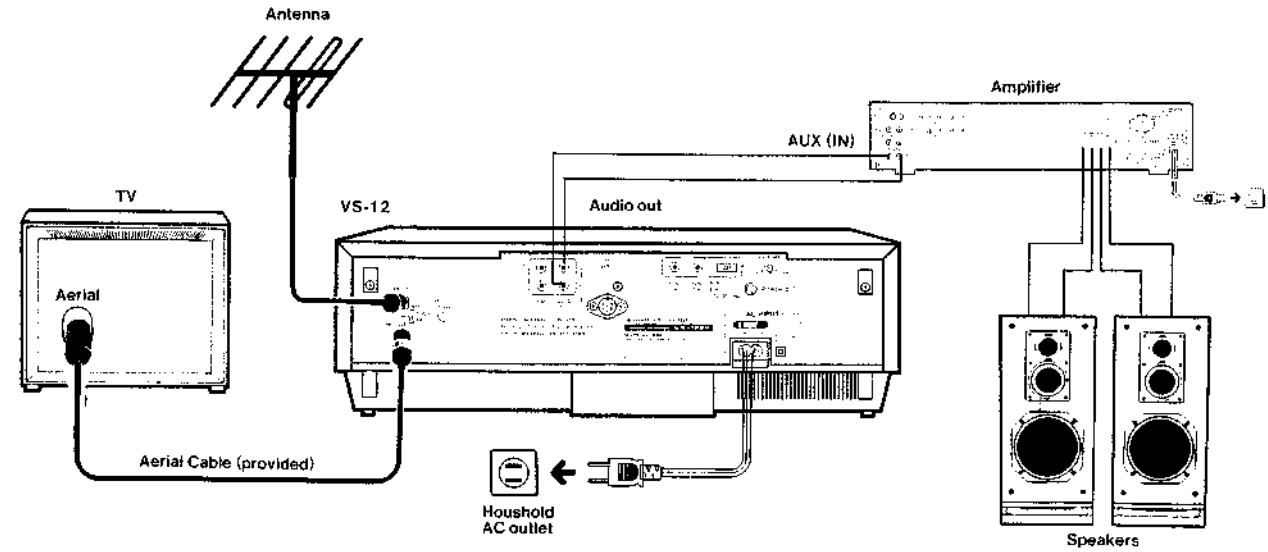
This connection allows you to record Hi-Fi stereo sound from any component connected to the amplifier, i.e. tuner, CD, turntable, etc.



4

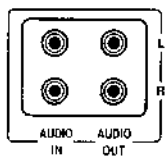
Please note: Due to the nature of the Hi-Fi recording process, you cannot sound dub (record a new sound track onto an old video tape).

Plug the power cord into the AC INPUT jack of the Akai VS-12 and plug the other end into a household AC outlet.

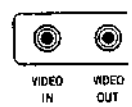


Basic overall view

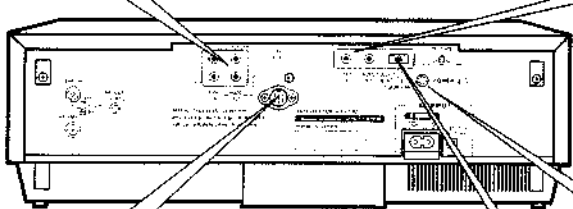
Let's check the rear panel of the Akai VS-12



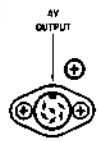
AUDIO jacks
These jacks allow you to connect the VS-12 to an external audio hi-fi source such as an amplifier to which has been connected a stereo cassette deck, CD player, turntable or tuner. This will enable you to enjoy Hi-Fi sound with your VS-12, or record a new audio sound track on to home movies by recording the video portion from another VCR, and the audio portion from a source connected to the VS-12's AUDIO jacks.



VIDEO jacks
Connect the VIDEO IN jack of the VS-12 to the VIDEO OUT jack of another VCR to make a new recording on the VS-12. You can also use the VIDEO OUT jack for direct connection to a TV or TV Monitor's LINE IN jacks for better video reception.

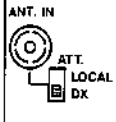


*** To adjust the picture quality**
Use the PICTURE control on the rear panel to adjust the picture quality (sharpness) to suit your taste.
The control should normally be set to its center position.

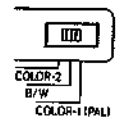


AV JACK
If you use an exclusive AV connection cable (available on the market) connect the TV's AV jack to the VS-12's AV output jack.
If the TV has a stereo amplifier, the playback sound will be in stereo if you play a tape recorded in stereo. (RF output of VS-12 is monaural.)
Direct connection through AV jack will improve picture and sound quality.

POWER switch
In regular use, the POWER switch should be left ON (▬). This is because power must be maintained to the antenna signal booster and the moisture prevention circuit inside the Akai VS-12. Leaving the POWER switch ON will have no effect on TV viewing. The TV can be turned on and off independently.



On the LOCAL/DX attenuator switch
The LOCAL/DX switch on the rear panel of the VS-12 is used to adjust the signal reception of the tuner section.
If the picture or display characters develop wavy lines during reception of a local TV station broadcast, it may be that the signal reception is too strong. In that case, move this selector to the LOCAL position to attenuate the signal strength.
If TV reception during a broadcast by satellite, for example, is poor and contains too much picture "noise", set this switch to the DX position to improve the picture reception.
(Normally, leave this switch in the DX position.)

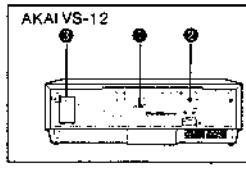


Video mode selector
The video mode selector is used to select the type of signal to be recorded or played back.
This selector should normally be set to COLOR-1 (PAL).

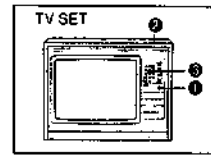
COLOR-2	Set to this position for Middle East SECAM (system B/G) color system recording or play back.
B/W	Set to this position for CCIR standard monochrome system recording or playback.
COLOR-1	Set to this position for PAL color (PAL) system recording or playback.

Tuning the TV to the video channel

Check before starting

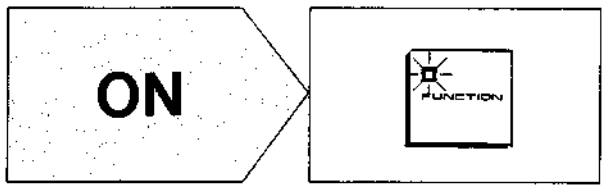


❶	Power cord is connected to the household AC outlet.
❷	POWER switch is set to ON.
❸	All the components are properly connected.

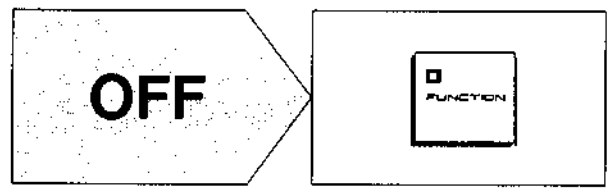


❶	Turned on.
❷	Properly connected.

Depress the FUNCTION button to turn on the Akai VS-12.
* Its indicator will light.



Depress the FUNCTION button again to turn off the Akai VS-12.
* Its indicator will go off.
* The timer inside the Akai VS-12 will continue to function.



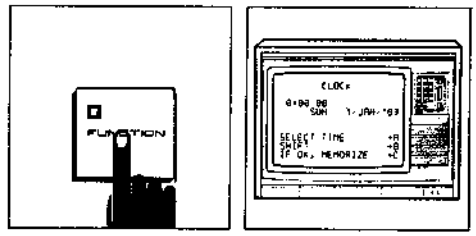
Caution

Moving the video tape recorder from a cold place to a warm place, or using it in a humid place will cause dew condensation on the drum and the video heads inside the unit. If recording or playback is carried out in this state, the heads may become dirty and the tape may be damaged. This could also result in malfunction of the machine itself.

To prevent this from occuring, the rear panel main power switch must be turned on for about one hour before starting recording or playback of a video cassette tape.
This is particularly important when a video cassette is inserted for the first time after purchase of the video cassette recorder.

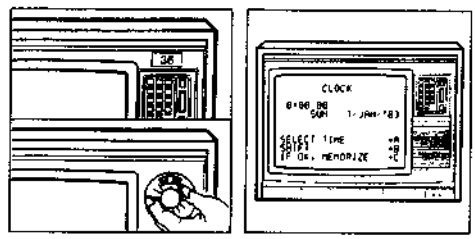
Tuning operation

The Akai VS-12 sends out a signal similar to that transmitted by a TV station. By tuning your TV (to the video channel) to receive this signal, you can select programs from the Akai VS-12 as you would select a program with the TV's channel selector. Whereas a TV broadcast signal has only one strong point of reception, the signal from the VS-12 may be readily visible at two tuning points. These points are usually located close to each other, and may be separated by a range on the tuning knob during which the picture is still visible but without color.
The correct tuning position should be the only one of the two which also contains the sound.
Please use the following method for best results.



1

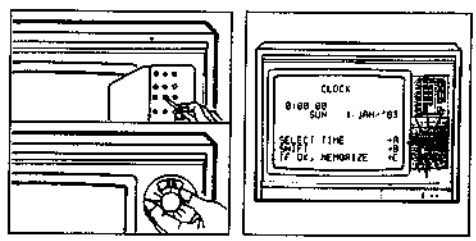
If your TV has an Automatic Frequency Control (AFC), or the Automatic Fine Tuning control (AFT), switch it off. (On some TV's this is done automatically when the control panel door is opened.)
Depress the FUNCTION button of the VCR to send the signal for time setting to the TV. The VS-12 will also send an audible tone to the TV. These will be your guides for fine tuning to the video channel.



2

If your TV has a synthesizer type tuner, set it to channel 36, or rough adjust until a picture (the time information) is obtained in the neighbourhood of channel 36 for non-synthesizer (continuous tuning) types.

Note:
If the TIME display will not clear up (remains distorted), it may be due to some interference from the antenna. In that case, try disconnecting the antenna cable, and reconnect it after step 3.
If the display characters are distorted after reconnecting the antenna, try changing the position of the LOCAL/DX switch on the back of the VS-12.

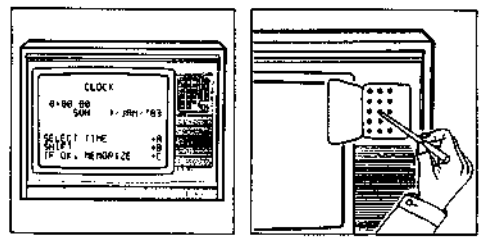


3

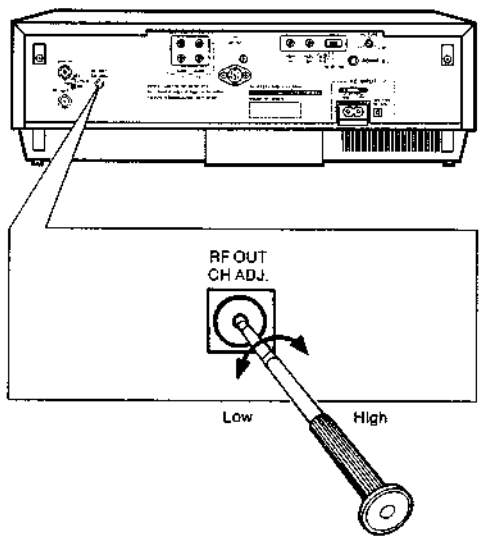
Fine tune the TV to optimize the picture quality. Be sure that the tone signal is clearly audible.
After completing this operation with the best picture possible, turn the AFT or AFC back on and check that there is no significant deterioration of the picture.

Should the time display and a TV program overlap:

UHF channel 36 is being used for broadcasting by a TV station in your area. In that case, your TV must be set to an unused channel between UHF 30 and 39.



TV
If channel 36 is being used for broadcasting, adjust the TV channel selector a little at a time until the TV screen goes blank. (Set it towards a higher or lower station.)



Akai VS-12
Adjust the RF converter a little at a time with a screwdriver until the display appears clearly on the TV screen.

* If the channel selector was set higher, set the RF converter towards high. The same thing applies if the channel selector was set lower.

NOTE:
Video channel setting range is from UHF channel 30 to 39.

Now you are ready to watch prerecorded tapes. Or, choose a station for TV reception from the Akai VS-12, by following the presetting operations on p. 19—20.

Let's set the timer to the actual time

There is a 24 hour digital timer inside the Akai VS-12. To set this timer to the actual time, please follow this procedure, using as an example: 12:30 mon 3/SEP/'84.

1

Depress the CLOCK button to display the information for setting the time to the actual time on your TV screen.
* Skip this step if the information is already displayed on the TV screen.

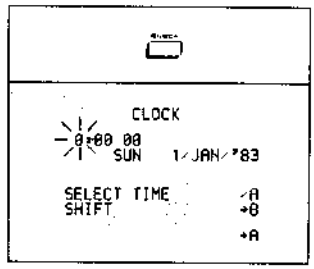
2 HOURS

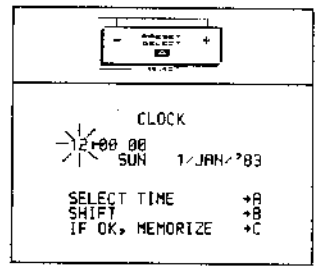
To follow the instruction "SELECT TIME — A", depress the − + button to select the correct hours.

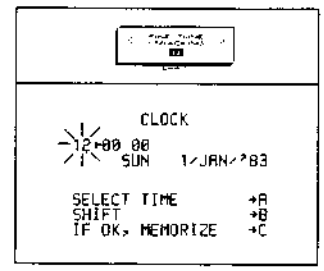
0, 1, 2, ... up to 23

3

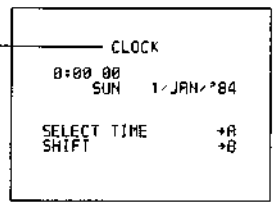
To follow the instruction "SHIFT — B", depress the < > button to shift to the next item to be set: minutes.



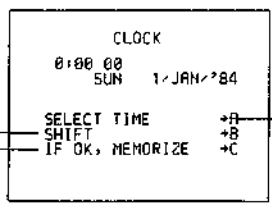




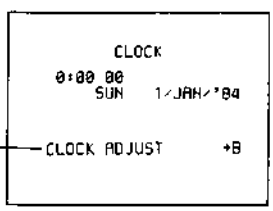
This tells you that this display is for setting the timer to the actual time.



This is instructing you to depress the < > button when you want to reset the actual time and date.

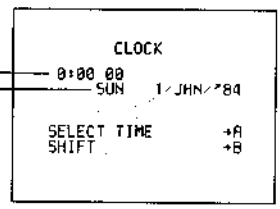


This is instructing you to depress the button to choose the item to be set. The chosen item will flash on and off.



This is instructing you to depress the < > button when you are satisfied with the indications you have set.

This tells you the time in 24 hour notation.



The left indication tells you the day of the week and the right indications tell you the date/month/year.

This is instructing you to depress the − + button to select the indication for the flashing item.
"SELECT TIME" will be displayed when you are to select the correct time.
"SELECT DAY" will be displayed when you are to select the correct day of the week.

"SELECT DATE" will be displayed when you are to select the correct day of the month.
"SELECT MONTH" will be displayed when you are to select the correct month.
"SELECT YEAR" will be displayed when you are to select the correct year.

On the Clock set display

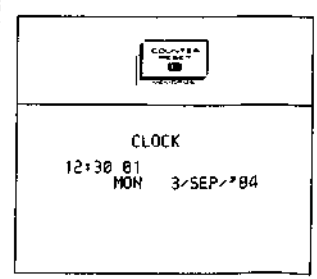
On the − + and < > buttons

− + button:
The − + button is used to select the indication for the flashing item chosen by the − + button.
+ side: Depress this side when you want to increase the indication.
− side: Depress this side when you want to decrease the indication.
Holding down either side will change the indication continuously.

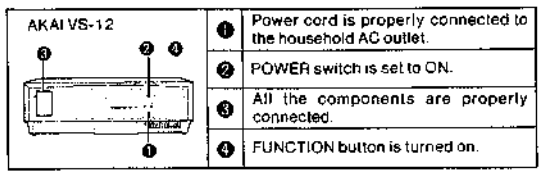
< > button:
The < > button is used to choose the item you want to set. The chosen item will flash on and off.
< side: Depress this side when you want to set an item which is after the item that is now flashing.
> side: Depress this side when you want to set an item which is before the item that is now flashing.

13 MEMORIZE

You have now correctly set the timer to the actual time.
To follow the instruction "IF OK, MEMORIZE — C", depress the button to memorize the data.
* The timer will start keeping time.
The full display is maintained for approximately 3 seconds. To recall the time see page 13.



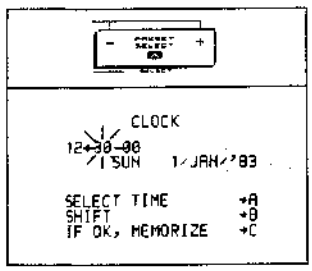
Check before starting



4 MINUTES

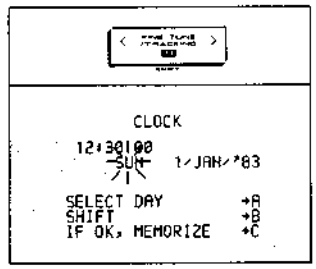
To follow the instruction "SELECT TIME — A", depress the − ⏏ + button to select the correct minutes.

00, 01, 02, ... up to 59



5

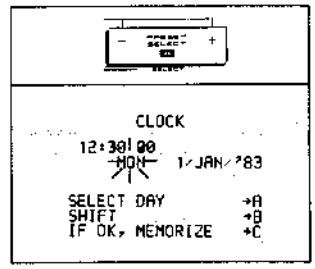
To follow the instruction "SHIFT — B", depress the < ⏏ > button to shift to the next item to be set: day of the week.



6

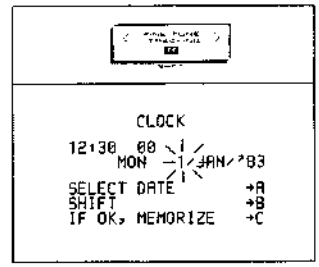
To follow the instruction "SELECT DAY — A", depress the − ⏏ + button to select the correct day of the week.

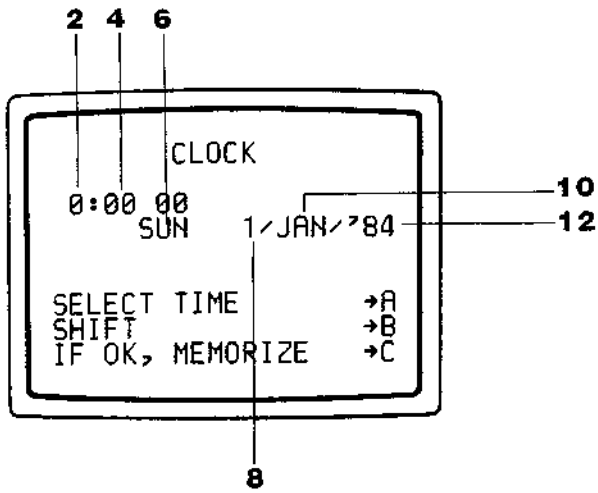
SUN, MON, TUE, WED, THU, FRI or SAT



7 DAY OF WEEK

To follow the instruction "SHIFT — B", depress the < ⏏ > button to shift to the next item to be set: date of the month.

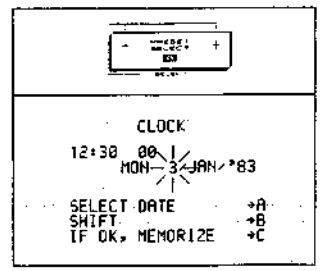




8 DATE OF MONTH

To follow the instruction "SELECT DATE — A", depress the − ⏏ + button to select the correct date.

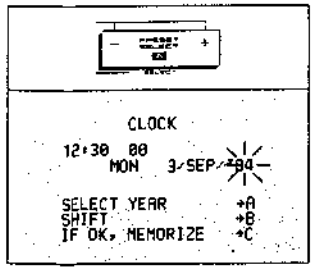
1, 2, 3, ... up to 31



12 YEAR

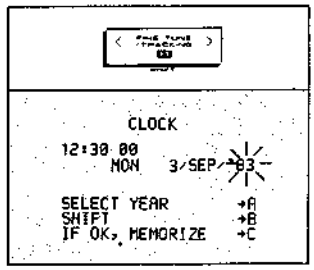
To follow the instruction "SELECT YEAR — A", depress the − ⏏ + button to select the correct year.

83, 84, 85 . . . . . up to 98



11

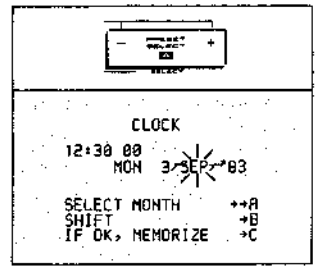
To follow the instruction "SHIFT — B", depress the < ⏏ > button to shift to the next item to be set: year.



10 MONTH

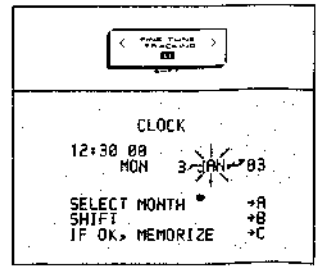
To follow the instruction "SELECT MONTH — A", depress the − ⏏ + button to select the correct month.

JAN, FEB, MAR . . . . . or DEC.



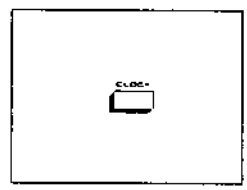
9

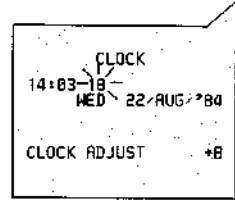
To follow the instruction "SHIFT — B", depress the < ⏏ > button to shift to the next item to be set: month.



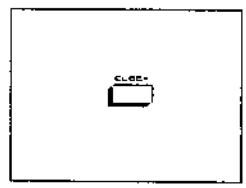
If you want to confirm the actual time and date

Depress the CLOCK button.





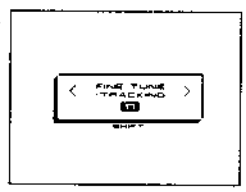
The information on the left will be displayed on your TV screen.

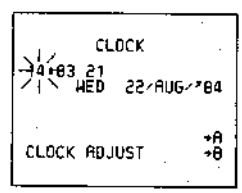


To remove the information from your TV screen, depress the CLOCK button again.

If you want to reset the actual time and date

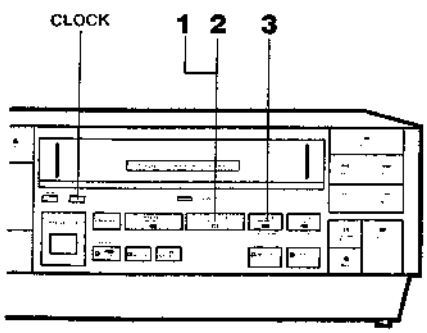
As an example, we will change the date from 22 AUG to 29 AUG.

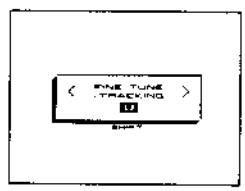


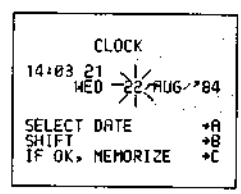


1

- Depress the CLOCK button to display the information for resetting the timer to the actual time.
- To follow the instruction "CLOCK ADJUST - B", depress the < ⏭ > button to display the information for setting the timer to the actual time.

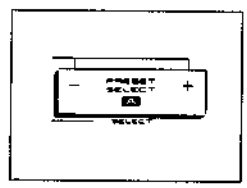


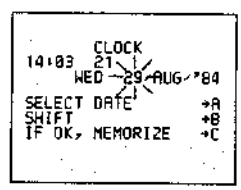


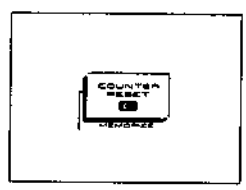


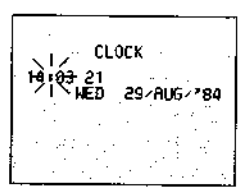
2

To follow the instruction "SHIFT] B", depress the < ⏭ > button again and again until the item you want to reset flashes on and off. Then to follow the instruction "SELECT TIME/ DAY/ DATE/ MONTH/ YEAR] A", depress the — ⏮ + button to reset the item.
Reset other items in the same manner. After you have reset all incorrect items, go to the next step.









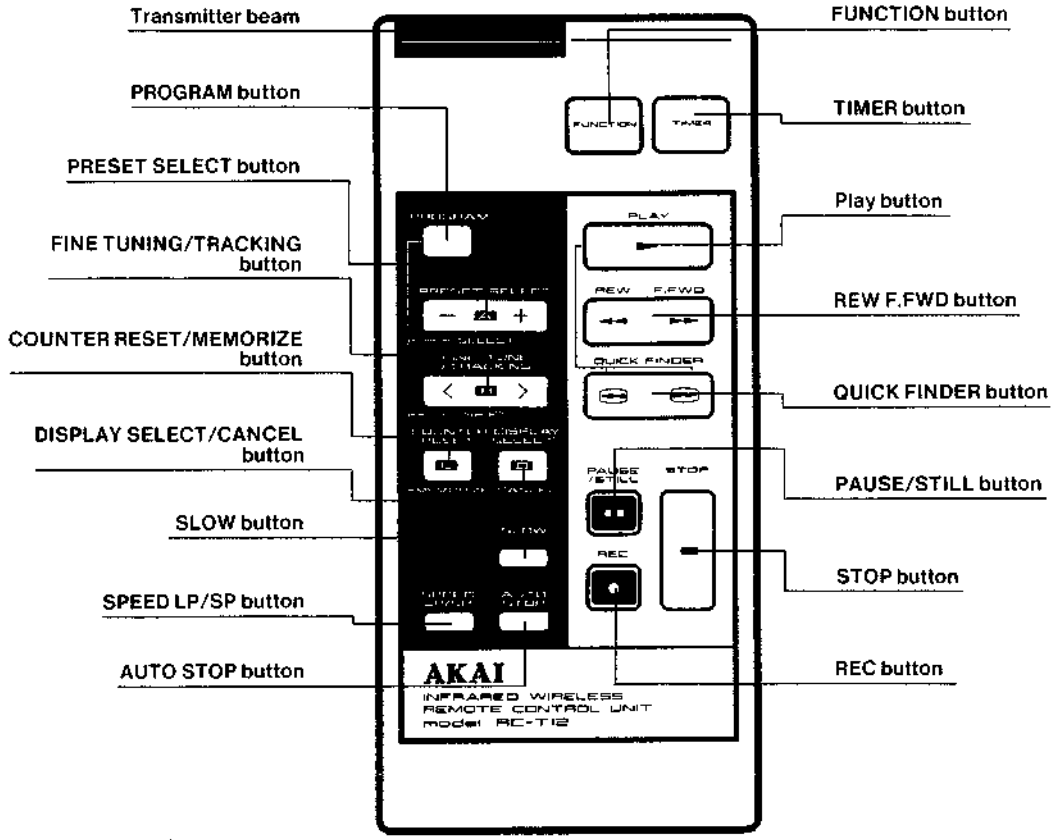
3

Depress the ⏮ button to memorize the new data.

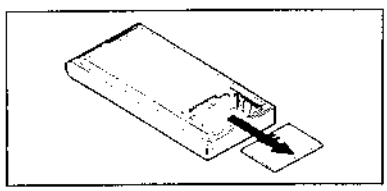
NOTE:
During the procedure for setting the timer to the actual time (previous page), any item can be reset by using the < ⏭ > and — ⏮ + buttons in the same manner.

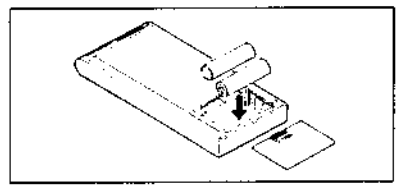
On the remote control unit RC-T12

The operation buttons of the Akai RC-T12 are used the same way as the operation buttons on the front panel of the Akai VS-12 except for the EJECT, CLOCK, PRESET, TAPE SELECT and INSERT buttons which do not appear on the RC-T12.



How to load the batteries for the Akai RC-T12





1 **Remove the battery compartment cover.**

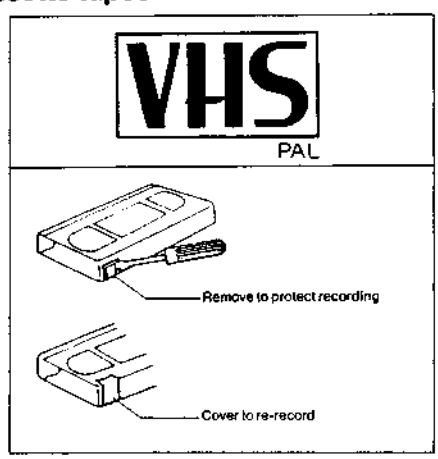
2 **Insert two AA, R6 or equivalent size batteries into the battery compartment as shown in the illustration.**

3 **Replace the battery compartment cover.**

NOTE:
When changing the batteries, change all the batteries at the same time.

Things to know about Video cassette tapes

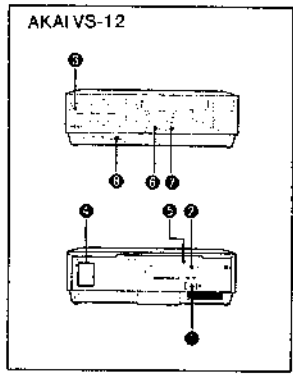
- Only VHS video cassette tapes may be used with the Akai VS-12.
- To protect a recording, remove the recording defeat tab with a screwdriver. To re-record, cover the cavity with a piece of adhesive tape.
- Never touch the tape with your fingers.
- Never open the video cassette tape case.
- Store standing on end in a well ventilated place, away from objects with strong magnetic fields and away from bright lighting.



NOTE:
- Before recording or playing back a video cassette tape, be sure to forward the tape slightly so that the leader tape (the transparent part of the tape) is not in the head path.

Let's play a pre-recorded tape

Check before starting



❶	Power cord is properly connected to the household AC outlet.	❻	TAPE SELECT button is set.
❷	Rear panel POWER switch is set to ON.	❼	AUDIO SELECTOR switch is set for the tape in use. See p. 23
❸	FUNCTION button is turned on.	❽	Amplifier is turned on and set to AUX or TAPE.
❹	All the components are properly connected.	❾	
❺	Rear panel Video mode selector is set properly. See p. 8	❿	

❶	Turned on.	
❷	Properly connected.	
❸	Set to the video channel.	

Important

A video cassette tape can be loaded or unloaded only when the Akai VS-12 is turned on.

* Confirm that the POWER switch is set to ON (▬) and FUNCTION button is turned ON (its indicator is lit).

Insert the video cassette tape correctly into the cassette loading compartment and give it a little push.

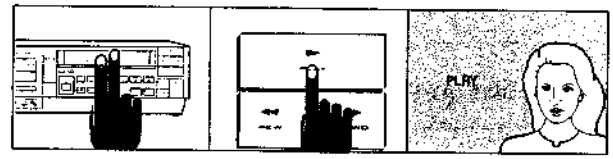
* Follow the markings on the video cassette tape to correctly insert it into the cassette loading compartment. If the video cassette tape is not inserted correctly it will be ejected.

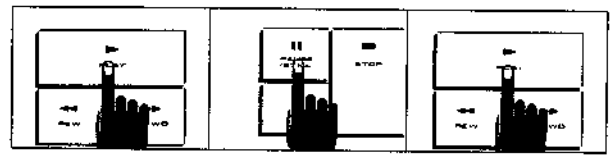
To play the tape, depress the PLAY (▶) button.

* "PLAY" will be displayed on the TV screen for approximately 3 seconds.

NOTE:
There is a 3 to 4 second delay before playback starts, while the tape moves into position.
If you wish to begin play immediately, prepare the tape by forwarding to the exact point on the tape where you wish to begin play. Depress the PAUSE button (▮▮). When you are ready to begin, depress the PLAY (▶) button again and the tape will start immediately.

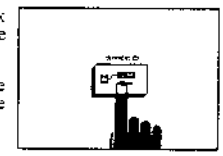
Note: To prevent damage to the tape, the VS-12 will automatically switch to the STOP mode after more than 2 min. in PAUSE.





The VS-12 will automatically set the playback speed to correspond with the speed at which the tape was recorded (LP or SP).

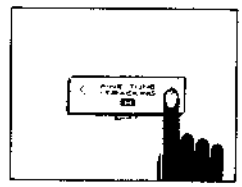
Whenever the end of the tape is reached, the tape will automatically rewind to the beginning. The warning buzzer sounds right before the tape stops.



TRACKING control

There may be disturbances in the playback picture. This can occur when you play back a tape recorded with another video cassette recorder. To improve the picture, depress the < ◀▶ > button.

* The tracking display will appear on the TV screen. The "X" is normally set to center of the tracking display.

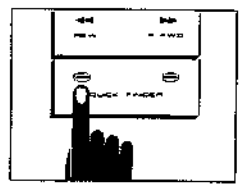


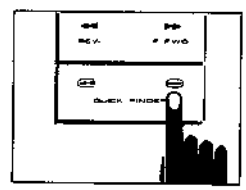
To improve the picture, depress the button on the — or + side. The "X" moves to indicate TRACKING is taking place.

* To carry out the tracking operation slowly, depress and release the < ◀▶ > button. (Holding down the button will move the "X" continuously). If you release the < ◀▶ > button for too long however, the display will disappear. In that case, depress the < ◀▶ > button again. When the picture is clear, release the button to stop tracking.
* The display will disappear a few seconds later.

QUICK FINDER

Use the Akai quick finder system during playback to visually locate any point on a recorded tape. The tape will be played back very quickly and no sound will be heard during quick finder operation.





Depress the QUICK FINDER (▶▶) button. The picture will go forward very quickly. When you reach the point you are looking for, depress the PLAY (▶) button to resume normal playback.

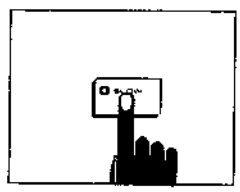
NOTE:
There will be disturbances in the picture during quick finder operation. This is normal and does not indicate a problem with the VS-12.

SLOW motion

During playback slow motion can be obtained (approximately half of normal speed) by depressing the SLOW button. No sound will be heard and there will be some noise bars during slow motion playback.

* "SLOW" will be displayed on the TV screen.

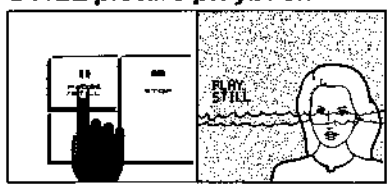
To resume playback, depress the PLAY (▶) button.



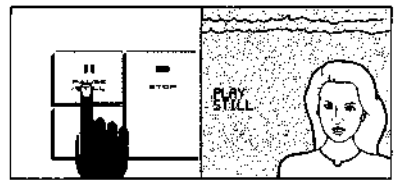
During slow motion playback, if some noise bars appear on the picture, depress the < ▮▮ > button until noise bars disappear.

NOTE:
Before slow motion playback, you may need to adjust the vertical stability. If you do not adjust the vertical stability, some noise bars will appear and vibrate the picture.
Depress PAUSE, then depress the < ▮▮ > button. The VERTICAL STABILITY display will appear on the TV. Hold down the <or > side of the button until picture vibration is reduced.

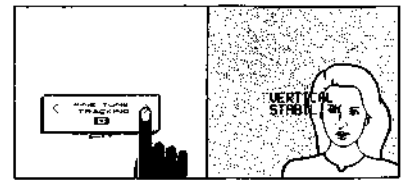
STILL picture playback



During playback, you can obtain a still picture by depressing the PAUSE/STILL (▮▮) button.
No sound will be heard and there will be noise bars during still picture playback.
To resume normal playback depress the PLAY (▶) button.



• To move the noise bars
In the LP mode:
The noise bars which appear during still picture playback can be positioned on the TV screen so that you can look clearly at the details you want. All you have to do is repeatedly depress the PAUSE/STILL (▮▮) button until the noise bars are positioned where you want them to be.
In the SP mode:
The noise bars can be moved in the same way as in LP mode. However, each push of the PAUSE/STILL button will advance the tape one frame.

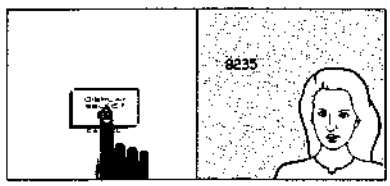


• If the still picture vibrates
If the still picture vibrates, depress the < or > side of the < ▮▮ > button. The display for "VERTICAL STABILITY" will be shown on the TV screen. Release the button when the vibration is reduced.
* To carry out this operation more slowly, depress and release the < ▮▮ > button. However, if you release the < ▮▮ > button for too long, the display will disappear. In that case, depress the < ▮▮ > button again.

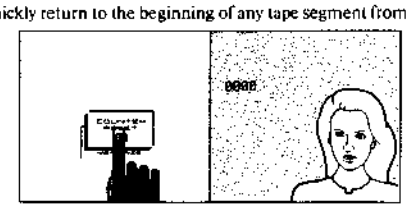
* The Akai VS-12 does not have the same properties as broadcasting equipment. Therefore some noise bars and vibrations will appear on the picture during quick finder, still, and slow motion playback.
* During quick finder, still, and slow motion playback, the color may disappear from your picture. This is not the fault of the Akai VS-12 but of your color TV.

AUTO STOP

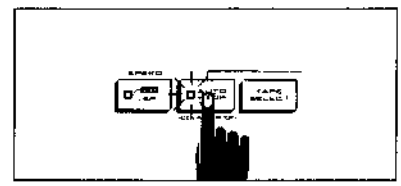
Use the AUTO STOP (COUNTER ZERO) system to quickly return to the beginning of any tape segment from either the play or record modes.



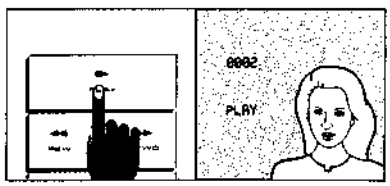
1 When you have located the point on the tape to which you want to return, repeatedly depress the ▮▮ button until the tape counter is displayed on the TV screen.



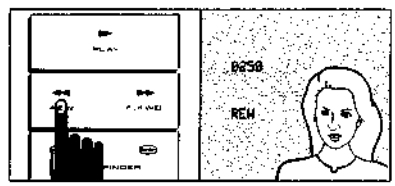
2 Depress the ▮▮ button to reset the tape counter to "0000".



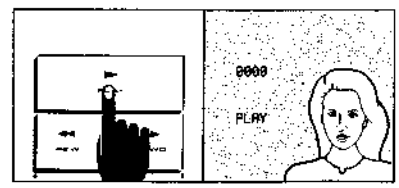
3 Depress the AUTO STOP (COUNTER "0") button.
* Confirm that its indicator is on.



4 Depress the PLAY (▶) button for at least 1 second to begin playback.
* "PLAY" will be displayed on the TV screen for approximately 3 seconds.



5 When you are ready to return to the point where you began playback, depress the REW (◀◀) button.
The tape will rewind to the beginning of the program (in other words, to the counter reading of "0000") and stop.



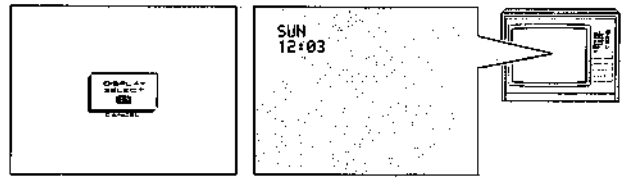
6 To repeat the process, depress the PLAY (▶) button again.
NOTE:
To use the AUTO STOP system during recording, depress the REC (●) button instead of the PLAY (▶) button in step 4.

NOTES:
To Unload a tape
Depress the EJECT (⏏) button. The video cassette tape will be ejected. Take out the video cassette tape.
The EJECT (⏏) button can be depressed any time except during automatic recording and sleep time recording.

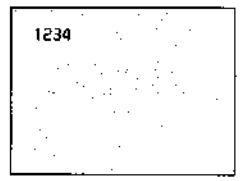
Using the DISPLAY SELECT button

During recording or playback, you can display 5 convenient pieces of information on your TV screen by repeatedly depressing the button.

1 Day of week and actual time

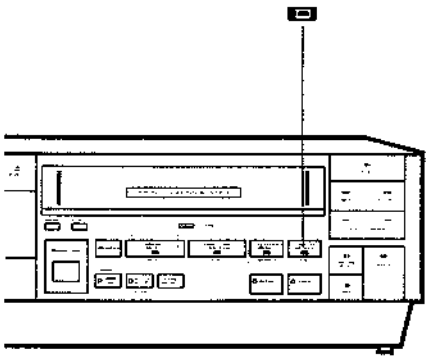


2 Tape counter

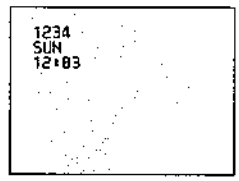


Shows the relative position of the tape.

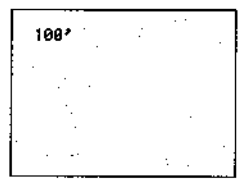
NOTE:
To reset the tape counter to "0000", depress the button.



3 Tape counter/day of week and actual time

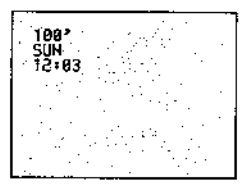


4 Tape remaining time

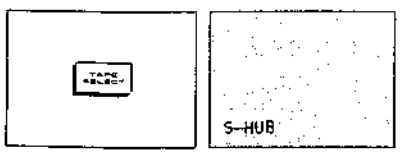


- Shows you in 5 minute intervals how long until the end of the tape.
- Set the TAPE SELECT button first.
- "???" indicates that the Akai VS-12 is calculating the tape time remaining.
- Tape remaining time does not function during rewind and fast forward. "???" will be displayed.

5 Tape remaining time/day of week and actual time



On the TAPE SELECT button



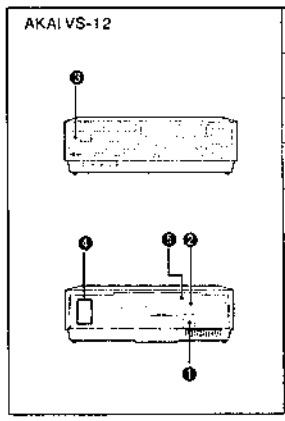
The Akai VS-12 is equipped with a tape remaining time system which tells you in 5 minute intervals how long until the end of the tape. Since video cassette tape's reel hub sizes vary according to the tape length, in order to accurately calculate the tape remaining time, the Akai VS-12 is equipped with the TAPE SELECT button. Before recording or playing back the video cassette tape, set the TAPE SELECT button according to the reel hub size. The position of the TAPE SELECT button will be displayed on the TV screen for approximately 3 seconds.

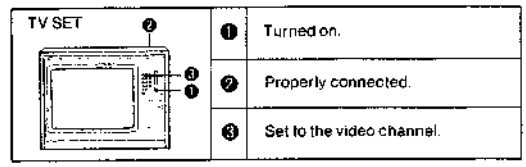
L-HUB	E-30 or E-60 tape
S-HUB	E-90, E-120 or E-180 tape
E-240	E-240 tape

NOTE:
On the acurracy of the tape remaining time.
As the tape remaining time counter does not function as a clock, there is some error in it's counting of time. The counter is intended only as a guide and not as an exact measurement of remaining time.

Let's look at the preset station displays of the Akai VS-12

Check before starting

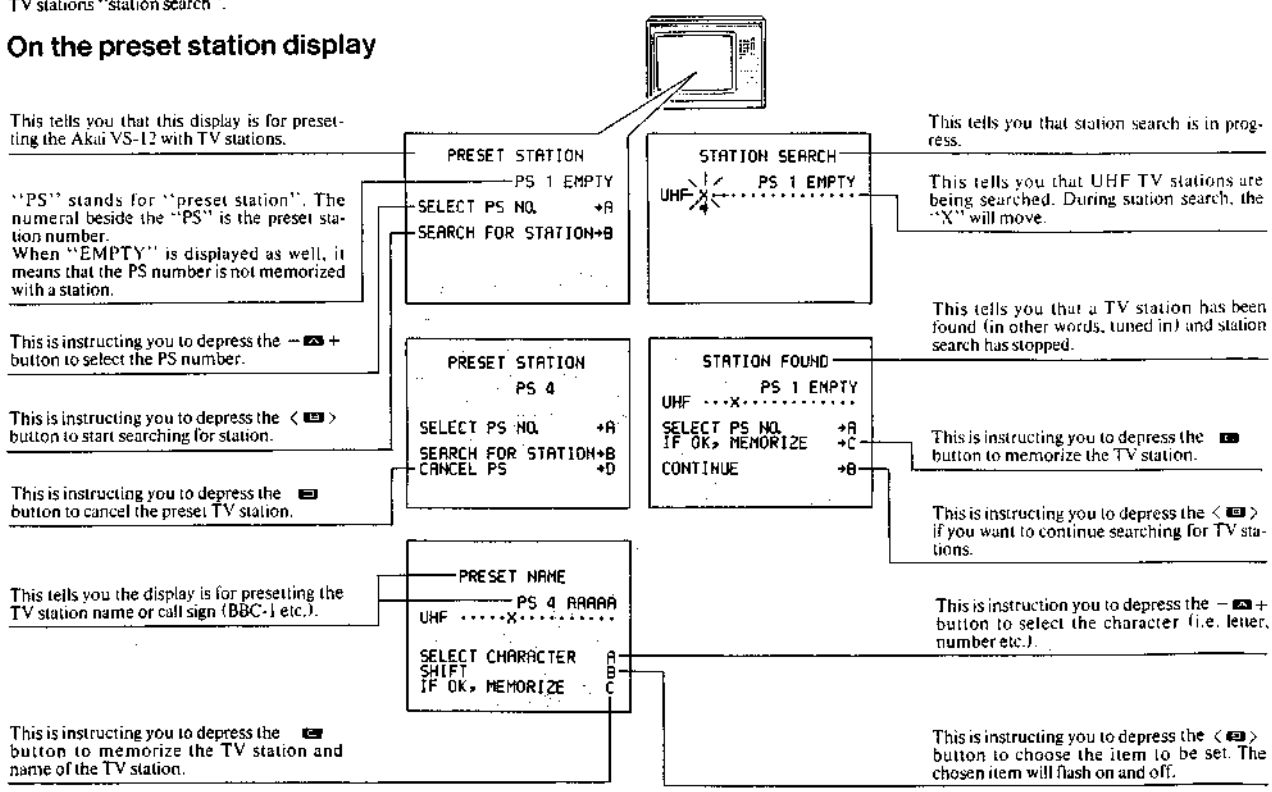




The Akai VS-12 must be tuned to all the locally available TV stations. We call this procedure "presetting". Up to 32 TV stations can be preset.

There is an automatic station search system inside the Akai VS-12 which searches for and tunes in TV stations. We call this searching for and tuning in of TV stations "station search".

On the preset station display



On the TAPE SPEED Selector

Tape	SPEED selector	Recording time: Standard Play (SP)	Recording time: Long Play (LP)
E-240		4 hours	8 hours
E-180		3 hours	6 hours
E-120		2 hours	4 hours
E-90		1-1/2 hours	3 hours
E-60		1 hour	2 hours
E-30		1/2 hour	1 hour

* Before recording, set the SPEED selector according to how long you want to record. During playback, the Akai VS-12 automatically detects and after a few seconds, plays back at the corresponding speed.
* When the SPEED selector is set to SP, slightly better sound quality can be obtained.

(18-20)

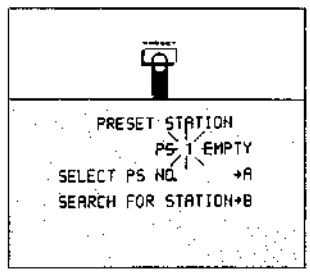
NOTE:
Akai does not recommend recording at two different speeds on one video cassette tape. Never change the SPEED selector during recording.

Presetting the Akai VS-12 with TV stations

Important:
Before presetting any stations, set the INPUT SELECTOR of the VS-12 to TUNER

1

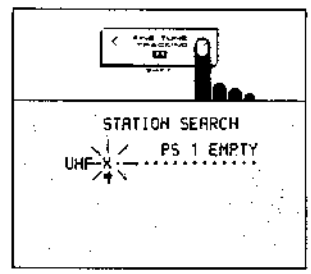
Depress the PRESET button to display the information for presetting the Akai VS-12 on your TV screen.



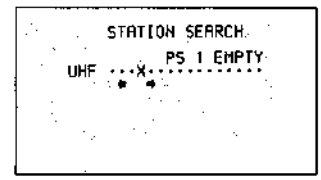
2

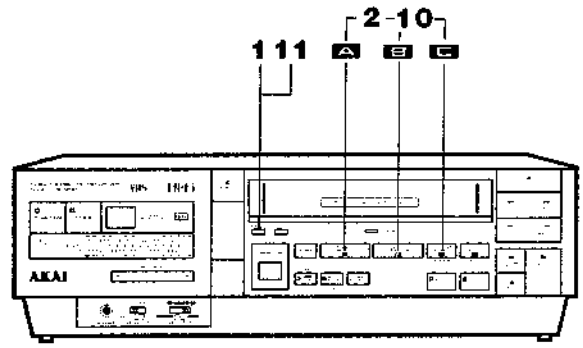
You can preset the Akai VS-12 automatically or manually:

AUTO
To follow the instruction "SEARCH FOR STATION — B", depress the < ▣ > button just once.
The "X" will move from the left to right (regardless of whether the < or > side is depressed), visually indicating the search for TV stations.



MANUAL
To follow the instruction "SEARCH FOR STATION — B", keep depressing the < or > side of the < ▣ > button.
The "X" will move towards the left when the < side is depressed and towards the right when the > side is depressed, visually indicating the search for TV stations.



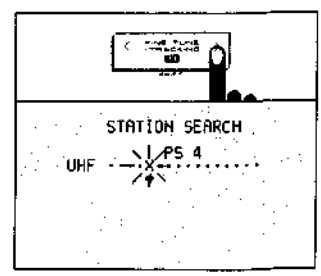


11

To stop station search operation, depress the PRESET button again. The display will disappear from the TV screen.

10

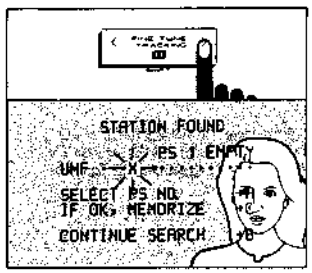
Repeat steps 3 to 9 until you have preset all the locally available TV stations.



NOTE:
- If you do not wish to preset a TV station name, depress the ▣ button twice at step 5.
  The preset station name will be automatically set to "AAAAA".
- The preset channel number display will not change during TV station presetting operations. It will change however if the −▣+ button is depressed after completion of TV station presetting operations.

3

AUTO
Station search stops when a TV station is found (i.e. tuned in) and this information and a program from the found TV station will be displayed.



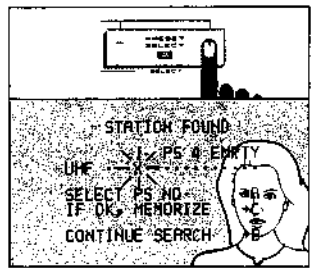
MANUAL
When a station is found (i.e. tuned in), release the button. The information will be displayed.

- If the display and the program are not clear, the TV station may be incapable of being memorized and TV search should be re-started Depress the < ▣ > button to re-start station search from where the previous station search stopped.
- If you do not want to memorize the station, depress the < ▣ > button to resume station search.

4

To follow the instruction "SELECT PS NO. — A", depress the — ▣ + button to select the preset channel (PS) number.

1, 2, 3, ... up to 32.

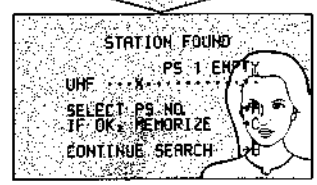


- For your convenience, select the preset channel number corresponding to the TV channel selector. For example, if channel selector 4 on your TV is tuned to TV station A, select preset channel 4.
- If "EMPTY" is not displayed after the preset channel number, that number is already memorized with a TV station and you must select another number

Is a TV station tuned in properly?

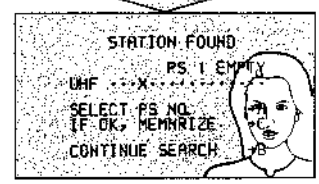
The automatic station search system searches for and tunes in TV stations. This searching for TV stations is indicated by the movement of the "X". Searching stops when a TV station is tuned in. A program from the tuned in TV station will be displayed on your TV screen.

OK

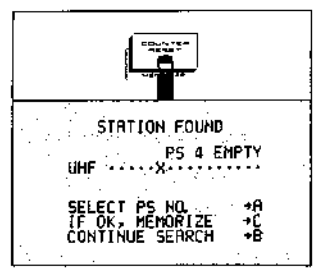


When the display and the program from the tuned in TV station are clear, you can memorize the station.

NO



When the display and the program from the tuned in TV station are not clear, the signal from the TV station is not strong enough for clear reception. In that case, the TV station may be incapable of being memorized and TV search should be restarted. This is done by depressing the < ▣ > button

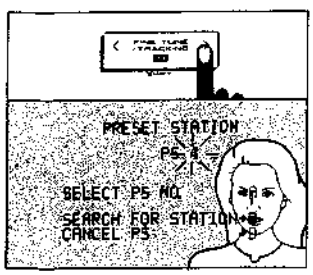


5

To follow the instruction "IF OK, MEMORIZE — C", depress the ▣ button to memorize the TV station into the selected preset channel number.

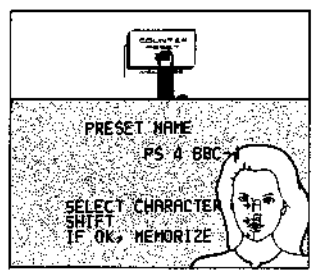
9

To follow the instruction "SEARCH FOR STATION — B", depress the < ▣ > button to restart station search from where the previous station search stopped.



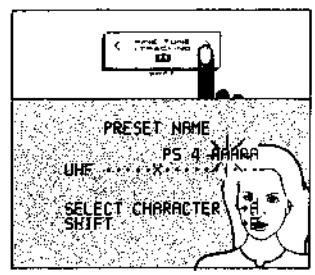
8

Repeat step 6 and 7 until you have preset all items for the TV station name. To follow the instruction "IF OK, MEMORIZE — C", depress the ▣ button to memorize the TV station name.



7

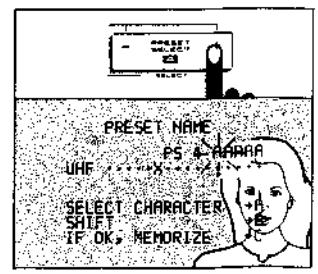
To follow the instruction "SHIFT — B", depress the < ▣ > button to shift to next item to be set character.



6 PRESET TV Station NAME

To follow the instruction "SELECT CHARACTER — A", depress the — ▣ + button and select a character (A, B, C, ...1, 2, 3, ...?, etc.).

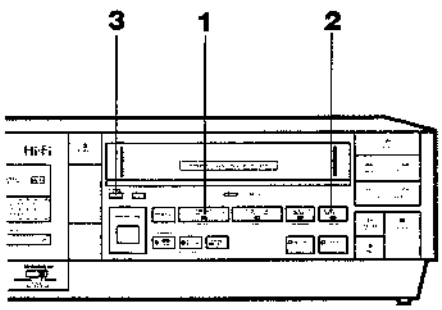
- Some punctuation marks are included in the alphabet section.

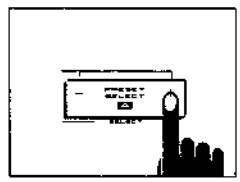


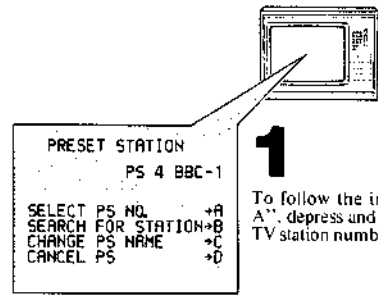
Additional preset station operations

If you want to change a preset TV station name

Depress the PRESET button.

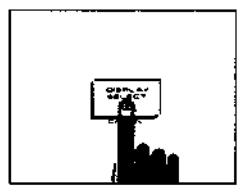


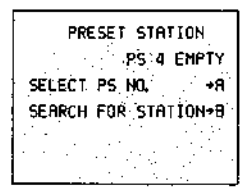




1

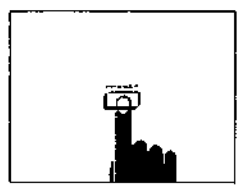
To follow the instruction "SELECT PS NO. — A", depress and hold the — A + button until the TV station number you want to cancel is displayed.





2

To follow the instruction "CANCEL PS — D" depress the D button to cancel the preset TV station. "EMPTY" will be displayed to indicate that the TV station is canceled.

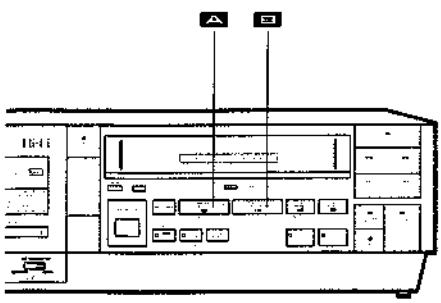


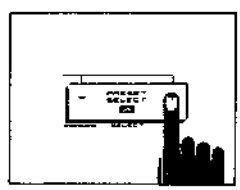
3

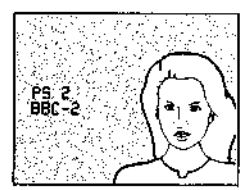
To remove the display, depress the PRESET button.

If the picture from a preset TV station is not clear.

If the color is off when a preset TV station is selected with the — A + button, use the < B > button to finely tune it in.



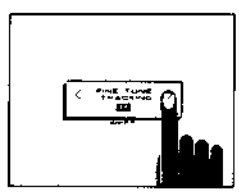


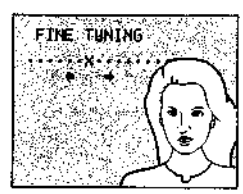


Depress the < B > button to show the display for fine tuning.

Depress the < side to move the "X" to the left and the > side to move the "X" to the right.

- Holding down the button will move the "X" continuously.
- To carry out the fine tuning operation more slowly, depress the button repeatedly in succession. If you release the button for too long, the display will disappear. In that case, depress the button again.



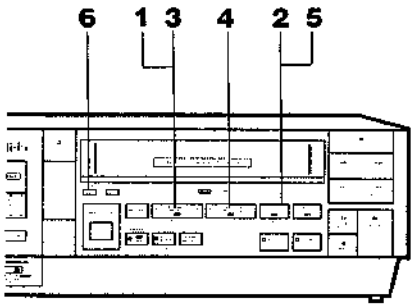


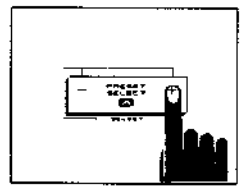
When a program is clearly tuned in, release the button to stop the fine tuning operation.

- The display will disappear a few seconds later.

If you want to cancel a preset TV station

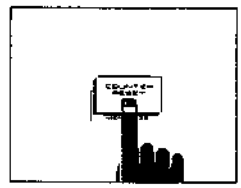
Depress the PRESET button.





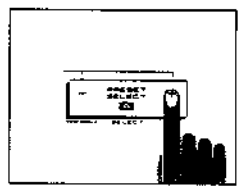
1

To follow the instruction "SELECT PS NO. — A", depress and hold the —▲+ button until the TV station number you want to change is displayed.



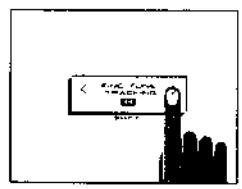
2

To follow the instruction "CHANGE PS NAME — C", depress the ▬ button to display the information for presetting the TV station name.



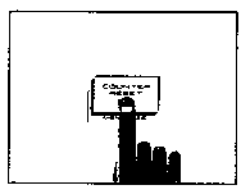
3

To follow the instruction "SELECT CHARACTER — A", depress the —▲+ button, and select a character.



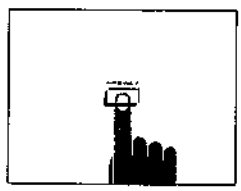
4

To follow the instruction "SHIFT — B", depress the <▬> button to shift to next item



5

Repeat step 3 and 4 until you have reset all items for the TV station name.
To follow the instruction "IF OK, MEMORIZE → C", depress the ▬ button to memorize the TV station name.



6

To remove the display, depress the PRESET button.

TV search is carried out in this order

AUTO

UHF — UHF

When all the frequencies have been scanned, the information for the end of station search will be displayed on your TV screen and a few seconds later it will disappear.

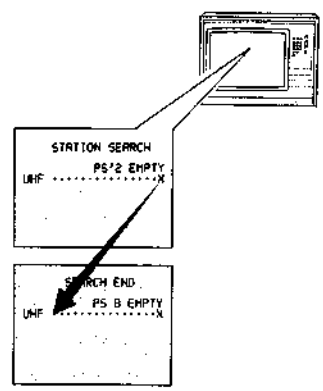
MANUAL

UHF — UHF — UHF . . . and so on . . . . .

During manual station search, scanning is continuous. The information for the end of station search will not be displayed on your TV screen.

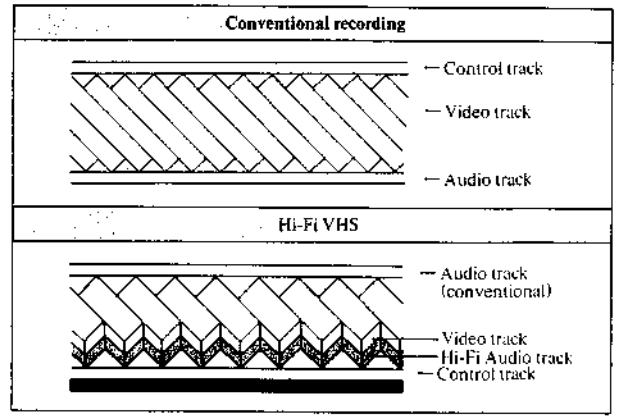
UHF band

End of TV search



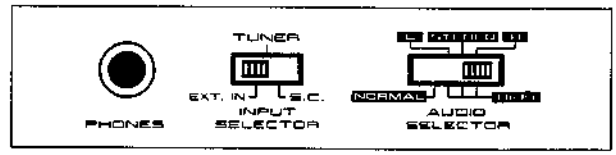
Hi-Fi VHS audio recording and playback

The Akai VS-12 is equipped with the ability to record or playback with full Hi-Fi stereo sound.



The VS-12 does this by using 2 audio heads mounted on the video drum, in addition to the 4 video heads. These heads run in the same path as the video heads and "layer" the audio track under the video track as illustrated.

Since you may want to playback tapes recorded with a conventional audio system, the Akai VS-12 is also equipped with a standard audio head and an AUDIO SELECTOR button to switch from NORMAL to HI-FI recording or playback.

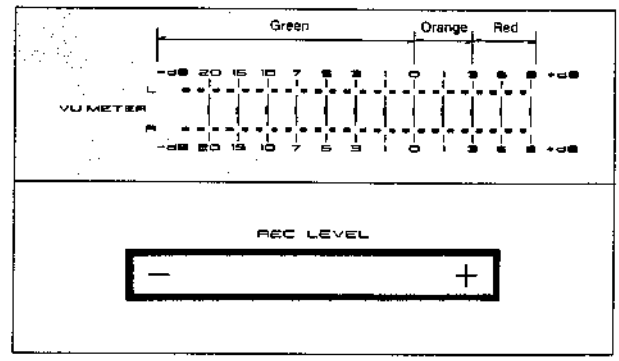


The VS-12 features a VU meter and REC LEVEL control to allow better audio recording control.
The VS-12's VU meter is color coded to make dB level identification quick and easy.

The dB level from −20 to 0dB is colored green.
The level from 0 to +3dB is colored orange.
The level above +3dB is colored red.

As the colors imply, green is a "safe" recording level; orange is a maximum recording level; red is an area where distortion is likely to occur. To produce the best recording results, set the REC LEVEL control so that the volume does not exceed the orange (+3dB) level on the VS-12's VU meter.

The VS-12 is also equipped with an initialization circuit, which automatically resets the REC LEVEL to a preset optimum recording level, whenever the VS-12 is turned on. This preset level should produce excellent recordings. If you change the recording volume with the REC LEVEL control, remember that if the VS-12 is turned off, when you turn it back on, it will return to the initial preset level.



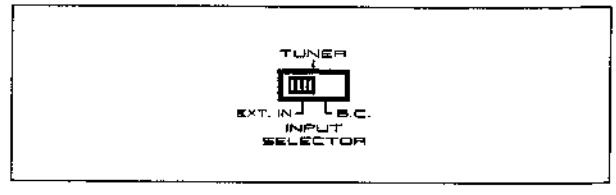
On the AUDIO and INPUT selectors

MODE	SOURCE	AUDIO SELECTOR	INPUT SELECTOR
Playback	Hi-Fi tape	HI-FI Stereo	Either position
	"Normal" tape	NORMAL	Either position
	TV broadcast	Either position	TUNER
Recording	From another VCR Hi-Fi or normal	HI-Fi Stereo	EXT IN
	From a TV broadcast	Hi-Fi Stereo	TUNER
	From another audio source	Hi-Fi Stereo	EXT IN

When recording or playing back from a normal VHS recording or a Hi-Fi VHS recording, the AUDIO selector switch must be properly positioned to obtain the desired result.
Likewise, the INPUT selector must be properly set to recieve signals from the EXT IN jacks of the VS-12, i.e., another VCR, or a stereo cassette deck, or to receive signals from the TV or VS-12's tuner.

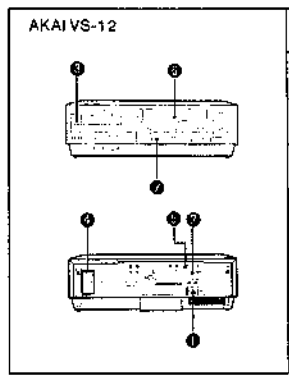
On the Simulcast feature

The INPUT selector also serves as a switch for separating the AUDIO IN of the VS-12, from VIDEO IN. This function is necessary for the simultaneous recording of an FM broadcast and a TV broadcast (simulcast).
With the amplifier and tuner or receiver connected to the VS-12 and turned to the proper station, turn on the TV and the VS-12.
Move the INPUT selector of the VS-12 to the SC position and get ready for recording following the operations on page 24.

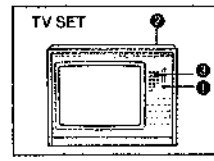


Let's record a TV program

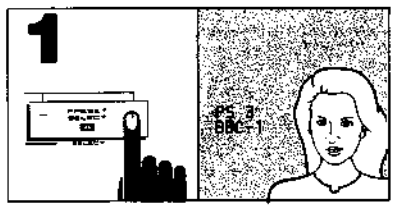
Check before starting



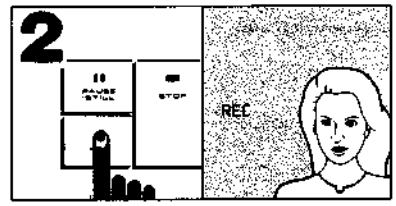
❶	Power cord is properly connected to the household AC outlet.	❺	Video mode selector is set properly.
❷	POWER switch is set to ON.	❻	A video cassette tape is loaded.
❸	FUNCTION button is turned on.	❼	The SPEED selector is set.
❹	All the components are properly connected.		



❶	Turned on.
❷	Properly connected.
❸	Set to the video channel.

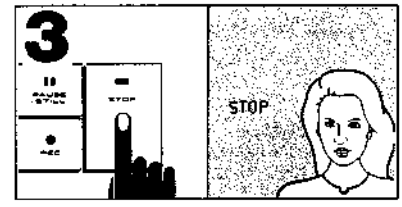


Depress the −⏏+ button to select the preset channel number memorized with the TV station to be recorded.
The program from the selected TV station will be displayed on your TV screen. At the same time, the selected preset channel number and name will be displayed on the TV screen for approximately 3 seconds.



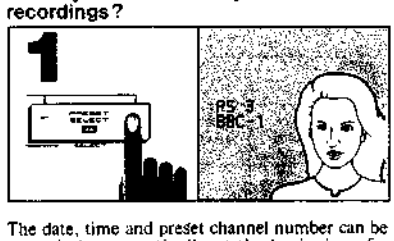
Set the AUDIO selector to Hi-Fi Stereo and set the INPUT selector to TUNER. Depress the REC (●) button for at least one second to begin recording.
"REC" will be displayed on your TV screen for approximately 3 seconds.

NOTE:
There is a 3 to 4 second delay before recording starts, while the tape moves into position. For instant recording starts, first depress PAUSE, then REC. When you are ready to begin recording, depress REC again. Recording will begin immediately.



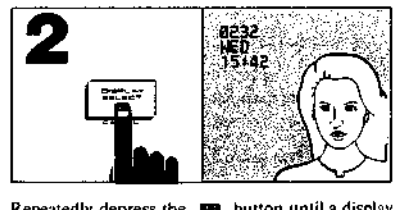
To stop recording depress the STOP (■) button.
"STOP" will be displayed on your TV screen for approximately 3 seconds.

Would you like to index your recordings?

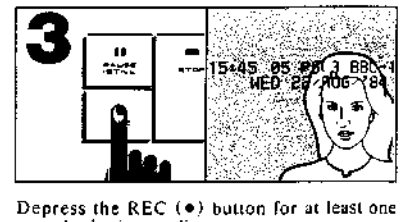


The date, time and preset channel number can be recorded automatically at the beginning of a recording for approximately 7 seconds. When you playback the tape at a later time, you can tell when it was recorded.

Depress the −⏏+ button to select the preset channel number memorized with the TV station to be recorded. The program from the selected TV station will be displayed on the TV screen. At the same time, the selected preset channel number will be displayed on the TV screen for approximately 3 seconds.



Repeatedly depress the ⏏ button until a display containing the day of the week and the actual time is shown on the TV screen.



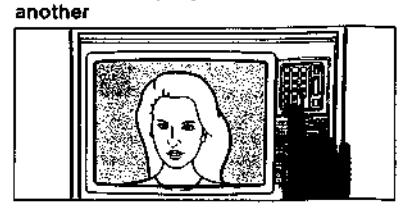
Depress the REC (●) button for at least one second to begin recording.
The index (date, time and preset channel number) will be displayed on the TV screen. This display will be recorded for approximately 7 seconds.

Now when you playback this recording, the date, and time that recording took place will be documented at the beginning of the tape.
Note: If you change your mind about recording this information, wait a few seconds for it to leave the screen before pressing REC.

Further recording notes:

- Recording can be stopped temporarily by depressing the PAUSE (▮▮) button.
  To prevent damage to the tape, do not remain in pause for more than 4 minutes. After 4 minutes the Akai VS-12 will automatically go into stop.
- To fast forward the tape, depress the F.FWD (▶▶) button.*"FF" will be displayed on the TV screen for approximately 3 seconds.
- To rewind the tape, depress the REW (◀◀) button.
- "REW" will be displayed on the TV screen for approximately 3 seconds.
- The tape is not played back during fast forward or rewind operations.
- To stop the tape, depress the STOP (■) button or depress the PLAY (▶) button to begin playback.
- If the REC (●) button will not function, check to see if the video cassette tape's recording defeat tab is broken. If it is, cover the hole with a piece of adhesive tape.
- Whenever the end of the tape is reached, the tape will automatically rewind to the beginning and stop.
- If you repeatedly depress the −⏏+ too quickly, the PS number shown on the TV screen might not correctly indicate the TV station selected. However, the PS number shown on the PRESET (PS) display on the front of the VS-12 will correctly show the PS number.
  Do not touch the −⏏+ button during recording or insert recording as this will cause the PS number to change.

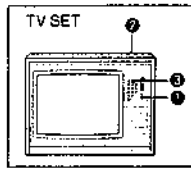
To watch one program while recording another



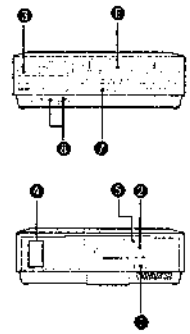
If you want to watch a program on a different channel while you are recording another program, after performing the above operation (Steps 1&2 of Let's record), move the TV's channel selector from the video channel to the channel of the program you want to watch.

Insert recording

Check before starting



❶	Turned on.
❷	Properly connected.
❸	Set to the video channel.



❶	Power cord is properly connected to the household AC outlet.
❷	Rear panel POWER switch is set to ON.
❸	FUNCTION button is turned on.
❹	All the components are properly connected.
❺	Rear panel Video mode selector is set properly.
❻	A video cassette tape is loaded.
❼	TAPE SELECT button is set.
❽	AUDIO selector and INPUT selector switchs are properly set.
❾	Amplifier turned on.

The Akai VS-12 is provided with an INSERT button to better enable you to produce a cleanly edited tape. The normal recording process produces unavoidable "noise" at the beginning and end of each recording. While this noise is not usually important, (since it occurs before the recording begins or after it is finished), when inserting a new passage into a preveously recorded tape, you want the transition to be as clear as possible. With the INSERT button, recorded noise is greatly reduced.

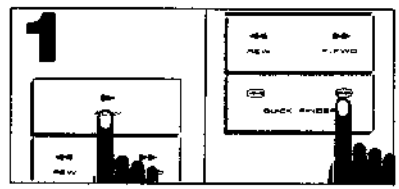
Before operation

Make sure the recording defeat tab of the video tape is not broken. If it is, cover it with a piece of adhesive tape before inserting the tape into the VS-12.

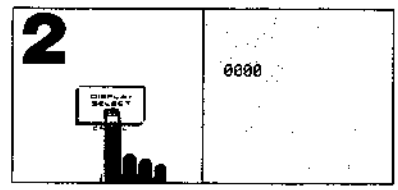
Connect your input source (another VCR for example), to the VIDEO IN and AUDIO IN jacks on the rear panel of the Akai VS-12.

How to operate

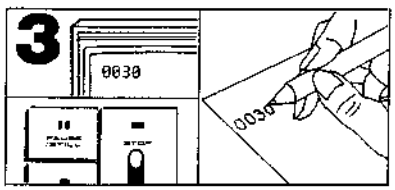
Repeatedly depress the ▭ button until the counter display appears. Then depress the AUTO STOP button to turn it on.



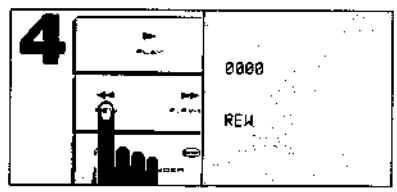
Depress the PLAY button of the VS-12 and then depress QUICK FINDER ⏩ (forward) or ⏪ (reverse), to search for the part of the pre-recorded tape you want to replace.



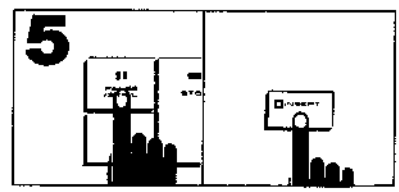
When you have found the exact beginning of the section you want to replace:
Depress the ▭ button to reset the tape counter to "0000".



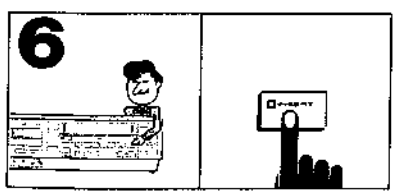
Play through the tape until you reach the end of the portion you want to replace. Press the STOP button and note the number on the tape counter so you will remember exactly where to stop later on.



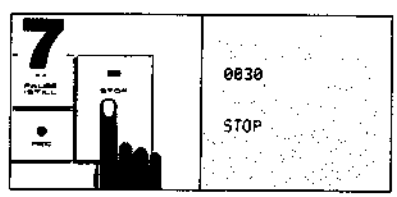
Depress the REW (◀◀) button.
The tape will automatically rewind to "0000".
Be sure that the AUTO STOP button's indicator is lit.



Depress the PAUSE (▮▮) button, and then the INSERT button for at least 1 second to put the Akai VS-12 into the INSERT (REC) PAUSE mode.
NOTE:
The INSERT button can be operated only after depressing the PAUSE (▮▮) button.



Depress the PLAY button of the VCR connected to the input jacks of the VS-12 to start playing the new section of video you want to record, and simultaneously depress the INSERT button on the VS-12 to begin recording that section.

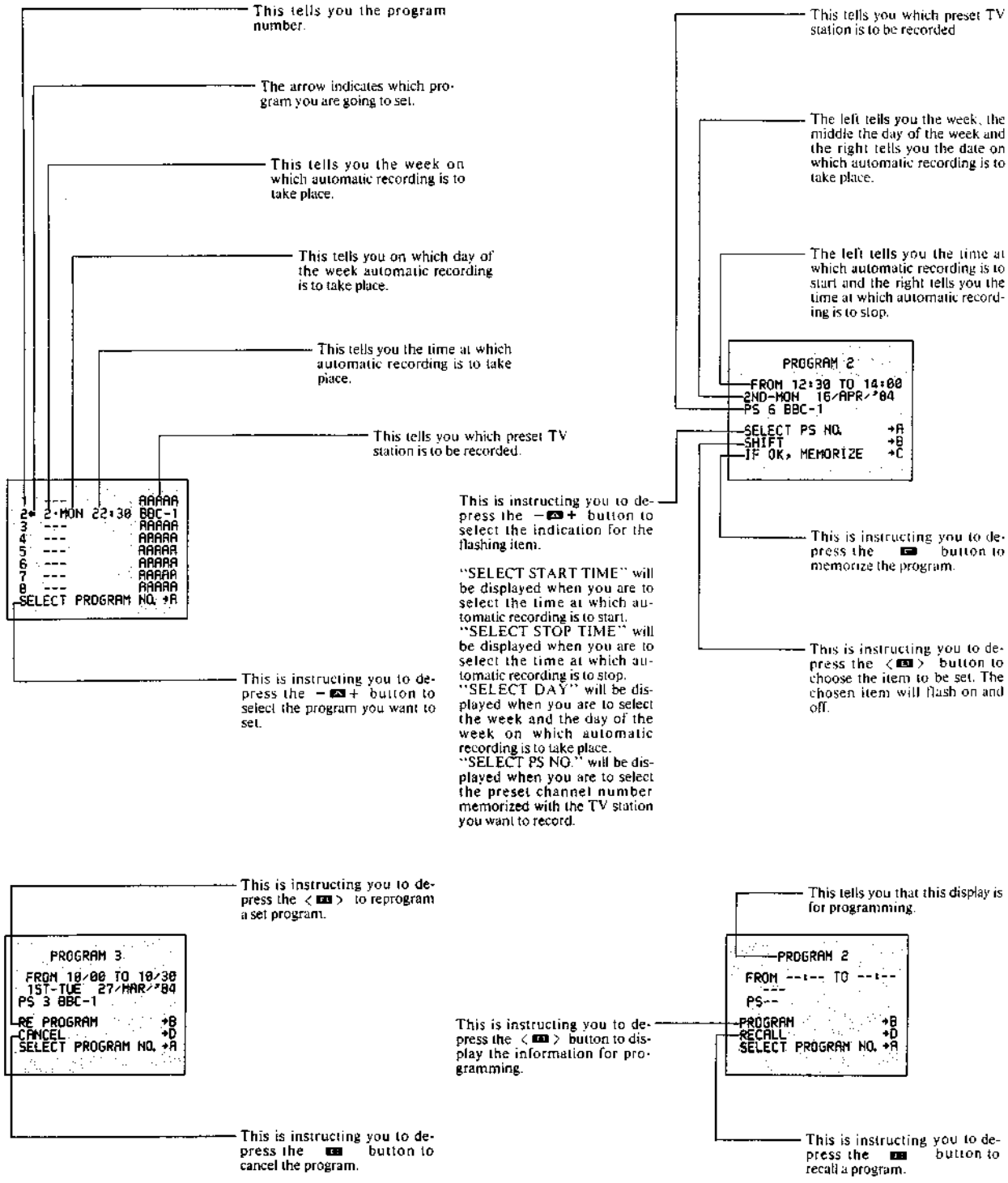


Now, when you reach the tape counter number that you noted in step 3, depress the STOP (■) button, to stop insert recording.

Note:
- The Akai VS-12 does not have the same properties as broadcast equipment. Therefore some noise bars and disturbances may appear on the picture at the beginning and end of insert recording.

Let's look at the programming display of the Akai VS-12

By programming the Akai VS-12, you can make it turn itself on, record a TV program and turn itself off, all automatically.
Up to 8 programs can be set in advance. You can freely choose the Time, Day, Week and TV station you wish to record, and you can do it up to 4 weeks in advance.

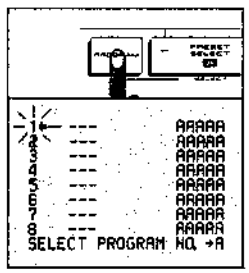


How to program the Akai VS-12 for automatic recording

As an example, we will set the program shown in step 18 below.

1

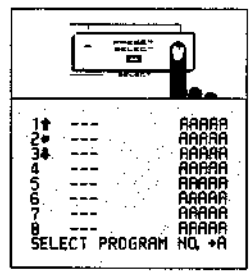
Depress the PROGRAM button to display the information for programming on your TV screen.



2 PROGRAM NO.

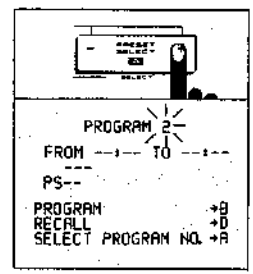
To follow the instruction "SELECT PROGRAM NO. — A", hold the − ▲ + button depressed until the arrow points to the program number you want to set.

* To set program 2, depress the − ▲ + button just once.



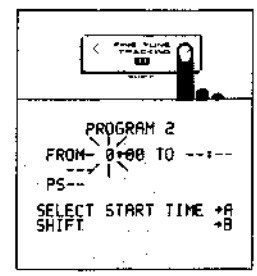
3

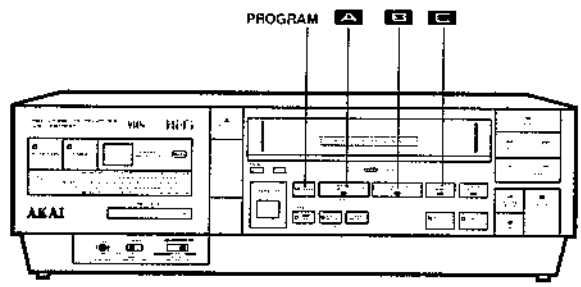
This information will be displayed when the − ▲ + button is released.



4

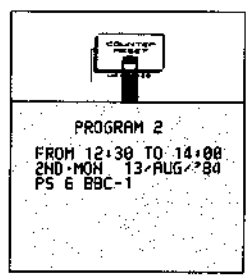
To follow the instruction "PROGRAM — B", depress the < ▶ > button to start programming.





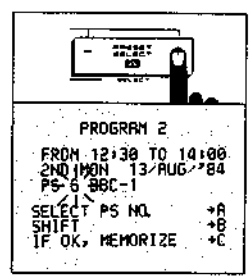
18 MEMORIZE

Programming is now finished. To follow the instruction "IF OK, MEMORIZE — C", depress the ● button to memorize the program.
To program other programs, repeat the procedure from step 2.
To reset or cancel a memorized program, refer to page 30 and 31.



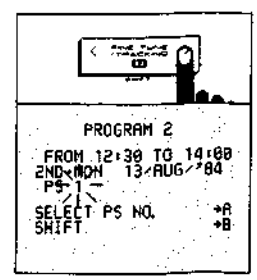
17

To follow the instruction "SELECT PS NO. — A", depress the − ▲ + button to select the preset channel number.



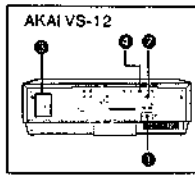
16 PS. no

To follow the instruction "SHIFT — B", depress the < ● > button to shift to the next item to be set: preset channel (PS) number memorized with the TV station to be recorded.

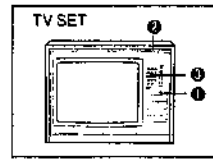


NOTE:
If you want to remove the programming display from your TV screen, depress the PROGRAM button again.

Check before starting



❶	Power cord is properly connected to the household AC outlet.
❷	POWER switch is set to ON
❸	All the components are properly connected.
❹	Rear panel Video mode selector is set properly.

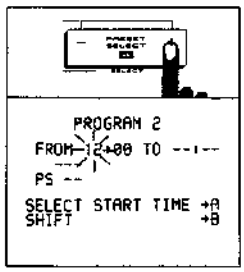


❶	Turned on.
❷	Properly connected.
❸	Set to the video channel.

5 START TIME HOURS

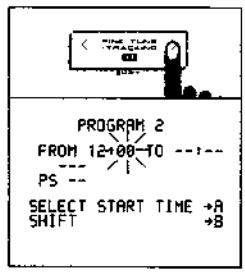
To follow the instruction "SELECT START TIME — A", depress the −▲+ button to select the turn on hours.

0, 1, 2, ... up to 23



6

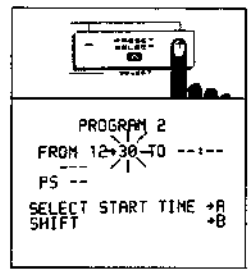
To follow the instruction "SHIFT — B", depress the 〈▭〉 button to shift to the next item to be set: start time minutes.



7 START TIME MINUTES

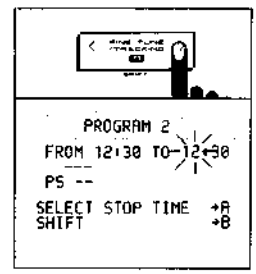
To follow the instruction "SELECT START TIME — A", depress the −▲+ button to select the start time minutes.

00, 01, 02, ... up to 59



8

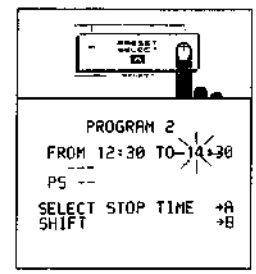
To follow the instruction "SHIFT — B", depress the 〈▭〉 button to shift to the next item to be set: stop time hours.

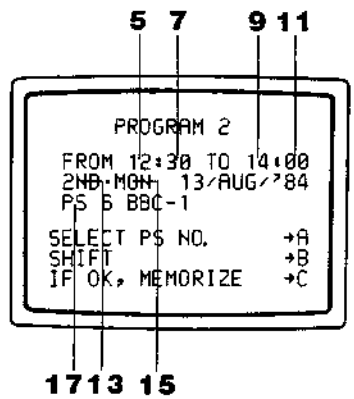


9 STOP TIME HOURS

To follow the instruction "SELECT STOP TIME — A", depress the −▲+ button to select the turn off hours.

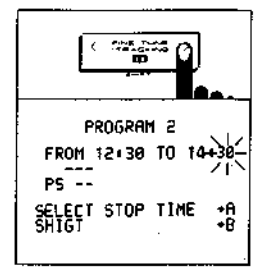
0, 1, 2, ... up to 23





10

To follow the instruction "SHIFT — B", depress the 〈▭〉 button to shift to the next item to be set: stop time minutes.



15 DAY OF WEEK

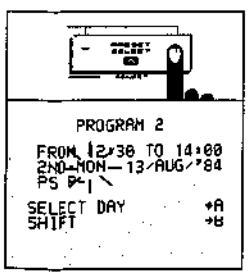
To follow the instruction "SELECT DAY — A", depress the −▲+ button to select the day.

* When the day of the week is set, the corresponding date will be displayed.

SUN, MON, TUE, WED, THU, FRI or SAT

14

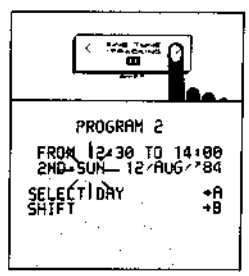
To follow the instruction "SHIFT — B", depress the 〈▭〉 button to shift to the next item to be set: day of the week.



13 WEEK

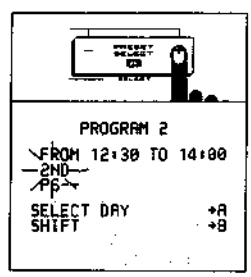
To follow the instruction "SELECT DAY — A", depress the −▲+ button to select the week.

1ST, 2ND, 3RD or 4TH



12

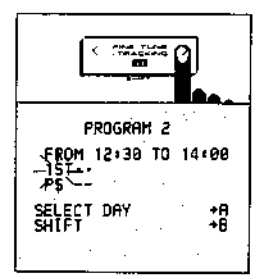
To follow the instruction "SHIFT — B", depress the 〈▭〉 button to shift to the next item to be set: week.

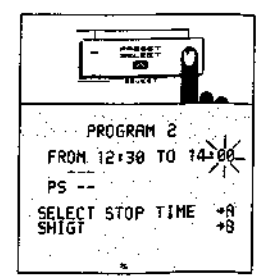


11 STOP TIME MINUTES

To follow the instruction "SELECT STOP TIME — A", depress the −▲+ button to select the stop time minutes.

00, 01, 02, ... up to 59

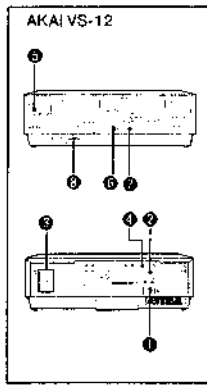




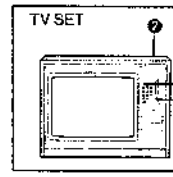
Let's prepare the Akai VS-12 for automatic recording

If you want to automatically record an index (date, time and preset channel), repeatedly depress the ▭ button until a display containing the day of the week and the actual time is displayed on the TV screen.

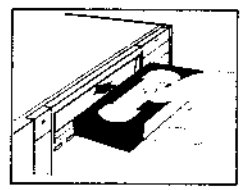
Check before starting



❶	Power cord is properly connected to the household AC outlet.
❷	POWER switch is set to ON.
❸	All the components are properly connected.
❹	Video mode selector is set properly.
❺	FUNCTION button is turned on.
❻	SPEED selector is set.
❼	TAPE SELECT button is set.
❽	AUDIO SELECTOR switch is set.
❾	Amplifier is turned on.



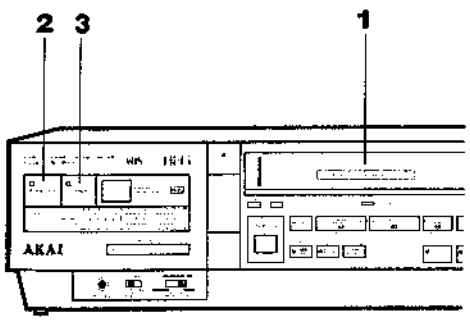
❶	Turned on.
❷	Properly connected.
❸	Set to the video channel.

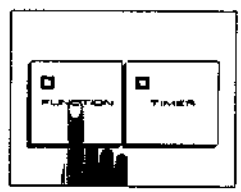


1

Insert a video cassette tape.
* Confirm that the recording defeat tab is not broken. If it is, cover the hole with a piece of adhesive tape.

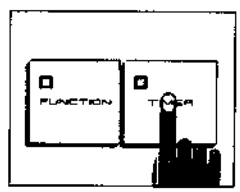
NOTE:
Make sure that the video cassette tape is long enough for the duration of automatic recording.





2

Depress the FUNCTION button to turn off the Akai VS-12.
* Confirm that its indicator is off.



3

Depress the TIMER button to make the Akai VS-12 standby for automatic recording.
* Confirm that its indicator is on.

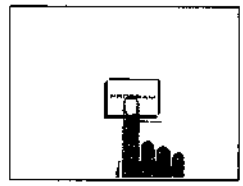
NOTE:
You can watch a TV program during automatic recording by setting the TV itself to the channel you want.
* Turn off the TV if you are not going to watch a program.

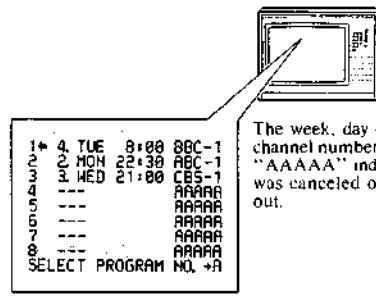
The Akai VS-12 will turn on 6 seconds before the programmed turn on time. One second later, it will automatically start recording and at the programmed turn off time, it will stop recording and turn itself off.

NOTE:
The VS-12 is equipped with an initialization mode which sets the REC LEVEL to an optimum point for good recording, whenever the power is turned on.
During regular recording operation, this level may be changed by use of the REC LEVEL control. However, during TIMER recording operation, the recording volume will always be set to the predetermined optimum level.

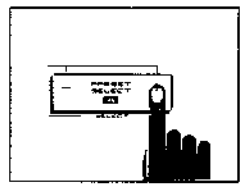
If you want to confirm a program

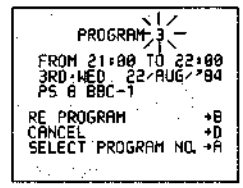
Depress the PROGRAM button.





The week, day of the week, start time and preset channel number of each program will be displayed. "AAAAA" indicates that the program is not set, was canceled or automatic recording was carried out.



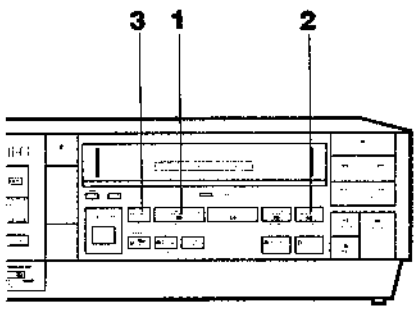


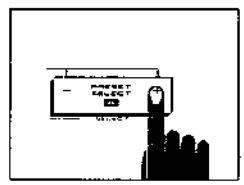
To confirm a program in more details, follow the instruction "SELECT PROGRAM NO. — A", hold the — + button depressed until the arrow points to the program you want to confirm. To confirm other programs, follow the instruction "SELECT PROGRAM NO. — A", and depress the — + button.

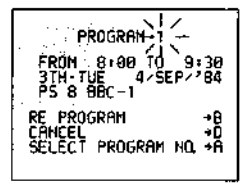
To cancel the information, depress the PROGRAM button.

To cancel a program after it has been memorized

Depress the PROGRAM button.

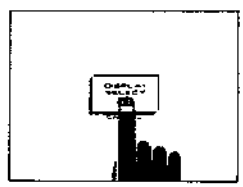


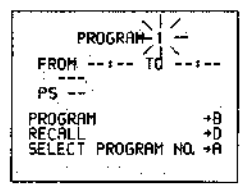




1

To follow the instruction "SELECT PROGRAM NO. — A", depress the — + button until the arrow points to the program you want to cancel.



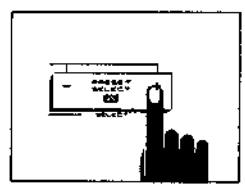


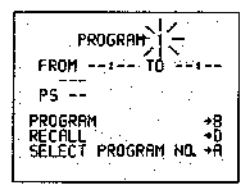
2

To follow the instruction "CANCEL — D", depress the button to cancel the program. To reprogram repeat the programming procedure from step 4

If you want to recall a finished or cancelled program

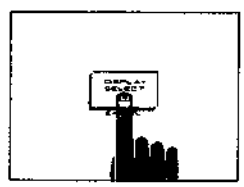
When an automatic recording has been carried out according to a program "AAAAA" will be displayed beside its program number when the PROGRAM button is depressed. To recall the program so that automatic recording can be again carried out according to the program's instructions:

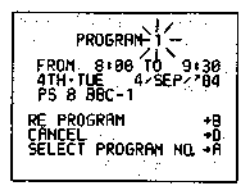




1

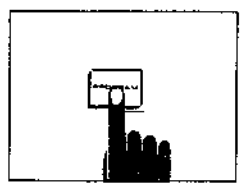
To follow the instruction "SELECT PROGRAM NO. — A", depress the — + button until the arrow points to the program you want to recall.





2

To follow the instruction "RECALL — D", depress the button to recall the program. Same thing applies for cancelled programs.

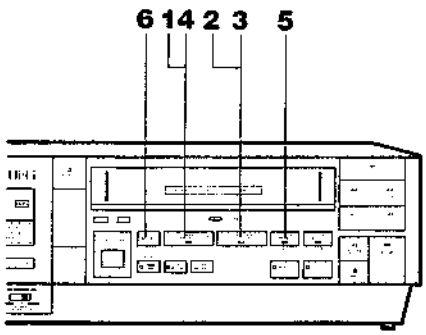


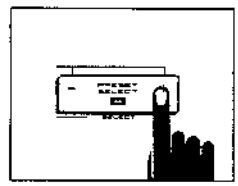
3

To cancel the information depress PROGRAM button.

To reset a program after it has been memorized

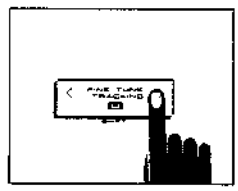
Depress the PROGRAM button.





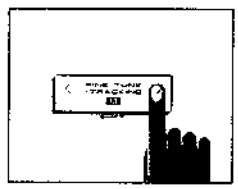
1

To follow the instruction "SELECT PROGRAM NO. — A", depress the — + button until the arrow points to the program you want to reset.



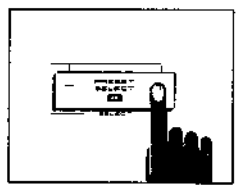
2

To follow the instruction "REPROGRAM — B", depress the > side of the < > button.



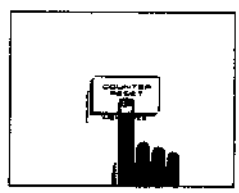
3

To follow the instruction "SHIFT — B", depress the < > button until the item you want to reset flashes on and off.



4

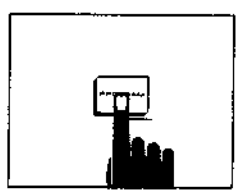
Then to follow the instruction "SELECT START TIME/STOP TIME/DAY/PS NO. — A", depress the — + button and reset the item. Reset other items in the same manner. After you have reset all the items, go to the next step.



5

To follow the instruction "IF OK, MEMORIZE — C", depress the button.

NOTE:
During programming, any item can be reset by using the and < > buttons in the same manner.



6

To remove the information, depress the PROGRAM button.

An example of 4-week timer setting

August						
SUN	MON	TUE	WED	THE	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			
September						
				1	2	3
4	5	6	7	8	9	10

"4-week" pre-setting means that you can "reserve" recording time on any one of 28 days in advance-including the day of setting. This means that beginning with today, you can pre-program your Akai VS-12 to automatically record at any time on any day for 28 days.

For example, let's say that today is Monday AUG. 1st and you wish to preset a recording time for later on tonight. Then set the week and day for "1st Monday" which will mean today (AUG. 1st). So now it follows that if you want to pre-set time for next Monday (AUG. 8th), you will set the week and day for "2nd Monday" and so on for "3rd Monday" (AUG. 15th) and "4th Monday" (AUG. 22nd). The same thing applies to the other days of the week.

Now let's say its Tuesday AUG. 2nd at 9:00 PM and you want to pre-set recording time for 8:00 PM the following Tuesday (AUG. 9th). Since it is already past 8:00 PM today (AUG. 2nd) when you are doing the setting, you must set the week and day for "1st Tuesday" since the 1st Tuesday you can record at 8:00 PM is now next week (AUG. 9th). In other words, "1st Tuesday" means the first Tuesday you can record at the time desired. The same thing applies to the other days of the week.

(32-3)

NOTE:
The real time counter in the Akai VS-12, uses a 24 hour notation system following the example:

1:00 AM = 1:00
12:00 PM = 12:00
1:00 PM = 13:00
2:00 PM = 14:00
12:00 AM = 0:00

Program List

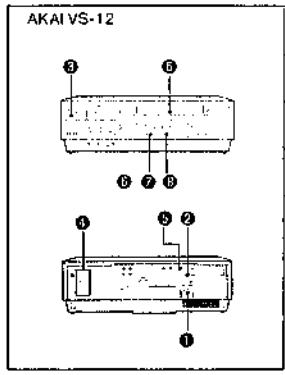
Program No.	Channel	TV program	Date	Start time	Stop time	Memo
1						
2						
3						
4						
5						
6						
7						
8						

IMPORTANT
PROGRAM PRIORITY

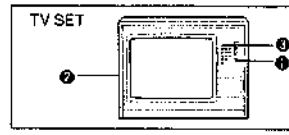
- If two programs are set to turn on at the same day and time the smaller program number has priority.
- If two programs overlap, the earlier program will be interrupted by the latter one.

Sleep time setting

Check before starting



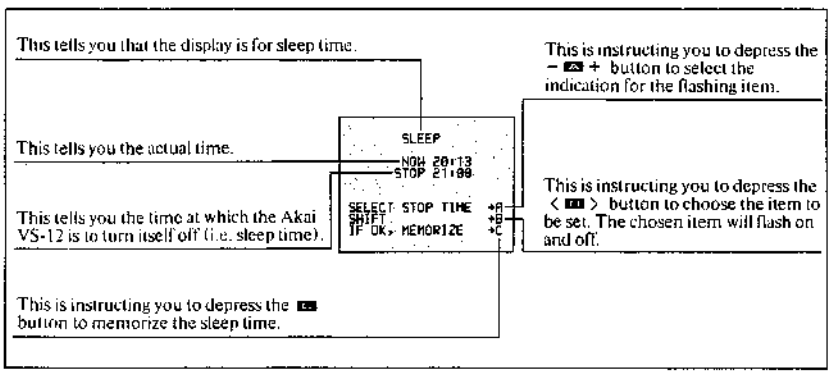
❶	Power cord is properly connected to the household AC outlet.	❺	Rear panel Video mode selector is set properly.
❷	Rear panel POWER switch is set to ON.	❻	AUDIO SELECTOR switch is set
❸	FUNCTION button is turned on.	❼	AUDIO selector and INPUT selector switchs are properly set.
❹	All the components are properly connected.		

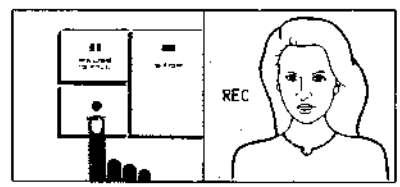


❶	Turned on.
❷	Properly connected.
❸	Set to the video channel.

The Akai VS-12 can be set to stop recording and turn itself off automatically when you have to leave before the program you are recording is finished. We call this turn off time "SLEEP TIME".

On the Sleep time display

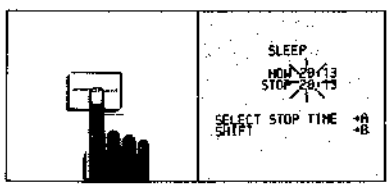




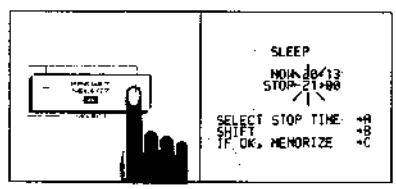
How to set sleep time

Depress the REC (●) button for at least 1 second to record a TV program.

* "REC" will be displayed on your TV screen for 3 seconds.



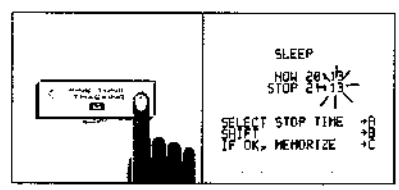
Depress the PROGRAM button to display the information for setting the sleep time on your TV screen.



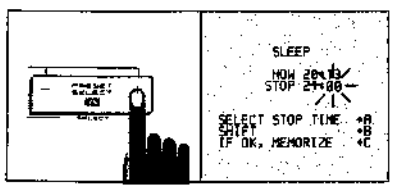
STOP TIME HOURS

To follow the instruction "SELECT STOP TIME — A", depress the − ⏏ + button to select the stop time hours.

0, 1, 2 ..... up to 23



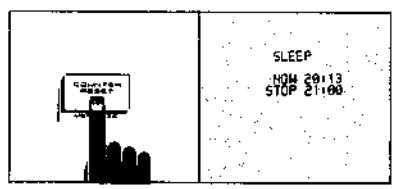
To follow the instruction "SHIFT — B", depress the < ⏏ > button to shift to the next item to be set: stop time minutes.



STOP TIME MINUTES

To follow the instruction "SELECT STOP TIME — A", depress the − ⏏ + button to select the stop time minutes.

00, 01, 02, ... up to 59



MEMORIZE

The procedure is now finished.

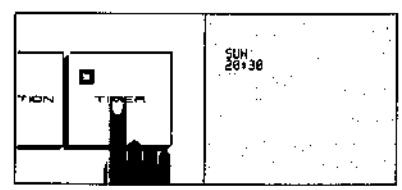
To follow the instruction "IF OK, MEMORIZE — C", depress the ⏏ button to memorize the sleep time.

The TIMER button's indicator will light in addition to the FUNCTION button's indicator. Once this operation has been completed, all the buttons will become inoperative.

* Don't forget to turn off the TV.

The Akai VS-12 will stop recording and turn itself off at the programmed sleep time.

After sleep time operation, depress the TIMER button. The indicator will go off. to operate the Akai VS-12 again, depress the FUNCTION button. Its indicator will turn on.



To cancel sleep time operation during sleep time recording

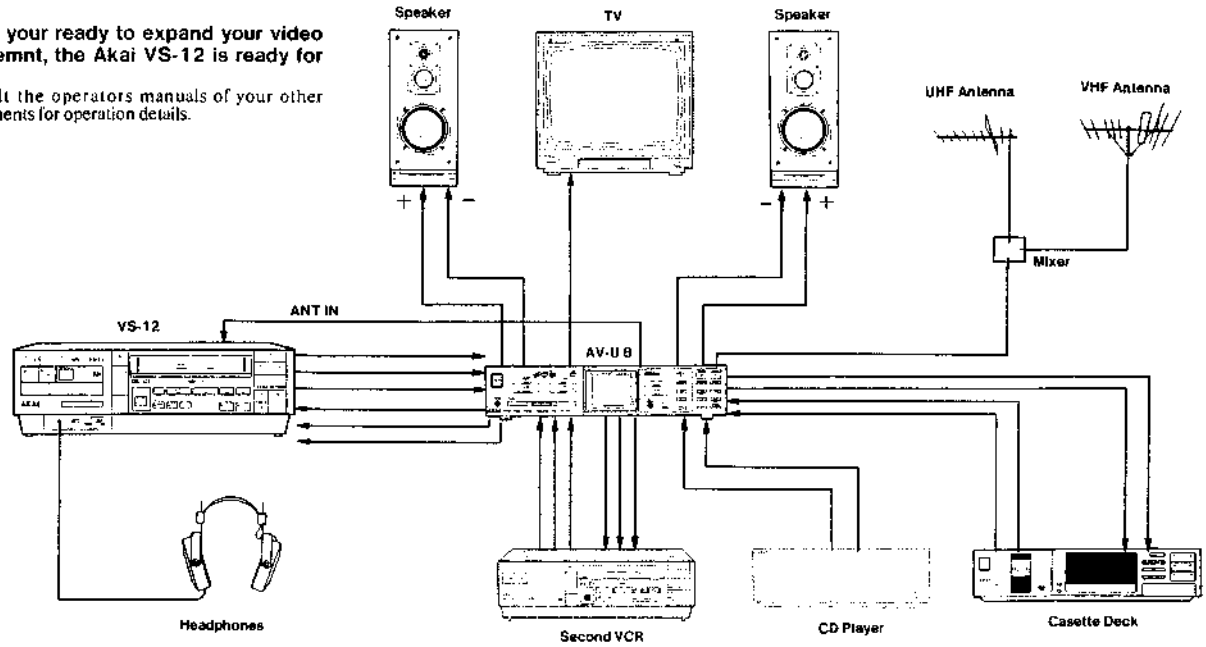
Depress the TIMER button. Its indicator will go off and the sleep time operation will be canceled the Akai VS-12 goes into normal recording mode.

NOTES

- If the tape ends before the programmed sleep time, the tape will rewind to the beginning and stop. When the tape has stopped, sleep time operation will be canceled but the Akai VS-12 will not turn itself off. Therefore make sure that the length of the tape is longer than the sleep time.
- If a sleep timer setting and a preprogrammed recording setting overlap, the preprogrammed recording will take priority over the sleep time setting. In other words, the pre-recorded program will take place as scheduled- both interrupting the program set with the sleep timer and keeping the VS-12 from turning itself off.

Expanding your home video centre

When your ready to expand your video enjoyemnt, the Akai VS-12 is ready for you.
Consult the operators manuals of your other components for operation details.



Final Notes

Power failure
When a power failure occurs, the Akai VS-12 will stop keeping time. When power is resumed, the Akai VS-12 will again start keeping time. To warn you that the time is slow, the information for setting the timer to the actual time will be displayed on the TV screen when the Akai VS-12 is turned on. In that case reset the timer following the procedure on page 9.

Memory back up
There is a rechargeable battery inside the Akai VS-12 for the station and program memories. The memories are retained even during a power failure. The memory back-up battery is recharged as long as the rear panel POWER switch is set to ON. It takes about 30 hours to fully charge the battery which will then supply power for about three days.

Notes:
When the power is cut off for three days or more, confirm the actual time, the preset channels and the programs. If the indication is wrong or if error is indicated, reset all the preset information again, starting with the actual time.

When the Akai VS-12 is receiving certain test patterns such as the Phillips type, there may be some distortion in the Interactive Monitor System characters on the TV screen.
This is not a malfunction of the Akai VS-12 and will not occur during reception of normal TV programs.

Maintenance
When a dirty tape is used, dirt will accumulate on the video heads. This will cause disturbances on the TV screen which cannot be eliminated with the Akai VS-12's tracking or the TV's fine tuning control. If this should occur, the heads as well as other internal parts must be cleaned. As this equipment is a finely precisioned instrument, never open the equipment yourself. Take it to a qualified service shop or to an authorized Akai Service Station to be cleaned.
* Akai does not recommend the use of cleaning tape.

Should a problem persist, write down the model and serial numbers and all pertinent data regarding warranty coverage as well as a clear description of the existing trouble and contact your nearest authorized Akai Service Station or the Service Department of Akai Electric Company, Tokyo, Japan.

SECTION 2

SERVICE MANUAL

TABLE OF CONTENTS

For basic adjustments, measuring methods, and operating principles, refer to GENERAL TECHNICAL MANUAL.

I. SPECIFICATIONS

Format		VHS standard
Video recording system		Rotary, slant azimuth two-head helical scan system
Recording/Playback time		240 min. with E-240 cassette on SP mode 480 min. with E-240 cassette on LP mode
Tape speed		
SP Mode		23.39mm/sec
LP Mode		11.70mm/sec
Quick finder		
SP Mode		approx. 5 times normal speed
LP Mode		approx. 9 times normal speed
FF, REW time		approx. 4 min. with E-180 cassette
RF input	VS-12EK	System I UHF ch 21 to 69
	VS-12EG	System B, G VHF ch 2 to 12, UHF ch 21 to 69
RF output	VS-12EK	System I type modulation UHF ch 30 to 39 adjustable (Preset ch 36)
	VS-12EG	System G type modulation UHF ch 30 to 39 adjustable (Preset ch 36)
Recording (line input)		PAL, CCIR (System B, G, I)
Playback (line output)		PAL, CCIR (System B, G, I)
Video		
Line input level		0.5 to 2.0Vp-p/75 ohms, unbalanced
Line output level		1.0Vp-p/75 ohms, unbalanced
S/N ratio		more than 43dB
Horizontal resolution		more than 250 lines (SP mode)
Audio (VHS HIFI: 2ch, Linear: 1ch)		
Line input level		–8dBm/50 kohms, unbalanced (309mVrms) (–20dBm at Recording level control max.)
Line output level		–6dBm/1 kohms, unbalanced (388mVrms)
Dynamic range		more than 80 dB (VHS HIFI)
S/N ratio		more than 70dB (VHS HIFI) more than 40dB (Linear track, SP mode)
Frequency response		20 to 20,000 Hz (VHS HIFI) 70 to 8,000 Hz (Linear track, SP mode)
Wow & Flutter		less than 0.005% WRMS (VHS HIFI)
Timer		
Programs		Eight 4-week one time programs and one shut down program
Clock referance		Quartz crystal
Preset TV Stations		32 stations capacity
Display		TV screen (Tape counter, Timer etc.)
Power requirements	VS-12EK	200V/240V AC, 50Hz
	VS-12EG	110V/220V AC, 50/60Hz
Power consumption		48W
Operating temperature		5°C to 40°C
Dimensions		440 (W) × 135 (H) × 363 (D) mm (17.3 × 5.3 × 14.3 inches)

Weight	10.7kg (23.6 lbs)

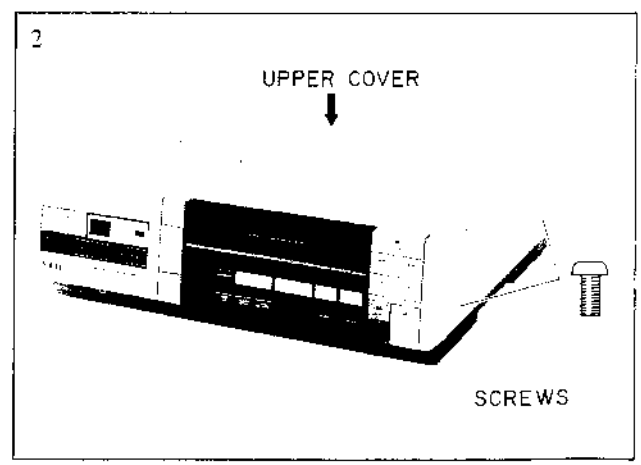
RC-T12

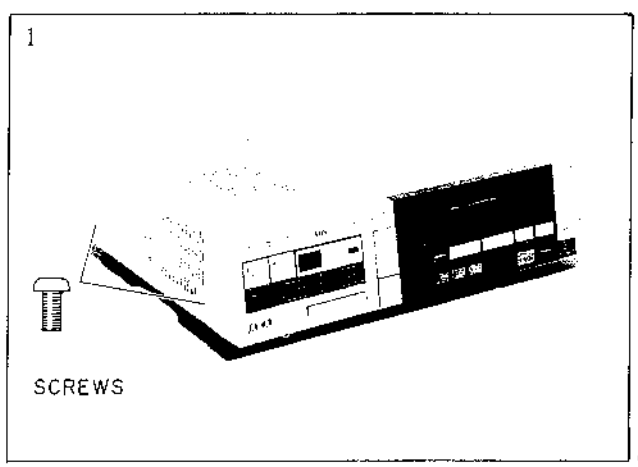
System	Infrared pulse position modulation system
Carrier frequency	38 ± 0.2kHz
Range	more than 8 meters
Directivity	± 30° (at 4 meters)
Batteries	R6 (or AA, SUM-3) × 2 (3 volts)
Dimensions	75 (W) × 18.5 (H) × 162 (D) mm
Weight	110g (without batteries)

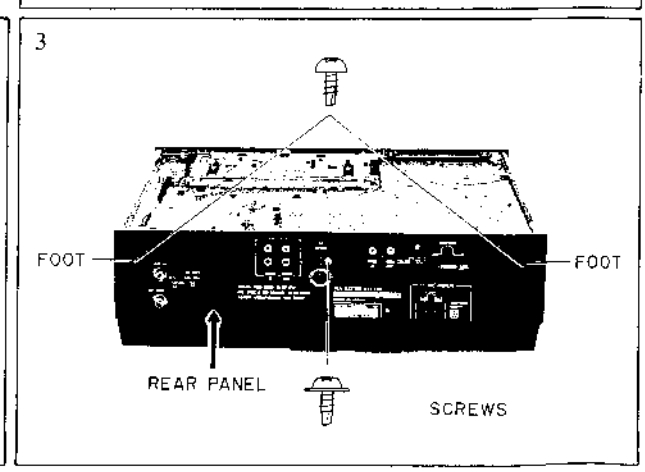
* For improvement purposes, specifications and design are subject to change without notice.

II. DISMANTLING OF UNIT

In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.







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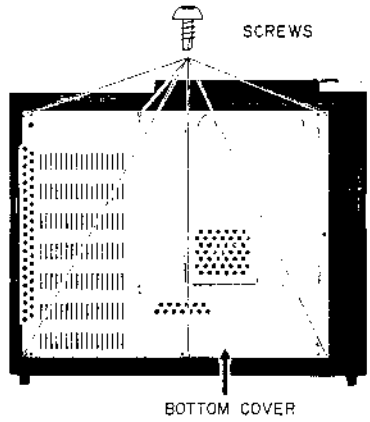
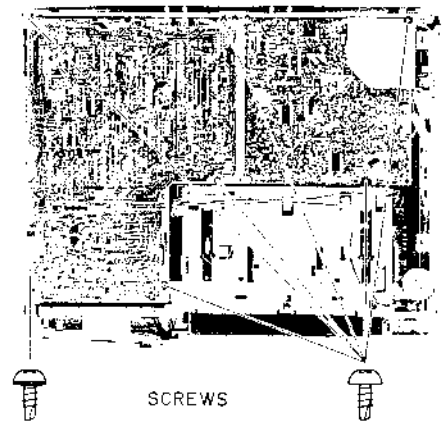
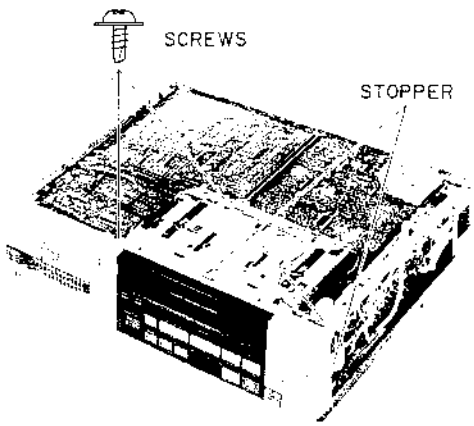

SCREWS
BOTTOM COVER

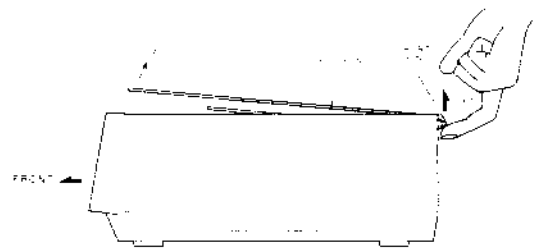
8


SCREWS

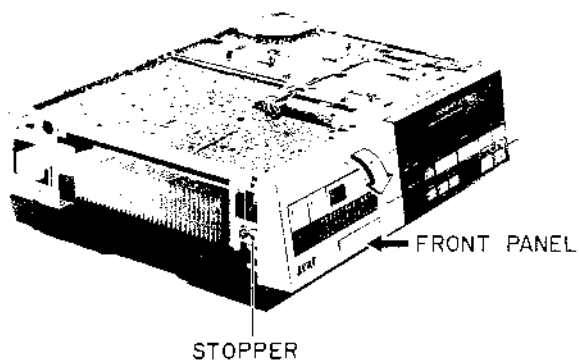
5


SCREWS
STOPPER

9



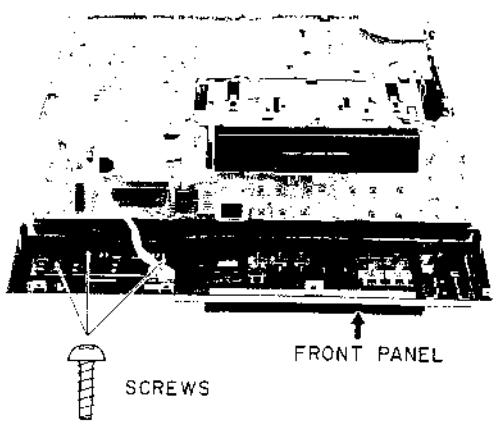
6


FRONT PANEL
STOPPER

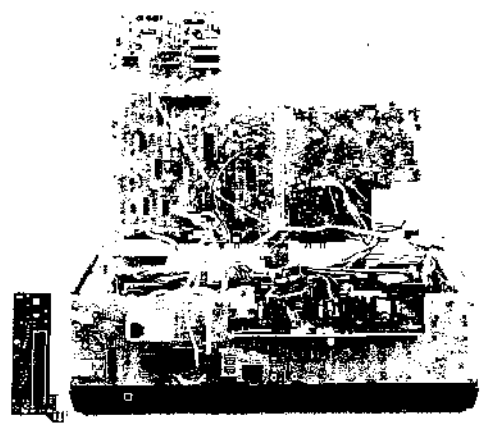
10


COVER
SCREWS
LOOSEN
THIS CONNECT
EJECTOR BLOCK

7


FRONT PANEL
SCREWS

11



III. CONTROLS

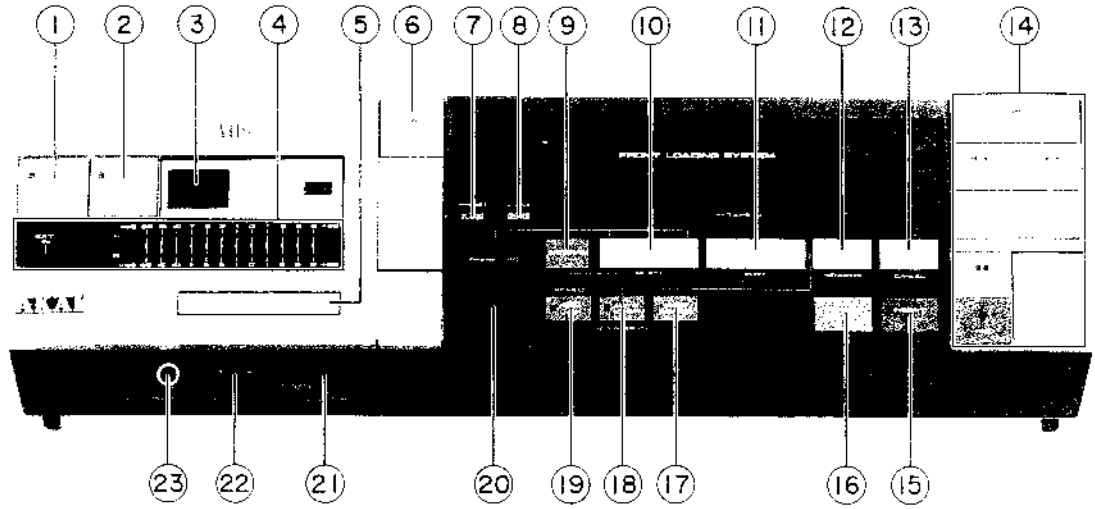


Fig. 3-1 Front View

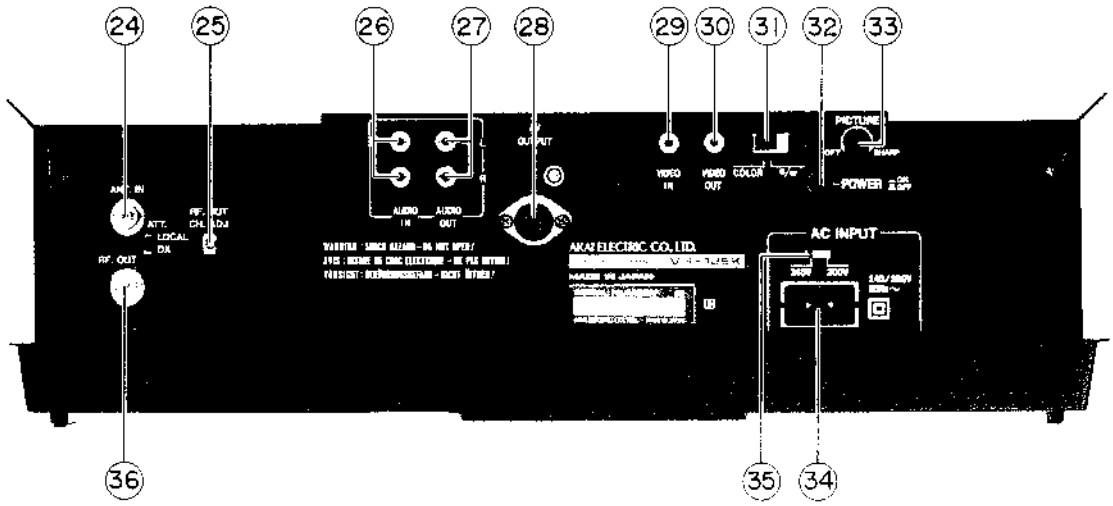


Fig. 3-2 Rear View

1. FUNCTION "ON/OFF" BUTTON
2. TIMER "ON/OFF" BUTTON
3. REMOTE CONTROL RECIEVER
4. BAR METER (FOR HIFI)
5. REC LEVEL BUTTON (FOR HIFI)
6. EJECT BUTTON
7. PRESET BUTTON (TO TUNE IN TV STATIONS)
8. CLOCK BUTTON (TO SET THE ACTUAL TIME AND DATE)
9. PROGRAM BUTTON (TO AUTOMATICALLY RECORD A TV PROGRAM)
10. PRESET SELECT [A] BUTTON
11. FINE TUNE/TRACKING [B] BUTTON
12. COUNTER RESET [C] BUTTON
13. DISPLAY SELECT [D] BUTTON
14. OPERATION BUTTON
    (▶)PLAY, (◀◀) REW, (▶▶) F.FWD, (◀◀ ▶▶) QUICK FINDER, (▮▮) PAUSE/STILL, (●) REC, (■) STOP
15. INSERT BUTTON (TO INSERT RECORDING A NEW PICTURE)
16. SLOW BUTTON (TO PLAYBACK AT HALF OF NORMAL SPEED)
17. TAPE SELECT BUTTON
18. AUTO STOP BUTTON
19. SPEED SELECT BUTTON (LP/SP)
20. PRESET CHANNEL DISPLAY
21. AUDIO SELECTOR SWITCH
22. INPUT SELECTOR SWITCH
23. HEADPHONE JACK
24. ANTENNA (ANT) IN JACK
25. RF CONVERTER CHANNEL ADJUSTMENT
26. EXT AUDIO INPUT JACK
27. EXT AUDIO OUTPUT JACK
28. AV OUTPUT JACK
29. VIDEO INPUT JACK
30. VIDEO OUTPUT JACK
31. COLOR MODE SWITCH
32. POWER "ON/OFF" SWITCH
33. PICTURE CONTROL KNOB
34. AC INLET
35. AC INPUT SELECTOR
36. RF OUTPUT JACK

IV. PRINCIPAL PARTS LOCATION

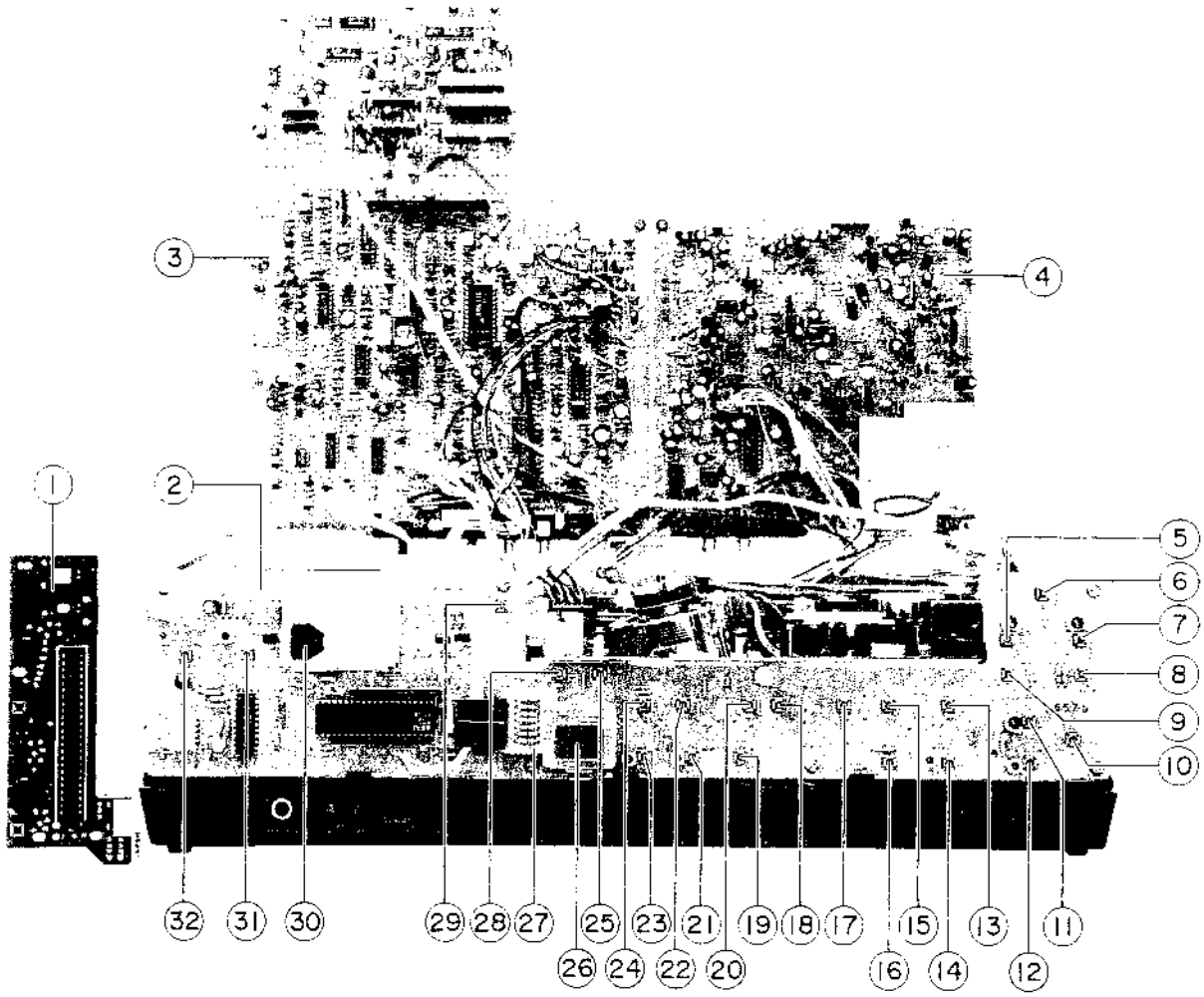


Fig. 4-1 Parts Location (Front View)

1. BAR METER BLK
2. OPERATION PC BOARD (V1015A521A)
3. VIDEO PC BOARD (V1015A501A)
4. HIFI AUDIO PC BOARD (V1039A5010)
5. REWIND SWITCH SW 14
6. PLAY SWITCH SW 13
7. FAST FORWARD SWITCH SW 15
8. QUICK FINDER FORWARD SWITCH SW 17
9. QUICK FINDER REVERSE SWITCH SW 16
10. STOP SWITCH SW 20
11. PAUSE/STILL SWITCH SW 18
12. REC SWITCH SW 19
13. DISPLAY SELECTOR SWITCH SW 12
14. INSERT SWITCH SW 27
15. COUNTER RESET SWITCH SW 11
16. SLOW SWITCH SW 26
17. FINE/TRACKING (+) SWITCH SW 10
18. FINE/TRACKING (–) SWITCH SW 9
19. TAPE SELECT SWITCH SW 23
20. PRESET SELECT (+) SWITCH SW
21. AUTO STOP SWITCH SW 8
22. PRESET SELECT (–) SWITCH SW 7
23. SPEED SELECT SWITCH SW 21
24. PROGRAM SWITCH SW 6
25. CLOCK SET SWITCH SW 5
26. PRESET CHANNEL INDICATOR DISPLAY
27. LED PC BOARD (V1015A521C)
28. PRESET SWITCH SW 4
29. EJECT SWITCH SW 3
30. REMOTE CONTROL RECEIVER
31. TIMER "ON/OFF" SWITCH SW 2
32. FUNCTION "ON/OFF" SWITCH SW 1

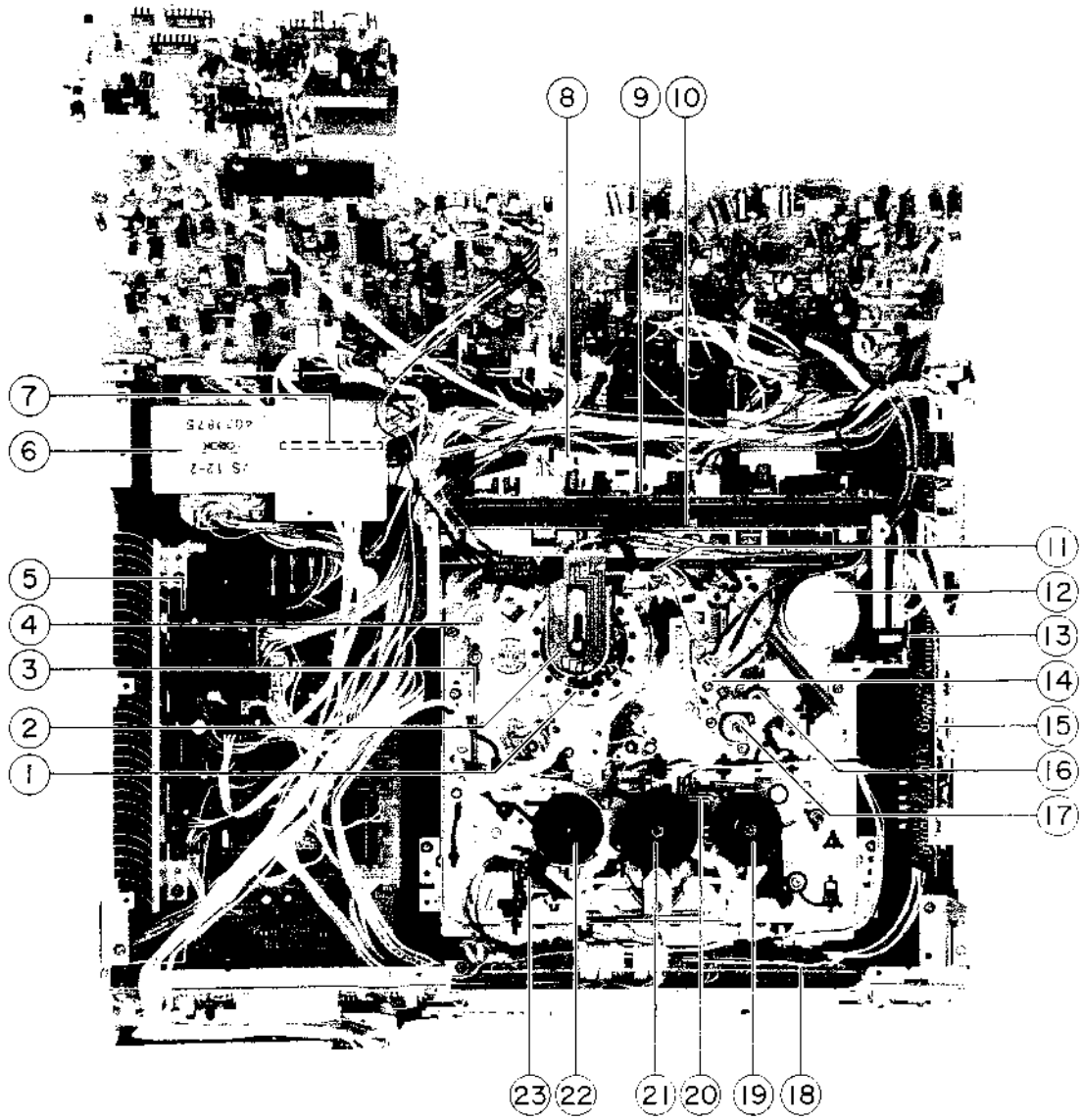


Fig. 4-2 Parts Location (Top View)

1. DRUM HEAD BLOCK
2. STATER COIL BLK PC BOARD (V1039D5080)
3. FULL ERASE HEAD
4. IMPEDANCE ROLLER
5. POWER SUPPLY & SYSCON PC BOARD (V1039A5110)
6. POWER TRANSFORMER
7. POWER FILTER PC BOARD (V1017D5060)
8. TUNER
9. DEMODULATOR PC BOARD (6B00159F)
10. PRE AMP PC BOARD (V1015A5070)
11. RELAY PC BOARD (V1039D5070)
12. CAPSTAN MOTOR
13. CM DRIVE PC BOARD (V1015A5018)
14. AUDIO/CONTROL HEAD
15. SERVO PC BOARD (V1015B5040)
16. PINCH ROLLER
17. CAPSTAN
18. MECHA DRIVE PC BOARD (V1015A502A)
19. TAKE UP REEL
20. HALL IC (R) PC BOARD (V1017D5070)
21. IDLER ASSY
22. SUPPLY REEL
23. HALL IC (L) PC BOARD (V1017D5080)

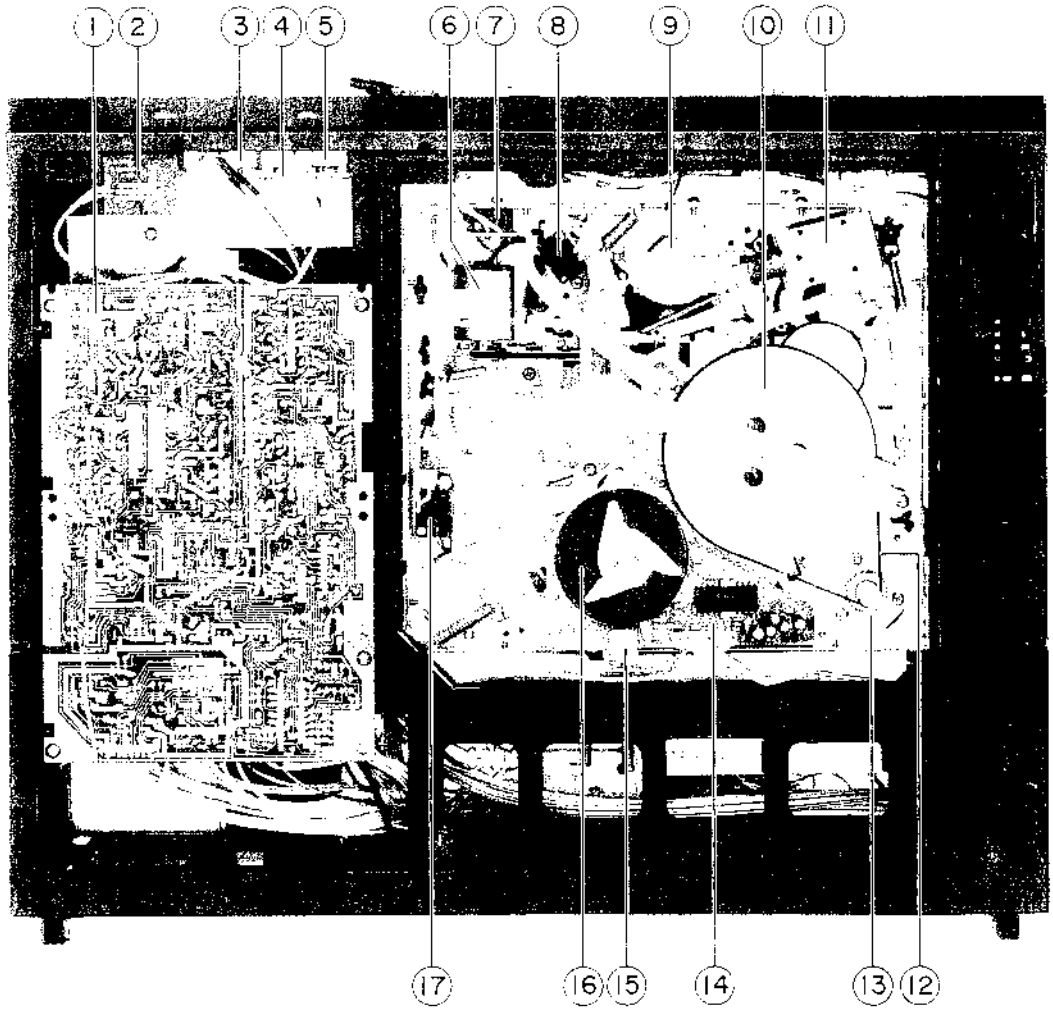


Fig. 4-3 Parts Location (Bottom View)

1. LINEAR AUDIO PC BOARD (V1039B5020)
2. PHONE JACK PC BOARD (V1039D5050)
3. INPUT SELECTOR SWITCH SW 1
4. SLIDE SWITCH PC BOARD (V1039D5120)
5. AUDIO SELECTOR SWITCH SW 2
6. LOADING MOTOR
7. RECORD SAFETY SWITCH SW 1 /RS SW PC BOARD (V1017A518D)
8. LOADING SWITCH B SW1/L SW (B) PC BOARD (V1017A518B)
9. REEL MOTOR
10. PLUNGER
11. CAPSTAN FLYWHEEL
12. CAPSTAN BELT
13. CAPSTAN MOTOR
14. DRIVE PC BOARD (M3201C5010)
15. DRUM MOTOR PG HEAD
16. DRUM MOTOR
17. LOADING SWITCH A SW 1/SW (A) PC BOARD (V1017A518C)

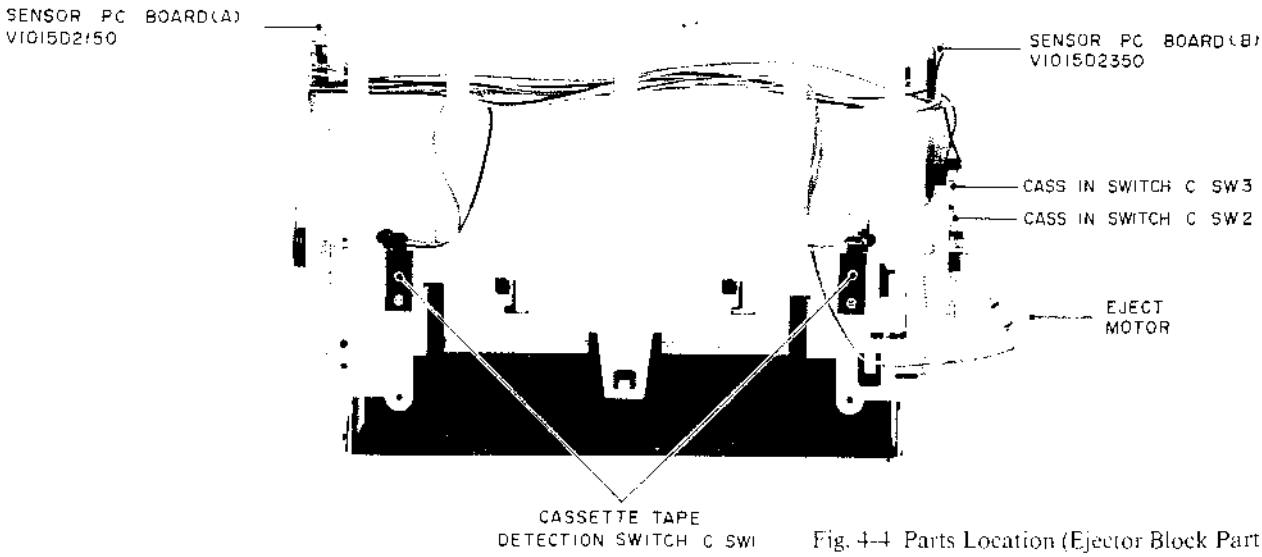


Fig. 4-4 Parts Location (Ejector Block Part)

V. MECHANICAL ADJUSTMENT

5-1. BEFORE THE ADJUSTMENT

5-1-1. HOW TO REFRESH MICROPROCESSOR

External noise, such as AC power flash can affect microcomputer circuitry. The contents of the memory of the microcomputer and external memory data may become scrambled. if this condition occurs, problems may arise with functions which had previously worked faultlessly. (For example. defective motion, programs cannot be correctly input, the TV search function fails to operate and the contents of the preset memory are deleted.) If this happens reinput the entire contents of the memory as follows. This shoud solve the problem. (Because the preset memory will have been deleted, it will be necessary to reset to TV channels.)

1) Turn on the power switch located on the rear panel with depressing both F.FWD and CUE buttons.
2) Then turn off and on again the power switch located on the rear panel.
3) Now, the refreshment of MI-COM is completed.

5-1-2. BUILD A DUMMY CONNECTOR

(Refer to Fig. 5-1)

Ejector block has to be removed for mechanical adjustment.

Consequently, it is necessary to build a dummy connector shwon in Fig. 5-1.

The connector used for this dummy connector is PLUG 8P Connector. (Parts Number EJ-331248)

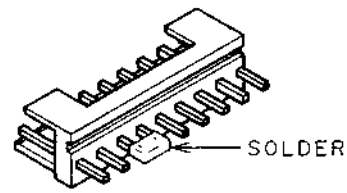


Fig. 5-1 Dummy Connector

5-1-3. CONFIRMATION OF REGULATOR OUTPUT VOLTAGE (Refer to Fig. 5-2 and chart 5-1)

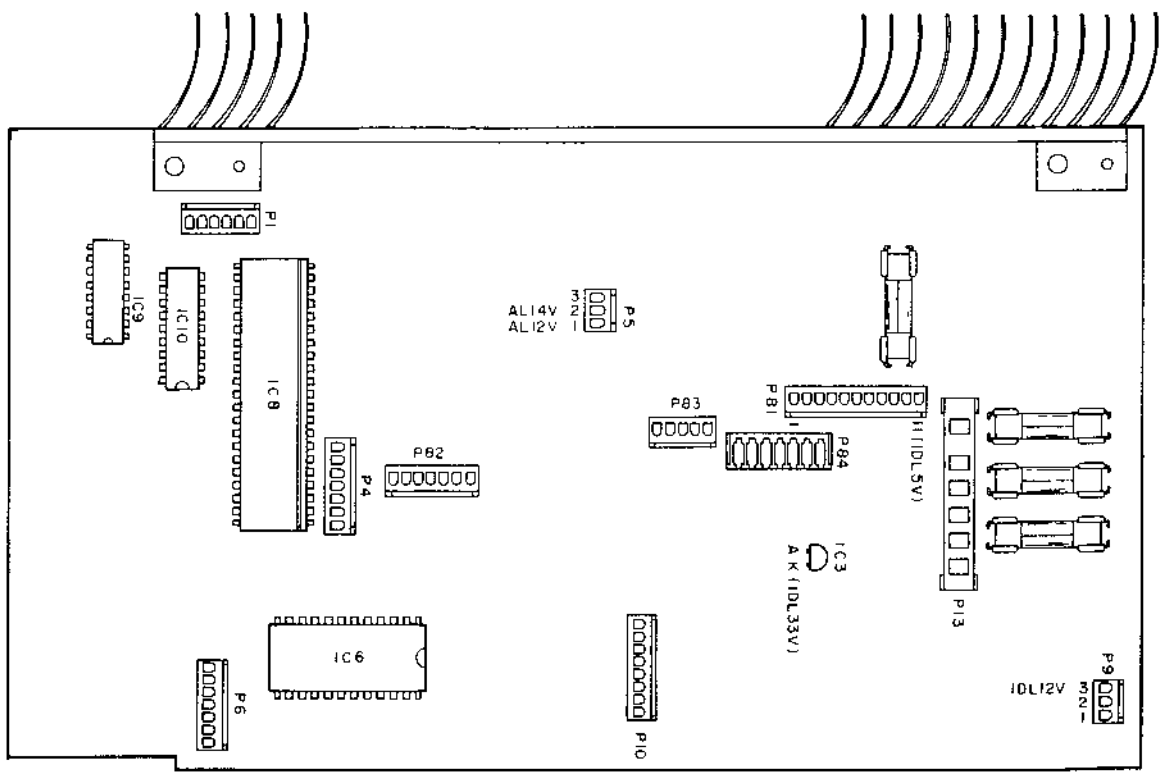


Fig. 5-2 Top view of Power & Syscon PC Board

Confirm that the voltages measured by a digital DC voltmeter at each point are as indicated in chart 5-1.

Check Points	Meter Readings
IDL 5V	5.0 ± 0.25V
IDL 12V	12.0 ± 1.0V
IDL 33V	33.0 ± 2.0V
AL 12V	12.0 ± 0.6V
AL 14V	14.0 ± 0.7V

Chart 5-1

5-2. TENSION LEVER POSITION ADJUSTMENT (Refer to Fig. 5-3)

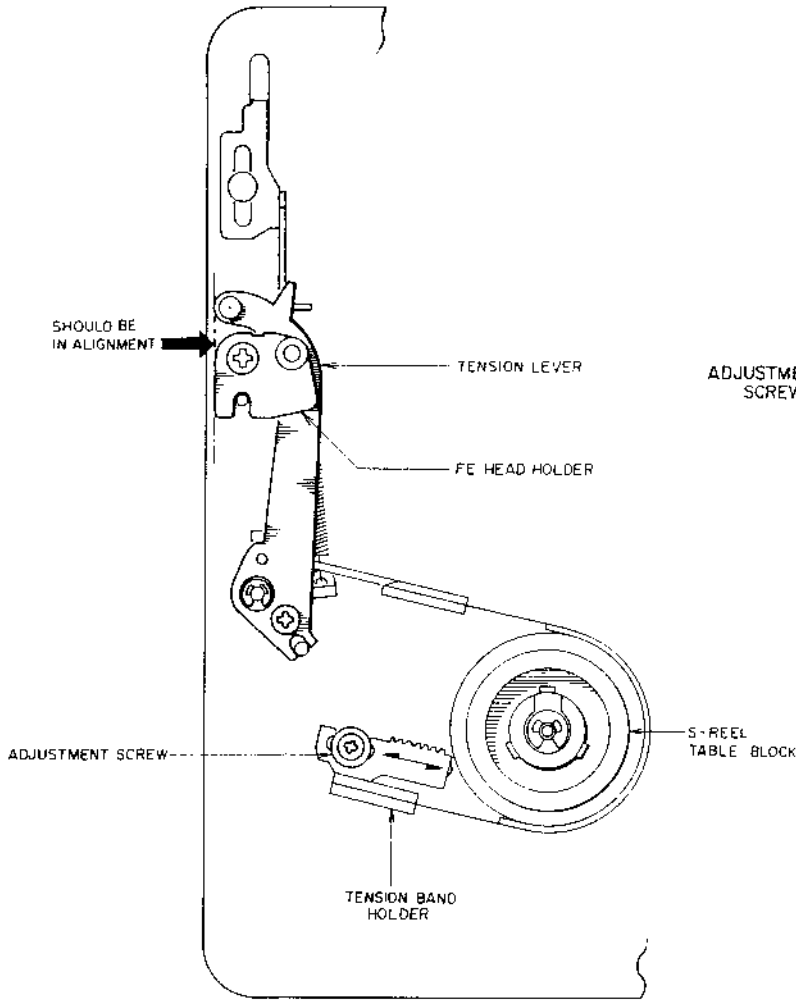


Fig. 5-3

1) Remove the Ejector block from Mechanism chassis.
2) Disconnect the 8P connector and connect a Dummy plug insted of the Ejector block which built at Section 5-1-2.
3) Achieve PLAY mode, and switch "OFF" the Power switch on the rear panel and maintain the loading position.
4) Loosen the adjustment screw and adjust the Tension band holder so that the tension lever and Full erase head holder are in alignment as shown in Fig. 5-3, and tighten the adjustment screw.

5-3. BACK TENSION ADJUSTMENT (Refer to Fig. 5-4, 5-5)

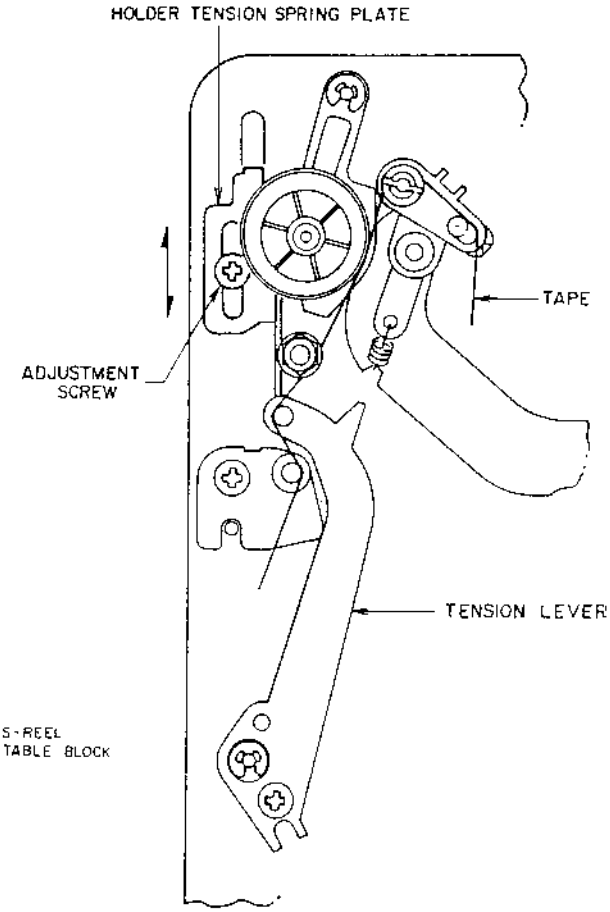


Fig. 5-4

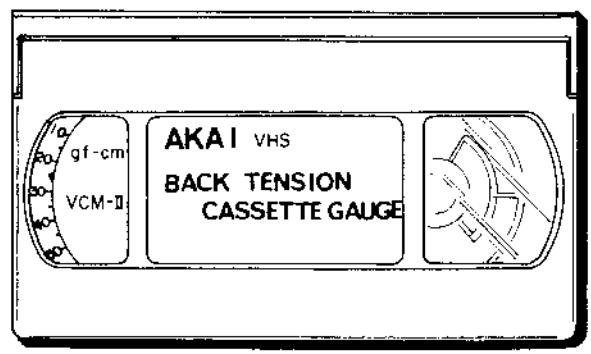


Fig 5-5 Back Tension Jig (AJ-751181)

1) Set the Back Tension Jig. (AJ-751181) as shown in Fig. 5-5, and put some weight on the Back Tension Jig.
2) Achieve PLAY mode.
3) Loosen the adjustment screw shown in Fig. 5-4, and adjust the Tension Spring Holder Plate so that the back tension will be 28 ± 5gf-cm, and tighten the adjustment screw.

VI. REPLACEMENT OF VIDEO HEAD ASSEMBLY

6-1. HOW TO REPLACE THE HEAD BLOCK

1) Remove the Drum Shield Cover.
2) Remove the two soldered wires connected between the PRE AMP PCB and RELAY PCB, and PRE AMP PCB and Shield Platex as shown in Fig. 6-1.

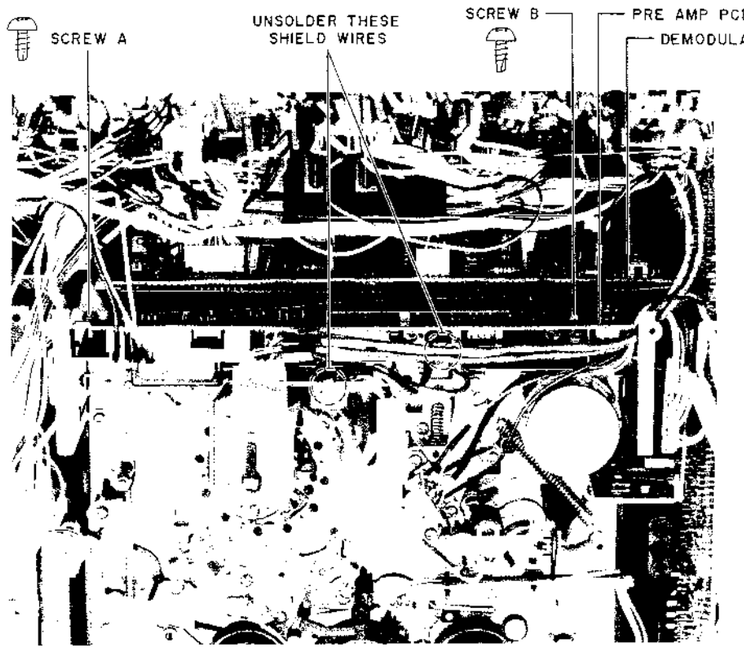


Fig. 6-1

3) Remove the two screws A, B fixing the PRE AMP PCB, and take off the Shield Case Cover on the PRE AMP PCB as shown in Fig. 6-1.
4) Disconnect the following four connectors from the Stator Coil Assy, PRE AMP PCB, and Power supply & Syscon PCB.
   a. Stator Coil connector connected to VIDEO PCB
   b. PRE AMP PCB 6pin connector connected to RELAY PCB
   c. PRE AMP PCB 2pin connector connected to RELAY PCB
   d. Posistor connector connected to Power supply & Syscon PCB
5) Remove the Fan and the Drum Motor Block (BLM-410) as shown in Fig. 6-2, Fig. 6-3.

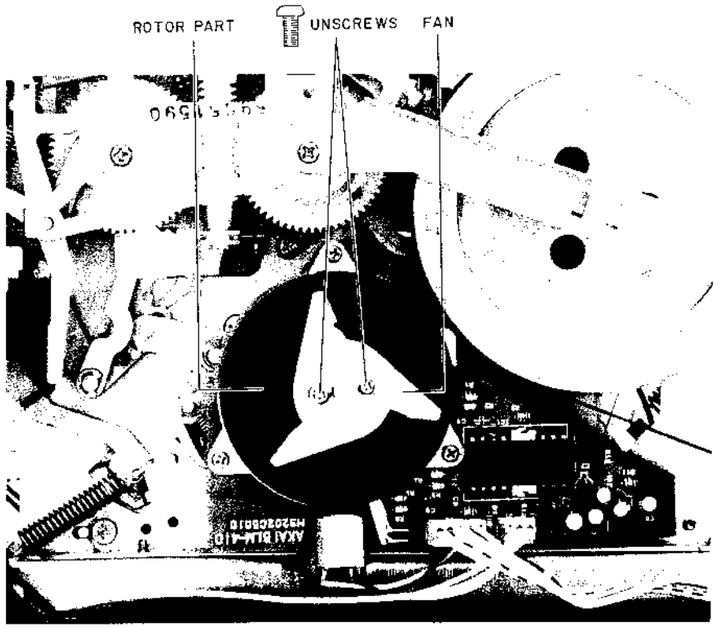


Fig. 6-2

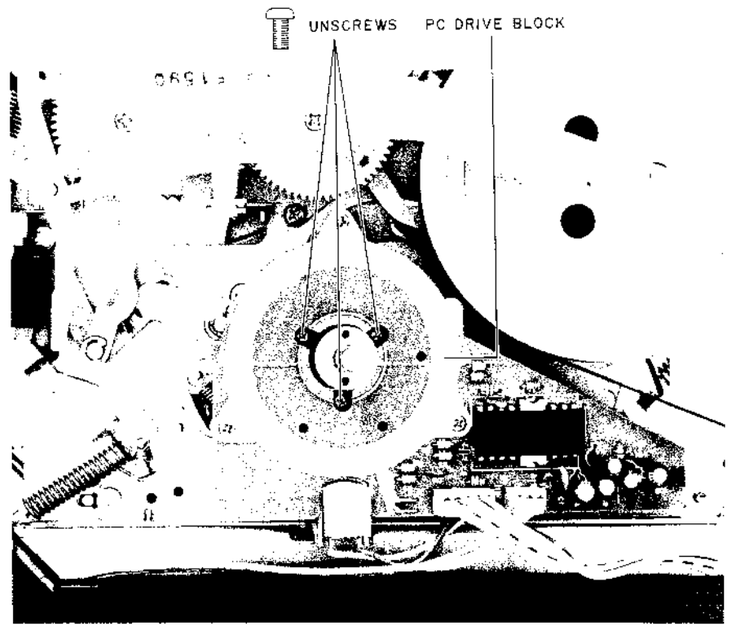


Fig. 6-3

6) Remove three screws fixing Lower Drum Assembly from the bottom as shown in Fig. 6-4.

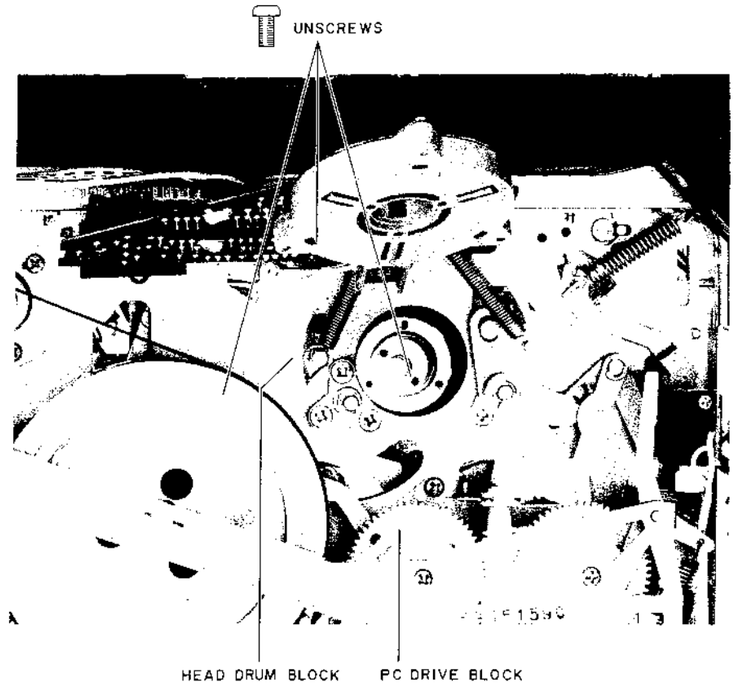


Fig. 6-4

7) Unsolder eight wires (BLK, BLU, WHT, BRN, GRY, RED, YLW, GRN) on RELAY PCB.

Remove two screws fixing STATOR COIL ASSY with HEAD DRUM BLOCK (Refer to Fig. 6-5)

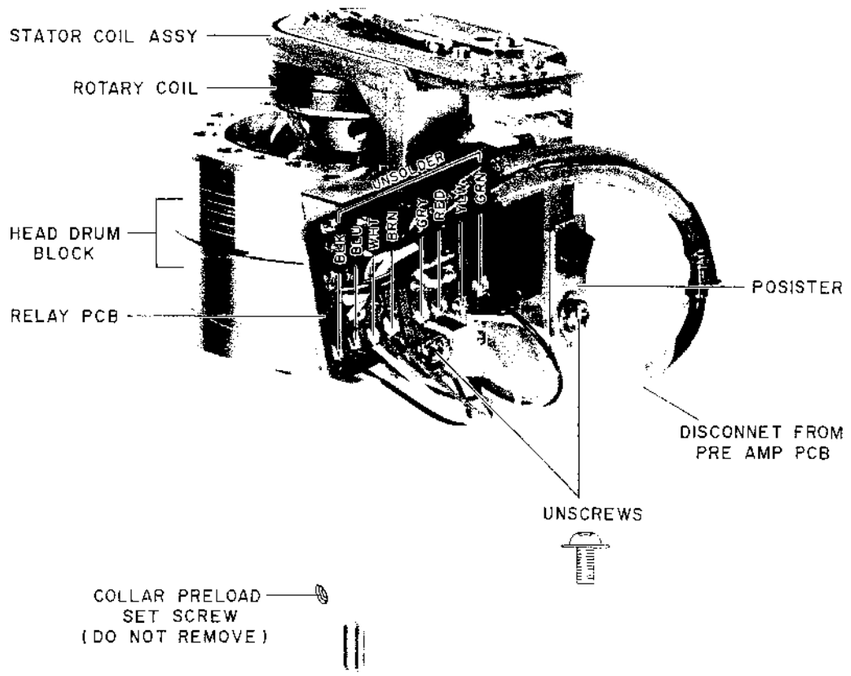


Fig. 6-5

8) Unsolder the four wires (ORG × 2, RED, BRN) connected between the Rotary Coil and the Upper Drum, and unscrew the hexagon screw (1.5mm), then pull out the Rotary Coil. (Refer to Fig. 6-6)

Caution: Do not attempt to remove the Collar Preload on the Lower Drum Assembly. If removed, a special jig is needed for its reinstallation.

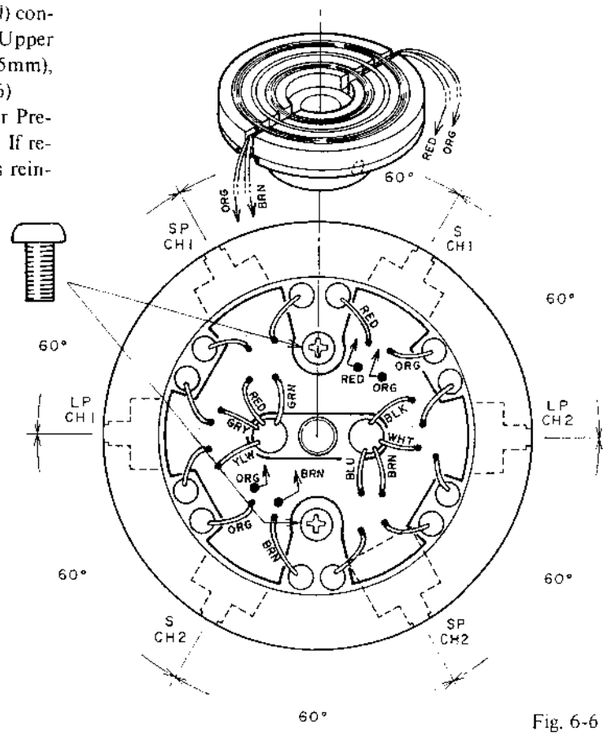


Fig. 6-6

9) Unsolder eight wires from lower rotary coil (BLK, WHT, BRN, BLU, YLW, GRY, RED, GRN) (Refer to Fig. 6-6)
10) Remove two screws fixing UPPER DRUM and take off UPPER DRUM.
11) Install the new UPPER DRUM (BV-V1039A120A)
12) Resolder eight wires which are unsoldered at step 9.
13) Install the ROTARY COIL without tightened screw and resolder four wires which are unsoldered at step 8
14) Install the STATOR COIL and tighten two screws which are removed at step 7, resolder eight wires from lower rotary coil.
15) Tighten the ROTARY COIL fixing screws with the THICKNESS GAUGE (AJ-751767) or a substitute as 0.2 ~ 0.25 mm gap shown in Fig. 6-7.

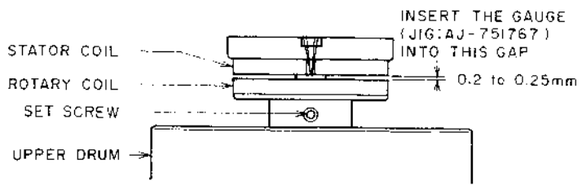


Fig. 6-7

Fig. 6-8

16) Install the HEAD BLOCK and other parts in revers order from step 6.

Caution: The position of the PG magnets on the ROTOR PART are located as shown in Fig. 6-9.

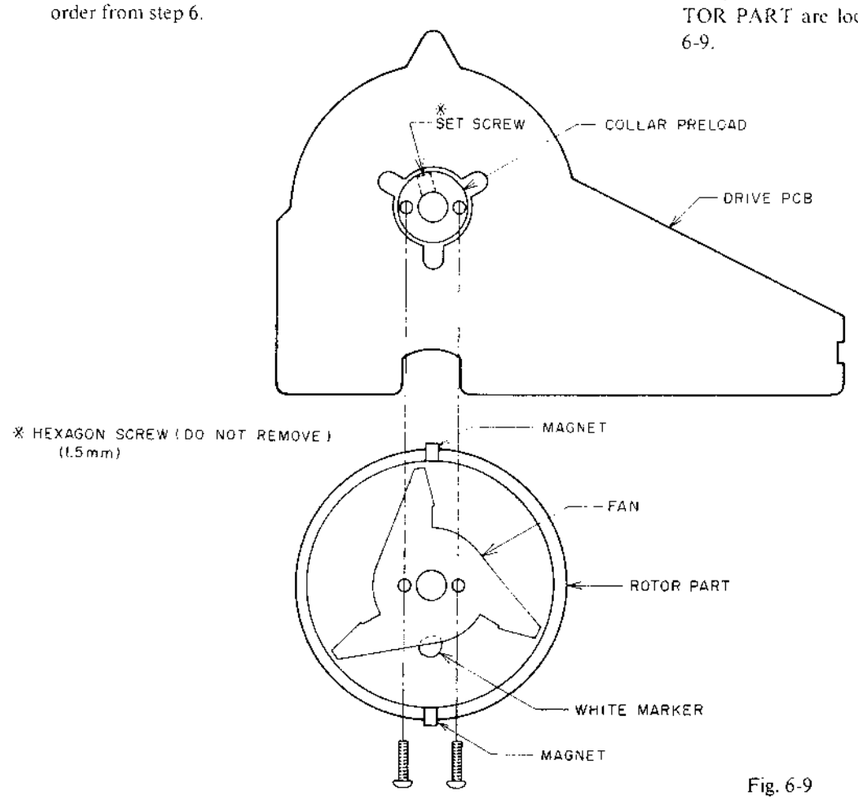


Fig. 6-9

6-2. AFTER REPLACEMENT

After replacement, the following adjustments and confirmations are necessary.

1) Confirmation of mechanical tracking (Control Head Position adjustment in 7-5).
2) PB Switching Point adjustment at SP/LP mode (Servo adjustment step 6).
3) REC Switching Point adjustment at SP/LP mode (Servo adjustment step 7).
4) Peaking adjustment (Video adjustment step 10).
5) REC Current adjustment (Video adjustment step 8).
6) FM REC Current adjustment (HIFI Audio adjustment step 2).
7) Audio Switching Pulse adjustment (HIFI Audio adjustment step 5).
8) Confirmation of Y/Chroma levels (Video adjustment step 18 & 19)
9) Confirmation of REC/PB LEVEL (HIFI AUDIO adjustment step 6)

VII. TAPE TRANSPORT ADJUSTMENT

7-1. TAPE GUIDE (R) ADJUSTMENT (Refer to Fig. 7-1)

1) Remove the Guide cap.
2) Set the Height Jig (AJ-750831) on the Mechanism chassis as shown in Fig. 7-1 and check the height of the lower face of the upper flange.
   If necessary, carefully adjust by turning the nut.

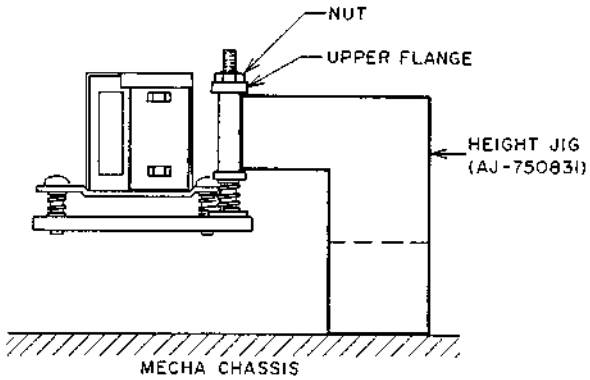


Fig. 7-1

7-2. SUPPLY TAPE GUIDE (L) ADJUSTMENT (Refer to Fig. 7-2)

1) Set the cassette tape and achieve PLAY mode.
2) Make adjustment with the supply guide height adjustment nut, so that the lower part of the tape will pass the lower part of the guide pole without curling as shown in Fig. 7-2.

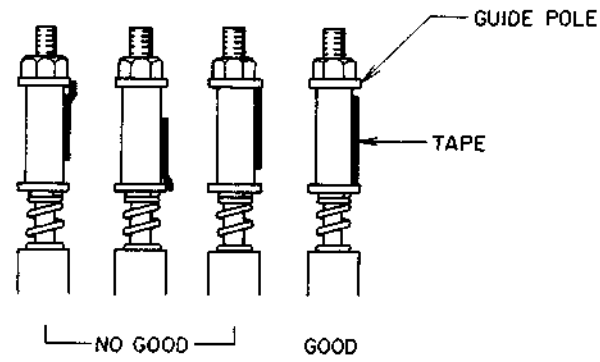


Fig. 7-2

7-3. GUIDE ROLLER HEIGHT ADJUSTMENT (Refer to Figs. 7-3 to 7-6)

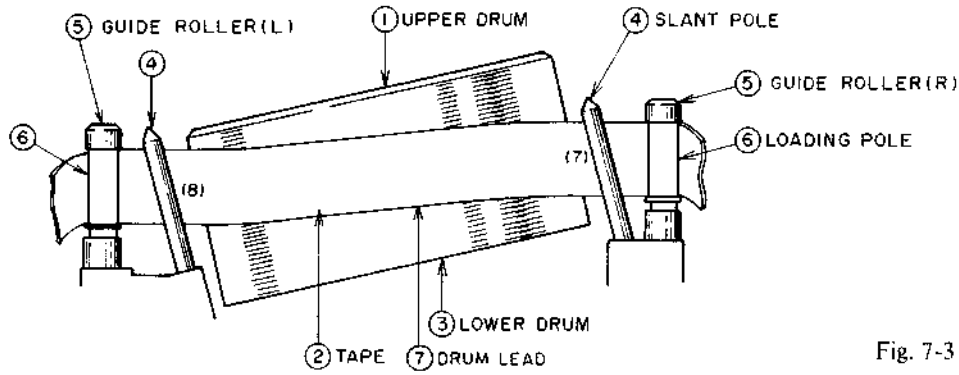


Fig. 7-3

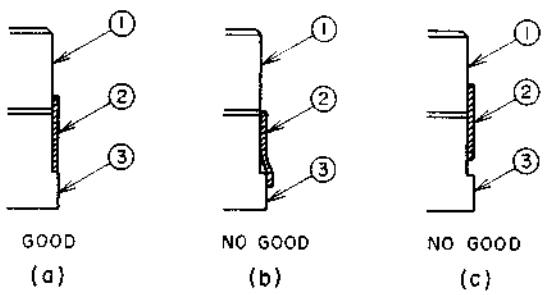


Fig. 7-4

Fig. 7-5

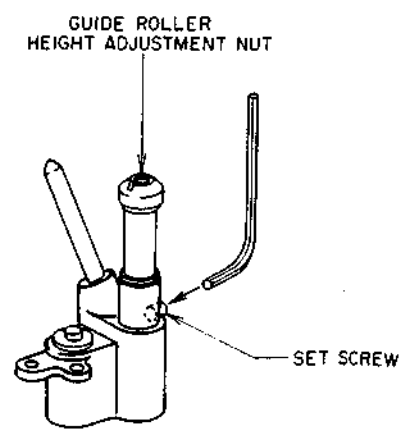


Fig. 7-6

1) Slightly loosen the set screw at the lower part of the Guide roller so that the Guide roller can be adjusted with reasonable tightness (See Fig. 7-6)
2) Connect an oscilloscope to TP7 (FM envelope out) of the Video PC Board.
3) Set the Reference tape (AT-750795) and achieve PLAY mode.
4) Ensuring it that the oscilloscope shows such a waveform as shown in Fig. 7-5 and also watching the point ⑦ of Fig. 7-3, adjust the height of the Guide roller (R) so that the tape runs without curling as shown in Fig. 7-4 (a).
5) Similarly, adjust the height of the guide roller (L) watching the waveform on the oscilloscope and the point ⑦ of Fig. 7-3.
6) Make sure that there is no shaking in the picture on the monitor TV.
7) Fix the Guide roller with the set screw.

7-4. AUDIO/CONTROL HEAD HEIGHT, TILT AND AZIMUTH ADJUSTMENT

(Refer to Fig. 7-7 to 7-9)

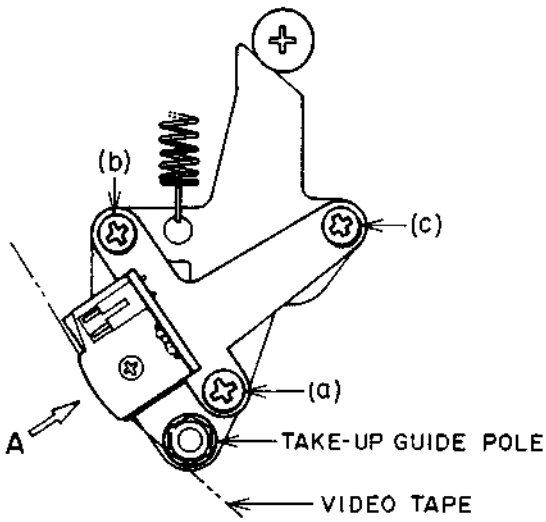
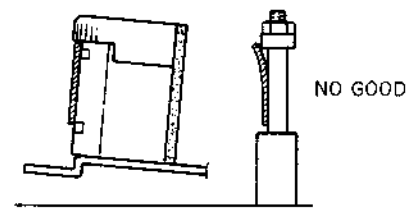
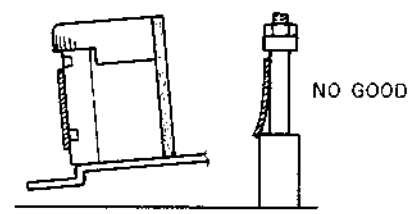


Fig. 7-7





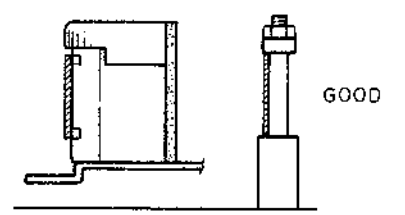


Fig. 7-9

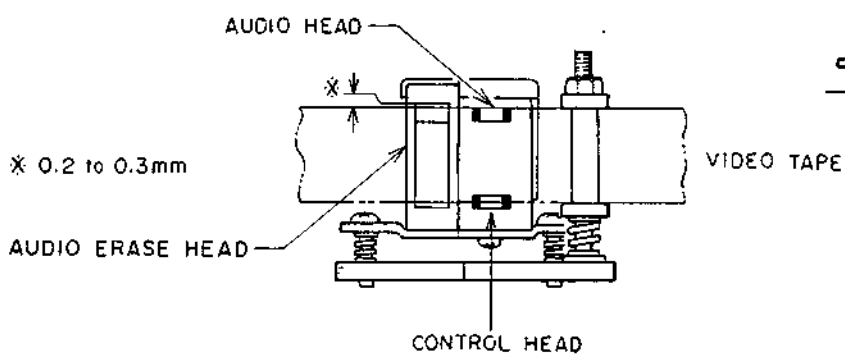


Fig. 7-8

1) Connect an AC Voltmeter to Audio Out.
2) Playback the Reference tape (AT-750795).
3) Turn screw (a), (b) and (c) slightly in order but by exactry the same amount. Adjust the audio output levle to its maximum. Take screw (a) as your standard and use screw (b) for azimuth adjustment. Adjust screw (c) until there is no tape wrinkle in the guide pole section, the audio output level is at maximum and there is the minimum possible level fluctuation.
Then raise and lower screw (a) very slightly and adjust (b) and (c), and set to the point for maximum output.

Note: Repeat the adjustment of Tape guide height, Guide roller height and AUDIO/CTL Head several times in order to achieve the perfect tape runn ing.

7-5. CONTROL HEAD POSITION ADJUSTMENT (Refer to Fig. 7-10)

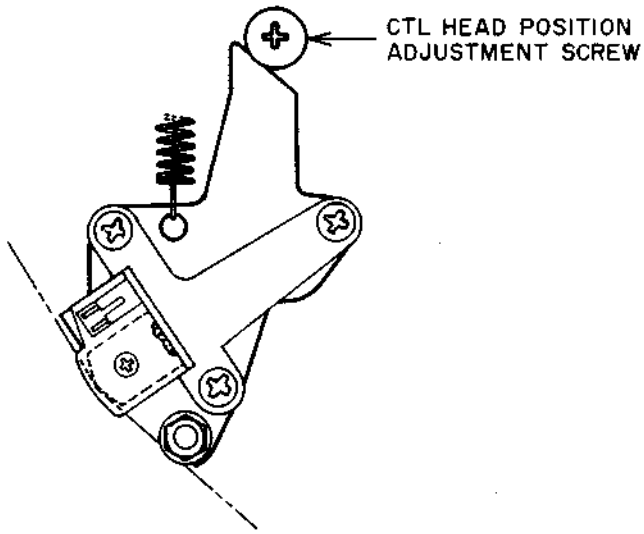


Fig. 7-10

1) Connect an oscilloscope to TP7 (pre-out) of the Video PC Board.
2) Set the Reference tape (AT-750795) and initiate play mode.
3) While watching the waveform on the oscilloscope, also watching the monitor screen and push the TRACKING Button on the front panel.
   Confirm the tracking marker in which direction the maximum point of the waveform is located from the center position.
4) Turn back the tracking marker to the center position, and carry out the following (a) or (b) adjustment.
   (a) If the maximum point of the waveform is reached by moving the tracking marker to Left side from the center position, turn the adjustment driver counter-clockwise and make adjustment to maximum point.
   (b) If the maximum point of the waveform is reached by moving tracking marker to right side from the center position, turn the adjustment driver clockwise and make adjustment to maximum point.

Note: Make these adjustments only after the tape running is completely adjusted.

7-6. ADJUSTMENT OF QUICK FINDER (REVIEW) RUN (Refer to Figs. 7-11, 7-12)

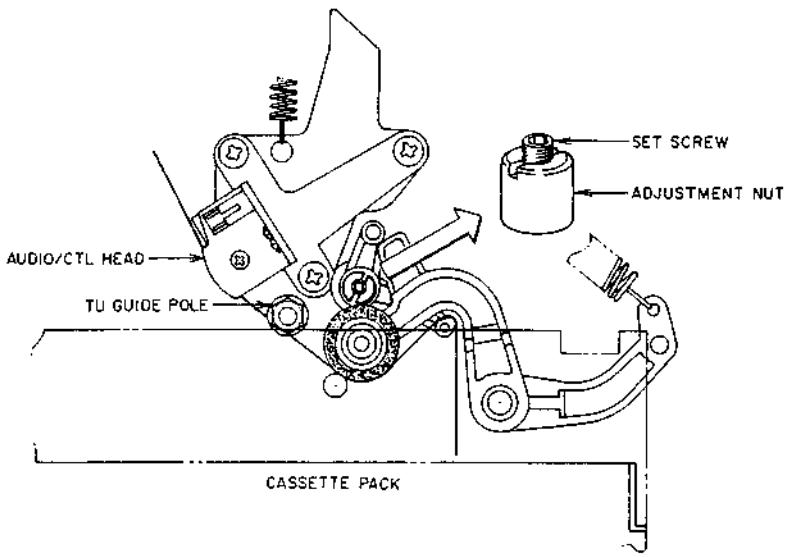


Fig. 7-11

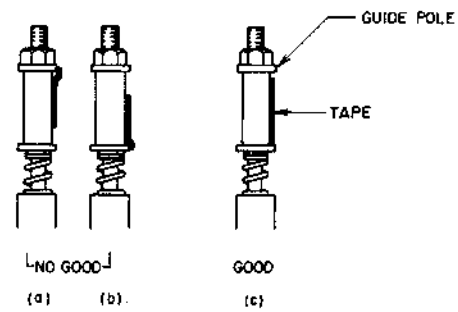


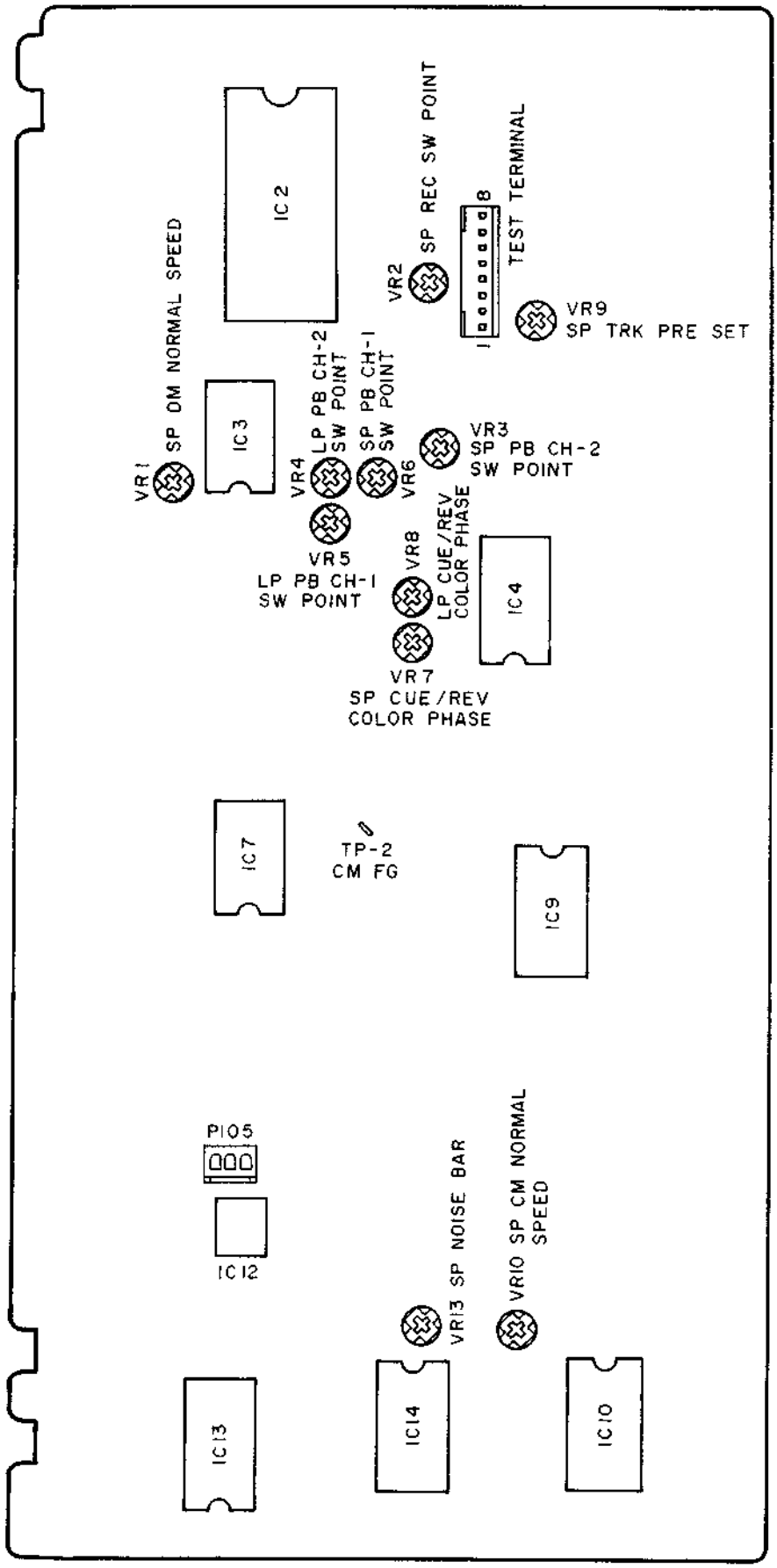
Fig. 7-12

1) Set a recording and playback tape E-240 and wind it up.
2) Press the REVIEW button to initiate REVIEW mode.
3) Loosen the set screw shown in Fig. 7-11 so that the adjustment nut can be turned.
4) While watching the tape running on the take-up guide pole, turn the adjustment screw slowly so as to eliminate the curling of the tape (Fig. 7-12 (c)).
5) Tighten the set screw and fix the adjustment screw.
6) After the completion of adjustment, press the STOP button once, and after unloading the tape, recheck the review run.

Note: If the adjustment nut is turned too fast, some deviation may be found after adjustment because the tape running does not follow such a fast pace.

VIII. SERVO ADJUSTMENT

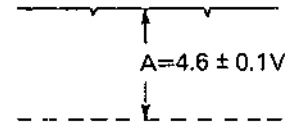
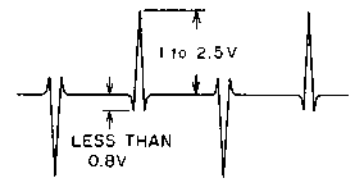
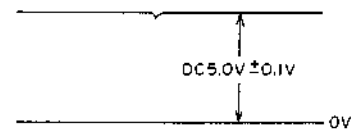
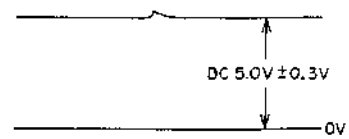
8-1. SERVO ADJUSTMENT (FOR MODELS VS-12)

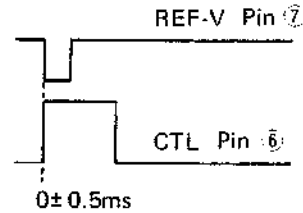
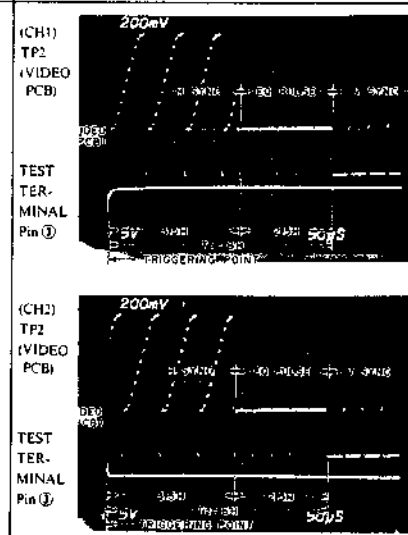


TEST TERMINAL

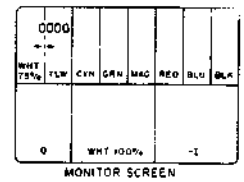
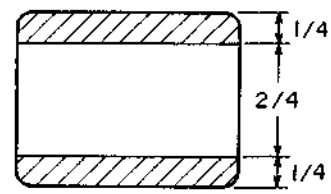
PIN 1	DM SPEED
PIN 2	GND
PIN 3	SW POINT
PIN 4	CM SPEED
PIN 5	PG PULSE
PIN 6	WAVE FORMED CTL PULSE
PIN 7	REF-V
PIN 8	CTL PULSE

Fig. 8-1 Servo PC Board adjustment points

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
1	AFC	Color Bar from Color Bar Generator	EE	TP14 (Video PCB)	VR12	 Adjust VS12 so that A is within DC 4.6V ± 0.1V.
2	Drum Motor PG level	Reference Test Tape (AT-750795)	SP PB	Test Terminal (Pin ⑤)	Confirmation	 Confirm the Drum Servo phase error voltage is within DC 5.0V ±0.1V.
3	Drum Motor Normal Speed	Reference Tape (AT-750795)	SP PB	Test Terminal (Pin ①)	VR1	 Adjust so that the Drum Servo phase error voltage is within DC 5.0V ± 0.1V.
		Self Recorded Tape at LP Mode	LP PB	Test Terminal (Pin ①)	Confirmation	Confirm the Drum Servo phase error voltage is within DC 5.0V ±0.1V.
4	Capstan Motor Normal Speed	Reference Tape (AT-750795)	SP PB	Test Terminal (Pin ④)	VR10	 Adjust so that the Capstan servo phase error voltage is within DC 5.0V ± 0.3V.
		Self Recorded Tape at LP Mode	LP PB	Test Terminal (Pin ④)	Confirmation	Confirm the Capstan Servo phase error voltage is within DC 5.0 V ± 0.5V.

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
5	Tracking Preset	Reference Test Tape (AT-750795)	SP PB	Test Terminal (Pin ⑥) (Pin ⑦)	VR9	 Tracking marker "X" on the monitor screen is set to the center of the dotted line by pressing the TRACKING BUTTON on the Front Panel.  Adjust VR9 so that the down edge of the REF-V (Servo standard signal) is lined up with the phase of CTL pulse.
		Self Recorded Tape at LP Mode	LP PB	Test Terminal (Pin ⑥) (Pin ⑦)	Confirmation	Confirm so that the up edge of the REF-V and raising up waveform of CTL pulse is within 0 ± 1.0 ms.
6	PB Switching Point	Reference Test Tape (AT-750795)	SP PB	TP2 (Video PCB) Test Terminal (Pin ③)	VR6 (CH1) VR3 (CH2)	 Adjust T1 with VR5 and T2 with VR4 to 6.5H ±0.3H The difference between T1 and T2 should be within 0.5H.
		Reference Test Tape (AT-751775)	LP PB	TP2 (Video PCB) Test Terminal (Pin ③)	VR5 (CH1) VR4 (CH2)	Adjust T1 and T2 and T2 to 6.5H ±0.3H in the same way as above at LP mode.

*Refer to Fig. 8-3 on page 57 for the adjustment in step 7.

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
7	REC Switching Point	Color Bar from Color Bar Generator	SP REC	TP2 (Video PCB)	VR203 (Linear Audio PCB)	Adjust T1 and T2 to 6.5H ±0.3H as the same manner in Step 6.
			LP REC	Test Terminal (Pin ③)	VR202 (Linear Audio PCB)	Adjust T1 and T2 to 6.5H ±0.3H in the same way as above at SP mode.
8	CUE/REV Color Phase	Color Bar Test Tape (AT-750797)	SP CUE	Monitor Screen	VR7	 MONITOR SCREEN Adjust VR7 so that the blur between the color bars is minimum.
			SP REV	Monitor Screen	Confirmation	Confirm the blur between the color bars is minimum.
		Self Recorded Tape at LP Mode	LP CUE	Monitor Screen	VR8	Adjust VR8 so that the blur between the color bars is minimum.
			LP REV	Monitor Screen	Confirmation	Confirm the blur between the color bars is minimum.
9	Noise Bar	Self Recorded Tape at SP Mode	SP STILL	Monitor Screen	VR13	 1. Disconnect the connector P105. 2. Keep the STILL Button pressing, and adjust VR13 so that the Noise Bar is located within 1/4 Part from the upper or lower of the Monitor Screen.

8-2. HIFI AUDIO ADJUSTMENT (FOR MODELS VS-12)

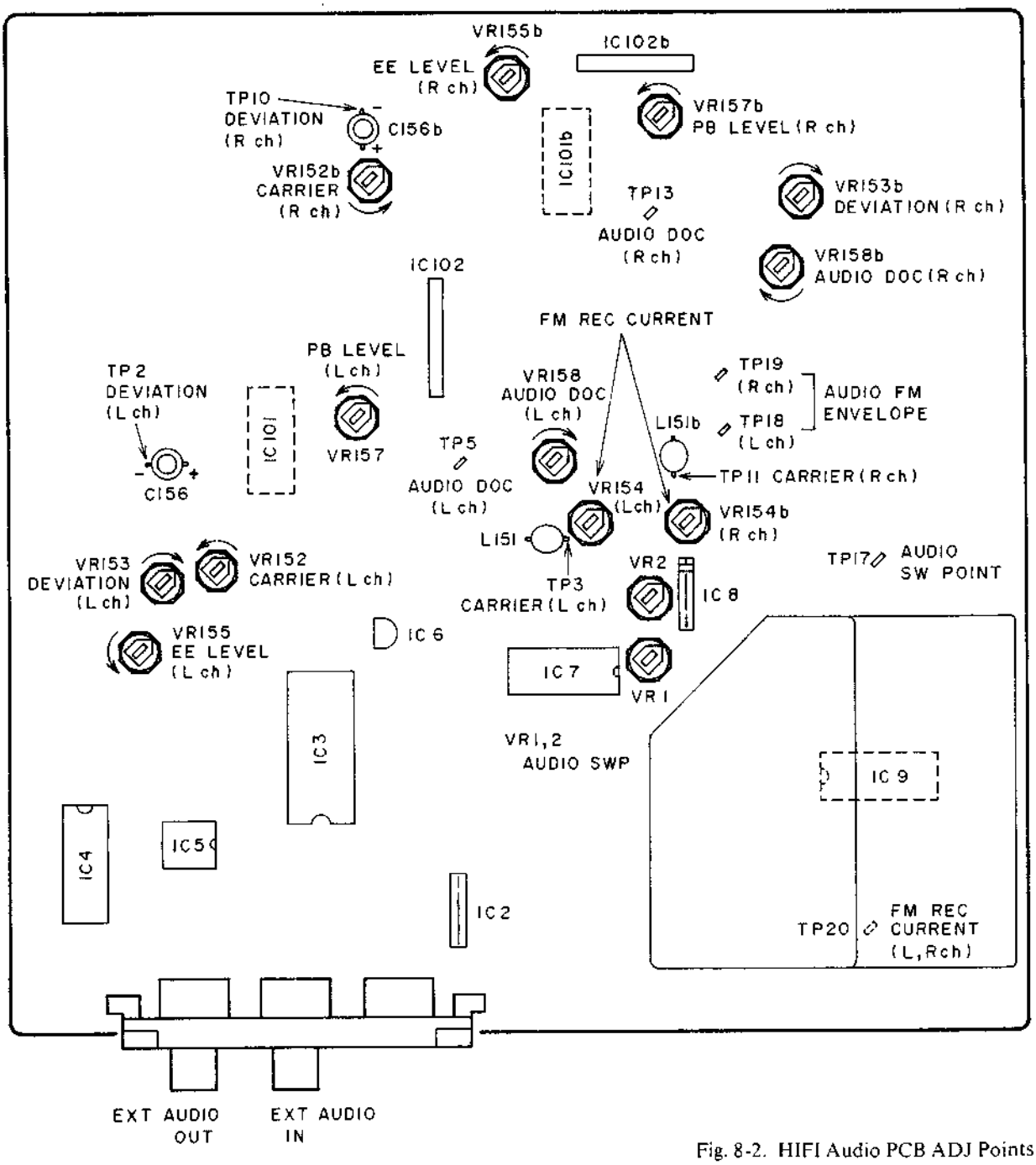
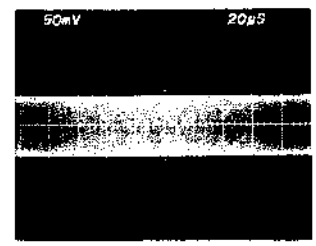
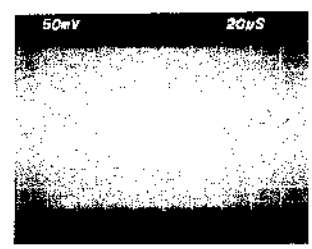


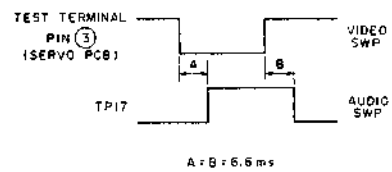
Fig. 8-2. HIFI Audio PCB ADJ Points

TEST POINTS

TP2:	DEVIATION (L CH)
TP3:	CARRIER (L CH)
TP5:	AUDIO DOC (L CH)
TP10:	DEVIATION (R CH)
TP11:	CARRIER (R CH)
TP13:	AUDIO DOC (R CH)
TP17:	AUDIO SW POINT
TP20:	FM REC CURRENT (L, R)
TP18:	AUDIO FM ENVELOPE (L), TP19 (R)

Caution : Set the Audio Selector to HIFI, stereo.

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
1	Carrier Frequency	PAL Color Bar from Color Bar Generator, No Audio Input	EE	TP3 (Lch) TP11 (Rch)	VR152 (Lch) VR152b (Rch)	1. Connect a frequency counter to TP3. 2. Adjust VR152 so that the frequency counter reads 1.4 MHz ±10 kHz. 1. Connect a frequency counter to TP11. 2. Adjust VR152b so that the frequency counter reads 1.8 MHz ±10 kHz.
2	FM REC Current	PAL Color Bar from Color Bar Generator, No Audio Input	REC	TP20	VR154 (Lch)	 1. Connect an oscilloscope to TP20. 2. Adjust VR154 so that 100 mV $^{+10}_{-40}$ mV.
					VR154b (Rch)	 3. Adjust VR154b so that 200 mV $^{+10}_{-0}$ mV.
3	EE Level	PAL Color Bar from Color Bar Generator & Audio 400 Hz, –8 dBm Input	EE	Audio Out (Lch) Audio Out (Rch)	VR155 (Lch) VR155b (Rch)	1. Connect an AC voltmeter to Audio Out (LCH). 2. Adjust VR155 so that the voltmeter reads –6.0 ±0.5 dBm. 1. Connect an AC voltmeter to Audio Out (RCH) terminal. 2. Adjust VR155b so that the voltmeter reads –6.0 ±0.5 dBm.
4	Deviation	PAL Color Bar from Color Bar Generator & Audio 400 Hz, –8 dBm Input	REC	TP2 (Lch) TP10 (Rch)	VR153 (Lch) VR153b (Rch)	1. Connect an AC voltmeter to TP2. 2. Adjust VR153 so that the voltmeter reads –26.5 dBm. 1. Connect a AC voltmeter to TP10. 2. Adjust VR153b so that the voltmeter reads –26.5 dBm.

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
5	Audio Switching Pulse	PAL Color Bar Test Tape (AT-750795)	PB	TP17 (HIFI Audio PCB) & Test Terminal Pin ③ (Servo PCB)	VR-1 (B) VR-2 (A)	 Adjust VR1 & VR2 so that A = B = 6.6 msec as shown above.
6	REC/PB Level	PAL Color Bar from Color Bar Generator Audio 400 Hz, –8 dBm Input	REC/PB (SP)	Audio Out (Lch)	VR157 (Lch)	1. Connect an AC voltmeter to Audio Out (LCH). 2. Adjust VR157 so that the meter reads –6.0 ±0.5 dBm. 3. Distortion less than 0.3%.
				Audio Out (Rch)	VR157b (Rch)	1. Connect an AC voltmeter to Audio Out (RCH). 2. Adjust VR157b so that the meter reads –6.0 ±0.5 dBm. 3. Distortion less than 0.3%.
7	Audio DOC	PAL Color Bar Test Tape (AT-750797)	PB	TP5 (Lch)	VR158 (Lch)	1. Connect a DC voltmeter to TP5. 2. Adjust VR158 so that the meter reads 1.3V ±0.1V.
				TP13 (Rch)	VR158b (Rch)	1. Connect a DC voltmeter to TP13. 2. Adjust VR158b so that the meter reads 1.3V ±0.1V.
8	Frequency Response	PAL Color Bar from Color Bar Generator, Audio Input 20 Hz, 100 Hz, 1kHz, 10 kHz, 15 kHz, –28 dBm	REC/PB (SP)	Audio Out	Confirmation	20 Hz –26 $^{+0}_{-3}$ dBm 100 Hz –26 ±0.5 dBm 10 kHz –26 ±1.0 dBm 15 kHz –26 $^{+0}_{-4}$ dBm

8-3. LINEAR AUDIO ADJUSTMENT (FOR MODELS VS-12)

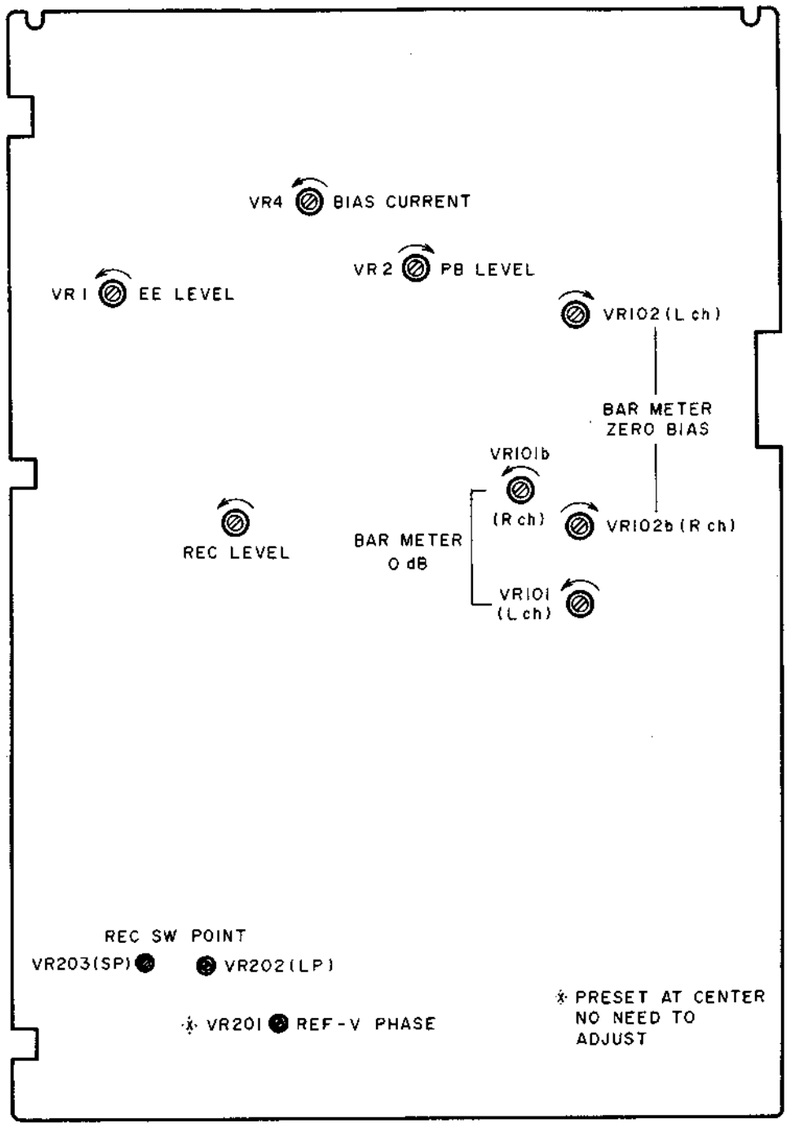
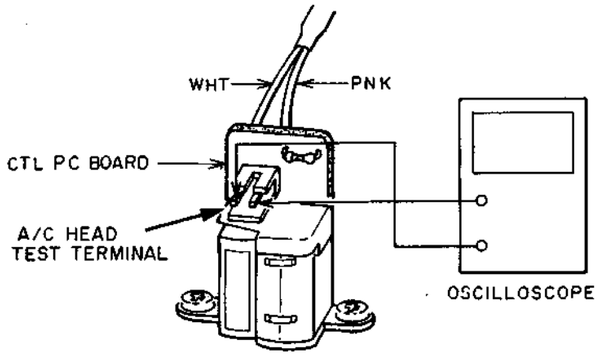


Fig. 8-3 Linear Audio PCB ADJ Points



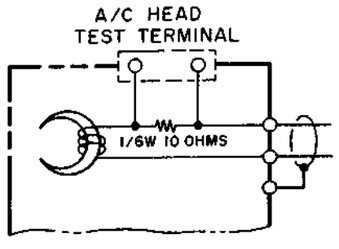
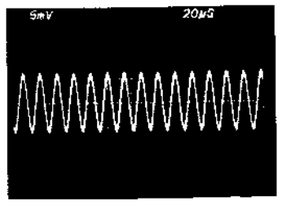


Fig. 8-4

Caution : Set the Audio Selector to Normal.

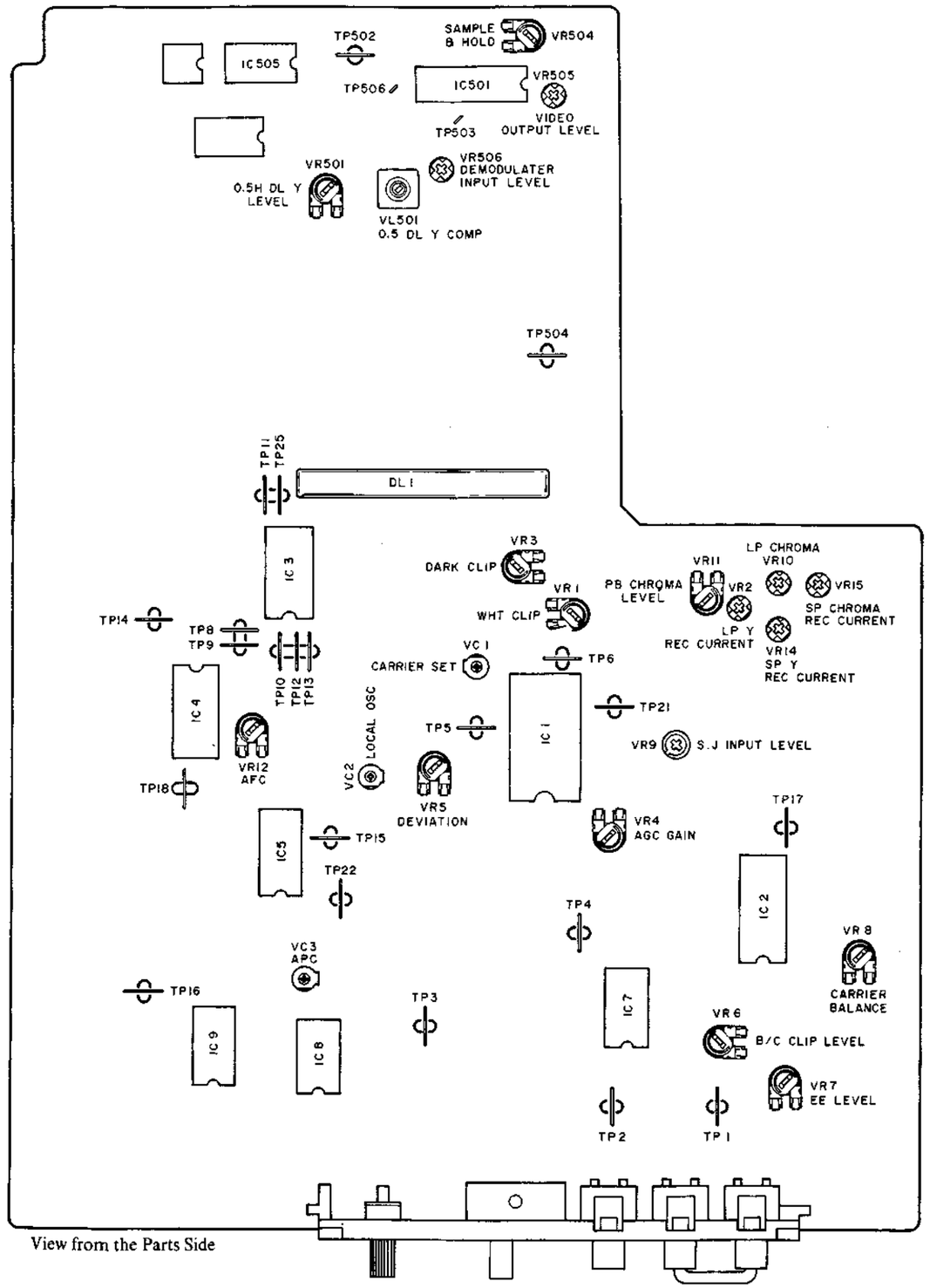
Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
1	PB Level	Audio 1 kHz Reference Tape (AT-711880)	PB	Audio Out	VR2	−6.0 ±0.5 dBm
2	PB Head Azimuth	Audio 6 kHz Test Tape (AT-750795)	PB	Audio Out	Confirmation	-7.0^{+2}_{-} dBm
3	PB S/N	PAL RF SWEEP Test Tape (AT-750802), No Audio Input	PB	Audio Out	Confirmation	Less than −46 dBm
4	EE Level	Audio Input 1 kHz, −8 dBm	EE	Audio Out	VR1	−6.0 ±0.5 dBm
5	Bias Frequency	No Signal Input	REC	Erase Head Terminals	Confirmation	1. Connect a frequency counter across Erase Head terminals. 70 ±4 kHz
6	Bias Current	No Signal Input	REC	A/C Head Test Terminals	VR4	 12 mVp-p
7	REC/PB Level	Audio Input 1 kHz, −8 dBm	REC/PB	Audio Out	VR3 (SP)	(SP) −6 dB ± 1 dBm Less than 3% Distortion (LP) Confirmation −6 ±2 dBm Less than 4% Distortion
8	Frequency Response	Audio Input 1k, 6k, 7k −28 dBm	REC/PB	Audio Out	Confirmation	(LP) −26 ±1 dBm at 1 kHz -26^{+3}_{-2} dBm at 6 kHz (SP) -26^{+3}_{-2} dBm at 7 kHz −25 ± 1 dBm at 1 kHz

8-4. AUDIO BAR METER ADJUSTMENT (FOR MODELS VS-12)

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
1	Zero Bias	Audio Input 1 kHz, –23 dBm	EE	Bar Meter LED Display	VR102 (Lch) VR102b (Rch)	1. See Note 1. 2. Adjust VR102 (Lch) and VR102b (Rch) to the point so that the first two LEDs from the left (L & Rch) are gone out.
2	0 dB Display	Audio Input 1 kHz, –8 dBm	EE	Bar Meter LED Display	VR101 (Lch) VR101b (Rch)	1. See Note 1. 2. Adjust VR101 (Lch) and VR101b (Rch) to the point so that all the green LEDs up to 0 dB are lit.
3	Meter Display Step	Audio Input 1 kHz, –8 dBm	EE	Bar Meter LED Display	Confirmation	See Note 2.

Note : 1. Leave the REC LEVEL button untouched after the Function button is pressed.
2. After the adjustment in Step 2, confirm that two orange LEDs are lit when the REC volume (+) is pressed once. Next, press the REC volume (–) once, and confirm that these two orange LEDs are gone out. Then, press the REC volume (–) once more, and confirm that the green LEDs between 0 dB and –3 dB are gone out.

8-5. VIDEO ADJUSTMENT



View from the Parts Side

Fig. 8-5. Video PC Board Adjustment Points

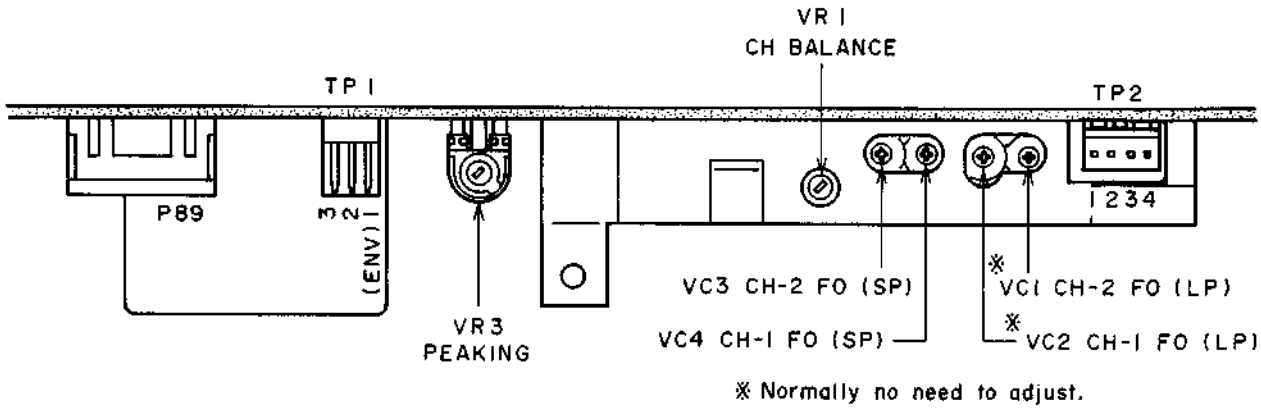


Fig. 8-6. Pre Amp PC Board Adjustment Points

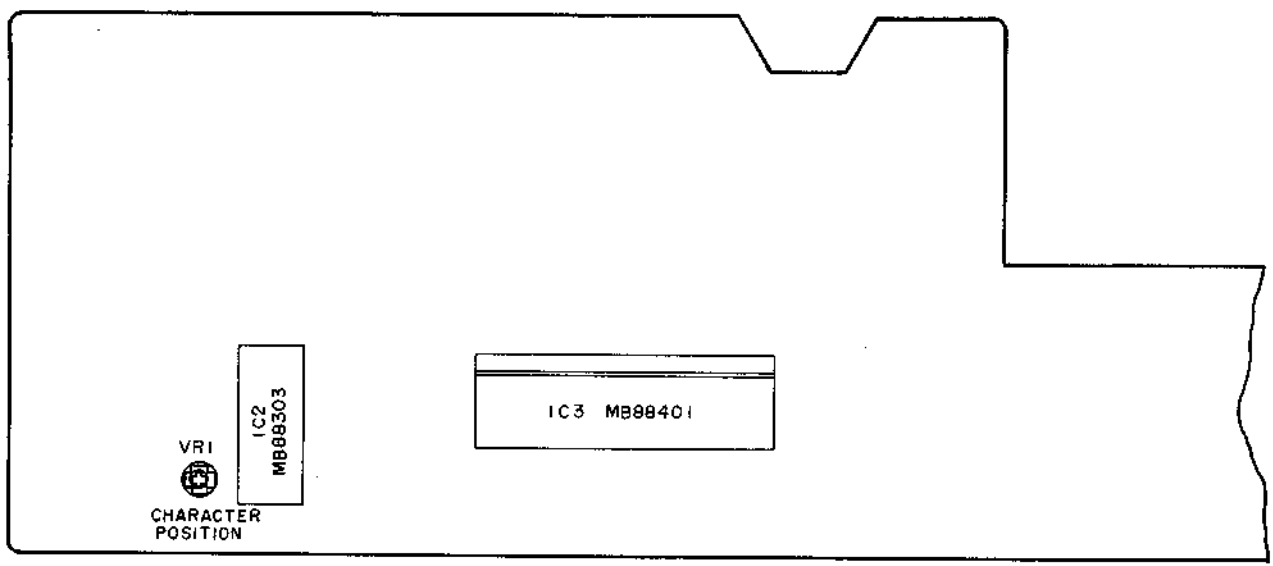
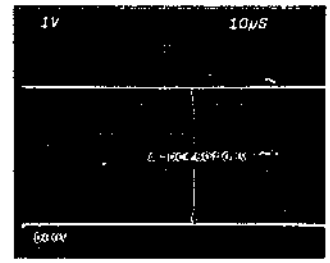
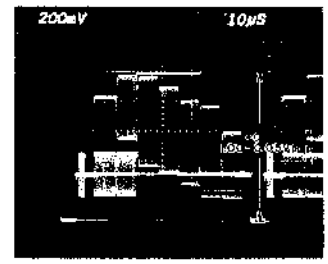
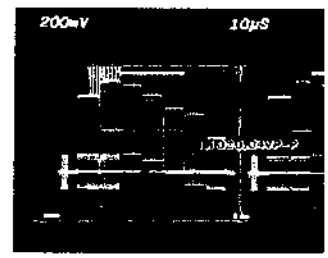
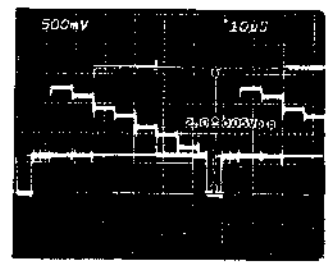
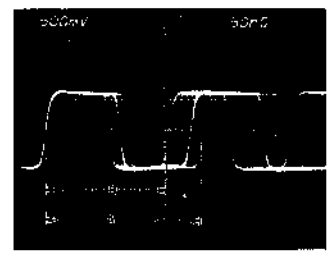
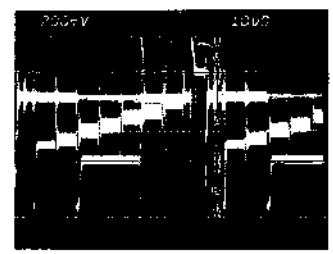


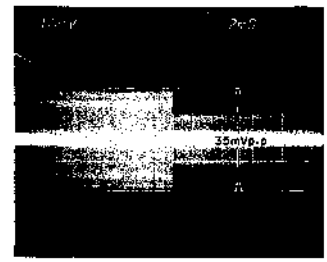
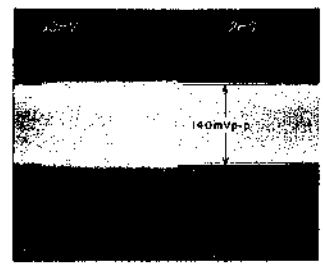
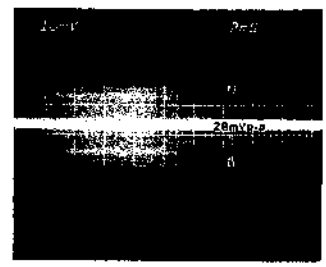
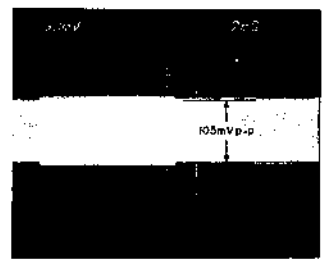
Fig. 8-7. Operation PC Board Adjustment Points

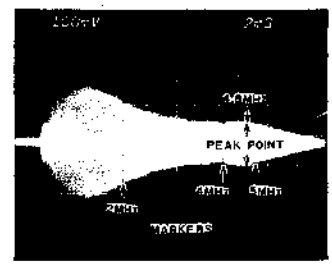
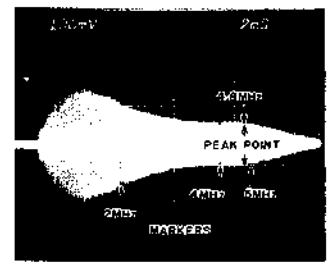
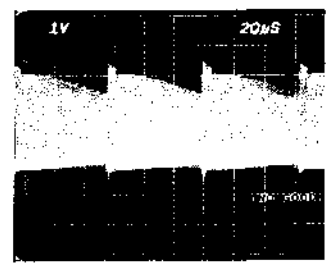
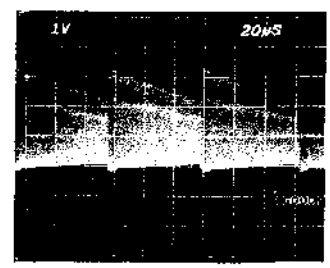
Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
1	AFC	Color Bar from Color Bar Generator	EE	TP14	VR12	 Adjust VR12 so that A is within DC4.6V ±0.1V.
2	EE level	Color Bar from Color Bar Generator	EE	TP2	VR7	 1. Adjust VR7 so that the VIDEO Output (TP2) is within 1.00 ±0.05 Vp-p. 2. Confirm that RF output both Y & chroma signal) is appeared at TP3.
3	B/C Clip level	Color Bar from Color Bar Generator	PB	TP2	VR6	 1. Display charactor to the monitor screen. 2. Adjust so that the Video signal level is 1.10 ±0.05 Vp-p.
4	AGC Gain	Color Bar from Color Bar Generator	EE	TP5	VR4	 Adjust VR4 so that A is within 2.10 ±0.05 Vp-p.

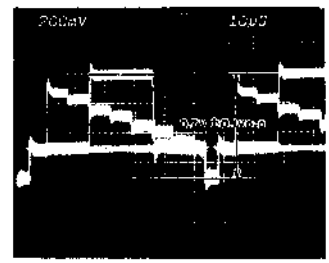
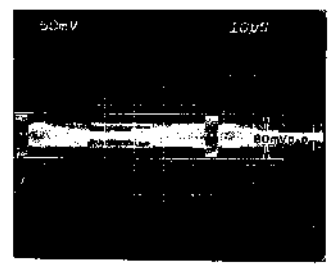
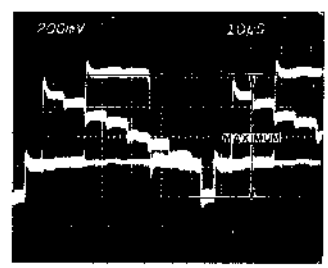
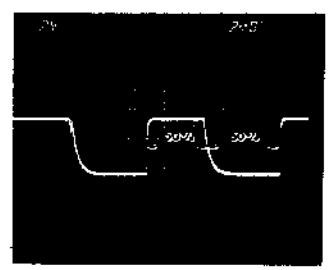
Caution:

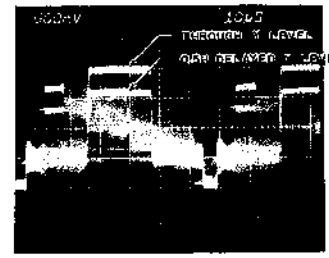
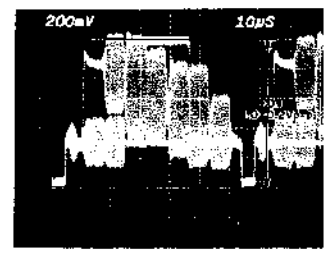
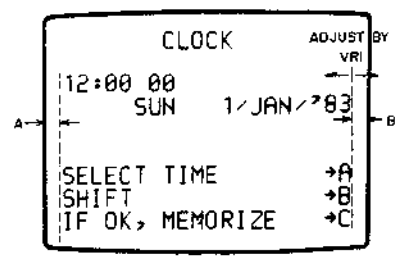
1. The output of the Color Bar Generator should be 1.0 Vp-p.
2. The video out terminal should be terminated with 75 ohms dummy or load (monitor T.V.).

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
5	APC OSC	Color Bar from Color Bar Generator	EE	TP10	VC3	1. Supply color bar signal to line input. 2. Connect a frequency counter and oscilloscope to TP10. 3. Set MODE SWITCH in COLOR 2 Position (For EK model, connect between Pin ⑦ and Pin ⑪ of IC4 AN6362 on VIDEO PC BOARD). 4. Adjust VC3 as FREQUENCY COUNTER reads 5.060571 MHz ±50 Hz.
6	FM OSC	Color Bar from Color Bar Generator	EE	TP21	VC1 (Carrier set) VR5 (Deviation)	 Carrier set A = 0.263 μs (3.8 MHz) Deviation B = 0.208 μs (4.8 MHz)
7	White Clip and Dark Clip	Color Bar from Color Bar Generator	EE	TP6	VR1 (White clip) VR3 (Dark clip)	 Adjust VR1 and VR3 so that the waveform at TP6 is as shown above. White clip A : B = 1.0 : 0.6 Dark clip A : C = 1.0 : 0.4

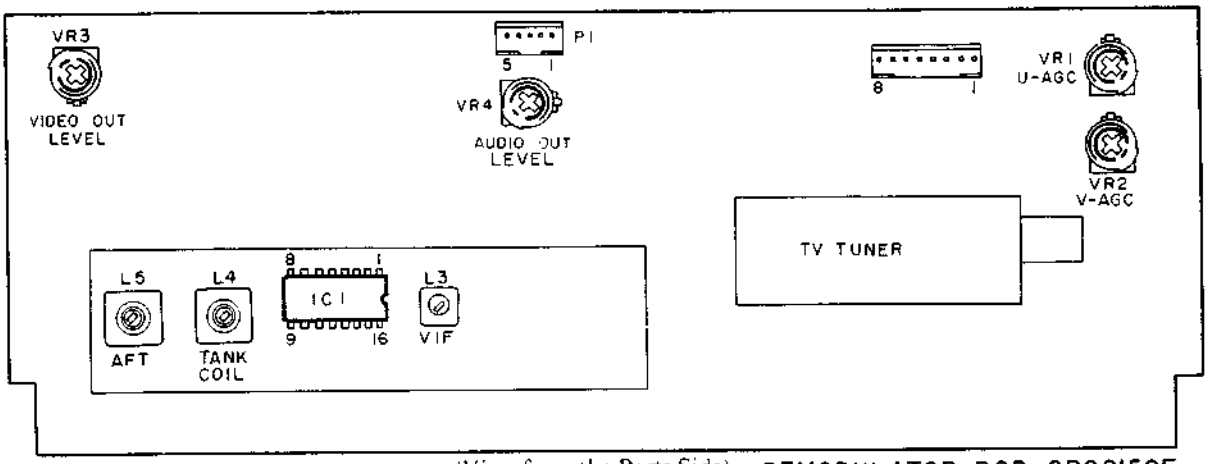
Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
8	REC CURRENT	Color Bar from Color Bar Generator	SP REC	TP2-2 (Pre-Amp PCB)	VR15 (Chroma)	1. Turn VR14 fully clockwise  2. Adjust VR15 so that the chroma REC current waveform is 35 mVp-p as shown above. 
					VR14 (Y)	3. Adjust VR14 so that the Y REC current waveform is 135 mVp-p as shown above.
			LP REC	TP2-2	VR10 (Chroma)	1. Turn VR2 fully clockwise.  2. Adjust VR10 so that the chroma REC current waveform is 28 mVp-p as shown above. 
					VR2 (Y)	3. Adjust VR2 so that the Y REC current waveform is 110 mVp-p as shown above.

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
9	Head peak (Fo) Frequency and Channel Balance	RF Sweep Tape (AT-750802)	SP PB	TP1 (Pin 1) (Pre-Amp PCB) Test Terminal (Pin 2) (Servo PCB)	VC3 (CH-1 F) (Pre-Amp PCB) VC3 (CH-2 F) (Pre-Amp PCB) VR1 (CH Balance) (Pre-Amp PCB)	(CH-1)  1. Adjust VC3 (CH-1) so that the Peak Frequency is 4.8 MHz as shown above. (CH-2)  2. Adjust VC3 (CH-2) so that the Peak Frequency is 4.8 MHz as shown above. 3. Adjust VR1 so that the 4.8 MHz Peak Frequency levels between CH-1 and CH-2 are equal.
10	Peaking	Color Bar Test Tape (AT-750797)	SP PB	Monitor Screen	VR3 (Pre-Amp PCB)	Adjust VR3 so that the no over modulation and no smear on the Screen.
11	Carrier Balance	Reference Tape (AT-750795)	PB	TP17	VR8	 (Incorrect)  (Correct) Adjust VR8 so that the waveform is as shown above.

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
12	Local OSC	Color Bar Tape (AT-750797)	PB	TP15	VC2	1. Connect a frequency counter to TP15. 2. Adjust VC2 so that the frequency counter reads 4.433619 MHz ±10 Hz.
13	Skew Jump Input level	Color Bar Tape (AT-750797)	PB	TP504	VR9	 Adjust VR9 so that the video signal level at TP504 is 0.7 ±0.1 Vp-p.
14	Skew Jump Y Demodulator Input level	Color Bar Test Tape (AT-750797)	PB	TP503	VR506	 Adjust VR506 so that the Y Demodulator Input waveform is 80 mV as shown above.
15	0.5H DL Y composition	Color Bar Test Tape	PB	TP501	VL501	 Adjust VL501 so that the Y-level is maximum.
16	Sample and Hold	Self Recorded Tape at LP mode	Cue (LP)	TP502	VR504	 Adjust VR504 so that the waveform is as shown above.

Step	Adjustment Item	Input	Mode	Test Point	Adjustment Parts	Result & Remarks
17	0.5H DL Y-level	Self Recorded Tape at LP mode	Review (LP)	TP2	VR501	 (Incorrect) ⬇  (Correct) Adjust VR1 so that the 0.5H delayed Y-level and through Y-level are same.
18	VIDEO Output level		PB	TP2	VR505	 Adjust VR505 so that the Video output Y level is 1.00 $^{+0.1}_{-0.20}$ Vp-p.
19	PB Chroma level	Color Bar Tape (AT-750797)	PB	TP2	VR11	 Adjust VR11 so that the cyan level is within 0.55 ±0.1 Vp-p.
20	Charactor Position	Color Bar from Color Bar Generator	EE	Monitor Screen	VR1 (Operation PCB)	 1. Display the character on the monitor screen. 2. Adjust VR1 so that the space A and B are 1.0 : 1.5.

8-6. DEMODULATOR ADJUSTMENT



(View from the Parts Side) **DEMODULATOR PCB 6B00159F**

Fig. 8-7 Demodulator PC Board Adjustment point

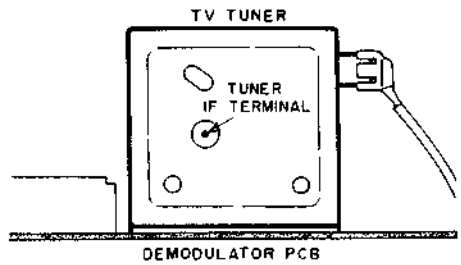


Fig. 8-8 IF Terminal

8-6-1. TANK COIL ADJUSTMENT (Refer to Fig. 8-7 to Fig. 8-9)

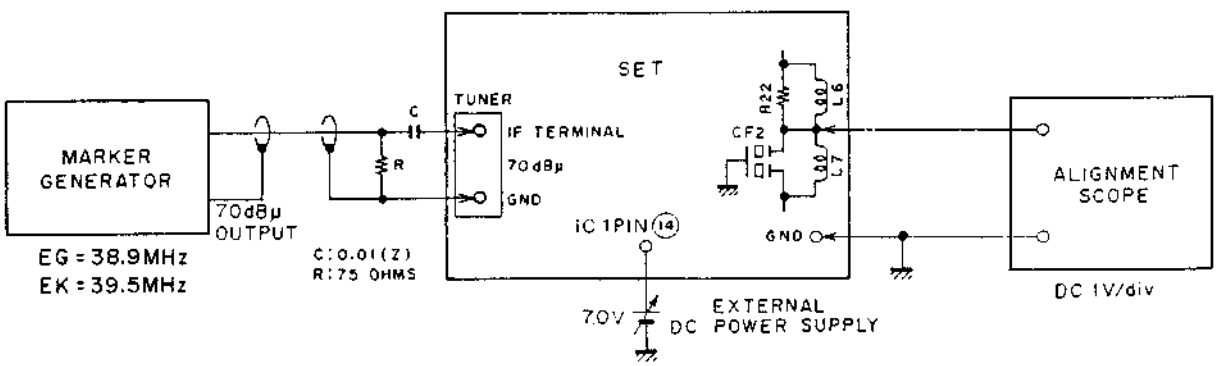


Fig. 8-9

a) Supply 70dBμ IF frequency (EG = 38.9 MHz, EK = 39.5 MHz) to the IF terminal (Refer to Fig. 8-9).
b) Connect the alignment scope as shown in Fig. 8-9.
c) Supply DC7.0V to Pin ⑭ of IC1, from the External DC power supply.
d) Adjust L4 so that the DC voltage appearing on the alignment scope is minimum.

Note: 0 dBμ = 1 μV

* If only the TANK COIL (L4) was replaced, this adjustment can be accomplished as follows.

a) Receive a video signal (color bar, etc.) and observe the video output signal.
b) Turn the TANK COIL (L4) counter-clockwise from Lower end (core moves upwards) so that the level of the burst signal becomes minimum as shown in Fig. 8-10.

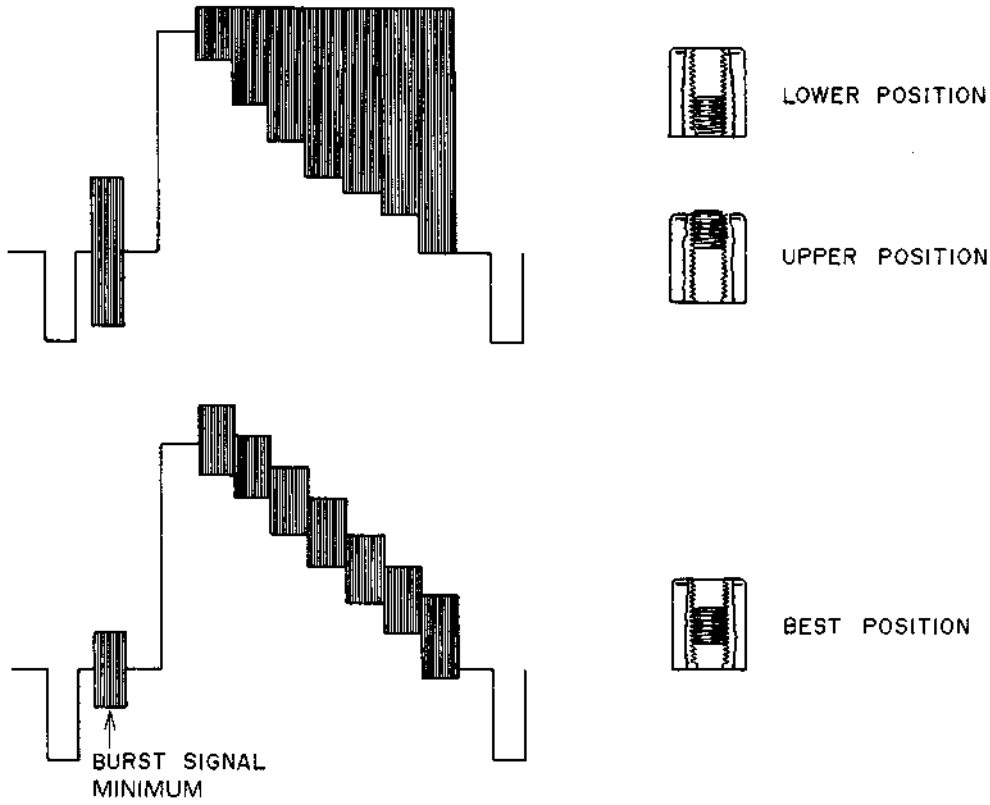


Fig. 8-10

8-6-2. AFT ADJUSTMENT (Refer to Figs. 8-11, 8-12)

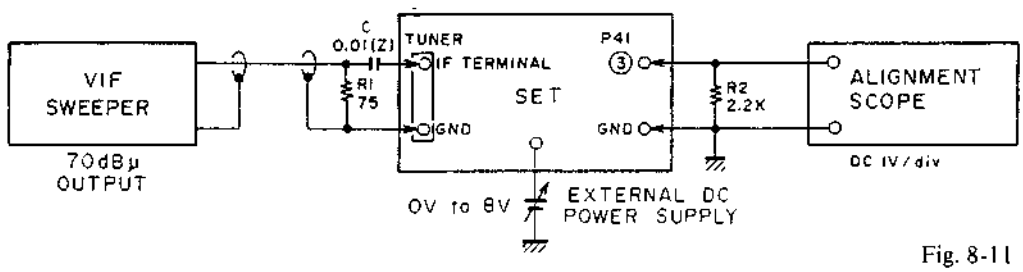


Fig. 8-11

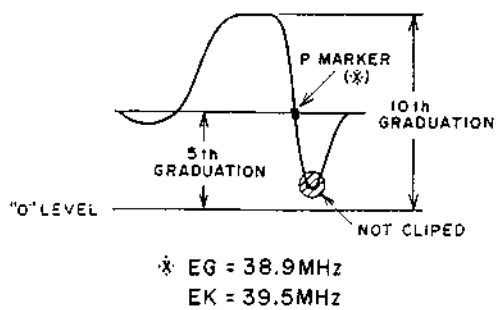


Fig. 8-12

a) Connect VIF sweeper output 70 dBμ to the IF terminal
b) Connect an alignment scope to the AFT terminal (Pin ③ of P41).
c) Give an optional size to the waveform with the External DC power supply (not clipped as shown in Fig. 8-12).
e) Adjust L5 so that the marker (EG = 38.9 MHz, EK = 39.5 MHz) is positioned 5th graduation of the alignment scope (Fig. 8-12).

8-6-3. VIF ADJUSTMENT (Refer to Figs. 8-13, 8-14)

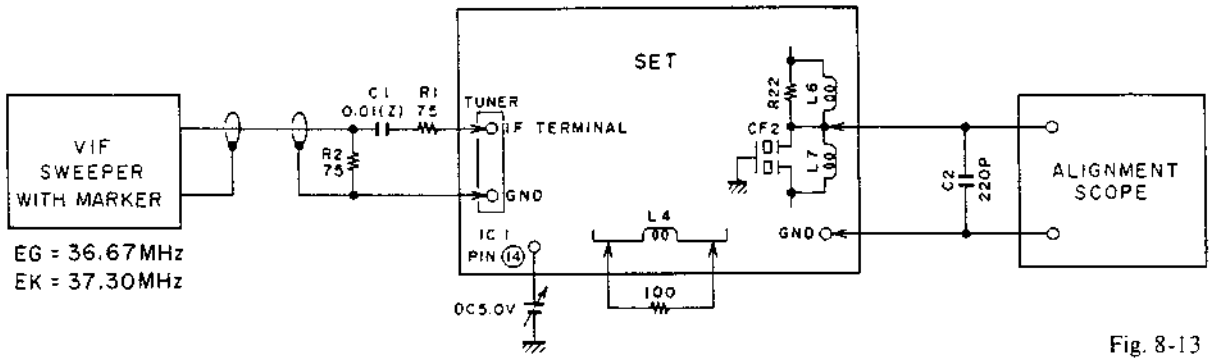


Fig. 8-13

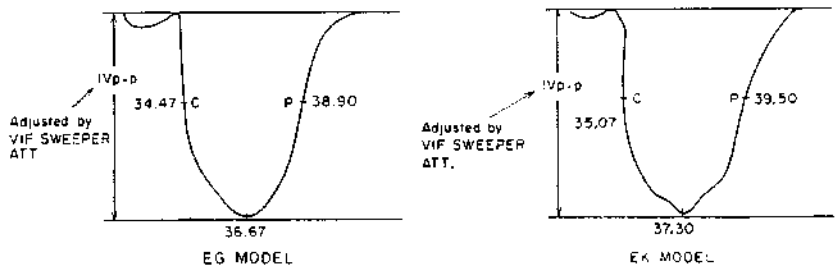


Fig. 8-14

a) Supply DC5.0V to IC1 pin ⑭ from the External DC power supply.
b) Adjust the output Attenuator of the VIF Sweeper to obtain 1.0V p-p on the Alignment Scope.
c) Connect an alignment scope as shown Fig. 8-11.
d) Connect dummy resistors of 100 ohms with both ends of the tank coil (L4).
e) Adjust L3 so that the marker (EG = 38.9 MHz, EK = 39.5 MHz) and waveform on the Alignment Scope as shown in Fig. 8-12.

8-6-4. IF AGC ADJUSTMENT

a) Disconnect all External Connection for previous Adjustment.
b) Tune and Receive the RF signal (Caution: Confirm the RF OUT is EV, EV-M = VHF 12 CH Color Bar, EA = VHF 6 CH Color Bar, ES = UHF 30 CH Color Bar.)
c) Connect an oscilloscope to video output Pin ⑤ of P42 and adjust VR3, so that the video output level is 0.9 Vp-p.

8-6-5. RF AGC ADJUSTMENT

V-AGC

a) Tune and receive VHF CH. 12 70 dBμ from the Pattern Generator.
b) Connect an oscilloscope to the Video Output Pin ⑤of P42.
c) Adjust VR2 to obtain the condition from the noisy Video Output Signal to the least noise Video Output Signal (Refer to Fig. 8-15).

U-AGC

a) Tune and Receive UHF CH. 40.
b) Adjust VR1 in the same way as V-AGC Adjustment.

8-6-6. AUDIO OUTPUT ADJUSTMENT

a) Apply DC 6.0V to Pin ② of P41.
b) Connect an AC voltmeter and a distortion meter to Pin ② of P42.
c) Add the following RF signals to ANT IN.
EG, modes VHF 12 CH (Color Bar) } 58 dBμ
EK, model UHF 30 CH (Philips) } OUTPUT
d) Adjust with VR4 so that the reading of the AC voltmeter is –6 dBm.

IX. DC RESISTANCE OF VARIOUS COILS

PARTS	NAME	DC RESISTANCE	
A/C Head	HV225207SCD	Audio Control Erase	270 ohms ± 10% 820 ohms ± 10% 1.98 ohms ± 10%
FE Head	HV113201V		3 ohms ± 10%
P.G Head	TP306		580 ohms ± 10%
Capstan Motor (M901)	DMF4923	Motor F.G	5.82 ohms ± 10% 660 ohms ± 10%
Loading Motor (M902)	MXN-12AE18A		30 ~ 50 ohms ± 20%
Reel Motor (M903)	MJB5B51		23.5 ohms ± 10%
Eject Motor (M904)	MMN-5C2RP		20 ohms ± 10%
Plunger Solenoide	1240 PLT (15V)	RED ↔ ORG RED ↔ BLK	30 ohms ± 10% 200 ohms ± 10%

X. PC BOARD TITLES AND IDENTIFICATION NUMBERS

PC BOARD TITLE	PC BOARD NUMBER
VIDEO PC BOARD	V1015A501A
POWER SUPPLY & SYSTEM CONTROL PC BOARD	V1039A5110
SERVO PC BOARD	V1015B5040
LINEAR AUDIO PC BOARD	V1037B5020
HIFI AUDIO PC BOARD	V1039A5010
MECHA DRIVE PC BOARD	V1015A502A
DEMODULATOR PC BOARD	6B00159F
SLIDE SW (2) PC BOARD	V1039D5120
PHONE JACK PC BOARD	V1039D5050
OPERATION PC BOARD	V1015A501A
LED (3) PC BOARD	V1015A521C
DRIVE PC BOARD	M3202C5010
POWER FILTER PC BOARD	V1017D5060
C M DRIVE PC BOARD	V1015A501B
PRE AMP PC BOARD	V1015A5070
SENSOR (L) PC BOARD	V1015D5200
RELAY PC BOARD	V1039D5070
A V PC BOARD	V1015D5150
R S SW PC BOARD	V1017A518D
L SW (A) PC BOARD	V1017A518C
L SW (B) PC BOARD	V1017A518B
BAR METER PC BOARD	

RC-T12 (REMOTE CONTROL TRANSMITTER)

PC BOARD TITLE	PC BOARD NUMBER
TRANSMITTER PC BOARD	

SECTION 3

PARTS LIST

TABLE OF CONTENTS

ATTENTION

1. When placing an order for parts, be sure to list the parts no. model no., and description. There are instances in which if any of this information is omitted, parts cannot be shipped or the wrong parts will be delivered.
2. Please be careful not to make a mistake in the parts no. If the parts no. is in error, a part different from the one ordered may be delivered.
3. Because parts number and parts unit supply in the Preliminary Parts List may be partially changed, please use this parts list for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List shows the parts that are considered necessary for repairs. Other parts, such as resistors and capacitors, are shown in the "Common List for Service Parts". Select and order such parts from the "Common List for Service Parts".
2. The Recommended Spare Parts shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not be supplied in principle.
4. How to read list

a) Mechanism Block

2. HEAD BASE BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
2-1x	BH-T2023A320A	HEAD BASE BLOCK GX-F66R
2-2	HP-H2206A010A	HEAD R/P PR4-8FU C
2-3	ZS-477876	PAN20×03STL CMT
2-4	ZS-536488	BID20×08STL CMT
2-5	ZG-402895	CS ANGLE ADJUST SPRING

- SP (Service Parts) Classification
- A small "x" indicates the inability to show that particular part in the Photo or Illustration.
- This number corresponds with the individual parts index number in that figure
- This number corresponds with the Figure Number

b) P.C Board Block

6. SYS. CON. P.C BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
6-1	BA-T2034A070A	PC SYS CON BLK GX-F44R
6-IC1	EI-324536	IC HD14049BP
6-IC2	EI-336801	IC MB8841-564M
6-IC3	EI-331661	IC SN7405N
6-IC4	EI-336725	IC M54527P
6-TR1to4	ET-200985	TR 2SC2603 F,G
6-TR5to28	ET-554657	TR 2SA733A P,Q
6-D1	ED-318292	D SILICON H 1S2473T-77 T26
6-D2to4	ED-308952	D GERMA V 1K34A-LR F07
6-D5to10	ED-318292	D SILICON H 1S2473T-77 T26
6-X1	EI-318384	OSC X'TAL NC-18C 3.579545MHZ

- SP (Service Parts) Classification
- This reference numbers corresponds with symbol numbers of Schematic Diagrams.

5. Both the kind of part and installation position can be determined by the Parts Number. To determine where a parts number is listed, utilize Parts Index at end of Parts List. It is necessary first of all to find the Parts Number. This can be accomplished by using the Reference Number listed at right of parts number in the Parts Index.

WARNING

⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT

⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

RECOMMENDED SPARE PARTS LIST

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items.

REF. NO.		PARTS NO.	DESCRIPTION
1		AV-349310	BATTERY PACK 4.8V 60MA-415
2		BA-M3202A020A	PC DRIVE (2) BLK BLM-410
3		BM-749896	LOADING MOTOR SUB ASSY (3)
4		BM-352233	MOTOR CAPSTAN DMF-4923
5		BM-348088	MOTOR MMN-5C2RP
6		BM-345265	MOTOR REEL MJB5B51
7		BM-B344824	ROTOR PART
8		BT-354503	⚠ TRANS POWER VS-12-1 (EG)
9		BT-354518	⚠ TRANS POWER VS-12-2 (EK)
10	N	BV-V9009A010A	HEAD DRUM BLK VS-12
11		BV-V1039A110A	LOWER DRUM BLK VS-12EG
12		BV-353839	RF CONVERTOR MDL6-023 (EG)
13		BV-353840	RF CONVERTOR MIL6-023 (EK)
14		BV-V1039A120A	UPPER DRUM BLK VS-12EG
15		EC-346765	C S-FIX H ECR-HA010A11 2.8-10
16		EC-346764	C S-FIX H ECR-HA020D11 4-20
17		EC-348972	C S-FIX V ECR-HB050G11
18		ED-350748	⚠ D SILICON DBA60C-K15
19		ED-347618	⚠ D SILICON DS135E-FB6 100/1.0A
20		ED-322238	⚠ D SILICON 1B4B41 100/1.0A
21		ED-346603	⚠ D ZENER H HZ6 A1
22		ED-347776	D LED BG5608S GRN
23		ED-347777	D LED BR5628S RED
24		ED-249377	D LED GL3AR1 RED
25		ED-283138	D LED GL3PG1 GRN
26		ED-352722	D LED DL-101VR RED
27		ED-352723	D LED LD-603MG GRN
28		ED-348462	D LED SL2221T GRN
29		ED-351202	D PHOTO PN313 AK
30		ED-301911	D SILICON H DS448
31		ED-344280	D SILICON H GMA-01-FY2 F05
32		ED-523427	D SILICON H 1SS16
33		ED-604541	D SILICON H 1S2076
34		ED-624903	D SILICON H 1S2473
35		ED-347767	D SILICON V MC911 DOUBLE
36		ED-347768	D SILICON V MC921 DOUBLE
37		ED-348205	D SILICON V MC931 DOUBLE
38	N	ED-560913	D SILICON V 1S2473VE
39		ED-742520	D VARACTOR 1SV70-09
40		ED-347899	D ZENER H HZ20CP
41		ED-346595	D ZENER H HZ3 C2
42		ED-346622	D ZENER H HZ30 1
43		ED-346604	D ZENER H HZ7 B2
44		ED-346609	D ZENER H HZ9 C1
45		ED-349816	D ZENER H MA1056-H
46		EE-345115	TV TUNER CDE1-A04 (EG)
47		EE-345116	TV TUNER CBE1-013 (EK)
48		EF-347968	⚠ FUSE ICP-F10 150V 0.4A
49		EF-346880	⚠ FUSE ICP-F15 150V 0.6A
50		EF-668474	⚠ FUSE SEMKO T 250V 0.40A
51		EF-601942	⚠ FUSE SEMKO T 250V 0.63A
52		EF-623103	⚠ FUSE SEMKO T 250V 1.00A
53		EF-601301	⚠ FUSE SEMKO T 250V 2.00A
54		EF-690996	⚠ FUSE SEMKO T 250V 4.00A
55		EH-322365	DL EFD-EN645A11E
56		EH-348223	DL MS-26H H-2K
57		EH-353396	DL EFD-BR124A13D
58		EH-348225	DL MS-19 (L-11)
59		EH-348224	DL MS-26 (H-3K)
60		EH-345114	FILTER BP LJ20BP 4.43MHz x 0.3 4.43MC
61		EH-352718	FILTER BP LJ25BP1.4M01-32
62		EH-352719	FILTER BP LJ25BP1.8M01-32
63		EH-705499	FILTER CE SFE 5.5MHz
64		EH-705500	FILTER CE SFE 6MHz
65		EH-749840	FILTER CE TPS 6.0MD.
66		EH-749841	FILTER CE 5.5MC19A
67		EH-749842	FILTER CE 6.0MC19A
68		EH-324339	FILTER LC AP LCB-56
69		EH-324375	FILTER LC BP LCB-57 4.43MHz
70		EH-325807	FILTER LC BP LCB-61 5.06MHz
71		EH-330465	FILTER LC DST310-55B271M
72		EH-324305	FILTER LC HP LCB-53
73		EH-324398	FILTER LC LP LCB-58
74		EH-345113	FILTER LC LP LJ25LP3.4M01
75		EH-348142	FILTER LC LP LJ25LP3.4M02
76		EH-352720	FILTER LP LJ15LP0.1M01-32
77		EH-348368	FILTER LP LPF1.50
78		EH-348367	FILTER LP LPF500
79		EH-742662	FILTER SAW SAF38.9MZ51Z
80		EH-742663	FILTER SAW SAF39.5MZ51Z
81		EI-353281	⚠ IC SI3052V
82		EI-354502	⚠ IC STR9012
83		EI-347758	⚠ IC TA78012AP
84		EI-337530	⚠ IC UPC574J
85		EI-336987	HALL ELEMENT DHD-H150
86		EI-341516	IC AN6041
87		EI-307616	IC AN608P
88		EI-348974	IC AN6209
89		EI-347764	IC AN6307
90		EI-324204	IC AN6310
91		EI-353690	IC AN6326N
92		EI-321604	IC AN6341N
93		EI-324203	IC AN6342N
94		EI-326044	IC AN6350
95		EI-324151	IC BA6360
96		EI-324160	IC AN6362
97		EI-324182	IC AN6371
98		EI-352715	IC AN6391S
99		EI-337625	IC BA236
100		EI-337964	IC BA401
101		EI-330352	IC BA6109
102		EI-353695	IC BA634
103		EI-348222	IC BA7001
104		EI-348220	IC BA7022
105	N	EI-354399	IC BU4001B
106		EI-354640	IC BU4052B
107	N	EI-354401	IC BU4066B
108		EI-347733	IC DN6838
109		EI-321605	IC DN819
110		EI-322309	IC HA11703
111		EI-352714	IC HA11752
112		EI-352716	IC HA120066MP
113		EI-354780	IC HA17358
114	N	EI-328593	IC HD14053BP
115		EI-347781	IC LA6393D
116		EI-347779	IC LA6393S
117		EI-345759	IC LC7530
118		EI-347766	IC MBL8243M
119		EI-349143	IC MB88202-105G
120		EI-337519	IC MB88301-A
121		EI-347773	IC MB88303M
122		EI-349121	IC MB88401-233K
123		EI-349126	IC MB88501-147M
124	N	EI-698703	IC MC14013BCP
125	N	EI-310038	IC MC14025BCP
126	N	EI-200572	IC MC14053BCP
127	N	EI-330392	IC MC14070BCP
128		EI-353698	IC M50760-365P
129		EI-348897	IC M51014L
130		EI-353227	IC M5216L
131		EI-337228	IC M5218LO
132		EI-347769	IC M54514AP
133		EI-337503	IC M54532P
134		EI-347760	IC M54534P
135		EI-749829	IC M54573L
136		EI-348958	IC M58981P-45
137		EI-348229	IC NE555P
138		EI-344921	IC TA7245BP
139		EI-705494	IC TA7607AP
140		EI-337529	⚠ IC TA78L005AP
141		EI-355743	IC TA78009AP
142		EI-300834	IC TC4520BP
143		EI-353696	IC TK15021
144		EI-318270	IC UA556PC
145		EI-749828	IC UPC1391H
146		EI-337360	IC UPC4082C
147		EI-352717	IC.LF1803
148		EI-349372	OSC CE CSA4.00MG 4MHz
149		EI-330256	OSC CE F85-006 4MHz
150		EI-348543	OSC X'TAL HC-18/U 10.240000MHz
151		EI-347434	OSC X'TAL HC-18/U 4.194304MHz
152		EI-309878	OSC X'TAL 4.433619MHz
153		EI-322347	OSC X'TAL 4.435571MHz
154		EL-332451	PL CORD 12.0V 60MA
155		EM-352692	IND LE LT-1127
156		EO-347791	⚠ COIL OSC 1 0512033
157		EO-348206	COIL VARI 1 YBTKANS-28929Z 2.20μH
158		EP-345264	SOLENOID W/TAP 1240PLT 15V
159		EQ-348929	RELAY SIG G5A232P 2TR 12V
160		ER-701259	⚠ R FUSE SB 1/4W 100J
161		ER-742497	⚠ R FUSE 1/4W 220J
162		ES-332384	SW MICRO SS-5-F
163		ES-347911	⚠ SW PUSH ESB-8213V 01-1
164		ES-309312	⚠ SW SLIDE 00220481 02-2
165		ES-348089	SW LEAF MSW-1429C 01-1 NO
166		ES-352333	SW LEAF MSW-1550C
167		ES-318284	SW LEVER SCL101R23A 1-01-02N
168		ES-347790	SW SLIDE 00120323 1-01-02
169		ES-354896	SW SLIDE 00230107 02-3 N
170		ES-349641	SW SLIDE 00230890 (9.3) 2-02-03
171		ES-352694	SW SLIDE 00240944
172		ES-347755	SW TACT EVQ-QSE05T
173		ET-337194	⚠ TR 2SB761 Q,R
174		ET-318308	PHOTO SENSOR PN202S
175		ET-354415	TR DTA144ES
176		ET-711091	TR DTC124F
177		ET-354414	TR DTC144ES
178		ET 353734	TR FET 2SJ103 GR,BL
179		ET-348898	TR FET 2SJ40 C,D,E
180		ET-308472	TR 2SA115 E,F,G
181		ET-347738	TR 2SA1282A E,F
182		ET-346806	TR 2SA1309 Q,R,S
183		ET-337569	TR 2SA675A E,F,H
184		ET-336845	TR 2SB641 Q,R,S,T
185		ET-348931	TR 2SB774 R,S,T
186		ET-338424	TR 2SB941 Q,R,S
187		ET-522270	TR 2SC1210 D
188		ET-350724	TR 2SC1214 B,C,D
189		ET-306719	TR 2SC2236 O,Y
190		ET-308141	TR 2SC2603 G
191		ET-351858	TR 2SC3311 Q,R,S
192		ET-349081	TR 2SC3373 S,T
193		ET-349592	TR 2SC3400
194		ET-742646	TR 2SC388A
195		ET-344999	TR 2SD1010 R,S,T
196	N	ET-328868	TR 2SD1012-V G,H
197		ET-338324	TR 2SD1012-V H
198		ET-348948	TR 2SD1273 P,Q
199		ET-208012	TR 2SD571 K
200		ET-352406	TR 2SD661 R,S,T,U
201		ET-200418	TR 2SD661 S,T,U
202		ET-200402	TR 2SD958 S,T,U
203		EV-332264	R S-FIX H EVM38G 3P 0.30W 503
204		EV-200403	R S-FIX H EVN38 3P 102
205		EV-200461	R S-FIX H EVN38 3P 103
206		EV-318605	R S-FIX H EVN38 3P 203
207		EV-200462	R S-FIX H EVN38 3P 503
208		EV-307626	R S-FIX H H0621A 3P 0.30W 103
209		EV-336769	R S-FIX H H0621A 3P 0.30W 473
210		EV-336767	R S-FIX H H0621A 3P 0.30W 683
211		EV-352255	R S-FIX H H0621A 3P 332
212		EV-332404	R S-FIX H H0651A 3P 0.05W 101
213		EV-307621	R S-FIX H H0651A 3P 0.05W 103
214		EV-330212	R S-FIX H H0651A 3P 0.05W 152
215		EV-332320	R S-FIX H H0651A 3P 0.05W 332
216	N	EV-307706	R S-FIX H H0651A 3P 0.05W 471
217		EV-336770	R S-FIX H H0651A 0.05W 473
218		EV-349156	R S-FIX H H0651A 3P 0.05W 681
219		EV-336852	R S-FIX H KVSF807U 3P 102
220		EV-336853	R S-FIX H KVSF807U 3P 103
221		EV-336854	R S-FIX H KVSF807U 3P 104
222		EV-336850	R S-FIX H KVSF807U 3P 202
223		EV-336851	R S-FIX H KVSF807U 3P 501
224		EV-336847	R S-FIX H KVSF807U 3P 502
225	N	EV-341225	R S-FIX H KVSF807U 3P 503
226		EV-341226	R S-FIX H KVSF807U 3P 204
227		EV-356296	R S-FIX H TM64K3 3P 0.3W 154
228		EV-337957	R S-FIX H TM64K3 3P 0.30W 102
229		EV-337950	R S-FIX H TM64K3 3P 0.30W 683
230		EV-356298	R S-FIX H TM64K3 3P 0.30W 684
231		EV-702569	R S-FIX TT24R 103B
232		EV-702567	R S-FIX TT24R 202
233		EV-348413	R S-FIX V RVA0911 T3P 202
234		EV-523708	R S-FIX V V8K1-1 3P 501
235		EV-749777	R S-FIX 502
236		EX-351674	POSISTER PTH499H
237		EX-330533	POSISTER PTH61G04BD3R3N
238		EY-348960	BUZZER PKM24-4A0
239		HC-347811	HEAD CTL HV225207SCD
240		HC-347163	HEAD PU TP306
241	N	HE-325273	HEAD E HV113201 V
242		MB-345018	BELT CAPSTAN
243		MB-780029	BELT LOADING
244		MI-327773	IDLER ASSY
245		MP-604531	ROLLER PINCH VS-2 (NEW)
246	N	BV-V1039A080A	HEAD DRUM BLK VS-12EG

NOTE: N: New Parts

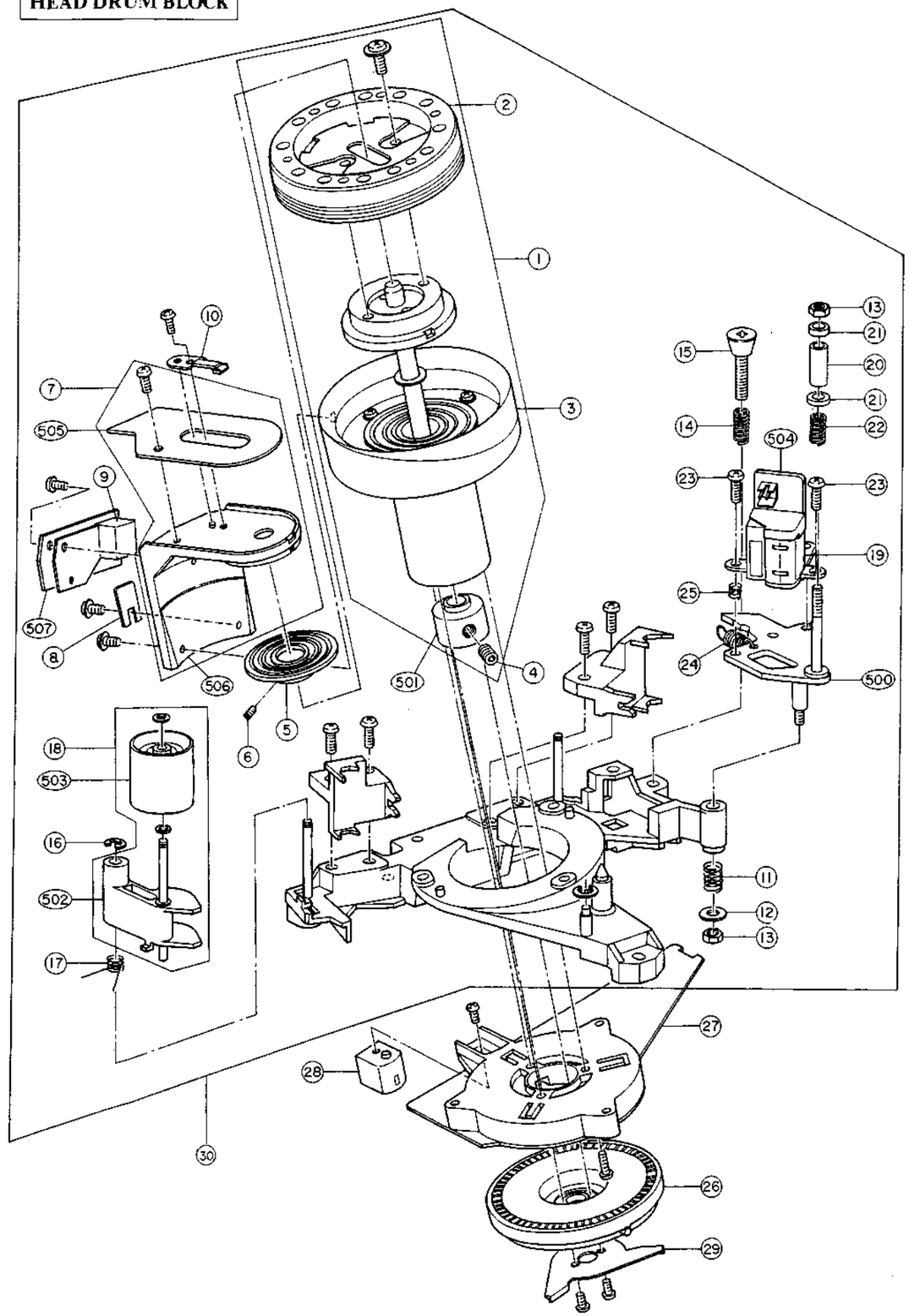
1. HEAD DRUM BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
	HEAD DRUM BLOCK	
1-1	BV-V9009A010A	HEAD DRUM SUB BLK VS-12EG
	UPPER DURM BLOCK	
1-2	BV-V1039A120A	UPPER DURM BLK VS-12EG
	LOWER DURM BLOCK	
1-3	BV-V1039A110A	LOWER DURM BLK VS-12EG
1-4	ZS-318206	6SET40×040SCM PKR WP
	HEAD DURM BLOCK	
1-5	VT-B353093	ROTARY COIL PART
1-6	ZS-356815	6SET30×060SCM PKR HP
1-7	VT-V1039A240A	STATER COIL BLK VS-12EG
1-8	EX-351674	POSISTER PTH499H
1-9	EQ-348929	RELAY SIG G5A-232P 2TR 12V
1-10	VT-353098	DRUM EARTH BRUSH ASSY
	DURM BASE BLOCK	
1-11	ZG-331178	SP PUSH PRESS ACH
1-12	ZW-550642	PW31×080×050STL CMT
1-13	ZW-516993	N30STL CMT 1
1-14	ZG-332979	SP PUSH CTL (B)
1-15	ZS-354085	SCREW ADJUST (2)
1-16	ZW-357164	RING E230SUP CMT
1-17	ZG-327740	SP TORSION LZ
	ROLLER IMPEDANCE BLOCK	
1-18	BL-V1017A140A	ROLLER IMPEDANCE BLK VS-4EG
	A/C H BLOCK	
1-19	HC-347811	HEAD CTL HV225207SCD
1-20	HZ-343076	GUIDE TAPE (C)
1-21	HZ-342726	GUIDE TAPE (B)
1-22	ZG-328225	SP C-3.5/0.8-10.0G C-102G
1-23	ZS-380046	PAN30×10STL CMT
1-24	ZG-327757	SP PULL ACH SET
1-25	ZG-313257	SP C-3.5/0.8-8.0 C-101
	MOTOR BLM-410	
1-26	BM-B344824	ROTOR PART
	PC DRIVE BLOCK	
1-27	BA-M3202A020A	PC DRIVE (2) BLK BLM-410
1-28	HC-347163	HEAD PU TP306
1-IC1	EI-344921	IC TA7245BP
1-R12	ER-333586	R CB H S15 FS RDS 1/2W 3R3J
1-29	MZ-351099	FAN
1-30	BV-V1039A080A	HEAD DRUM BLK VS-12EG

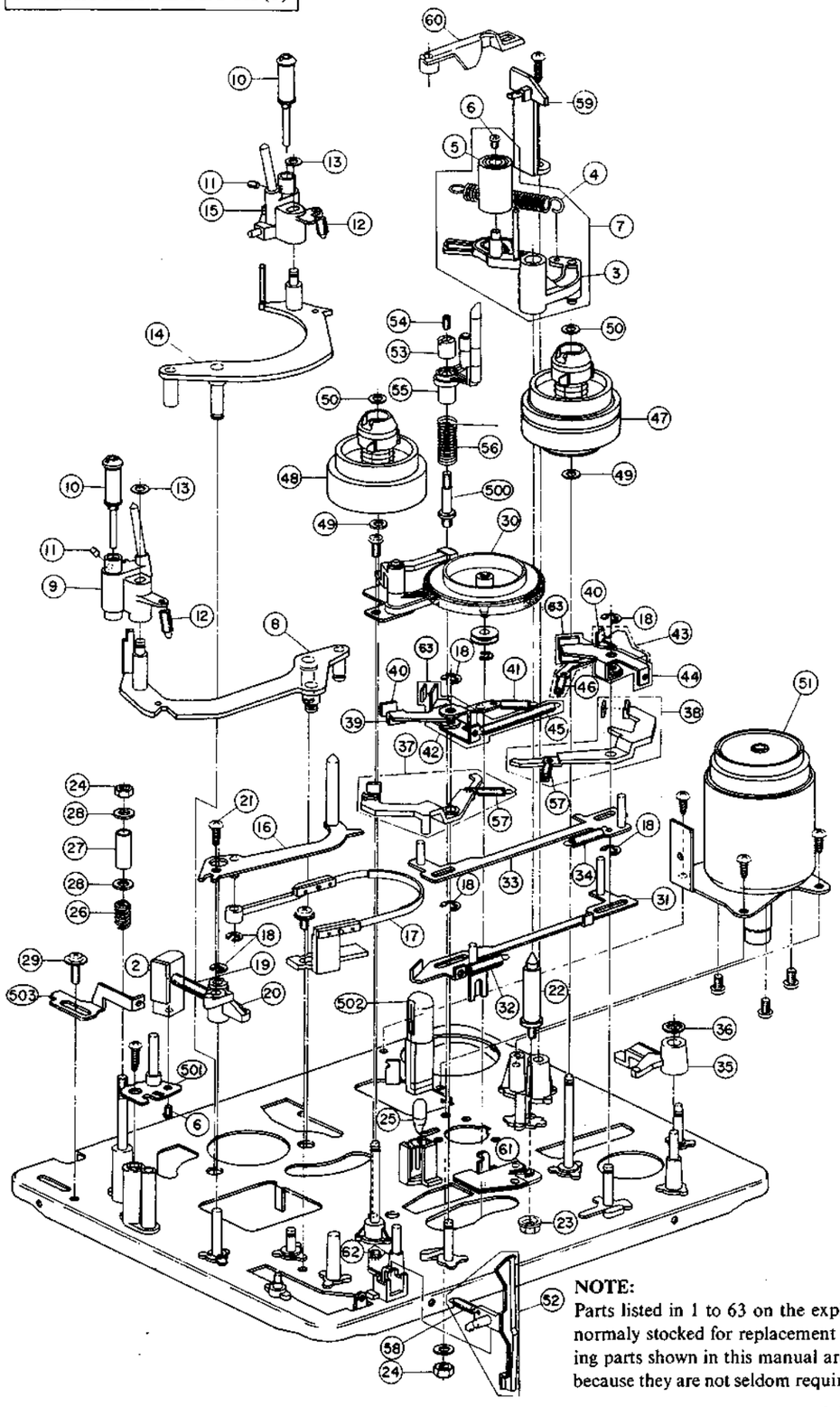
NOTE:

Parts listed in 1 to 30 on the exploded view and list are normaly stocked for replacement purpose. The remaining parts shown in this manual are not normaly stocked, because they are not seldom required for routine service.

HEAD DRUM BLOCK



MECHA FRAME BLOCK (1)



NOTE:
Parts listed in 1 to 63 on the exploded view and list are normaly stocked for replacement purpose. The remaining parts shown in this manual are not normaly stocked, because they are not seldom required for routine service.

2. MECHA FRAME BLOCK (1)

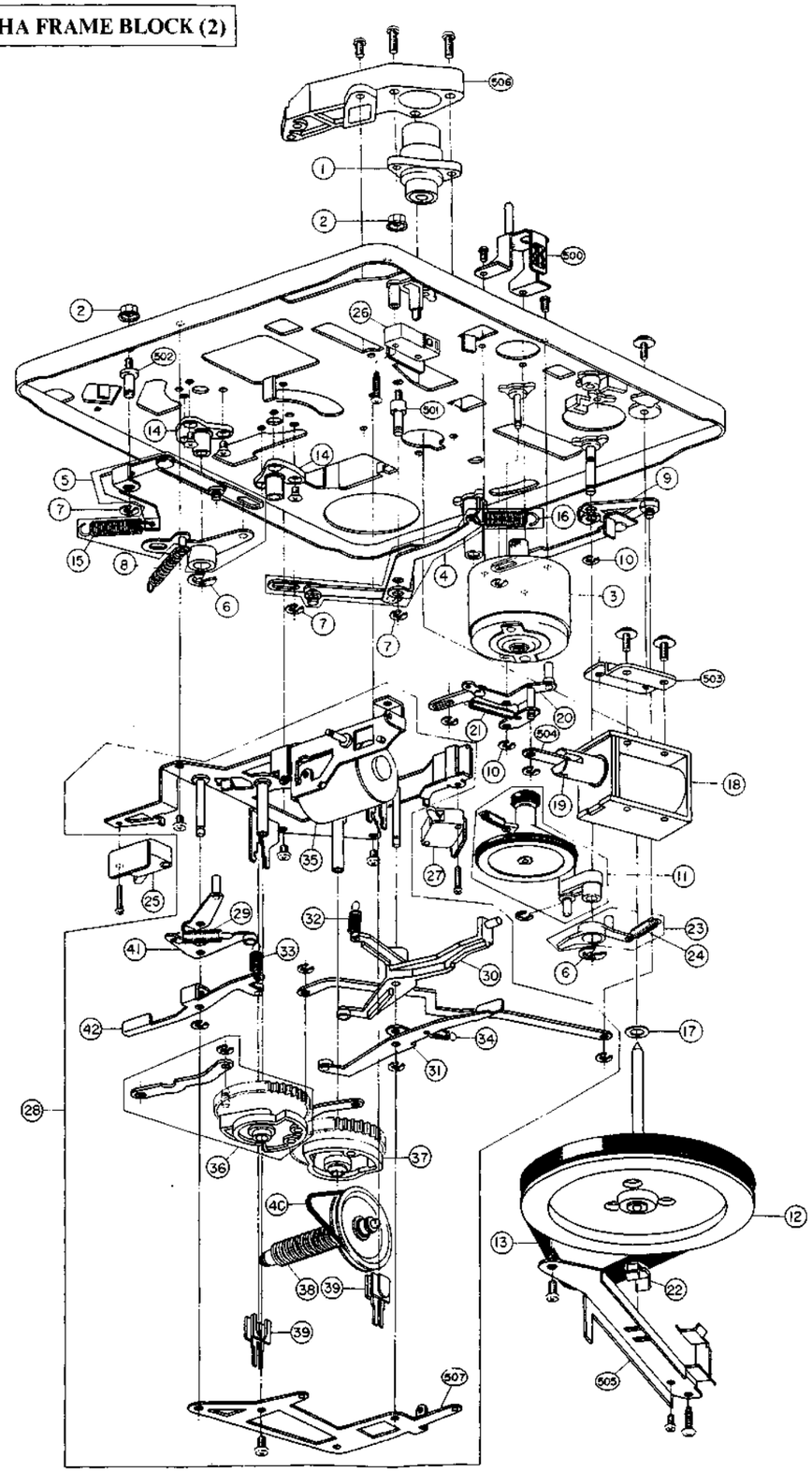
REF. NO.	PARTS NO.	DESCRIPTION
2-1	BB-V1015A200A	MECHA FRAME ASSY VS-8FG
	HOLDER ERASE HEAD BLOCK	
2-2	HE-325273	HEAD E HV113201 V
	LEVER PINCH ROLLER BLOCK	
2-3	BL-B326296	LEVER PINCH ROLLER PART
2-4	ZG-342091	SP PULL PINCH ROLLER
2-5	MP-604531	ROLLER PINCH VS-2(NEW)
2-6	ZS-477876	PAN20×03STL CMT
2-7	BV-V1009A320A	LEVER PINCH ROLLER BLK (VS-2 NEW)
	LEVER LOADING (L) BLOCK	
2-8	BL-B348989	LEVER LOADING (L) PART
2-9	VT-B319445	LOADING LEADER (L) PART
2-10	VT-317947	VERTICAL POLE PART (P)
2-11	ZS-341471	6SET23×030SCM PKR HP
2-12	ZG-318043	SP LEADER
2-13	ZW-344643	PW26×070×025PSL
	LEVER LOADING (R) BLOCK	
2-14	BL-B348098	LEVER LOADING(R) PART
2-15	VT-B319446	LOADING LEADER (R) PART
	TENSION ARM BLOCK	
2-16	BL-B326468	LEVER TENSION PART
2-17	VT-328134	TENSION BAND ASSY
2-18	ZW-357164	RING E230SUP CMT
2-19	ZG-328664	SP T2-4.0/0.4-35.5 T2-118
2-20	VT-326470	HOLDER TENSION LEVER
2-21	ZS-310984	PT BR 30×08STL CMT
	MECHA FRAME BLOCK	
2-22	MH-321688	PROP 9 PINCH ROLLER LEVER
2-23	ZS-609434	N FRANGE 30STL CMT
2-24	ZW-516993	N30STL CMT 1
2-25	EL-332451	PL CORD 12.0V 60MA
2-26	ZG-349805	SP PUSH GUIDE TAPE
2-27	HZ-343076	GUIDE TAPE (C)
2-28	HZ-342726	GUIDE TAPE (B)
2-29	ZS-328607	TRIPLE SCREW PAN30×05
2-30	MI-327773	IDLER ASSY
2-31	BL-B322090	LEVER BRAKE SLIDE (B) PART
2-32	ZG-313045	SP T1-5.0/0.55-25.0 T1-158
2-33	BL-B322027	LEVER BRAKE SLIDE (A) PART
2-34	ZG-332463	SP T2-3.2/0.29-20 T2-064
2-35	ML-330640	LEVER BRAKE RELEASER
2-36	ZW-653163	RING CS280STL PKR
2-37	BL-V1004A090A	LEVER FF BRAKE BLK VS-5EG
2-38	BL-V1004A100A	LEVER REW BRAKE BLK VS-5EG
2-39	VT-B322286	LEVER S LOADING BRAKE PART
2-40	VT-322159	SHEET BRAKE (A)
2-41	ZG-318204	SP T2-3.2/0.29-16 T2-062
2-42	BL-V1004A120A	LEVER BRAKE (A) BLK VS-5EG
2-43	BL-V1004A130A	LEVER TU LOADING BRAKE BLK VS-5EG
2-44	BL-V1004A140A	LEVER BRAKE (B) BLK VS-5EG
2-45	ZG-344132	SP PULL BRAKE
2-46	ZG-312945	SP T1-3.2/0.29-14.0 T1-061
2-47	BR-347731	TU REEL TABLE BLK
2-48	BR-347732	SUPPLY REEL TABLE BLK
2-49	ZW-324417	PW31×060×050PSL
2-50	ZW-344643	PW26×070×025PSL
2-51	BM-352233	MOTOR CAPSTAN DMF-4923
2-52	BL-V1004A170B	LEVER REC SAFETY BLK VS-4EG
2-53	ZS-326246	NUT ADJUST
2-54	ZS-328608	6SET26×030SCM PKR FP
2-55	BL-B326220	LEVER REVIEW PART
2-56	ZG-326247	SP TORSION REVIEW
2-57	ZG-328659	SP T2-3.2/0.2-16 T2-043
2-58	ZG-312997	SP T1-4.0/0.4-16.0 T1-111
2-59	VT-345031	HOLDER OPENER
2-60	VT-326477	GUIDE CAP
	HALL IC BLOCK	
2-61	EI-347733	IC DN6838 (IC1)
2-62	EI-347733	IC DN6838 (IC2)
2-63	VT-322203	SHEET BRAKE (B)

3. MECHA FRAME BLOCK (2)

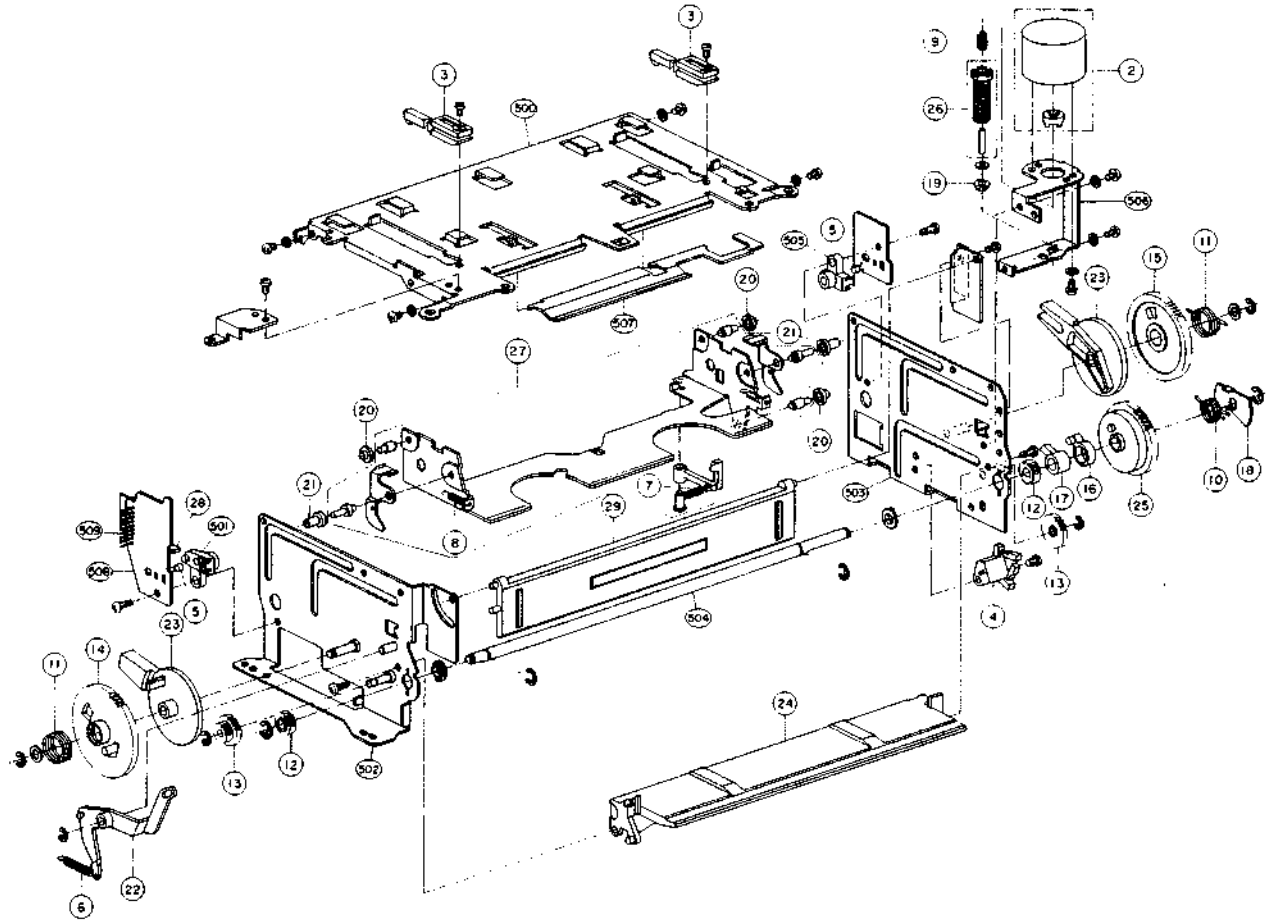
REF. NO.	PARTS NO.	DESCRIPTION
		MECHA FRAME BLOCK
3-1	MZ-B321701	HOLDER CAPSTAN PART
3-2	ZS-609434	N FRANGE 30STL CMT
3-3	BM-345265	MOTOR REEL MJB5B5I
3-4	BL-B326455	LEVER TOGGLE SP (B) PART
3-5	BL-B326453	LEVER TOGGLE SP (A) PART
3-6	ZW-290283	RING U 285SUP CMT
3-7	ZW-270101	RING E300SUP CMT
3-8	ZG-321769	SP T2-5.0/0.55-35.5 T2-161
3-9	BL-B326464	LEVER ROLLING PART
3-10	ZW-357164	RING E230SUP CMT
3-11	BV-327815	TU IDLER ASSY
3-12	MI-B328611	FLYWHEEL PART
3-13	MB-345018	BELT CAPSTAN
3-14	MV-322302	METAL LOADING
3-15	ZG-328610	SP T2-6.3/0.8-28 T2-198
3-16	ZG-313085	SP T1-6.3/0.8-25.0 T1-197
3-17	ZG-328661	PW41×070×025PSL
		PLUNGER BLOCK
3-18	EP-345264	SOLENOID W/TAP 1240PLT 15V
3-19	MH-261191	SPRING PIN 3×12
3-20	BL-B604437	LEVER PLUNGER PART
3-21	ZG-328661	SP T2-3.2/0.29-25 T2-066
		HOLDER FLYWHEEL BLOCK
3-22	VT-326476	HOLDER PIVOT
		LEVER TU IDLER KICK BLOCK
3-23	BV-V1004A220A	LEVER TU IDLER KICK BLK VS-5EG
3-24	ZG-316197	SP T2-4.0/0.4-20.0 T2-113
3-25	ES-318284	SW LEVER SCL101R23A 1-01-02N (L SW A)
3-26	ES-332384	SW MICRO SS-5-F (RS SW)
3-27	ES-318284	SW LEVER SCL101R23A 1-01-02N (L SW B)
		LOADING BLOCK
3-28	BV-V1017A250A	LOADING BLK VS-4EG
3-29	ZG-780032	SP TENSION LEVER RETURN
3-30	BL-780033	BRAKE LEVER ASSY
3-31	BL-780034	SW LEVER B ASSY
3-32	ZG-780035	SP BRAKE LEVER
3-33	ZG-780039	SP SW A
3-34	ZG-780040	SP SW B
3-35	BM-749896	LOADING MOTOR SUB ASSY (3)
3-36	VT-780025	LOADING GEAR A ASSY
3-37	VT-780026	LOADING GEAR B SUB ASSY
3-38	VT-780027	LOADING WARM ASSY
3-39	VT-749898	HOLDER GEAR SHAFT
3-40	MB-780029	BELT LOADING
3-41	BL-780030	TENSION LEVER ASSY
3-42	BL-780031	SW LEVER A ASSY

NOTE:
Parts listed in 1 to 42 on the exploded view and list are normaly stocked for replacement purpose. The remaining parts shown in this manual are not normaly stocked, because they are not seldom required for routine service.

MECHA FRAME BLOCK (2)



EJECTOR ASSY (2)



4. EJECTOR ASSY (2)

REF. NO.	PARTS NO.	DESCRIPTION
4-1	BV-352356	EJECTOR ASSY (2)
	EJECTOR ASSY (2)	
4-2	BM-348088	MOTOR MMN-5C2RP
4-3	ES-348089	SW LEAF MSW-1429C 01-1 NO
4-4	ES-352333	SW LEAF MSW-1550C
4-5	ET-318308	PHOTO SENSOR PN202S
4-6	ZG-312922	SP T1-3.2/0.2-10.0 T1-039
4-7	ZG-324331	SP T2-3.2/0.2-12.5 T2-041
4-8	ZG-312944	SP T1-3.2/0.29-12.5 T1-060
4-9	ZG-313212	SP C-6.5/0.6-12.5 C-057
4-10	ZG-749705	SP (A)
4-11	ZG-749695	SP (C)
4-12	ZG-749696	GEAR (A)
4-13	MZ-749692	GEAR (B)
4-14	MZ-749694	GEAR (C)
4-15	MZ-749715	GEAR (D)
4-16	MZ-749697	COLLAR BRAKE (A)
4-17	MZ-749698	COLLAR BRAKE (B)
4-18	MZ-712538	HOLDER SPRING
4-19	MZ-749895	COLLAR WARM
4-20	MR-749685	GUIDE ROLLER (A)
4-21	MR-749686	GUIDE ROLLER (C)
4-22	ML-749691	ARM COVER
4-23	ML-749693	ARM DRIVE
4-24	MZ-749855	GUIDE FRAME
4-25	MZ-749699	WARM WHEEL
4-26	MZ-749853	WARM PART
4-27	MZ-749640	HOLDER CASSETTE
4-28	ET-200418	TR 2SD661 S.T.U
	FINAL ASSEMBLY BLOCK	
4-29	SP-349117A	MASK VS-4EG

NOTE:

Parts listed in 1 to 29 on the exploded view and list are normaly stocked for replacement purpose. The remaining parts shown in this manual are not normaly stocked, because they are not seldom required for routine service.

5. VIDEO (PAL) PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
5-1EG	BA-V1015A150H	PC VIDEO (PAL) BLK VS-12EG
5-1EK	BA-V1015A150J	PC VIDEO (PAL) BLK VS-12EK
		VIDEO (PAL) PC BOARD
5-IC1	EI-324204	IC AN6310
5-IC2	EI-322309	IC HA11703
5-IC3	EI-324151	IC AN6360
5-IC4	EI-324160	IC AN6362
5-IC5	EI-324182	IC AN6371
5-IC6	EI-324203	IC AN6342N
5-IC7	EI-328593	IC HD14053BP
5-IC8	EI-354399	IC BU4001B
5-IC9	EI-310038	IC MC14025BCP
5-IC10	EI-347781	IC LA6393D
5-IC501	EI-348220	IC BA7022
5-IC503	EI-348229	IC NE555P
5-IC504	EI-698703	IC MC14013BCP
5-IC505	EI-330392	IC MC14070BCP
5-IC506	EI-341516	IC AN6041
5-IC507	EI-307616	IC AN608P
5-IC508	EI-341516	IC AN6041
5-IC509	EI-307616	IC AN608P
5-IC510	EI-348229	IC NE555P
5-IC511	EI-337529	⚠ IC TA78L005AP
5-IC512	EI-348222	IC BA7001
5-IC514	EI-348222	IC BA7001
5-IC515	EI-307616	IC AN608P
5-TR1 to 5	ET-308141	TR 2SC2603 G
5-TR6	ET-308472	TR 2SA1115 E,F,G
5-TR7	ET-308141	TR 2SC2603 G
5-TR8, 9	ET-308472	TR 2SA1115 E,F,G
5-TR10	ET-308141	TR 2SC2603 G
5-TR11	ET-308472	TR 2SA1115 E,F,G
5-TR12, 13	ET-308141	TR 2SC2603 G
5-TR14	ET-350724	TR 2SC1214 B,C,D
5-TR15 to 18	ET-308141	TR 2SC2603 G
5-TR19	ET-308472	TR 2SA1115 E,F,G
5-TR20	ET-344999	TR 2SD1010 R,S,T
5-TR22, 23	ET-308141	TR 2SC2603 G
5-TR24	ET-348931	TR 2SB774 R,S,T
5-TR25, 26	ET-308141	TR 2SC2603 G
5-TR27, 28	ET-308472	TR 2SA1115 E,F,G
5-TR29	ET-308141	TR2SC2603 G
5-TR30	ET-344999	TR 2SD1010 R,S,T
5-TR31	ET-308472	TR 2SA1115 E,F,G
5-TR32	ET-308141	TR 2SC2603 G
5-TR33	ET-308472	TR 2SA1115 E,F,G
5-TR34 to 39	ET-308141	TR 2SC2603 G
5-TR40	ET-308141	TR 2SC2603 G (EG)
5-TR41 to 48	ET-308141	TR 2SC2603 G
5-TR501, 502	ET-308141	TR2SC2603 G
5-TR503	ET-308472	TR 2SA1115 E,F,G
5-TR505 to 509	ET-308141	TR 2SC2603 G
5-TR512 to 515	ET-308141	TR 2SC2603 G
5-TR517, 518	ET-308141	TR 2SC2603G
5-D1, 2	ED-344280	D SILICON H GMA-01-FY2 F05
5-D3, 4	ED-523427	D SILICON H 1SS16
5-D6, 7	ED-523427	D SILICON H 1SS16
5-D8, 9	ED-344280	D SILICON H GMA-01-FY2 F05
5-D11 to 14	ED-344280	D SILICON H GMA-01-FY2 F05
5-D15	ED-301911	D SILICON H DS448 (EG)
5-D17	ED-344280	D SILICON H GMA-01-FY2 F05
5-D19	ED-344280	D SILICON H GMA-01-FY2 F05
5-D501 to 504	ED-344280	D SILICON H GMA-01-FY2 F05
5-D505	ED-346609	D ZENER H HZ9 C1
5-D506	ED-301911	D SILICON H DS448
5-WD1 to 4	ED-347768	D SILICON V MC921 DOUBLE
5-SW1EG	ES-349641	SW SLIDE 0023089(9.3) 2-02-03 (EG)
5-SW1EK	ES-347790	SW SLIDE 00120323 1-01-2 (EK)
5-VR1	EV-336851	R S-FIX H KVSF807U 3P 501
5-VR2	EV-349156	R S-FIX H H0651A 3P 0.05W 681
5-VR3	EV-336852	R S-FIX H KVSF807U 3P 102
5-VR4	EV-336847	R S-FIX H KVSF807U 3P 502
5-VR5	EV-336852	R S-FIX H KVSF807U 3P 102

REF. NO.	PARTS NO.	DESCRIPTION
5-VR6	EV-336853	R S-FIX H KVSF807U 3P 103
5-VR7	EV-336852	R S-FIX H KVSF807U 3P 102
5-VR8	EV-336853	R S-FIX H KVSF807U 3P 103
5-VR9	EV-337957	R S-FIX H TM64K3 3P 0.30W 102
5-VR10	EV-307706	R S-FIX H H0651A 3P 0.05W 471
5-VR11	EV-336850	R S-FIX H KVSF807U 3P 202
5-VR12	EV-336852	R S-FIX H KVSF807U 3P 102
5-VR13	EV-348413	R S-FIX V RVA0911 T3P 202
5-VR14	EV-349156	R S-FIX H H0651A 3P 0.05W 681
5-VR15	EV-307706	R S-FIX H H0651A 3P 0.05W 471
5-VR501	EV-336852	R S-FIX H KVSF807U 3P 102
5-VR504	EV-341225	R S-FIX H KVSF807U 3P 503
5-VR505	EV-332320	R S-FIX H H0651A 3P 0.05W 332
5-VR506	EV-332404	R S-FIX H H0651A 3P 0.05W 101
5-VL501	EO-348206	COIL VARI TYBTKANS-28929Z 2.20μH
5-L1	EO-330240	COIL FIX I EL0606SKI 470K
5-L2	EO-330241	COIL FIX I EL0606SKI 221K
5-L3	EO-330249	COIL FIX I EL0606SKI 8R2K
5-L4, 5	EO-330248	COIL FIX I EL0606SKI 330K
5-L6, 7	EO-330241	COIL FIX I EL0606SKI 221K
5-L9	EO-345867	COIL FIX I EL0606SKI 120K
5-L10	EO-330246	COIL FIX I EL0606SKI 560K
5-L11, 12	EO-330241	COIL FIX I EL0606SKI 221K
5-L13	EO-330251	COIL FIX I EL0606SKI 471K
5-L14	EO-330246	COIL FIX I EL0606SKI 560K
5-L15	EO-330241	COIL FIX I EL0606SKI 221K
5-L16	EO-318383	COIL FIX I EL07H 682J
5-L17	EO-330241	COIL FIX I EL0606SKI 221K
5-L19	EO-330240	COIL FIX I EL0606SKI 470K
5-L20	EO-330246	COIL FIX I EL0606SKI 560K
5-L21	EO-330241	COIL FIX I EL0606SKI 221K
5-L22	EO-330249	COIL FIX I EL0606SKI 8R2K
5-L23	EO-330241	COIL FIX I EL0606SKI 221K
5-L25	EO-351184	COIL FIX I EL0606SKI 821K
5-L26	EO-330249	COIL FIX I EL0606SKI 8R2K
5-L27	EO-345870	COIL FIX I EL0606SKI 150K
5-L501	EO-330244	COIL FIX I EL0606SKI 2R2K
5-L502	EO-330242	COIL FIX I EL0606SKI 390K
5-L503 to 506	EO-330249	COIL FIX I EL0606SKI 8R2K
5-L508	EO-330252	COIL FIX I EL0606SKI 101K
5-FL1	EH-324305	FILTER LC HP LCB-53
5-FL2	EH-345113	FILTER LC LP LJ25LP3.4M01
5-FL3	EH-324339	FILTER LC AP LCB-56
5-FL4	EH-348142	FILTER LC LP LJ25LP3.4M02
5-FL6	EH-324375	FILTER LC BP LCB-57 4.43MHz
5-FL7	EH-345114	FILTER BP LJ20BP 4.43MHz×0.3 4.43MC
5-FL8	EH-324398	FILTER LC LP LCB-58
5-FL9	EH-325807	FILTER LC BP LCB-61 5.06MHz
5-FL501	EH-348223	DL MS-26H H-2K
5-FL502	EH-348224	DL MS-26 (H-3K)
5-FL503	EH-348225	DL MS-19 (L-11)
5-FL504	EH-348367	FILTER LP LPF500
5-FL505	EH-348368	FILTER LP LPF1.50
5-DL1	EH-353396	DL EFD-BR124A13D
5-X1	EI-309878	OSC X'TAL 4.433619MHz
5-X2	EI-322347	OSC X'TAL 4.435571MHz
5-X501	EI-348543	OSC X'TAL HC-18/U 10.240000MHz
5-VC1	EC-346764	C S-FIX H ECR-HA020D11 4-20
5-VC2	EC-346765	C S-FIX H ECR-HA010A11 2.8-10
5-VC3	EC-346764	C S-FIX H ECR-HA020D11 4-20
5-C87	EC-200949	C EC V F05 NP SM 470M 10DC
5-C94	EC-307793	C EC V F05 NP SM 220M 10DC
5-C96	EC-332052	C EC V F05 NP SM 4R7M 35DC
5-C556	EC-200948	C EC V F05 NP SM 1R0M 50DC
5-2	EJ-352707	JACK PLATE VIDEO YKC21-5079
		CM DRIVE PC BOARD
5-TR1B	ET-208012	TR 2SD571 K
5-TR2B	ET-308472	TR 2SA1115 E,F,G
5-TR3B	ET-338424	TR 2SB941 Q,R,S
5-TR4B	ET-308472	TR 2SA1115 E,F,G
5-TR5B	ET-308141	TR 2SC2603 G

REF. NO.	PARTS NO.	DESCRIPTION
5-TR6B	ET-308472	TR 2SA1115 E,F,G
5-TR7B	ET-348948	TR 2SD1273 P,Q
5-TR8B	ET-208012	TR 2SD571 K
5-TR9B	ET-308472	TR 2SA1115 E,F,G
5-TR10B	ET-338424	TR 2SB941 Q,R,S
5-TR11B	ET-308141	TR 2SC2603 G
5-TR12B	ET-308472	TR 2SA1115 E,F,G
5-TR13B	ET-348948	TR 2SD1273 P,Q
5-D1B, 2B	ED-344280	D SILICON H GMA-01-FY2 F05
5-L1B, 2B	EO-669273	COIL FIX 2 FL5R200 180
5-FL1B, 2B	EH-330465	FILTER LC DST310-55B271M
5-R6B	ER-636401	R CB H RD 1/2W R50J

6. HIFI AUDIO PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
6-1	BA-V1039A030A	PC HIFI AUDIO BLK VS-12EG
	HIFI AUDIO PC BOARD	
6-IC2	EI-353696	IC TK15021
6-IC3	EI-345759	IC LC7530
6-IC4	EI-354640	IC BU4052B
6-IC5	EI-337360	IC UPC4082C
6-IC6	EI-337529	⚠ TA78L005AP
6-IC7	EI-318270	IC UA556PC
6-IC8	EI-353695	IC BA634
6-IC9	EI-352714	IC HA11752
6-IC10	EI-337529	⚠ IC TA78L005AP
6-IC101	EI-352715	IC AN6391S
6-IC102	EI-352717	IC LF1803
6-IC201	EI-352716	IC HA120066MP
6-TR1, 2	ET-349081	TR 2SC3383 S,T
6-TR3 to 7	ET-308141	TR 2SC2603 G
6-TR8	ET-308472	TR 2SA1115 E,F,G
6-TR9 to 19	ET-308141	TR 2SC2603 G
6-TR20, 21	ET-353734	TR FET 2SJ103, GR, BL
6-TR22, 23	ET-308141	TR 2SC2603 G
6-TR152, 153	ET-349081	TR 2SC3383 S,T
6-TR201	ET-349081	TR 2SC3383 S,T
6-D4	ED-344280	D SILICON H GMA-01-FY2 F05
6-D201 to 203	ED-344280	D SILICON H GMA-01-FY2 F05
6-VR1, 2	EV-332264	R S-FIX H EVM38G 3P 0.30W 503
6-VR152	EV-200403	R S-FIX H EVN38 3P 102
6-VR153	EV-200461	R S-FIX H EVN38 3P 103
6-VR154	EV-200403	R S-FIX H EVN38 3P 102
6-VR155	EV-200461	R S-FIX H EVN38 3P 103
6-VR157	EV-318605	R S-FIX H EVN38 3P 203
6-VR158	EV-200462	R S-FIX H EVN38 3P 503
6-L2 to 4	EO-330252	COIL FIX 1 EL0606SKI 101K
6-L5	EO-354600	COIL FIX 1 LAL02 F05
6-L6 to 8	EO-330252	COIL FIX 1 EL0606SKI 101K
6-L151	EO-345883	COIL FIX 1 EL0606SKI 151J
6-FL1	EH-352718	FILTER BP LJ25BP1.4M01-32
6-FL2	EH-352719	FILTER BP LJ25BP1.8M01-32
6-FL151	EH-352720	FILTER LP LJ15LP0.1M01-32
6-C202	EC-306438	C STY V F05 500 101J 50DC
6-2	EJ-352711	PIN J T5969 P 4P

7. LINEAR AUDIO PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
7-1	BA-V1039A140A	PC LINEAR AUDIO BLK VS-12EG
	LINEAR AUDIO PC BOARD	
7-IC1	EI-348974	IC AN6209
7-IC101	EI-353227	IC M5216L
7-IC102	EI-354780	IC HA17358
7-IC151	EI-353698	IC M50760-365P
7-IC152	EI-355743	⚠ IC TA78009AP
7-IC153	EI-337529	⚠ IC TA78L005AP
7-IC201	EI-337625	IC BA236
7-IC202	EI-200572	IC MC14053BCP
7-TR1	ET-200418	TR 2SD661 S,T,U
7-TR2	ET-308141	TR 2SC2603 G
7-TR3	ET-308472	TR 2SA1115 E,F,G
7-TR5 to 9	ET-308141	TR 2SC2603 G
7-TR10	ET-308472	⚠ TR 2SA1115 E,F,G
7-TR11, 12	ET-308141	TR 2SC2603 G
7-TR13	ET-308472	TR 2SA1115 E,F,G
7-TR14, 15	ET-200402	TR 2SD958 S,T,U
7-TR101	ET-308141	TR 2SC2603 G
7-TR102	ET-338324	TR 2SD1012-V H
7-TR151	ET-308141	TR 2SC2603 G
7-TR153	ET-354415	TR DTA144ES
7-TR154	ET-354414	TR DTC144ES
7-TR155	ET-308472	TR 2SA1115 E,F,G
7-TR156	ET-328868	TR 2SD1012-V G,H
7-TR201, 202	ET-308141	TR 2SC2603 G
7-D3 to 5	ED-344280	D SILICON H GMA-01-FY2 F05
7-D101 to 108	ED-344280	D SILICON H GMA-01-FY2 F05
7-D151 to 154	ED-344280	D SILICON H GMA-01-FY2 F05
7-D155	ED-624903	D SILICON H 1S2473
7-D156	ED-560913	D SILICON V 1S2473VE
7-D157	ED-624903	D SILICON H 1S2473
7-VR1	EV-336853	R S-FIX H KVSF807U 3P 103
7-VR2	EV-341226	R S-FIX H KVSF807V 3P 204
7-VR3	EV-336853	R S-FIX H KVSF807U 3P 103
7-VR4	EV-336854	R S-FIX H KVSF807U 3P 104
7-VR101	EV-336850	R S-FIX H KVSF807U 3P 202
7-VR102	EV-341226	R S-FIX H KVSF807V 3P 204
7-VR201	EV-356296	R S-FIX H TM64K3 3P 0.3W 154
7-VR202	EV-337950	R S-FIX H TM64K3 3P 0.30W 683
7-VR203	EV-356298	R S-FIX TM64K3 3P 0.30W 684
7-L1	EO-321254	COIL FIX 1 FL07H 562J
7-L2	EO-443722	COIL FIX 1 FL09H 102J
7-L151	EO-318398	COIL FIX 1 FL9H-26 101K
7-OSC1	EO-347791	⚠ COIL OSC 1 0512033
7-FL1	EO-348978	COIL TUN 1 PAL-682 15.625KC
7-FL2, 3	EO-348977	COIL TUN 1 070-241 70.00KC
7-R203	ER-330274	R MF H F10 1/4W 2003F
7-R215	ER-307730	R MF H F10 1/4W 7502F
7-C32	ER-347263	C MC V F05 FM 221J 500DC

8. SERVO PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
8-1	BA-V1015A130C	PC SERVO BLK VS-12EG
	SERVO PC BOARD	
8-IC1	EI-337228	IC M5218L0
8-IC2	EI-326044	IC AN6350
8-IC3	EI-354401	IC BU4066B
8-IC4	EI-200572	IC MC14053BCP
8-IC5	EI-337228	IC M5218L0
8-IC6	EI-347779	IC LA6393S
8-IC7	EI-354399	IC BU4001B
8-IC8	EI-337228	IC M5218L0
8-IC9	EI-300834	IC TC4520BP
8-IC10	EI-321604	IC AN6341N
8-IC11	EI-321605	IC DN819
8-IC12	EI-347781	IC LA6393D
8-IC13	EI-349143	IC MB88202-105G
8-IC14	EI-200572	IC MC14053BCP
8-TR1, 2	ET-308472	TR 2SA1115 E,F,G
8-TR3	ET-308141	TR 2SC2603 G
8-TR4	ET-308472	TR 2SA1115 E,F,G
8-TR5 to 20	ET-308141	TR 2SC2603 G
8-TR21	ET-308472	TR 2SA1115 E,F,G
8-TR22	ET-308141	TR 2SC2603 G
8-TR23	ET-354414	TR DTC144ES
8-D1	ED-348205	D SILICON V MC931 DOUBLE
8-D2 to 4	ED-347767	D SILICON V MC911 DOUBLE
8-D5	ED-347768	D SILICON V MC921 DOUBLE
8-D6	ED-347767	D SILICON V MC911 DOUBLE
8-D7	ED-347768	D SILICON V MC921 DOUBLE
8-D8, 9	ED-347767	D SILICON V MC911 DOUBLE
8-D10	ED-347768	D SILICON V MC921 DOUBLE
8-D11 to 13	ED-347767	D SILICON V MC911 DOUBLE
8-D14	ED-348205	D SILICON V MC931 DOUBLE
8-D15, 16	ED-347768	D SILICON V MC921 DOUBLE
8-D21 to 29	ED-344280	D SILICON H GMA-01-FY2 F05
8-D31	ED-344280	D SILICON H GMA-01-FY2 F05
8-D34 to 38	ED-344280	D SILICON H GMA-01-FY2 F05
8-D39	ED-560913	D SILICON V 1S2473VE
8-VR1	EV-307626	R S-FIX H H0621A 3P 0.30W 103
8-VR3 to 6	EV-336769	R S-FIX H H0621A 3P 0.30W 473
8-VR7, 8	EV-352255	R S-FIX H H0621A 3P 332
8-VR9	EV-307621	R S-FIX H H0651A 3P 0.05W 103
8-VR10	EV-336767	R S-FIX H H0621A 3P 0.30W 683
8-VR13	EV-336770	R S-FIX H H0651A 3P 0.05W 473
8-R20	ER-348973	R MF V 1/4W 6802F
8-R33	ER-309821	R MF V 1/4W 1303F
8-R36	ER-309821	R MF V 1/4W 1303F
8-R146	ER-309825	R MF V 1/4W 2003F

9. PRE AMP PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
9-1	BA-V1039A170A	PC PRE BLK VS-12EG
	PRE AMP PC BOARD	
9-IC1	EI-337529	⚠ IC TA78L005AP
9-IC2	EI-353690	IC AN6326N
9-IC3	EI-337964	IC BA401
9-IC4	EI-347764	IC AN6307
9-IC5	EI-307616	IC AN608P
9-TR1 to 14	ET-308141	TR 2SC2603G
9-TR16	ET-308141	TR 2SC2603 G
9-TR17	ET-308472	TR 2SA1115 E,F,G
9-TR18	ET-308141	TR 2SC2603 G
9-D1 to 3	ED-344280	D SILICON H GMA-01-FY2 F05
9-VR1	EV-523708	R S-FIX V V8K1-1 3P 501
9-VR3	EV-523708	R S-FIX V V8K1-1 3P 501
9-L1	EO-330241	COIL FIX I EL0606SKI 221K
9-L2	EO-330252	COIL FIX I EL0606SKI 101K
9-L3	EO-330250	COIL FIX I EL0606SKI 220K
9-L4	EO-330251	COIL FIX I EL0606SKI 471K
9-L5	EO-243977	COIL FIX I FL07H 102J
9-L6	EO-330255	COIL FIX I EL0606SKI 180K
9-L7, 8	EO-330249	COIL FIX I EL0606SKI 8R2K
9-L9	EO-345861	COIL FIX I EL0606SKI 3R3K
9-L10	EO-330245	COIL FIX I EL0606SKI 100K
9-L11	EO-330249	COIL FIX I EL0606SKI 8R2K
9-L12	EO-330252	COIL FIX I EL0606SKI 101K
9-L14	EO-330252	COIL FIX I EL0606SKI 101K
9-L15	EO-355688	COIL FIX I EL0607SKI 220K
9-L16	EO-330250	COIL FIX I EL0606SKI 220K
9-L17	EO-330252	COIL FIX I EL0606SKI 101K
9-L18, 19	EO-330241	COIL FIX I EL0606SKI 221K
9-L20	EO-330252	COIL FIX I EL0606SKI 101K
9-DL1	EH-322365	DL EFD-EN645A11E
9-VC1 to 4	EC-348972	C S-FIX V ECR-HB050G11

10. POWER SUPPLY AND SYSTEM CONTROL PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
10-1	BA-V1039A250A	PC POWER/SYSCON BLK VS-12EG
		POWER SUPPLY AND SYSTEM CONTROL PC BOARD
10-IC1	EI-354502	⚠ IC STR9012
10-IC2	EI-347758	⚠ IC TA78012AP
10-IC3	EI-337530	⚠ IC UPC574J
10-IC4	EI-353281	⚠ IC SI3052V
10-IC5	EI-347781	IC LA6393D
10-IC6	EI-347766	IC MBL8243M
10-IC7	EI-347760	IC M54534P
10-IC8	EI-349126	IC MB88501-147M
10-IC9	EI-337519	IC MB88301-A
10-IC10	EI-348958	IC M58981P-45
10-IC11	EI-347779	IC LA6393S
10-IC12	EI-354780	⚠ IC HA17358
10-TR1	ET-337569	TR 2SA675A E,F,H
10-TR2	ET-306719	TR 2SC2236 O,Y
10-TR3, 4	ET-308141	TR 2SC2603 G
10-TR7	ET-306719	TR 2SC2236 O,Y
10-TR8	ET-308141	TR 2SC2603 G
10-TR9	ET-344999	TR 2SD1010 R,S,T
10-TR10 to 13	ET-308141	TR 2SC2603 G
10-TR14	ET-308472	TR 2SA1115 E,F,G
10-TR15	ET-347738	TR 2SA1282A E,F
10-TR16	ET-308141	TR 2SC2603 G
10-TR17, 18	ET-347738	TR 2SA1282A E,F
10-TR19	ET-308472	TR 2SA1115 E,F,G
10-TR20	ET-308141	TR 2SC2603 G
10-TR21	ET-349592	TR 2SC3400
10-TR22	ET-337194	⚠ TR 2SB761 Q,R
10-D1	ED-337618	⚠ D SILICON DS135E-FB6 100/1.0A
10-D2, 3	ED-344280	D SILICON H GMA-01-FY2 F05
10-D4	ED-350748	⚠ D SILICON DBA60C-K15
10-D5	ED-322238	⚠ D SILICON 1B4B41 100/1.0A
10-D6	ED-337618	⚠ D SILICON DS135E-FB6 100/1.0A
10-D7 to 10	ED-344280	D SILICON H GMA-01-FY2 F05
10-D11	ED-346622	D ZENER H HZ30 1
10-D12 to 16	ED-344280	D SILICON H GMA-01-FY2 F05
10-D19	ED-344280	D SILICON H GMA-01-FY2 F05
10-D26	ED-624903	D SILICON H 1S2473
10-D27	ED-346603	⚠ D ZENER H HZ6 A1
10-D28, 29	ED-624903	D SILICON H 1S2473
10-TH1, 2	EX-330533	⚠ POSISTER PTH61G04BD3R3N
10-X1	EI-347434	OSC X'TAL HC-18/U 4.194304MHz
10-X2	EI-330256	OSC CE F85-006 4MHz
10-SF5 to 8	EF-346880	⚠ FUSE ICP-F15 150V 0.6A
10-IB1	EH-348961	COMP R RKC1/8B11D 103J
10-IB2	EH-348962	COMP R RKC1/8B5D 103J
10-IB3	EH-348963	COMP R M-3739
10-R44	ER-337563	R MF H F10 1/4W 4751F
10-R45	ER-353105	R MF V 1/4W 2371F
10-R46	ER-353106	R MF V 1/4W 2351F
10-R75	ER-346164	R MF H F10 1/4W 7500F
10-R76	ER-309815	R MF V 1/4W 1202F
10-R92	ER-314603	R MF V 1/4W 3001F
10-R93	ER-341607	R MF H F10 1/4W 1802F
10-C9	EC-201638	C EC V CUT SM 331M 63.0DC
10-C50	EC-345111	C TT V EF 1R5M 50DC
10-BU1	EY-348960	BUZZER PKM24-4A0
10-BT1	AV-349310	BATTERY PACK 4.8V 60MA-415
10-F1	EF-690996	⚠ FUSE SEMKO T 250V 4.00A
10-F2	EF-601301	⚠ FUSE SEMKO T 250V 2.00A
10-F3	EF-601942	⚠ FUSE SEMKO T 250V 0.63A
10-F4	EF-668474	⚠ FUSE SEMKO T 250V 0.40A

11. MECHA DRIVE PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
11-1	BA-V1017A200E	PC MECHA DRIVE BLK VS-8EG
		MECHA DRIVE PC BOARD
11-IC1	EI-347766	IC MBL8243M
11-IC2	EI-347769	IC M54514AP
11-IC3	EI-337503	IC M54532P
11-IC4 to 6	EI-330352	IC BA6109
11-TR1 to 3	ET-346806	TR 2SA1309 Q,R,S
11-TR4	ET-351858	TR 2SC3311 Q,R,S
11-TR6	ET-351858	TR 2SC3311 Q,R,S
11-TR7	ET-347738	TR 2SA1282A E,F
11-TR8,9	ET-346806	TR 2SA1309 Q,R,S
11-TR10	ET-351858	TR 2SC3311 Q,R,S
11-TR11,12	ET-352406	TR 2SD661 R,S,T,U
11-TR13	ET-346806	TR 2SA1309 Q,R,S
11-D1,2	ED-624903	D SILICON H 1S2473
11-D3	ED-344280	D SILICON H GMA-01-FY2 F05
11-D4	ED-624903	D SILICON H 1S2473
11-D5	ED-347899	D ZENER H HZ 20CP
11-D6	ED-624903	D SILICON H 1S2473
11-D7 to 9	ED-344280	D SILICON H GMA-01-FY2 F05
11-D10	ED-346595	D ZENER H HZ3 C2
11-D11,14	ED-344280	D SILICON H GMA-01-FY2 F05
11-D15	ED-624903	D SILICON H 1S2473
11-D16	ED-346604	D ZENER H HZ7 B2
11-D17	ED-624903	D SILICON H 1S2473
11-D18	ED-344280	D SILICON H GMA-01-FY2 F05
11-D21 to 23	ED-344280	D SILICON H GMA-01-FY2 F05
11-D24	ED-349816	D ZENER H MA1056-H
11-D25,26	ED-344280	D SILICON H GMA-01-FY2 F05
11-D28	ED-344280	D SILICON H GMA-01-FY2 F05
11-D29,30	ED-301911	D SILICON H DS448
11-IB1	EH-347735	COMP R M-3724
11-TH1	EX-330533	POSISTER PTH61G04BD3R3N
11-R12	ER-343989	R MF H F05 1/6W 1001F
11-R34	ER-306127	R CB H S15 FS RDS 1/2W 681J
11-R36	ER-349151	R CT P SNP 7W 220K

12. OPERATION PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
12-1EG	BA-V1015A060H	PC OPERATION BLK VS-12EG
12-1EK	BA-V1015A060J	PC OPERATION BLK VS-12EK
		OPERATION PC BOARD
12-IC2	EI-347773	IC MB88303M
12-IC3	EI-349121	IC MB88401-233K
12-IC4	EI-348897	IC M51014L
12-TR1 to 4	ET-336845	TR 2SB641 Q,R,S,T
12-TR5	ET-348898	TR FET 2SJ40 C,D,E
12-D1 to 8	ED-624903	D SILICON H 1S2473
12-D9	ED-523427	D SILICON H 1SS16
12-D12	ED-347776	D LED BG5608S GRN
12-D13	ED-249377	D LED GL3AR1 RED
12-D14	ED-347776	D LED BG5608S GRN
12-D15	ED-347777	D LED BR5628S RED
12-D16	ED-249377	D LED GL3AR1 RED
12-D17,18	ED-347777	D LED BR5628S RED
12-D19	ED-283138	D LED GL3PG1 GRN
12-D20 to 22	ED-249377	D LED GL3AR1 RED
12-D24	ED-249377	D LED GL3AR1 RED
12-D25	ED-351202	D PHOTO PN313 AK
12-D28	ED-624903	D SILICON H 1S2473
12-SW1 to 23	ES-347755	SW TACT EVQ-QSE05T
12-SW26,27	ES-347755	SW TACT EVQ-QSE05T
12-VR1	EV-330212	R S-FIX H H0651A 3P 0.05W 152
12-X1	EI-349372	OSC CE CSA4.000MG 4MHz
12-SF1	EF-347968	⚠ FUSE ICP-F10 150V 0.4A
12-IB1	EH-347736	COMP R RKC1/8B15 4.7K J
12-IB2	EH-347737	COMP R RKC1/8 B16 4.7K J
12-2	VT-327212	FILTER PLATE
		LED PC BOARD
12-D11	ED-348462	D LEC SL2221T GRN

13. DEMODULATOR PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
13-1EG	BA-V1037A260A	PC DE-MODULATOR BLK VS-6EG (EG)
13-1EK	BA-V1037A260B	PC DE-MODULATOR BLK VS-6EK (EK)
	DEMODULATOR PC BOARD	
13-2EG	EE-345115	TV TUNER CDE1-A04 (EG)
13-2EK	EE-345116	TV TUNER CBE1-013
13-IC1	EI-705494	IC TA7607AP
13-IC2	EI-749828	IC UPC1391H
13-IC3	EI-749829	IC M54573L (EG)
13-Q1	ET-742646	TR 2SC388A
13-Q2 to 4	ET-308141	TR 2SC2603 G
13-Q5	ET-522270	TR 2SC1210 D
13-Q6	ET-308472	TR 2SA1115 E,F,G
13-Q7	ET-308141	TR 2SC2603 G
13-Q8	ET-308472	TR 2SA1115 E,F,G
13-Q9 to 11	ET-308141	TR 2SC2603 G
13-Q13	ET-308141	TR 2SC2603 G
13-Q14,15	ET-711091	TR DTC124F (E,G)
13-D1	ED-604541	D SILICON H 1S2076
13-D2,3	ED-604541	D SILICON H 1S2076 (E,G)
13-D4	ED-742520	D VARACTOR ISV70-09
13-D5 to 7	ED-604541	D SILICON H 1S2076
13-VR1	EV-749777	R S-FIX 502
13-VR2	EV-749777	R S-FIX 502 (EG)
13-VR3	EV-702567	R S-FIX TT24R 202
13-VR4	EV-702569	R S-FIX TT24R 103B
13-L1	EO-707836	COIL FIX T 144LZ 0.39μH K
13-L2EG	EO-742653	COIL RF 144LY 2.0μH K
13-L2EK	EO-742654	COIL RF 144LY 2.2μH K
13-L3	EO-749830	COIL RF 199KNAS-12593Z
13-L4	EO-742574	COIL RF P320190
13-L5	EO-705491	COIL TKXNS-279789NK
13-L6	EO-749833	COIL FIX LRL06 820K
13-L7EG	EO-749836	COIL FIX LRL06 100K (EG)
13-L7EK	EO-749834	COIL FIX LRL06 120K (EK)
13-L8	EO-749834	COIL FIX LRL06 120K
13-L10EG	EO-749834	COIL FIX LRL06 120K
13-L10EK	EO-749836	COIL FIX LRL06 100K
13-CF1EG	EH-742662	FILTER SAW SAF38.9MZ51Z
13-CF1EK	EH-742663	FILTER SAW SAF39.5MZ51Z
13-CF2EG	EH-705499	FILTER CE SFE 5.5MHz
13-CF2EK	EH-749840	FILTER CE TPS 6.0MD
13-CF3EG	EH-705499	FILTER CE SFE 5.5MHz
13-CF3EK	EH-705500	FILTER CE SFE 6MHz
13-CF4EG	EH-749841	FILTER CE 5.5MC19A
13-CF4EK	EH-749842	FILTER CE 6.0MC19A
13-R36	ER-713146	R CB H 1/2W 151J
13-R44	ER-742497	⚠ R FUSE 1/4W 220J
13-R54,55	ER-749775	R MF RNL 1/4W 4751F
13-R56	ER-749776	R MF RNL 1/4W 2401F
13-R62	ER-742497	⚠ R FUSE 1/4W 220J
13-R63	ER-701259	⚠ R FUSE SB 1/4W 100J
13-C20	EC-749821	C TT R47M 35V
13-C28	EC-749822	C EC 102M 10V
13-C33	EC-749823	C PP 1H 153J 50DC
13-C39	EC-749824	C PP 1H 683K 50DC
13-C41 to 44	EC-749825	C PP 1H 683J 50DC
13-C45	EC-749826	C TT R68M 35V

14. BAR METER PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
14-1	EM-352692	IND LE LT-1127 GRAPH
14-D1	ED-352722	D LED LD-101VR RED
14-D2	ED-352723	D LED LD-603MG GRN
14-SW1,2	ES-347755	SW TACT EVQ-QSE05T

15. AV PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
15-J902	EJ-349350	DIN J TCS1661-01-0101 P 6P

16. PHONE JACK BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
16-SW1	ES-354896	SW SLIDE 00230107 02-3 N
16-SW2	ES-352694	SW-SLIDE 00240944
16-J1	EJ-353031	PHONE J 3P HLJ0520-010

17. POWER FILTER PC BOARD BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
17-F901	EF-623103	⚠ FUSE SEMKO T 250V 1.00A
17-C901	EC-338411	⚠ C CE V FZ 103P 400AC

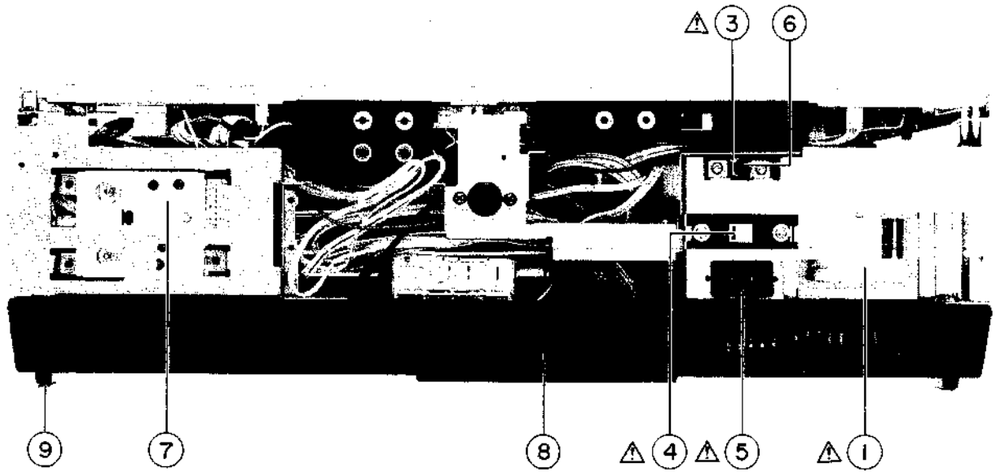
REMOTE CONTROL TRANSMITTER RC-T12

REF. NO.	PARTS NO.	DESCRIPTION
1-1	AV-352701	REMO. CON TRANSMITTER RC-T12-E (ENGLISH) (STANDARD COLOR)
1-1B	AV-354209	REMO. CON TRANSMITTER RC-T12-EB (ENGLISH) (BLACK)
1-2	AX-710025	COVER BATTERY RC-90T (STANDARD COLOR)
1-2B	AV-713375	COVER BATTERY B (BLACK)
1-3	AV-713368	RUBBER BUTTON SHEET CONTACT-ENGLISH (STANDARD COLOR)
1-3B	AV-713371	RUBBER BUTTON SHEET CONTACT-B-ENGLISH (BLACK)
1-4	AV-749979	TERMINAL BATTERY A(+)
1-5	AV-749980	TERMINAL BATTERY B(-)
1-6	AV-749981	TERMINAL BATTERY C
1-IC1	EI-749983	IC UPD1943G
1-X1	EI-749984	OSC CE KBR455BAT
1-TR1	ET-318604	TR 2SD545NP E,F
1-D1,2	ED-557447	D SILICON H 1SI588
1-D3,4	ED-710035	D LED TLN105
1-D5	ED-780019	D LED SEL1123W

INDEX

NO.	REF. NO.	PARTS NO.	REF. NO.	PARTS NO.	REF. NO.
5	13-C41	ED-344280	10-D14	ED-624903	12-D1
5	13-C42	ED-344280	10-D15	ED-624903	12-D3
5	13-C43	ED-344280	10-D16	ED-624903	12-D4
5	13-C44	ED-344280	10-D19	ED-624903	12-D5
6	13-C45	ED-344280	11-D3	ED-624903	12-D6
7	12-D20	ED-344280	11-D7	ED-624903	12-D7
7	12-D21	ED-344280	11-D8	ED-624903	12-D8
7	12-D22	ED-344280	11-D9	ED-742520	13-D4
7	12-D24	ED-344280	11-D11	EE-345115	13-2EG
7	12-D13	ED-344280	11-D14	EE-345116	13-2EK
7	12-D16	ED-344280	11-D18	EF-346880	10-SF5
8	12-D19	ED-344280	11-D21	EF-346880	10-SF6
1	5-D15	ED-344280	11-D22	EF-346880	10-SF7
1	5-D506	ED-344280	11-D23	EF-346880	10-SF8
1	11-D29	ED-344280	11-D25	EF-347968	12-SF1
1	11-D30	ED-344280	11-D26	EF-601301	10-F2
8	10-D5	ED-344280	11-D28	EF-601942	10-F3
8	10-D1	ED-346595	11-D10	EF-623103	17-P901
8	10-D6	ED-346603	10-D27	EF-668474	10-F4
0	5-D8	ED-346604	11-D16	EF-690996	10-F1
0	5-D9	ED-346609	5-D505	EH-322365	9-DL1
0	5-D11	ED-346622	10-D11	EH-324305	5-FL1
0	5-D12	ED-347767	8-D6	EH-324339	5-FL3
0	5-D13	ED-347767	8-D8	EH-324375	5-FL6
0	5-D14	ED-347767	8-D9	EH-324398	5-FL8
0	5-D17	ED-347767	8-D4	EH-325807	5-FL9
0	5-D19	ED-347767	8-D11	EH-330465	5-FL1B
0	5-D501	ED-347767	8-D12	EH-330465	5-FL2B
0	5-D502	ED-347767	8-D13	EH-345113	5-FL2
0	5-D503	ED-347767	8-D2	EH-345114	5-FL7
0	5-D504	ED-347767	8-D3	EH-347735	11-IB1
0	5-D2B	ED-347768	5-WD1	EH-347736	12-IB1
0	5-D1B	ED-347768	5-WD2	EH-347737	12-IB2
0	5-D1	ED-347768	5-WD3	EH-348142	5-FL4
0	5-D2	ED-347768	5-WD4	EH-348223	5-FL501
0	6-D4	ED-347768	8-D15	EH-348224	5-FL502
0	6-D201	ED-347768	8-D16	EH-348225	5-FL503
0	6-D202	ED-347768	8-D5	EH-348367	5-FL504
0	6-D203	ED-347768	8-D10	EH-348368	5-FL505
0	7-D151	ED-347768	8-D7	EH-348961	10-IB1
0	7-D4	ED-347776	12-D12	EH-348962	10-IB2
0	7-D108	ED-347776	12-D14	EH-348963	10-IB3
0	7-D102	ED-347777	12-D18	EH-352718	6-FL1
0	7-D153	ED-347777	12-D15	EH-352719	6-FL2
0	7-D154	ED-347777	12-D17	EH-352720	6-FL151
0	7-D107	ED-347899	11-D5	EH-353396	5-DL1
0	7-D5	ED-348205	8-D14	EH-705499	13-CF2EG
0	7-D103	ED-348205	8-D1	EH-705499	13-CF3EG
0	7-D104	ED-348462	12-D11	EH-705500	13-CF3EK
0	7-D105	ED-349816	11-D24	EH-742662	13-CF1EG
0	7-D101	ED-350748	10-D4	EH-742663	13-F1EK
0	7-D3	ED-351202	12-D25	EH-749840	13-CF2EK
0	7-D106	ED-352722	14-D1	EH-749841	13-CF4EG
0	7-D152	ED-352723	14-D2	EH-749842	13-CF4EK
0	8-D23	ED-523427	5-D7	EI-200572	7-IC202
0	8-D28	ED-523427	5-D6	EI-200572	8-IC14
0	8-D29	ED-523427	5-D3	EI-200572	8-IC4
0	8-D31	ED-523427	5-D4	EI-300834	8-IC9
0	8-D24	ED-523427	12-D9	EI-307616	5-IC507
0	8-D34	ED-560913	7-D156	EI-307616	5-IC509
0	8-D25	ED-560913	8-D39	EI-307616	5-IC515
0	8-D22	ED-604541	13-D1	EI-307616	9-IC5
0	8-D35	ED-604541	13-D2	EI-309878	5-X1
0	8-D36	ED-604541	13-D3	EI-310038	5-IC9
0	8-D37	ED-604541	13-D5	EI-318270	6-IC7
0	8-D26	ED-604541	13-D6	EI-321604	8-IC10
0	8-D21	ED-604541	13-D7	EI-321605	8-IC11
0	8-D38	ED-624903	7-D155	EI-322309	5-IC2
0	8-D27	ED-624903	7-D157	EI-322347	5-X2
0	9-D1	ED-624903	10-D26	EI-324151	5-IC3
0	9-D2	ED-624903	10-D28	EI-324160	5-IC4
0	9-D3	ED-624903	10-D29	EI-324182	5-IC5
0	10-D2	ED-624903	11-D1	EI-324203	5-IC6
0	10-D3	ED-624903	11-D2	EI-324204	5-IC1
0	10-D7	ED-624903	11-D4	EI-326044	8-IC2
0	10-D8	ED-624903	11-D6	EI-328593	5-IC7
0	10-D9	ED-624903	11-D15	EI-330256	10-X2
0	10-D10	ED-624903	11-D17	EI-330352	11-IC4
0	10-D12	ED-624903	12-D28	EI-330352	11-IC5
0	10-D13	ED-624903	12-D2	EI-330352	11-IC6

POWER AND RF BLOCK

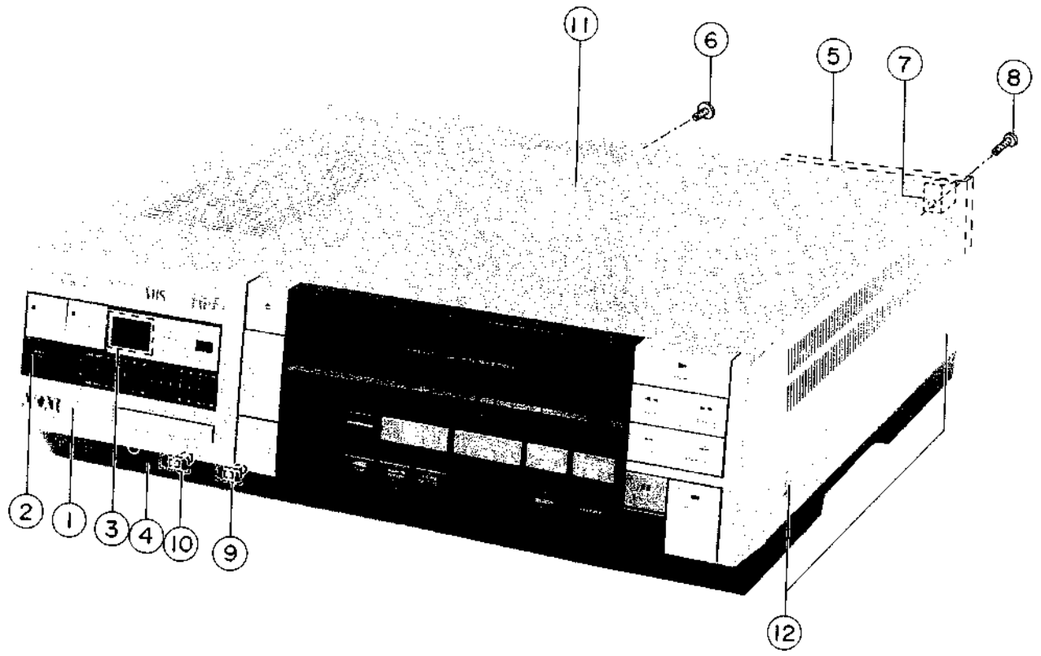


18. POWER AND RF BLOCK

REF. NO	PARTS NO.	DESCRIPTION
18-1EG	BT-354503	⚠ TRANS POWER VS-12-1
18-1EK	BT-354518	⚠ TRANS POWER VS-12-2
18-2x	ZS-313796	ST BID40 x 06STL CMT
18-3	ES-347911	⚠ SW PUSH ESB-8213V 01-1
18-4	ES-309312	⚠ SW SLIDE 00220481 02-2
18-5	EJ-301513	⚠ SOCKET INLET S-16453 E 2P
18-6	SK-531235	KNOB PUSH SW
18-7EG	BV-353839	RF CONVERTOR MDL6-023 (EG)
*18-7EK-B	BV-345125	RF MODULATOR MIW3-253 (EK-B) (OLD)
18-7EK	BV-353840	RF CONVERTOR MIL6-023 (EK, EK-B) (NEW)
18-8	SP-343189	HOLDER BATTERY
18-9	SA-345057	RUBBER FOOT

NOTE:
*18-7EK-B: Due to the change, EK-B model after SERIAL NO.90650 are employed new parts.

FINAL ASSEMBLY BLOCK



19. FINAL ASSEMBLY BLOCK

REF. NO.	PARTS NO.	DESCRIPTION
19-1EG	BD-B353085A	PANEL FRNOT VS-12EG PART
19-1EK	BD-B353085B	PANEL FRONT VS-12EK PART
19-1EKB	BD-B353085H	PANEL FRONT VS-12EK-B PART
19-2	SE-353088	WINDOW BAR METER (ENGLISH)
19-2B	SE-353088F	WINDOW BAR METER EK-B
19-3	SE-353090	WINDOW REMO. CON.
19-4	SE-353083A	MASK PHONE JACK(ENGLISH)
19-5EG	SP-353341L	PANEL REAR VA-12EG
19-5EK	SP-353341M	PANEL REAR VS-12EK
19-6	ZS-447840	T2BR30 x 08STL CMT
19-7	SA-345059	FOOT
19-8	ZS-462802	T2BR30 x 15STL CMT
19-9	SE-353082A	MASK SLIDE SWITCH (A) (MASK AUDIO SELECTOR SW)
19-10	SE-353082B	MASK SLIDE SWITCH (B) (MASK INPUT SELECTOR SW)
19-11	SP-345054D	COVER UPPER(B)
19-11B	SP-345054G	COVER UPPER EK-B
19-12	ZS-321783	ST BID40 x 10STL NI3
19-13xEG	EW-347673	⚠ AC CORD 2 CORES SP22-12460/CEE
19-13xEK	EW-302995	⚠ AC CORD 2 CORES VM0112/OCFL B
19-14x	EW-348414	CORD PAL (AERIAL CABLE)

SYMBOL FOR COLOR VARIATION
NON: STANDARD COLOR
B : BLACK

VS-12EG/EK

PARTS NO.	REF. NO.	PARTS NO.	REF. NO.	PARTS NO.	REF. NO.	PARTS NO.	REF. NO
AV-349310	10-BT1	EC-749825	13-C41	ED-344280	10-D14	ED-624903	12-D1
BA-M3202A020A	1-27	EC-749825	13-C42	ED-344280	10-D15	ED-624903	12-D3
BA-V1015A060H	12-1EG	EC-749825	13-C43	ED-344280	10-D16	ED-624903	12-D4
BA-V1015A060J	12-1EK	EC-749825	13-C44	ED-344280	10-D19	ED-624903	12-D5
BA-V1015A130C	8-1	EC-749826	13-C45	ED-344280	11-D3	ED-624903	12-D6
BA-V1015A150H	5-1EG	ED-249377	12-D20	ED-344280	11-D7	ED-624903	12-D7
BA-V1015A150J	5-1EK	ED-249377	12-D21	ED-344280	11-D8	ED-624903	12-D8
BA-V1017A200E	11-1	ED-249377	12-D22	ED-344280	11-D9	ED-742520	13-D4
BA-V1037A260A	13-1EG	ED-249377	12-D24	ED-344280	11-D11	EE-345115	13-2EG
BA-V1037A260B	13-1EK	ED-249377	12-D13	ED-344280	11-D14	EE-345116	13-2EK
BA-V1039A030A	6-1	ED-249377	12-D16	ED-344280	11-D18	EF-346880	10-SF5
BA-V1039A140A	7-1	ED-283138	12-D19	ED-344280	11-D21	EF-346880	10-SF6
BA-V1039A170A	9-1	ED-301911	5-D15	ED-344280	11-D22	EF-346880	10-SF7
BA-V1039A250A	10-1	ED-301911	5-D506	ED-344280	11-D23	EF-346880	10-SF8
BB-V1015A200A	2-1	ED-301911	11-D29	ED-344280	11-D25	EF-347968	12-SF1
BD-B353085A	19-1EG	ED-301911	11-D30	ED-344280	11-D26	EF-601301	10-F2
BD-B353085B	19-1EK	ED-322238	10-D5	ED-344280	11-D28	EF-601942	10-F3
BD-B353085H	19-1EKB	ED-337618	10-D1	ED-346595	11-D10	EF-623103	17-F901
BL-B322027	2-33	ED-337618	10-D6	ED-346603	10-D27	EF-668474	10-F4
BL-B322090	2-31	ED-344280	5-D8	ED-346604	11-D16	EF-690996	10-F1
BL-B326220	2-55	ED-344280	5-D9	ED-346609	5-D505	EH-322365	9-DL1
BL-B326296	2-3	ED-344280	5-D11	ED-346622	10-D11	EH-324305	5-FL1
BL-B326453	3-5	ED-344280	5-D12	ED-347767	8-D6	EH-324339	5-FL3
BL-B326455	3-4	ED-344280	5-D13	ED-347767	8-D8	EH-324375	5-FL6
BL-B326464	3-9	ED-344280	5-D14	ED-347767	8-D9	EH-324398	5-FL8
BL-B326468	2-16	ED-344280	5-D17	ED-347767	8-D4	EH-325807	5-FL9
BL-B348098	2-14	ED-344280	5-D19	ED-347767	8-D11	EH-330465	5-FL1B
BL-B348989	2-8	ED-344280	5-D501	ED-347767	8-D12	EH-330465	5-FL2B
BL-B604437	3-20	ED-344280	5-D502	ED-347767	8-D13	EH-345113	5-FL2
BL-V1004A090A	2-37	ED-344280	5-D503	ED-347767	8-D2	EH-345114	5-FL7
BL-V1004A100A	2-38	ED-344280	5-D504	ED-347767	8-D3	EH-347735	11-IB1
BL-V1004A120A	2-42	ED-344280	5-D2B	ED-347768	5-WD1	EH-347736	12-IB1
BL-V1004A130A	2-43	ED-344280	5-D1B	ED-347768	5-WD2	EH-347737	12-IB2
BL-V1004A140A	2-44	ED-344280	5-D1	ED-347768	5-WD3	EH-348142	5-FL4
BL-V1004A170B	2-52	ED-344280	5-D2	ED-347768	5-WD4	EH-348223	5-FL501
BL-V1017A140A	1-18	ED-344280	6-D4	ED-347768	8-D15	EH-348224	5-FL502
BL-780030	3-41	ED-344280	6-D201	ED-347768	8-D16	EH-348225	5-FL503
BL-780031	3-42	ED-344280	6-D202	ED-347768	8-D5	EH-348367	5-FL504
BL-780033	3-30	ED-344280	6-D203	ED-347768	8-D10	EH-348368	5-FL505
BL-780034	3-31	ED-344280	7-D151	ED-347768	8-D7	EH-348961	10-IB1
BM-B344824	1-26	ED-344280	7-D4	ED-347776	12-D12	EH-348962	10-IB2
BM-345265	3-3	ED-344280	7-D108	ED-347776	12-D14	EH-348963	10-IB3
BM-348088	4-2	ED-344280	7-D102	ED-347777	12-D18	EH-352718	6-FL1
BM-352233	2-51	ED-344280	7-D153	ED-347777	12-D15	EH-352719	6-FL2
BM-749896	3-35	ED-344280	7-D154	ED-347777	12-D17	EH-352720	6-FL151
BR-347731	2-47	ED-344280	7-D107	ED-347899	11-D5	EH-353396	5-DL1
BR-347732	2-48	ED-344280	7-D5	ED-348205	8-D14	EH-705499	13-CF2EG
BT-354503	18-1EG	ED-344280	7-D103	ED-348205	8-D1	EH-705499	13-CF3EG
BT-354518	18-1EK	ED-344280	7-D104	ED-348462	12-D11	EH-705500	13-CF3EK
BV-V1004A220A	3-23	ED-344280	7-D105	ED-349816	11-D24	EH-742662	13-CF1EG
BV-V1009A320A	2-7	ED-344280	7-D101	ED-350748	10-D4	EH-742663	13-F1EK
BV-V1017A250A	3-28	ED-344280	7-D3	ED-351202	12-D25	EH-749840	13-CF2EK
BV-V1039A110A	1-3	ED-344280	7-D106	ED-352722	14-D1	EH-749841	13-CF4EG
BV-V1039A120A	1-2	ED-344280	7-D152	ED-352723	14-D2	EH-749842	13-CF4EK
BV-V9009A010A	1-1	ED-344280	8-D23	ED-523427	5-D7	EI-200572	7-IC202
BV-327815	3-11	ED-344280	8-D28	ED-523427	5-D6	EI-200572	8-IC14
BV-345125	18-7EK-B	ED-344280	8-D29	ED-523427	5-D3	EI-200572	8-IC4
BV-352356	4-1	ED-344280	8-D31	ED-523427	5-D4	EI-300834	8-IC9
BV-353839	18-7EG	ED-344280	8-D24	ED-523427	12-D9	EI-307616	5-IC507
BV-353840	18-7EK	ED-344280	8-D34	ED-560913	7-D156	EI-307616	5-IC509
EC-200948	5-C556	ED-344280	8-D25	ED-560913	8-D39	EI-307616	5-IC515
EC-200949	5-C87	ED-344280	8-D22	ED-604541	13-D1	EI-307616	9-IC5
EC-201638	10-C9	ED-344280	8-D35	ED-604541	13-D2	EI-309878	5-X1
EC-306438	6-C202	ED-344280	8-D36	ED-604541	13-D3	EI-310038	5-IC9
EC-307793	5-C94	ED-344280	8-D37	ED-604541	13-D5	EI-318270	6-IC7
EC-332052	5-C96	ED-344280	8-D26	ED-604541	13-D6	EI-321604	8-IC10
EC-338411	17-C901	ED-344280	8-D21	ED-604541	13-D7	EI-321605	8-IC11
EC-345111	10-C50	ED-344280	8-D38	ED-624903	7-D155	EI-322309	5-IC2
EC-346764	5-VC1	ED-344280	8-D27	ED-624903	7-D157	EI-322347	5-X2
EC-346764	5-VC3	ED-344280	9-D1	ED-624903	10-D26	EI-324151	5-IC3
EC-346765	5-VC2	ED-344280	9-D2	ED-624903	10-D28	EI-324160	5-IC4
EC-347263	7-C32	ED-344280	9-D3	ED-624903	10-D29	EI-324182	5-IC5
EC-348972	9-VC1	ED-344280	10-D2	ED-624903	11-D1	EI-324203	5-IC6
EC-348972	9-VC2	ED-344280	10-D3	ED-624903	11-D2	EI-324204	5-IC1
EC-348972	9-VC4	ED-344280	10-D7	ED-624903	11-D4	EI-326044	8-IC2
EC-348972	9-VC3	ED-344280	10-D8	ED-624903	11-D6	EI-328593	5-IC7
EC-749821	13-C20	ED-344280	10-D9	ED-624903	11-D15	EI-330256	10-X2
EC-749822	13-C28	ED-344280	10-D10	ED-624903	11-D17	EI-330352	11-IC4
EC-749823	13-C33	ED-344280	10-D12	ED-624903	12-D28	EI-330352	11-IC5
EC-749824	13-C39	ED-344280	10-D13	ED-624903	12-D2	EI-330352	11-IC6

VS-12EG/EK

PARTS NO.	REF. NO.	PARTS NO.	REF. NO.	PARTS NO.	REF. NO.	PARTS NO.	REF. NO.
EI-330392	5-IC505	EO-330240	5-L1	ER-307730	7-R215	ET-308141	5-TR7
EI-337228	8-IC5	EO-330240	5-L19	ER-309815	10-R76	ET-308141	5-TR10
EI-337228	8-IC1	EO-330241	5-L2	ER-309821	8-R36	ET-308141	5-TR12
EI-337228	8-IC8	EO-330241	5-L6	ER-309821	8-R33	ET-308141	5-TR13
EI-337360	6-IC5	EO-330241	5-L7	ER-309825	8-R146	ET-308141	5-TR15
EI-337503	11-IC3	EO-330241	5-L11	ER-314603	10-R92	ET-308141	5-TR16
EI-337519	10-IC9	EO-330241	5-L12	ER-330274	7-R203	ET-308141	5-TR17
EI-337529	5-IC511	EO-330241	5-L15	ER-333586	1-R12	ET-308141	5-TR18
EI-337529	6-IC6	EO-330241	5-L17	ER-337563	10-R44	ET-308141	5-TR22
EI-337529	6-IC10	EO-330241	5-L21	ER-341607	10-R93	ET-308141	5-TR23
EI-337529	7-IC153	EO-330241	5-L23	ER-343989	11-R12	ET-308141	5-TR25
EI-337529	9-IC1	EO-330241	5-L24	ER-346164	10-R75	ET-308141	5-TR29
EI-337530	10-IC3	EO-330241	9-L1	ER-348973	8-R20	ET-308141	7-TR202
EI-337625	7-IC201	EO-330241	9-L19	ER-349151	11-R36	ET-308141	7-TR7
EI-337964	9-IC3	EO-330241	9-L18	ER-353105	10-R45	ET-308141	7-TR201
EI-341516	5-IC506	EO-330242	5-L502	ER-353106	10-R46	ET-308141	7-TR12
EI-341516	5-IC508	EO-330244	5-L501	ER-636401	5-R6B	ET-308141	7-TR2
EI-344921	1-IC1	EO-330245	9-L10	ER-701259	13-R63	ET-308141	7-TR5
EI-345759	6-IC3	EO-330246	5-L10	ER-713146	13-R36	ET-308141	7-TR9
EI-347434	10-X1	EO-330246	5-L14	ER-742497	13-R44	ET-308141	7-TR151
EI-347733	2-61	EO-330246	5-L20	ER-742497	13-R62	ET-308141	7-TR8
EI-347733	2-62	EO-330248	5-L4	ER-749775	13-R54	ET-308141	8-TR19
EI-347758	10-IC2	EO-330248	5-L5	ER-749775	13-R55	ET-308141	8-TR6
EI-347760	10-IC7	EO-330249	5-L3	ER-749776	13-R56	ET-308141	8-TR8
EI-347764	9-IC4	EO-330249	5-L22	ES-309312	18-4	ET-308141	8-TR3
EI-347766	10-IC6	EO-330249	5-L26	ES-318284	3-25	ET-308141	8-TR7
EI-347766	11-IC1	EO-330249	5-L503	ES-318284	3-27	ET-308141	8-TR5
EI-347769	11-IC2	EO-330249	5-L504	ES-332384	3-26	ET-308141	8-TR12
EI-347773	12-IC2	EO-330249	5-L506	ES-347755	12-SW1	ET-308141	8-TR9
EI-347779	8-IC6	EO-330249	5-L505	ES-347755	12-SW2	ET-308141	8-TR15
EI-347779	10-IC11	EO-330249	9-L7	ES-347755	12-SW3	ET-308141	8-TR20
EI-347781	5-IC10	EO-330249	9-L11	ES-347755	12-SW4	ET-308141	8-TR22
EI-347781	8-IC12	EO-330249	9-L8	ES-347755	12-SW5	ET-308141	8-TR18
EI-347781	10-IC5	EO-330250	9-L3	ES-347755	12-SW6	ET-308141	8-TR13
EI-348220	5-IC501	EO-330250	9-L16	ES-347755	12-SW7	ET-308141	8-TR11
EI-348222	5-IC514	EO-330251	5-L13	ES-347755	12-SW8	ET-308141	8-TR10
EI-348222	5-IC512	EO-330251	9-L4	ES-347755	12-SW9	ET-308141	8-TR17
EI-348229	5-IC503	EO-330252	5-L508	ES-347755	12-SW10	ET-308141	8-TR14
EI-348229	5-IC510	EO-330252	6-L2	ES-347755	12-SW11	ET-308141	8-TR16
EI-348543	5-X501	EO-330252	6-L3	ES-347755	12-SW12	ET-308141	9-TR18
EI-348897	12-IC4	EO-330252	6-L4	ES-347755	12-SW13	ET-308141	9-TR6
EI-348958	10-IC10	EO-330252	6-L6	ES-347755	12-SW14	ET-308141	9-TR8
EI-348974	7-IC1	EO-330252	6-L8	ES-347755	12-SW15	ET-308141	9-TR12
EI-349121	12-IC3	EO-330252	6-L7	ES-347755	12-SW16	ET-308141	9-TR13
EI-349126	10-IC8	EO-330252	9-L14	ES-347755	12-SW17	ET-308141	9-TR1
EI-349143	8-IC13	EO-330252	9-L2	ES-347755	12-SW18	ET-308141	9-TR3
EI-349372	12-X1	EO-330252	9-L12	ES-347755	12-SW19	ET-308141	9-TR11
EI-352714	6-IC9	EO-330252	9-L20	ES-347755	12-SW20	ET-308141	9-TR16
EI-352715	6-IC101	EO-330252	9-L17	ES-347755	12-SW21	ET-308141	9-TR14
EI-352716	6-IC201	EO-330255	9-L6	ES-347755	12-SW22	ET-308141	9-TR10
EI-352717	6-IC102	EO-345861	9-L9	ES-347755	12-SW23	ET-308141	9-TR2
EI-353227	7-IC101	EO-345867	5-L9	ES-347755	12-SW26	ET-308141	9-TR4
EI-353281	10-IC4	EO-345870	5-L27	ES-347755	12-SW27	ET-308141	9-TR9
EI-353690	9-IC2	EO-345883	6-L151	ES-347755	14-SW1	ET-308141	9-TR5
EI-353695	6-IC8	EO-347791	7-OSC1	ES-347755	14-SW2	ET-308141	9-TR7
EI-353696	6-IC2	EO-348206	5-VL501	ES-347790	5-SW1EK	ET-308141	10-TR10
EI-353698	7-IC151	EO-348977	7-FL2	ES-347911	18-3	ET-308141	10-TR3
EI-354399	5-IC8	EO-348977	7-FL3	ES-348089	4-3	ET-308141	10-TR13
EI-354399	8-IC7	EO-348978	7-FL1	ES-349641	5-SW1EG	ET-308141	10-TR4
EI-354401	8-IC3	EO-351184	5-L25	ES-352333	4-4	ET-308141	10-TR11
EI-354502	10-IC1	EO-354600	6-L5	ES-352694	16-SW2	ET-308141	10-TR12
EI-354640	6-IC4	EO-355688	9-L15	ES-354896	16-SW1	ET-308141	10-TR8
EI-354780	7-IC102	EO-443722	7-L2	ET-200402	7-TR14	ET-308141	10-TR16
EI-354780	10-IC12	EO-669273	5-L1B	ET-200402	7-TR15	ET-308141	10-TR20
EI-355743	7-IC152	EO-669273	5-L2B	ET-200418	4-28	ET-308141	13-Q4
EI-698703	5-IC504	EO-705491	13-L5	ET-200418	7-TR1	ET-308141	5-TR32
EI-705494	13-IC1	EO-707836	13-L1	ET-208012	5-TR1B	ET-308141	5-TR35
EI-749828	13-IC2	EO-742574	13-L4	ET-208012	5-TR8B	ET-308141	5-TR36
EI-749829	13-IC3	EO-742653	13-L2EG	ET-306719	10-TR2	ET-308141	5-TR37
EJ-301513	18-5	EO-742654	13-L2EK	ET-306719	10-TR7	ET-308141	5-TR38
EJ-349350	15-J902	EO-749830	13-L3	ET-308141	5-TR42	ET-308141	5-TR39
EJ-352707	5-2	EO-749833	13-L6	ET-308141	5-TR26	ET-308141	5-TR40
EJ-352711	6-2	EO-749834	13-L10EG	ET-308141	5-TR34	ET-308141	5-TR41
EJ-353031	16-J1	EO-749834	13-L7EK	ET-308141	5-TR5B	ET-308141	5-TR43
EL-332451	2-25	EO-749834	13-L8	ET-308141	5-TR11B	ET-308141	5-TR44
EM-352692	14-1	EO-749836	13-L7EG	ET-308141	5-TR1	ET-308141	5-TR45
EO-243977	9-L5	EO-749836	13-L10EK	ET-308141	5-TR2	ET-308141	5-TR46
EO-318383	5-L16	EP-345264	3-18	ET-308141	5-TR3	ET-308141	5-TR47
EO-318398	7-L151	EQ-348929	1-9	ET-308141	5-TR4	ET-308141	5-TR48
EO-321254	7-L1	ER-306127	11-R34	ET-308141	5-TR5	ET-308141	5-TR501

VS-12EG/EK

RC-T12

PARTS NO.	REF. NO.	PARTS NO.	REF. NO.	PARTS NO.	REF. NO.	PARTS NO.	REF. NO.
AV-352701	1-1	ED-557447	1-D2				
AV-354209	1-1B	ED-710035	1-D3				
AV-713368	1-3	ED-710035	1-D4				
AV-713371	1-3B	ED-780019	1-D5				
AV-713375	1-2B	EI-749983	1-IC1				
AV-749979	1-4	EI-749984	1-X1				
AV-749980	1-5	ET-318604	1-TR1				
AV-749981	1-6						
AX-710025	1-2						
ED-557447	1-D1						

AKAI

MODEL VS-12 EG/EK

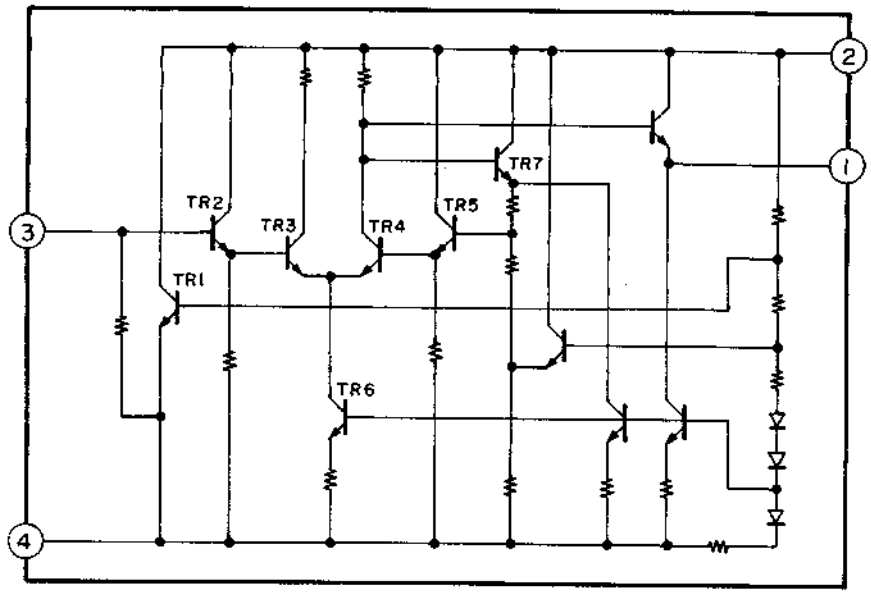
SECTION 4

SCHEMATIC DIAGRAM AND PC BOARDS

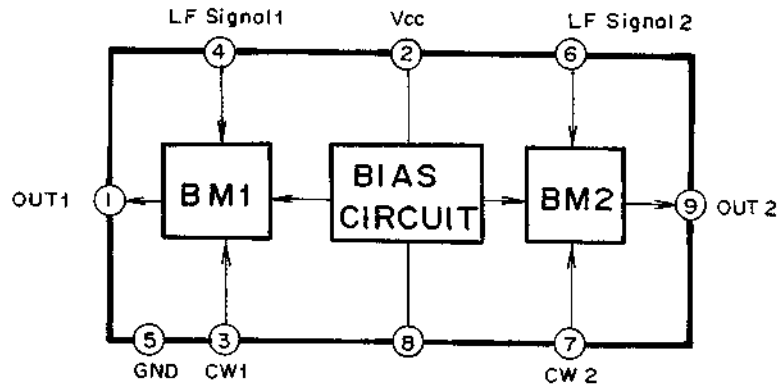
TABLE OF CONTENTS

SCHEMATIC DIAGRAM OF ICs

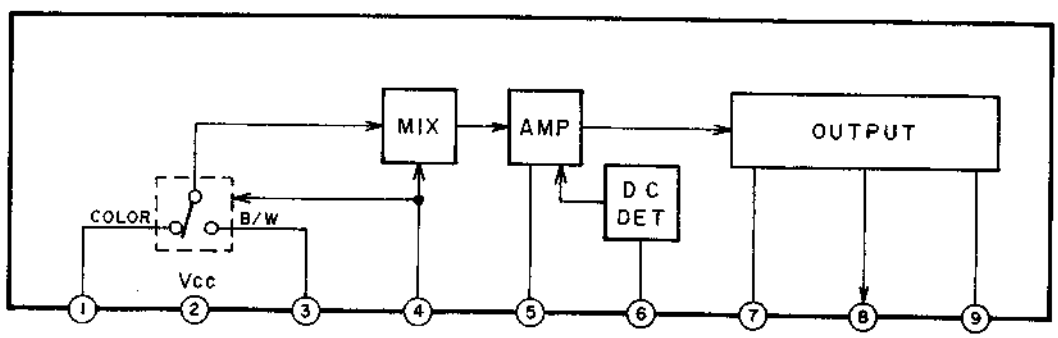
AN608P (Video Amp.)



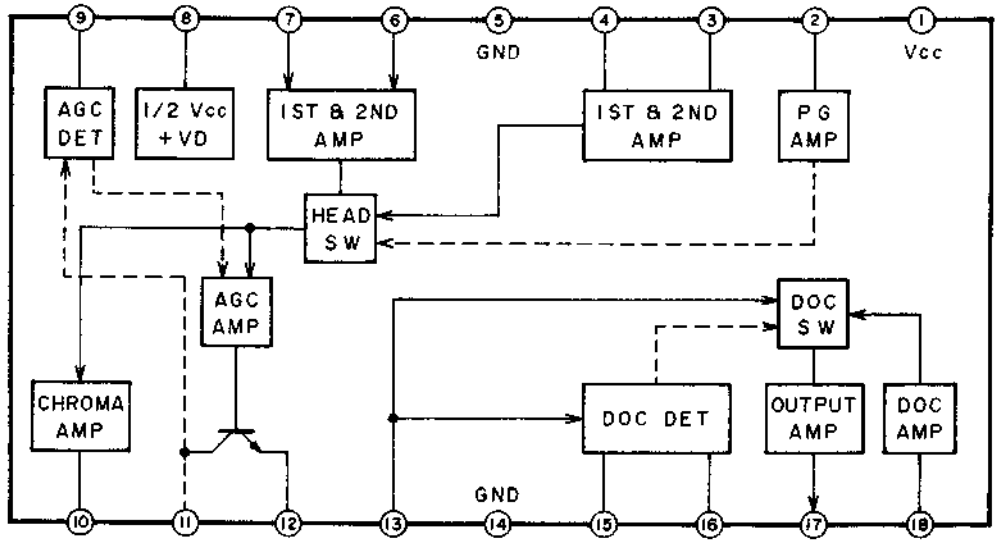
AN6041 (Dual Balanced Modulator)



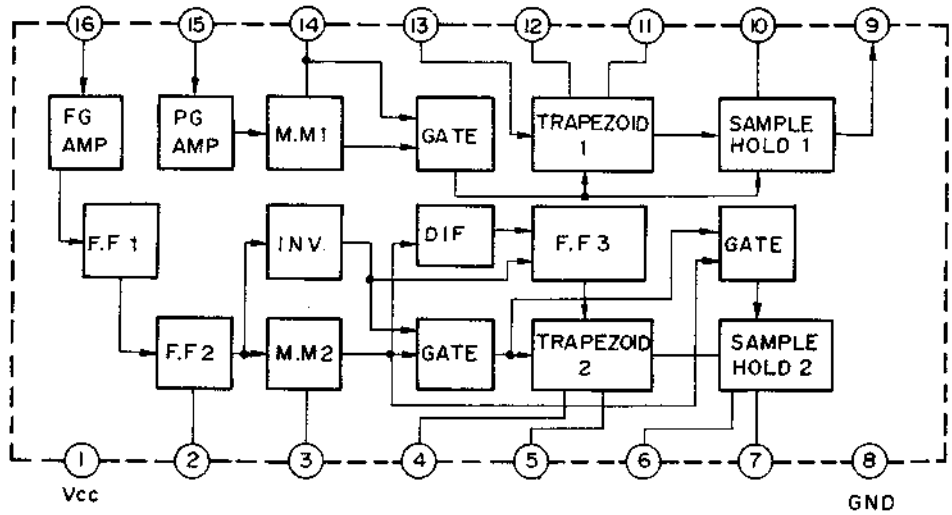
AN6307 (VTR Video Rec Amp)



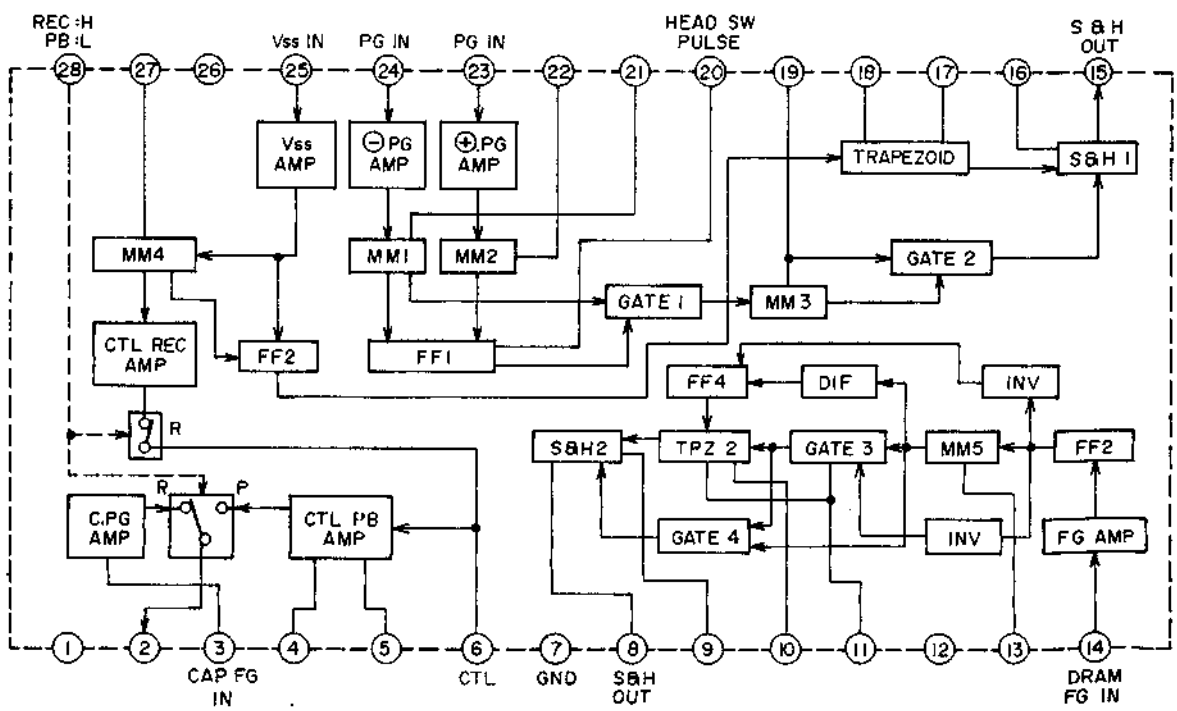
AN6326N (VTR Video Head Amp)



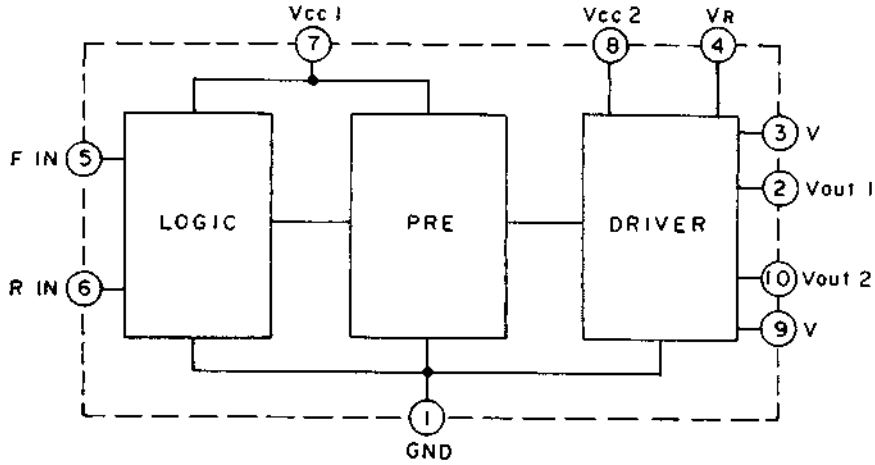
AN6341N (Capstan Servo Control)



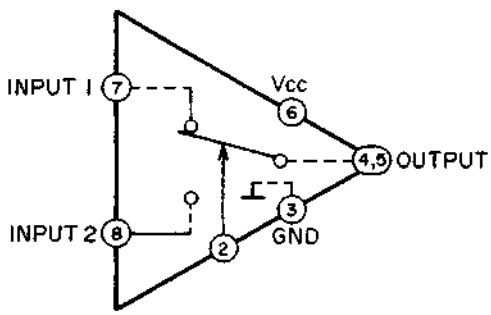
AN6350 (Drum Servo Control)



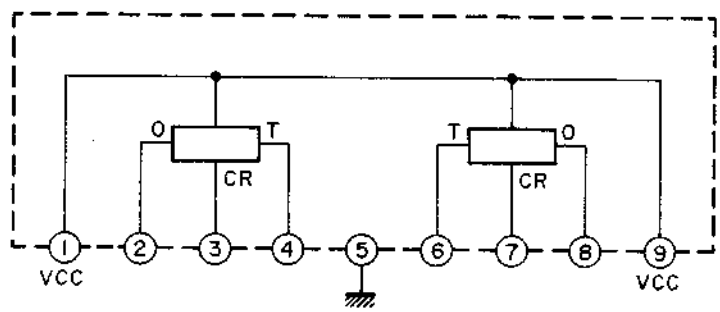
BA6109/BA6209 (NOR/REV Controlable Motor Power Driver)



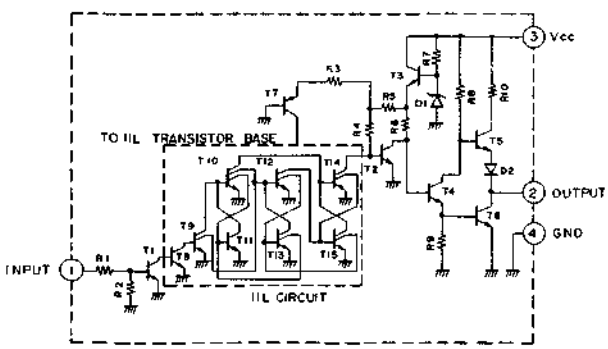
BA7001 (Video Signal Switcher)



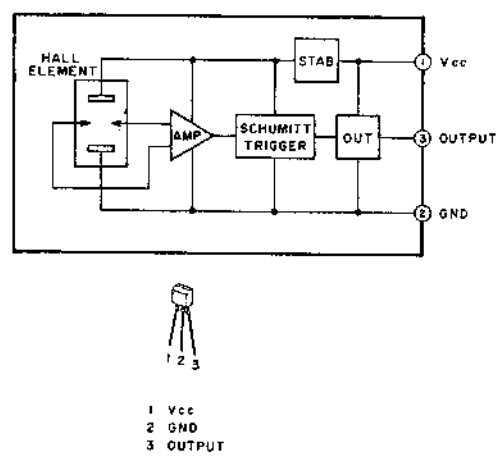
BA236 (Dual Monomulti)



DN819 (T Flip-Flop)

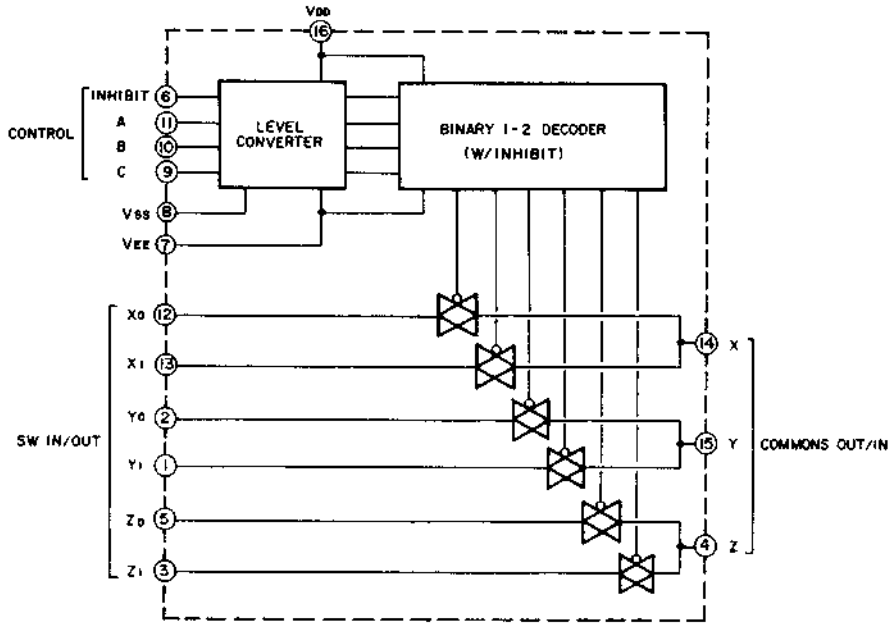


DN6838 (Hall IC)



1 Vcc
2 GND
3 OUTPUT

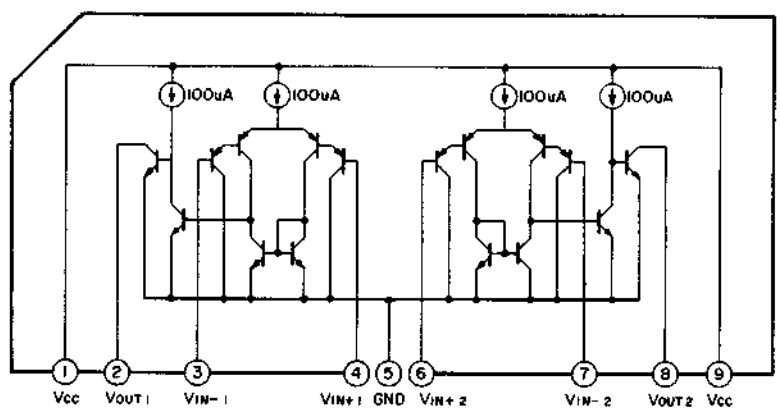
HD14053BP/MC14053BCP/BU4053B (Triple-2 Channel Multiplexer/Demultiplexer)



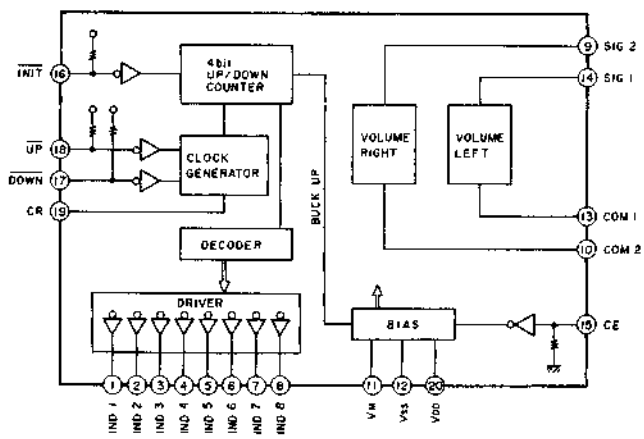
TRUTH TABLE

INHIBIT	A or B or C	"ON" CHANNEL
0	0	X_0 or Y_0 or Z_0
0	1	X_1 or Y_1 or Z_1

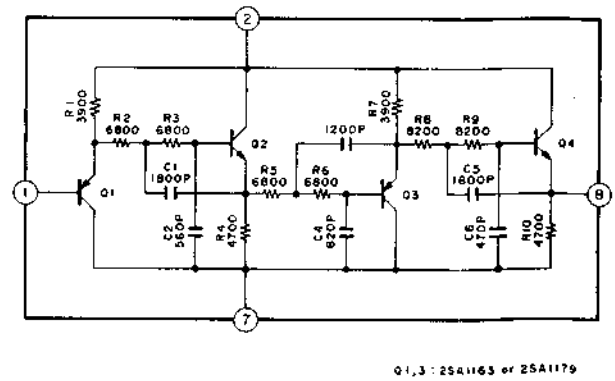
LA6393S (Dual Operational Amp)



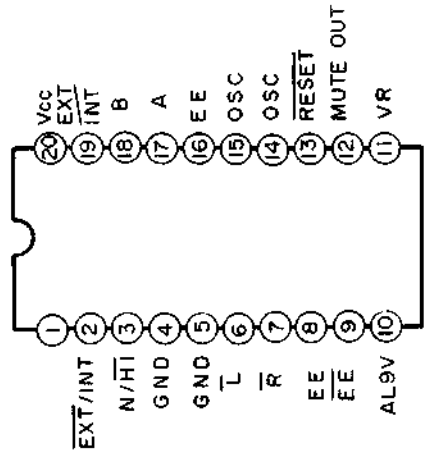
LC7530 (Electronic Volume)



LF1803 (3 Stage Active LPF)

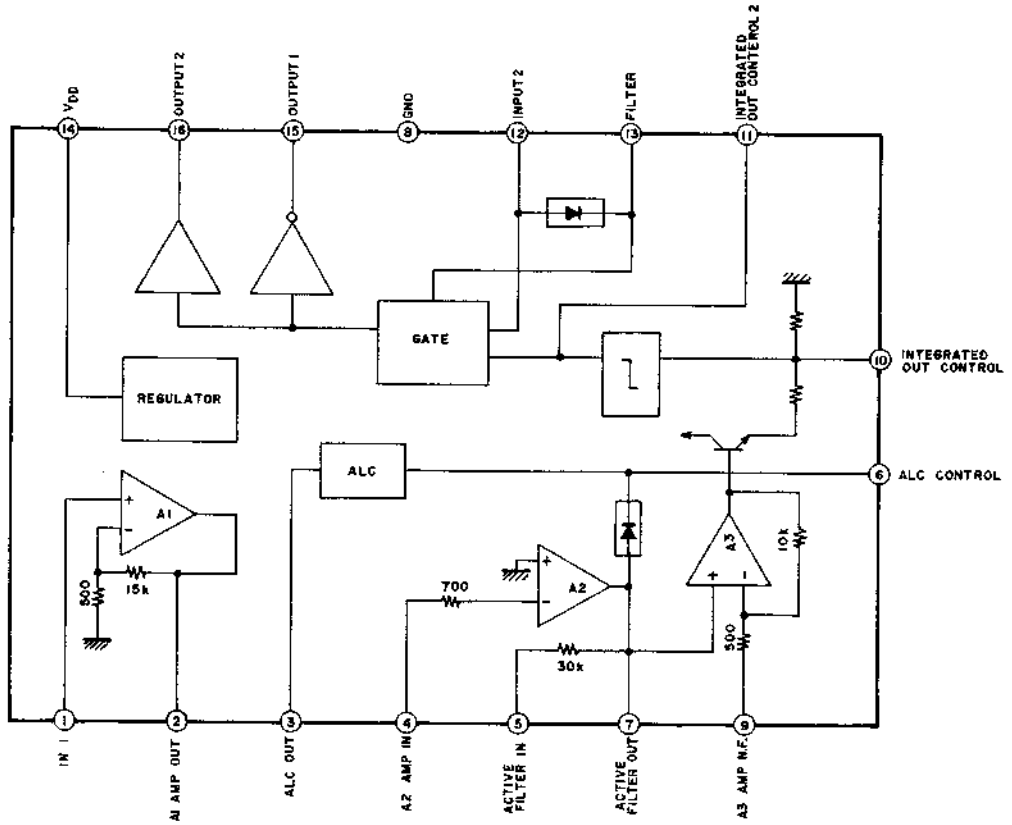


Q1,3 : 2SA1163 or 2SA1179
Q2,4 : 2SC2713 or 2SC2812

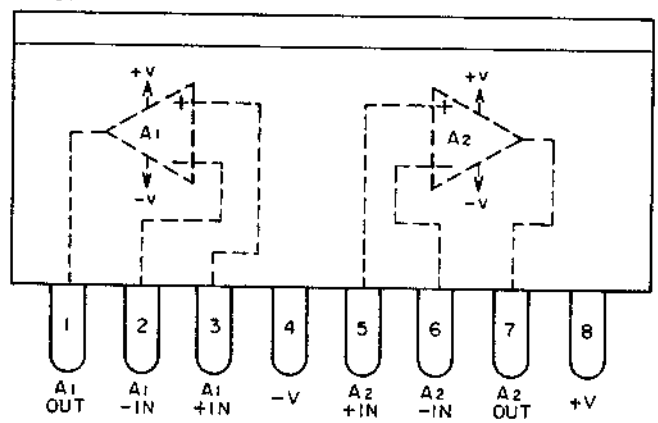


Pin No.	Symbol	Description
1	AUTO/MANU	Not used and connected to ground.
2	$\overline{\text{EXT}}$/INT	External/Internal (Tuner, S.C.) Video Input LED drive output, "L" at External, "H" at Internal.
3	$\overline{\text{Hi-Fi}}$/NOR	Hi-Fi/Normal LED drive output, "L" at Hi-Fi, "H" at Normal
4	CN Vss	Connect to ground.
5	Vss	Connect to ground.
6 7	$\overline{\text{L}}$ $\overline{\text{R}}$	Audio channel selection output MODE / NORMAL / L / L+R / R L / H / L / L / H R / H / L / L / L
8	EE D	$\overline{\text{A}-\text{PB}}$ (= EE) 100 msec delayed output, "L" is output 100 msec later when the mode is changed from EE to PB.
9	$\overline{\text{EE}}$ D	A – PB (= $\overline{\text{EE}}$) 100 msec delayed output, "L" is output 100 msec later when the mode is changed from EE to PB.
10	AL9V	AL9V input, mute is on after 2 sec from this input when Function SW is turned on.
11	VR	Electronic Volume Center Set output, "L" at Internal mode, "L" for 500 msec at External FUNCTION ON mode.
12	MUTE OUT	Mute drive output, Mute at "H".
13	$\overline{\text{RESET}}$	Reset terminal, Power on reset at "L".
14 15	X out X in	Oscillator terminal (300 kHz is oscillated when a resistor 120k ohms is connected)
16	EE	EE (= $\overline{\text{A}-\text{PB}}$) input, Audio PB at "L", EE at "H".
17 18	A B	Audio channel selection input MODE / NORMAL / L / L+R / R A / H / L / L / H B / H / H / L / L
19	EXT/INT	External/Internal (Tuner, S.C.) Video Input selection input, "L" at External, "H" at Internal.
20	V_{DD}	Power supply terminal (+5V)

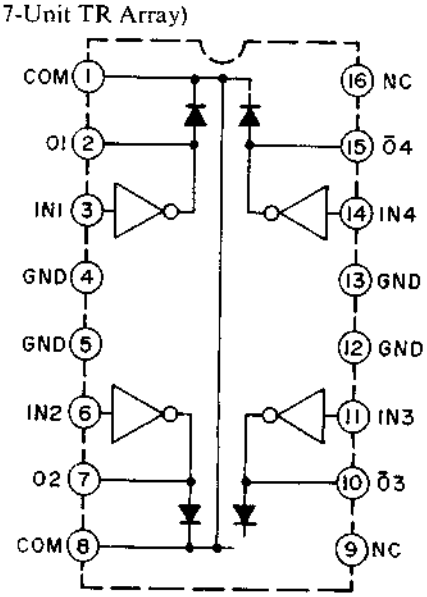
M51014L

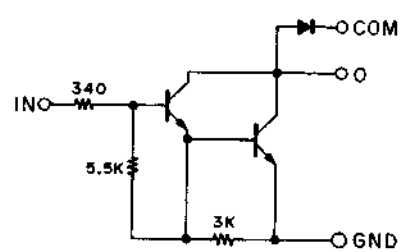


M5218LO (Dual Operational Amp)



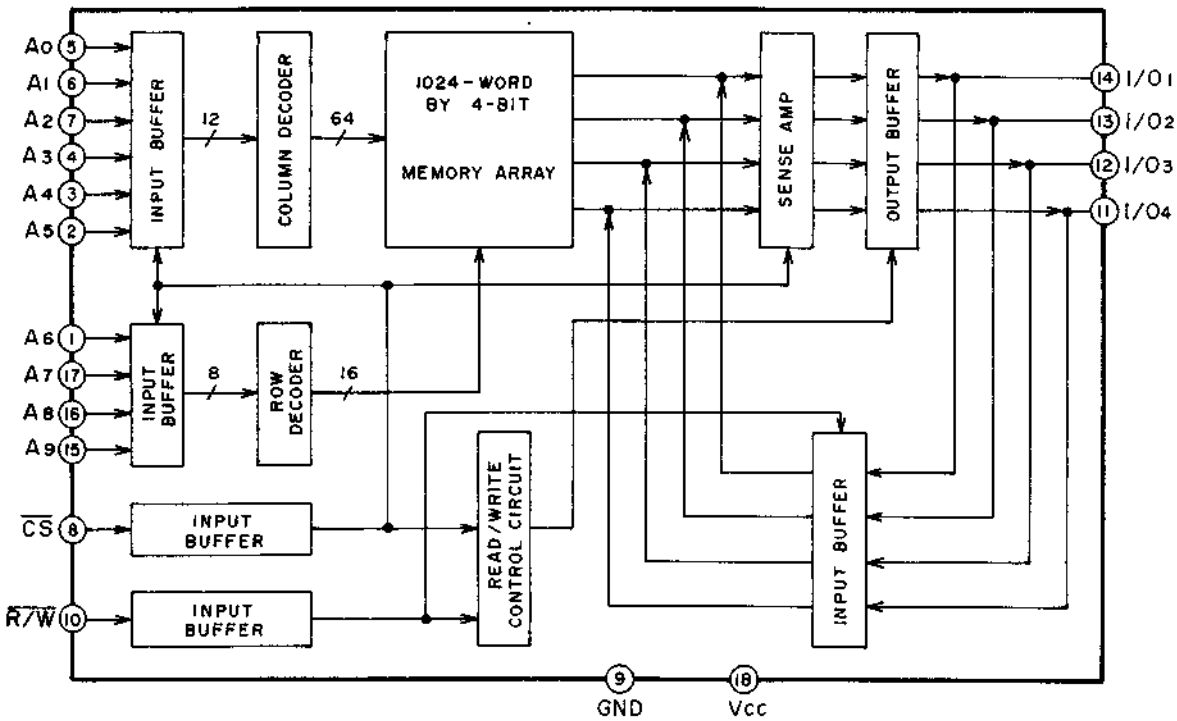
M54514AP (7-Unit TR Array)



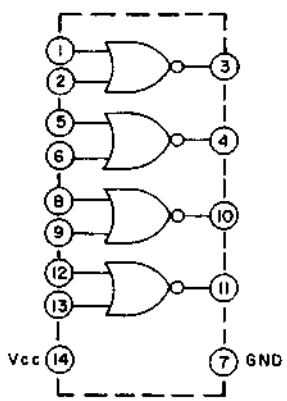


ALL GND CONNECTED IN INSIDE

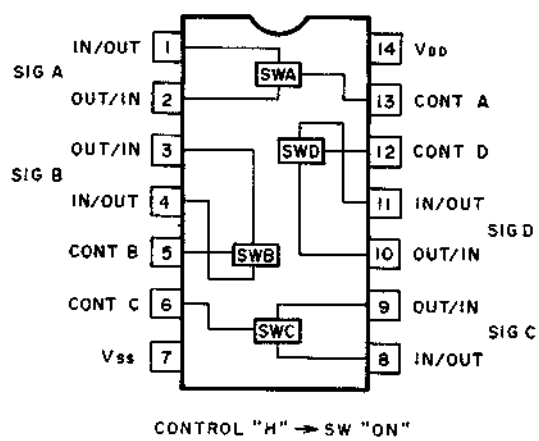
M58981P-45 (4K CMOS Static RAM)



MC14001 (Quadruple 2-Input NOR Gate)

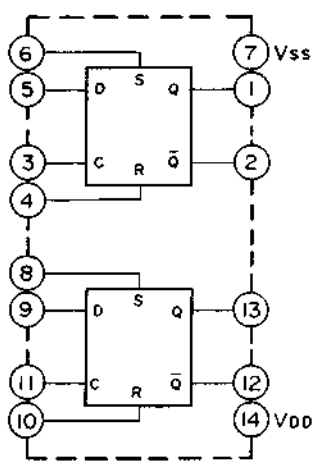


MC14066B (Quad Bilateral SW)



CONTROL "H" → SW "ON"

MC14013BCP (Dual D Flip-Flop)



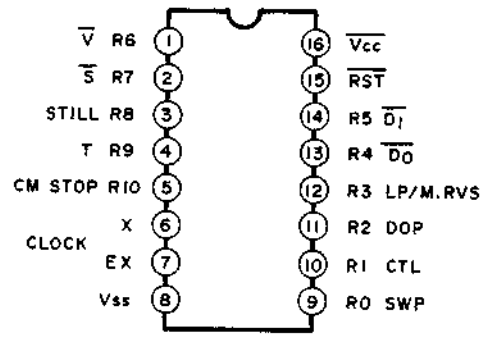
TRUTH TABLE

INPUTS				OUTPUTS	
CLOCK†	DATA	RESET	SET	Q	$\bar{Q}$
⌐⌐	0	0	0	0	1
⌐⌐	1	0	0	1	0
⌐⌐	X	0	0	Q	$\bar{Q}$
X	X	1	0	0	1
X	X	0	1	1	0
X	X	1	1	1	1

NO CHANGE

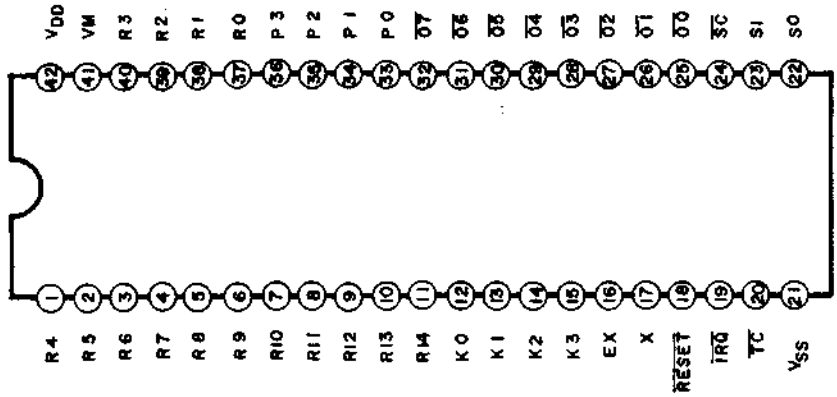
X : DON'T CARE

† : LEVEL CHANGE



Pin No.	IN/OUT	Symbol	Description
1	OUT	$\overline{V}$	Voltage apply to Capstan Motor.
2	OUT	$\overline{S}$	STILL or NORMAL.
3	IN	STILL	STILL Pulse from Syscon Mi-Com IC8 (MB88501-158M).
4	IN	T	Coincide the timing with after shaping the Drum FG waveform.
5	IN	OM STOP	At "H" Capstan Motor STOP. At "L" Capstan Motor MOVE.
6		X	Clock
7		EX	Clock
8		VSS	Ground
9	IN	SWP	Switching Pulse from Servo.
10	IN	CTL	CTL Pulse from Servo.
11	IN	DOP	DOP Pulse from Pre-Amp.
12	IN	LP/M RVS	Motor Reverse Control Line. FWD mode M RVS : L REV mode M RVS : H In case of STILL mode, this line change to LP control Line. LP mode : H SP mode : L
13	OUT	$\overline{D0}$	Capstan Motor Control Out. "H" REV RUN "L" FWD RUN, STOP
14	OUT	$\overline{DI}$	Capstan Motor Control Out. "H" FWD RUN, STOP "L" REV RUN
15		$\overline{RESET}$	At "H" level, Reset is removed.
16		VCC	Power input (+5V).

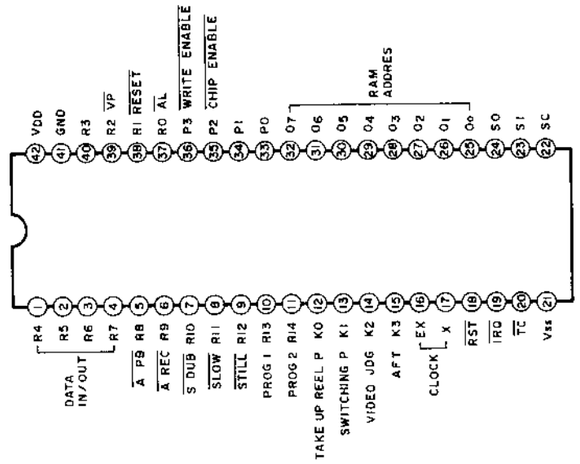
MB88401-233K (4 bit one-tip Microcomputer)



BAND SELECTION

Pin No.	Symbol	Description
1 to 8	R4 to R11	Output terminals for both Key Matrix scan and Address & Charactor Data
9	R12	E0 input (not used)
10	R13	EK input (not used)
11	R14	Connected to ground for VS-3 models.
12 to 15	K0 to K3	Key Matrix Data input
16 17	EX X	} Clock Oscillator terminals
18	$\overline{\text{RESET}}$	RESET signal input from SYSCON MI-COM IC5 (MB88401/206M)
19	$\overline{\text{IRQ}}$	REMOCON signal data input
20	$\overline{\text{TC}}$	Not used.
21	Vss	Connect to ground
22 23 24	SO SI $\overline{\text{SC}}$	Serial Data output Serial Data input Serial Clock input } Data exchange between SYSCON MI-COM IC5 (MB88501/147M)
25 to 32	$\overline{\text{O0}}$ to $\overline{\text{O7}}$	Mode Indicator LEDs (D12 to D19) drive output, lit at "L"
33 to 36	P0 to P3	LED drive voltage output, drive 3 systems of LEDs by 2 msec interval.
37	R0	Not used.
38	R1	$\overline{\text{VIDEO}}$/TV selection output
39 40	R2 R3	} CRT Controller IC (IC2 MB88303M) Control signal output
41	VM	Voltage for memory, connected to +5V
42	VDD	Power supply terminal (+5V)

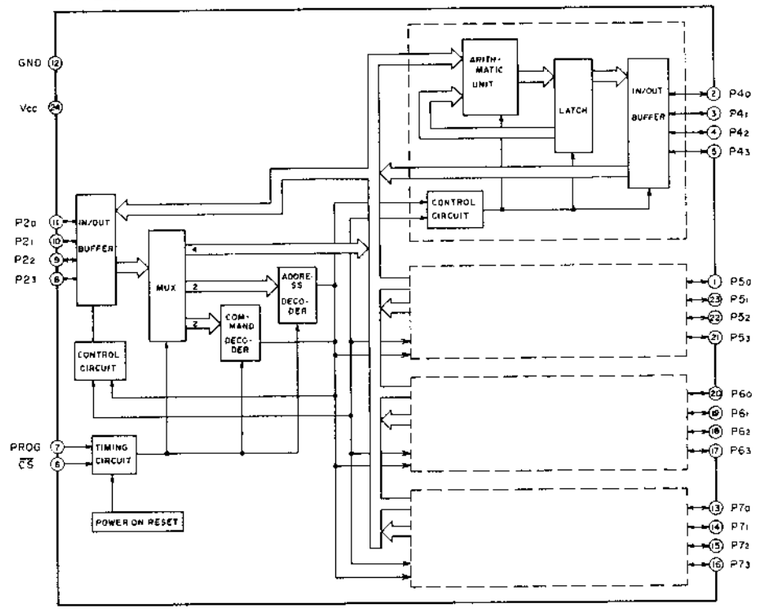
MB88501-147M



Pin No.	Symbol	Description
1 to 4	DATA I/O	DATA output to DAC IC9 (MB88301) EXPANDER IC6 (MBL8243M) and RAM IC10 (M58981).
5 6 7	$\overline{\text{AUDIO PB}}$ $\overline{\text{AUDIO REC}}$ $\overline{\text{SOUND DUB}}$	These are control signal output terminals which control AUDIO PB, AUDIO REC and SOUND DUB.
8	$\overline{\text{SLOW}}$	1/2 SLOW at "L"
9	$\overline{\text{STILL}}$	32 ms Trigger Pulse at "L" level for STILL.
10	PROG 1	This terminal is used for data transfer between the terminal ⑦ of IC1 (MBL8243M) of Mecha Drive P.CB.
11	PROG2	This terminal is used for data transfer between the terminal ⑦ of IC6 (MBL8243M) of Power Supply & Syscon P.CB.
12 13	TRP SWP	These terminals are used for controlling. Tape Counter, Reel Stop and the judgements of Drum Motor Stop by means of inputting TAKE-UP Reel Pulse and Switching Pulse.
14 15	VIDEO J AFT	These are used for controlling. "H" levels is input when VIDEO signal is in normal, "L" level in abnormal.
16	EX	Clock oscillator terminal.
17	X	Clock oscillator terminal.
18	$\overline{\text{RESET}}$	Not used. (Power "ON" Auto reset)
19	$\overline{\text{IRQ}}$	For trigger input to make a dummy V-Sync at TRICK Mode.
20	$\overline{\text{TC}}$ ($\overline{\text{POWER DOWN}}$)	When the power down detector detects a power down, it turns to "L" level and saves the data in the RAM. After that, "L" level outputs at pin ⑩ save end and a Reset function.
21	Vss	Ground.
22 23 24	SCLK SI SO	Serial Clock Serial Data IN/OUT Serial Data OUT/IN } Data exchange between the terminals of IC3 (MB88401) of Operation P.CB.
25 to 32	ADDRESS	These are terminals for address outputs of EXTERNAL RAM IC10 (M58981) of Power Supply & Syscon P.CB.
33 34	PAG1 PAG0	These are terminals for page outputs of EXTERNAL RAM IC10 (M58981) of Power Supply & Syscon P.CB.

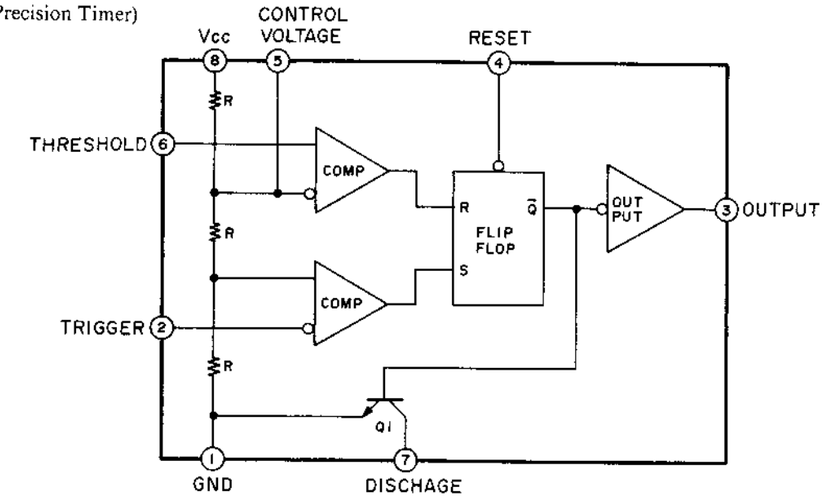
Pin No.	Symbol	Description
35 36	$\overline{\text{CHIP ENABLE}}$ $\overline{\text{WRITE ENABLE}}$	These are terminals for Read and Write control outputs of EXTERNAL RAM IC10 (M58981) of Power Supply & Syscon P.CB.
37	$\overline{\text{AL}}$	AL Power ON at "L" level.
38	$\overline{\text{RESET}}$	This terminal is Reset for IC3 (MB88401) Operation P.CB.
39	$\overline{\text{VP}}$	This terminal outputs a quasi V-sync at Tric Mode.
40	LD1	This terminal outputs the address of DAC IV9 (M38830A) and the data of out-read/out-control signals.
41	START	Connect to Ground.
42	VDD	Power Supply terminal (+5V).

MBL8243M (I/O EXPANDER)

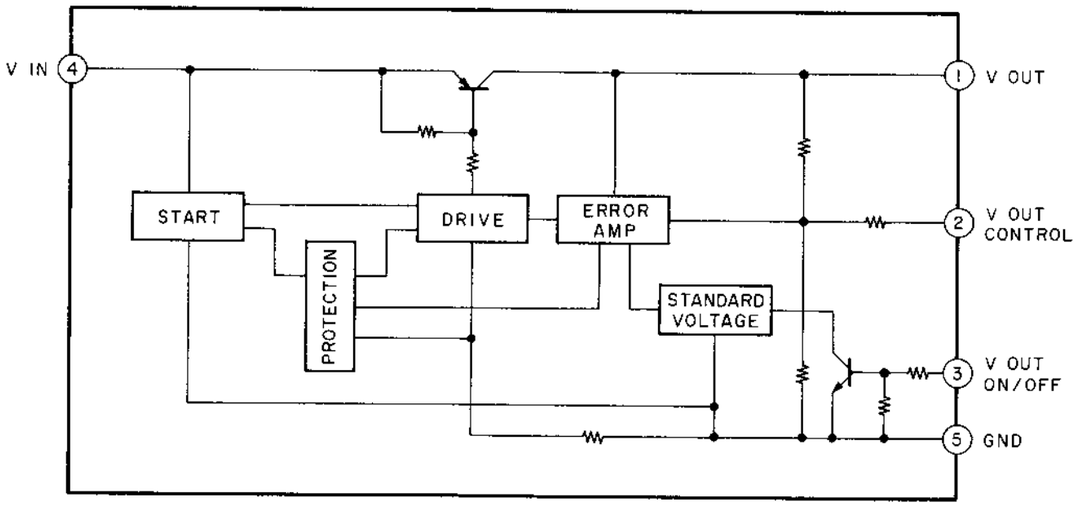


INPUT			OUTPUT		
PIN	SYMBOL	INPUT ITEM	PIN	SYMBOL	OUTPUT FOR
1	RS SW	REC Safety SW H: REC L: not REC	13	$\overline{\text{CUE}}$	CUE $\overline{\text{ON}}$/OFF
			14	$\overline{\text{REVW}}$	REVIEW $\overline{\text{ON}}$/OFF
2	LSW-A2	} Loading Position Detection SW	15	SP/$\overline{\text{LP}}$	Not used
3	LSW-B1		16	CM STP	Capstan Motor STOP
4	$\overline{\text{SS}}$	Tape Start Sensor	17	$\overline{\text{PL-ON}}$	Plunger $\overline{\text{ON}}$/OFF
5	$\overline{\text{ES}}$	Tape End Sensor	18	LM STP	Loading Motor OFF
7	PRG2	8 IN/OUT Control Signal	19	EM STP	Eject Motor STOP
21	CSW3	Ejector Set SW	20	M. $\overline{\text{RVS}}$	All Motor Reverse
22	CSW2	Ejector SW			
23	CSW1	Cassette SW			
8	DATA 1	} DATA IN/OUT			
9	DATA 2				
10	DATA 3				
11	DATA 4				

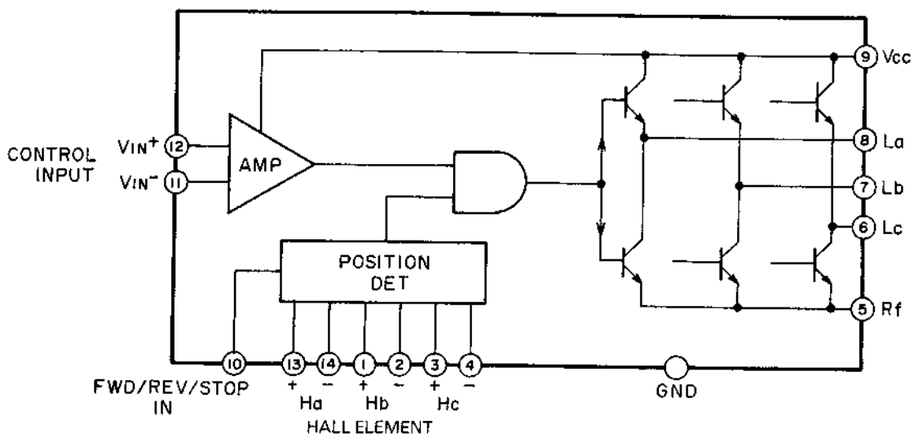
NE555P (Precision Timer)



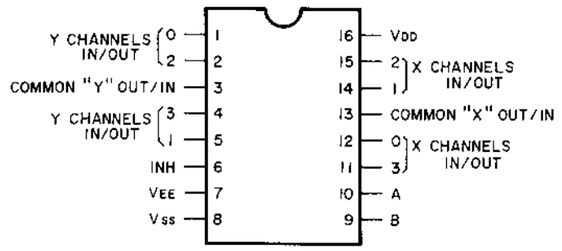
STR9012 (REGULATOR)



TA7245P

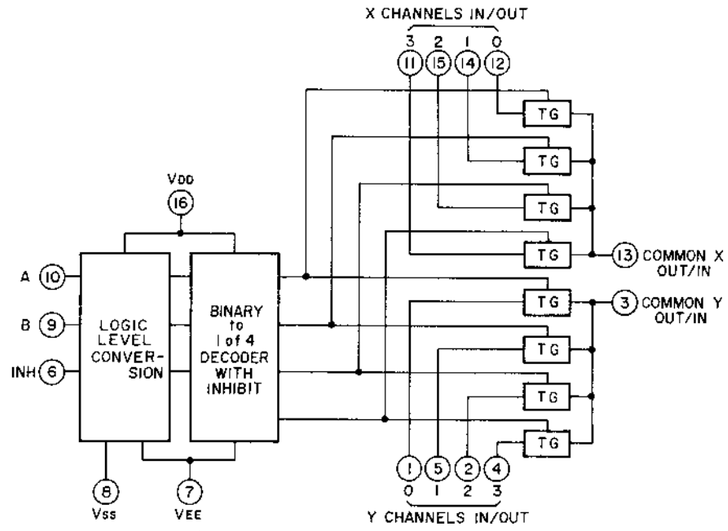


TC4052BP (ANALOG MULTIPLEXERS/DEMULTIPLEXERS)

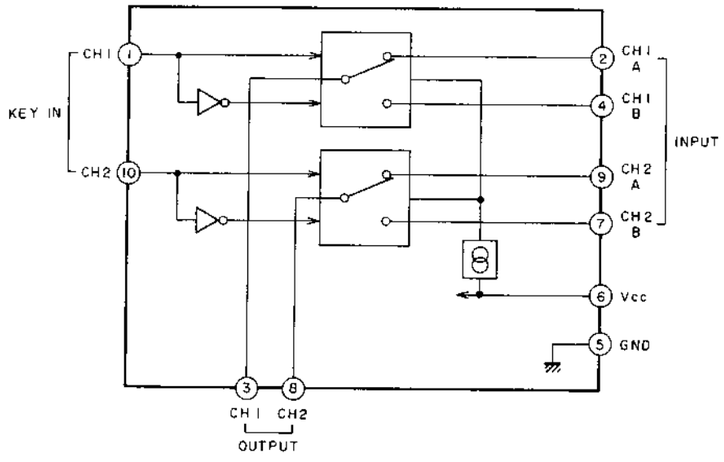


INHIBIT (6)	A (10)	B (9)	"ON" CHANNEL
L	L	L	0X, 0Y
L	H	L	1X, 1Y
L	L	H	2X, 2Y
L	H	H	3X, 3Y
H	X	X	NONE

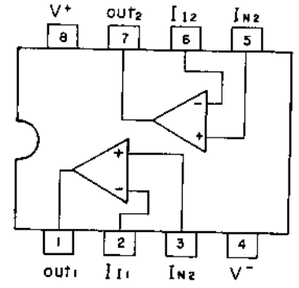
X=DON'T CARE



TK15021 (ANALOG SW)



μPC1458(Dual Operational Amp)



VS-12

TO TRANSFORMER
TO MECHA DRIVE PCB P35
TO LINEAR AUDIO PCB P218
TO DEMODULATOR PCB P41
TO RF CONVERTER PCB P43
DRIVE PCB P39
TO VIDEO PCB P16
TO LINEAR AUDIO PCB P218
TO VIDEO PCB P86
TO MECHA DRIVE
TO SERVO PCB
TO OPERATION PCB (1) to (6)

DATA BUS LINE
WITH MECHA DRIVE IC3
DATA BUS LINE
DATA BUS LINE
ADRESS BUS LINE
TRANSFER BUS LINE
WITH OPERATION MI-COM IC3

IC1 Si-9012
IC2 TA78012AP
IC4 TA78005P
IC6 MBL8243 I/O PORT EXPONDER
IC8 MB88501-147M CPU
IC9 MB86301A DAC
IC10 M5898I MEMORY (R&M)
IC11 COMP
IC7 INV

TR1,IC3 IDL 33V REG
TR3,4 POWER DOWN DETECTOR
TR10, R22, C37 DIFFERENTIAL CIRCUIT
TR11 AMP
TR12 AMP
TR14 INV
TR15 AMP
TR16
TR17
TR18
TR19
TR20 INV
TR21
TR7 TR8 SERVO "ON"
TR15 PB "ON"
TR17 REC "ON"
TR18 EE "ON"
TR19 A-PB "ON"

R29,C46 LPF
R35,C46 LPF
R41,C49 LPF
R44 to 46 C51 to 54 TWEEN-T FILTER

BUZZER

VS-12EG/EK
POWER & SYSCON
BLOCK DIAGAM
NO. 7-1 831104C

TO POWER SUPPLY & SYSCON

IDL 5
$\overline{RST}$
GND
$\overline{S.CLK}$
S.IN/OUT
S.OUT/IN

DATA TRANSFER BETWEEN SYSCON MICON IC8

TO VIDEO PCB

VOW
$\overline{VOB}$
V.SYNC
$\overline{H.SYNC}$
INC
GND

IC2 MB88303M

ADRESS & CHRACTOR DATA

KEY SCAN & ADRESS CHRACTOR DATA

IC3 MB88401-233K

INDICATOR DRIVE OUT

KEY IN

KEY MATRIX DATA IN

R18 CHRACTOR POSITION ADJ

C6

X'TAL X1

C8 C7

EK MODEL

REMOCON SIGNAL DATA

IC4 TR5

REMOTE CONTROL RECEIVER & DECODER

REMOTE CONTROL SIGNAL DATA FROM TRANSMITTER RC-TI2

D25

TR1 BUFFER

TR2 BUFFER

TR4 BUFFER

TR3 BUFFER

PPESET CHANNEL INDICATOR

MODE, PRESET CHANNEL LED INDICATOR DATA

MODE INDICATOR LEDS

TAPE IN — O.STOP — REC — PLAY — LP — PAUSE — FUNCTION — FF — INSERT — RWD — TIMER —

KEY MATRIX

TAPE	CUE	REV	TIMER	FUNCTION	INS	D	PAUSE/STILL	
EJECT	F.F	REW	STOP	PLAY			REC	
	CLOCK	PRESET	C			A-	B-	
LP/SP	O-STOP		PROG			A+	B+	

KEY MATRIX SCAN

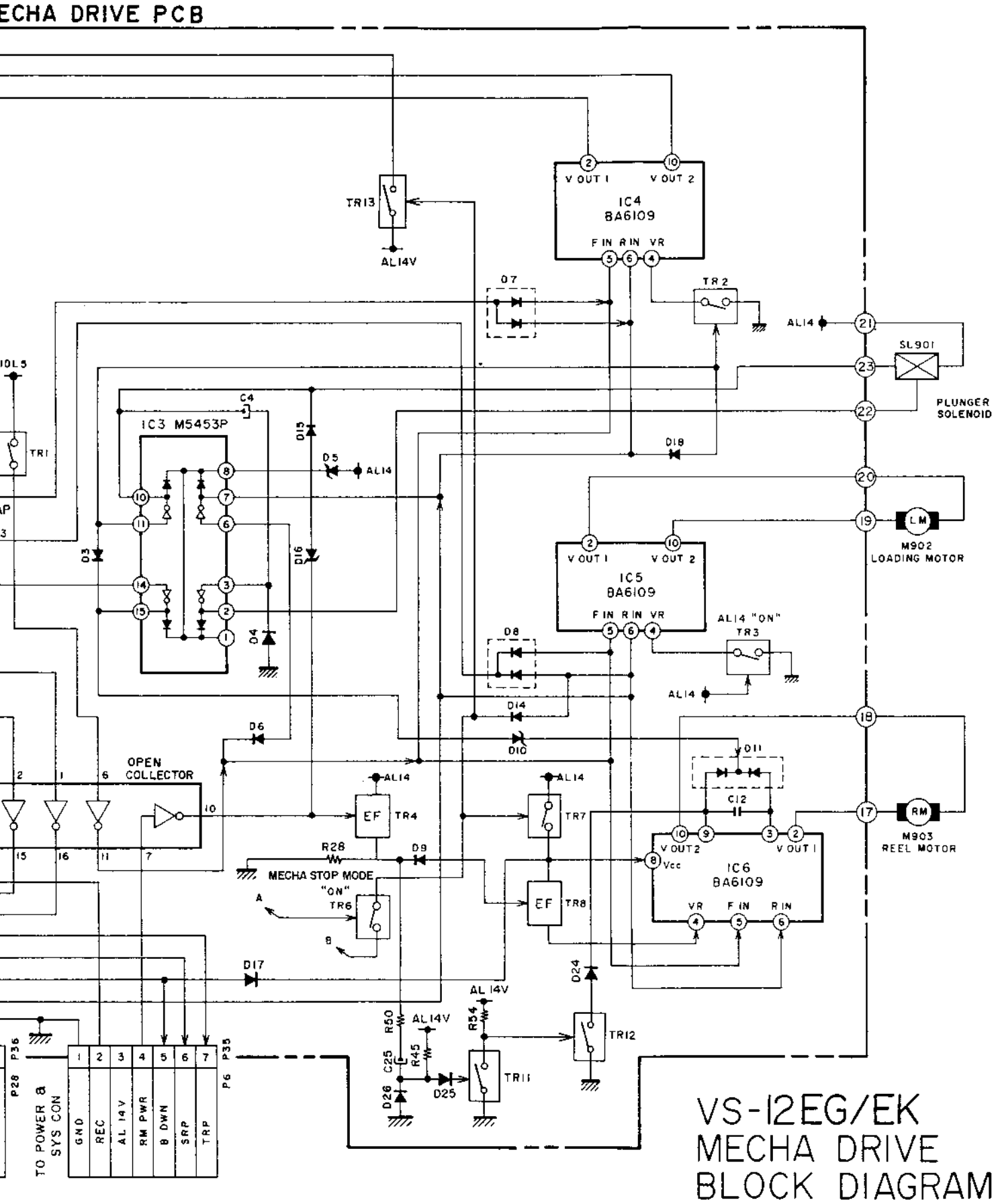
VS-12EG/EK OPERATION BLOCK DIAGRAM

NO.7-2 831112E 2C

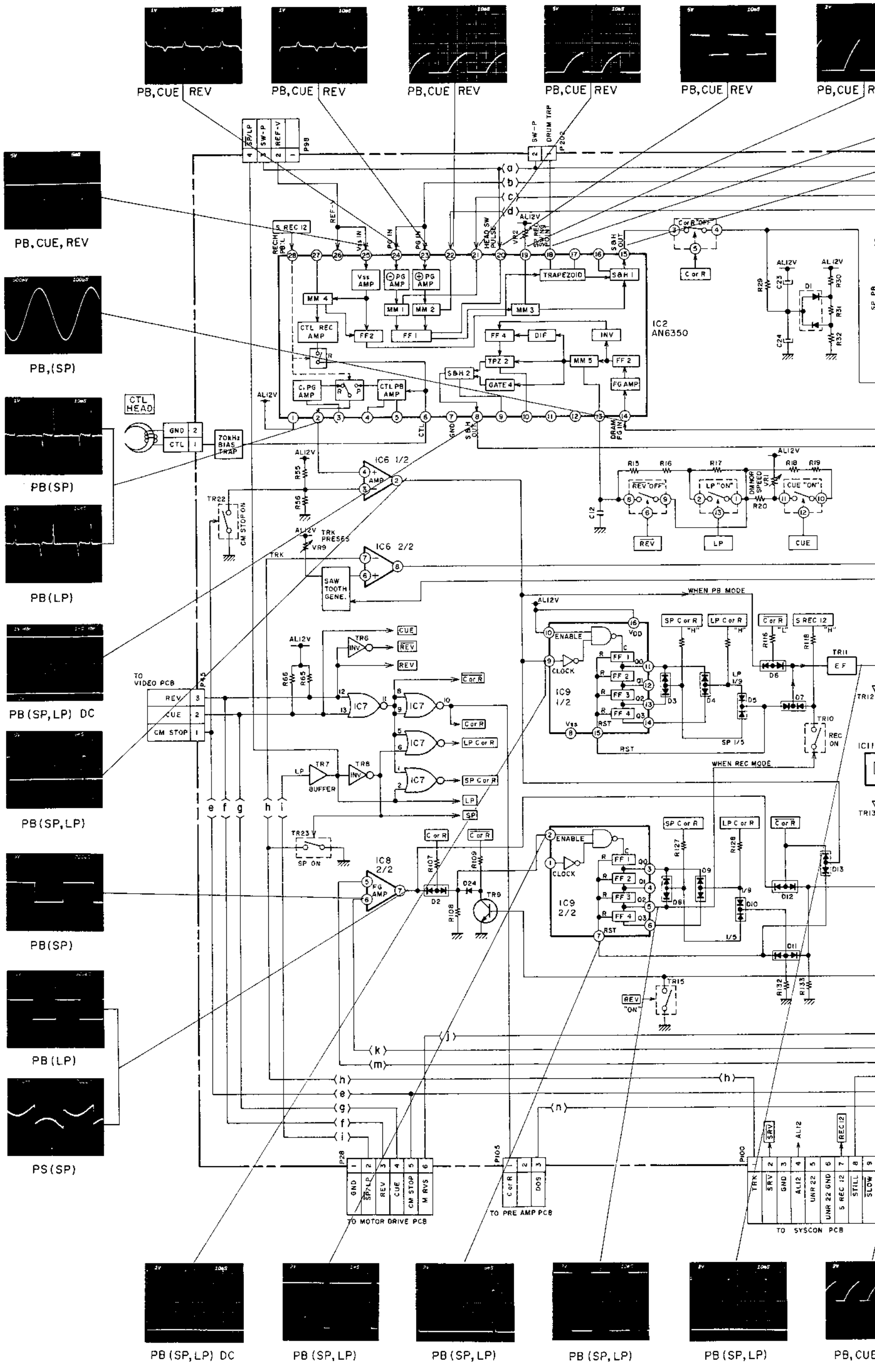
※ CONDITION OF EACH MECHA MODE

MODE \ SW CONDITION	L SW A	L SW B
STOP	ON	OFF
LOADING	OFF	OFF
SLIGHTLY BEFORE LOADED	OFF	ON
CONPLETELY LOADED	ON	ON

ECHA DRIVE PCB



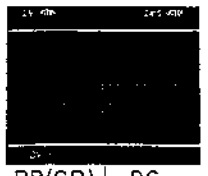
VS-12EG/EK
MECHA DRIVE
BLOCK DIAGRAM
NO. 7-3 830532E


PB, CUE REV
PB, CUE REV
PB, CUE REV
PB, CUE REV
PB, CUE REV
PB, CUE REV
PB, CUE, REV
PB, (SP)
PB (SP)
PB (LP)
PB (SP, LP) DC
PB (SP, LP)
PB (SP)
PB (LP)
PS (SP)
PB (SP, LP) DC
PB (SP, LP)
PB (SP, LP)
PB (SP, LP)
PB (SP, LP)
PB, CUE
IC2 AN6350
IC6 1/2
IC6 2/2
IC7
IC8 2/2
IC9 1/2
IC9 2/2
SAW TOOTH GENE.
TRAPEZOID
S&H 1
S&H 2
Vss AMP
⊖PG AMP
⊕PG AMP
MM 1
MM 2
MM 3
MM 4
MM 5
FF 1
FF 2
FF 4
DIF
INV
TPZ 2
GATE 4
FG AMP
CTL REC AMP
C.PG AMP
CTL PB AMP
CTL HEAD
70kHz BIAS TRAP
TRK PRESET
VR9
CM STOP ON
SP ON
BUFFER
C or R OFF
REV "OFF"
LP "ON"
CUE "ON"
DM MOR SPEED VR1
WHEN PB MODE
WHEN REC MODE
ENABLE
CLOCK
RST
REC ON
TO VIDEO PCB
TO MOTOR DRIVE PCB
TO PRE AMP PCB
TO SYSCON PCB
P98
P202
P45
P28
P105
P100

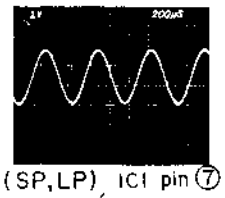
PB,CUE REV

PB,CUE REV

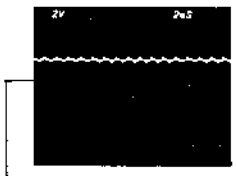
PB(SP,LP) DC



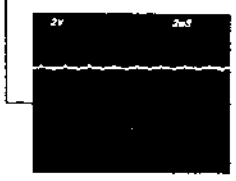
PB(SP) DC



PB(SP,LP) IC1 pin ⑦



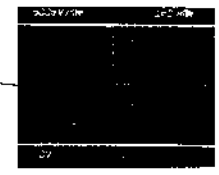
PB(SP) DC



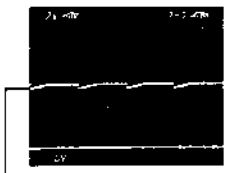
PB(LP)

PB(SP,LP)

PB(SP) DC

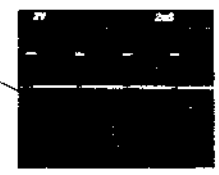


PB(SP) DC

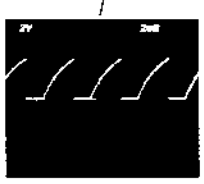


PB(SP) DC

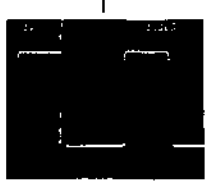
PB(LP) DC



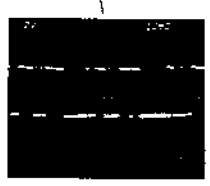
PB(SP,LP)



PB,CUE,REV



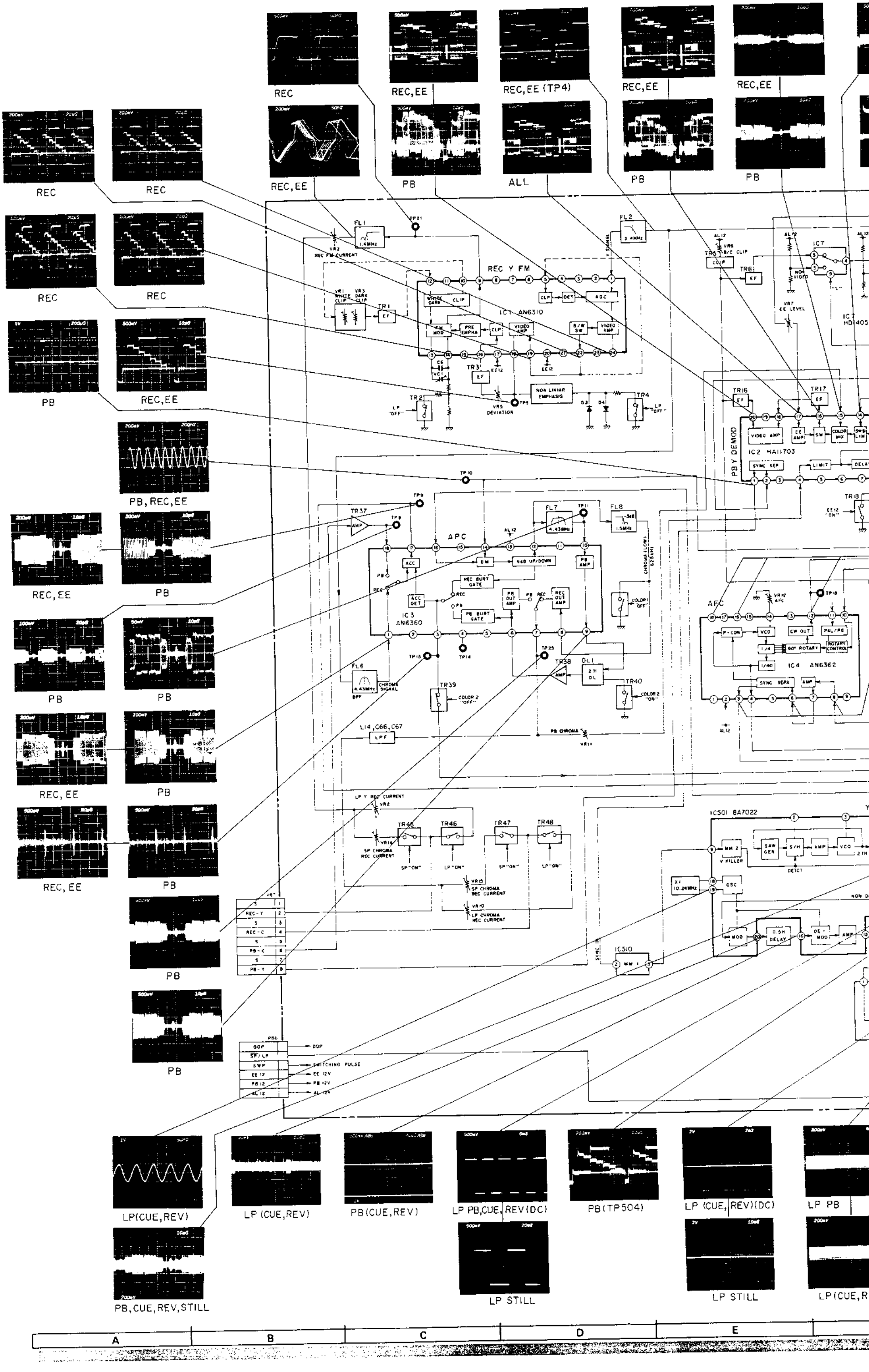
PB(SP)



PB(SP)

VS-12EG/EK SERVO BLOCK DIAGRAM

NO.7-4 831102C


REC
REC,EE
REC,EE (TP4)
REC,EE
REC,EE
REC,EE
PB
PB
ALL
PB
PB
REC
REC
REC
REC
PB
REC,EE
PB,REC,EE
REC,EE
PB
PB
PB
REC,EE
PB
PB
REC,EE
PB
PB
PB
REC Y FM
IC1 AN6310
IC7 HD14053
IC2 HA11703
PB Y DEMOD
IC3 AN6360
IC4 AN6362
APC
AFC
IC501 8A7022
LP(CUE,REV)
LP (CUE,REV)
PB(CUE,REV)
LP PB,CUE,REV(DC)
PB(TP504)
LP (CUE,REV)(DC)
LP PB
PB,CUE,REV,STILL
LP STILL
LP STILL
A
B
C
D
E

PB

PB

PB (TR19 Ⓑ)

PB, REC, EE

PB

PB

PB

PB (TR22 Ⓑ)

PB (TR44 Ⓔ)

ALL

PB

REC, EE

PB

REC, EE

PIN ③ PB, REC, EE

PIN ⑥ SP PB, REC, EE

PIN ⑧ SP PB

PIN ⑧ SP REC, EE

PIN ⑫ PB, REC, EE

PIN ⑯ PB, REC, EE

PIN ⑱ PB

PIN ② SP PB, REC, EE

PIN ⑥ SP CUE, REV

PIN ⑧ SP PB

PIN ⑬ SP PB

PIN ⑭ SP PB

LP PB

PB (DC)

LP PB

LP PB, CUE, REV

LP PB

LP PB

LP (CUE, REV)

SP PB, CUE, REV

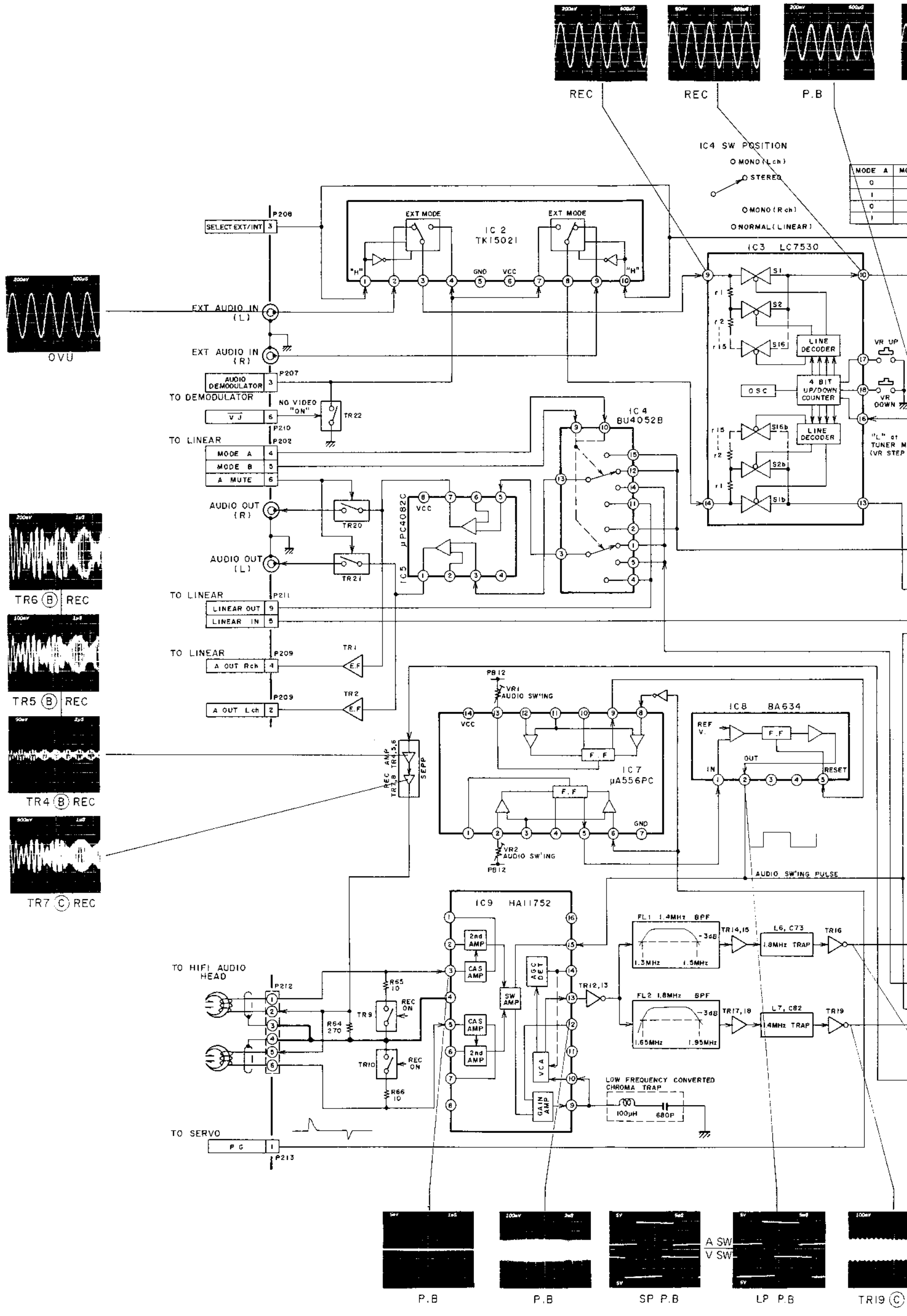
LP CUE, REV

LP PB, CUE, REV

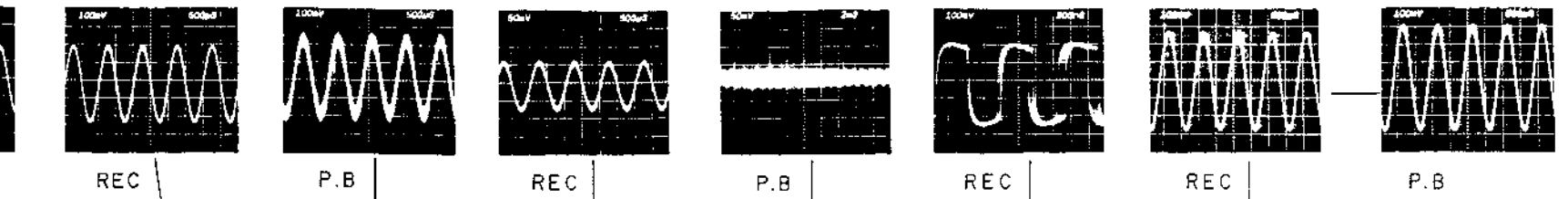
LP CUE, REV

LP CUE, REV

VS-12EG/EK
VIDEO
BLOCK DIAGRAM
NO.7-5 831106B



MODE A	MODE B
0	
1	
0	
1	

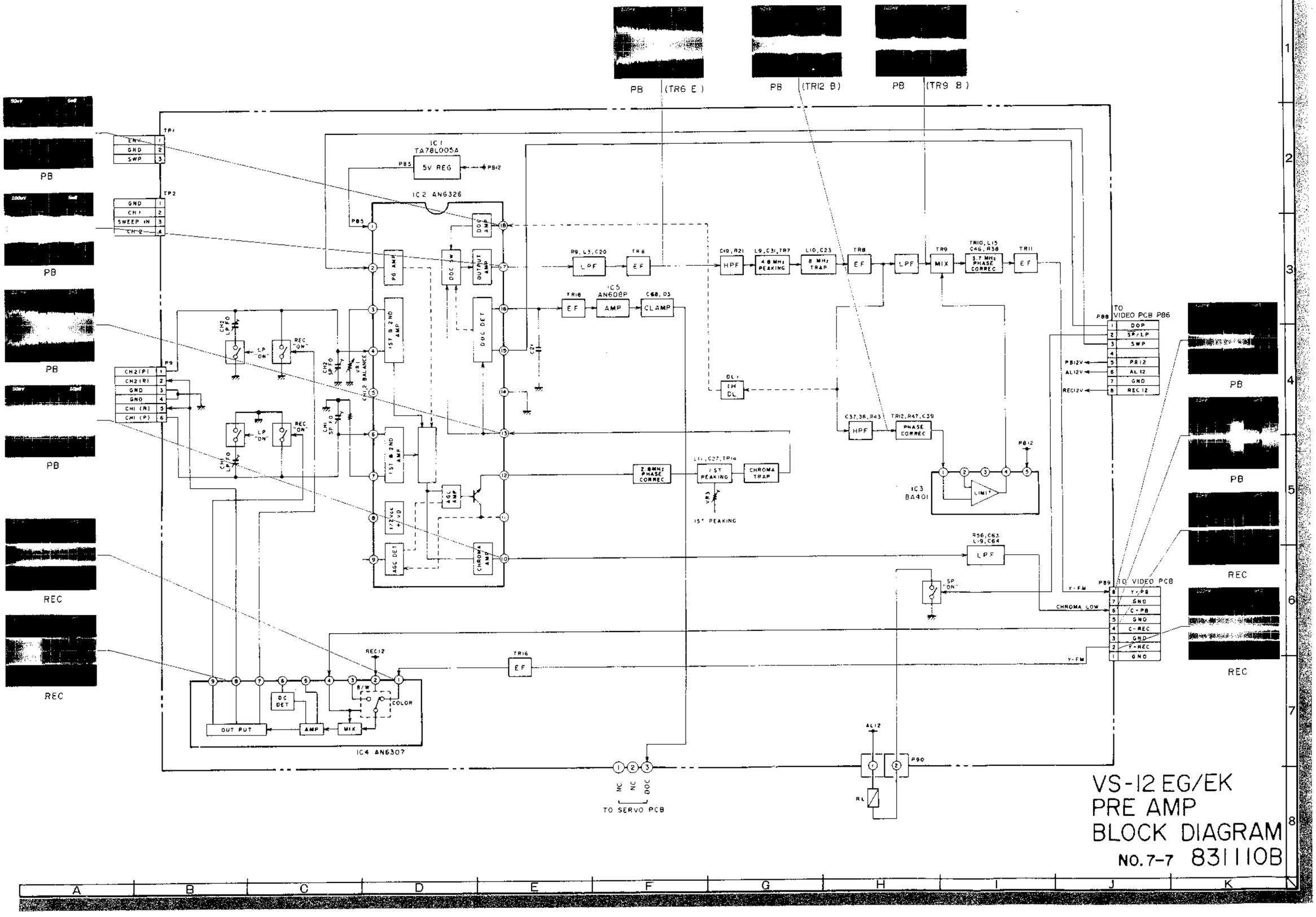


MODE A	MODE B	SW MODE
0	0	STEREO
1	0	MONO(Rch)
0	1	MONO(Lch)
1	1	NORMAL

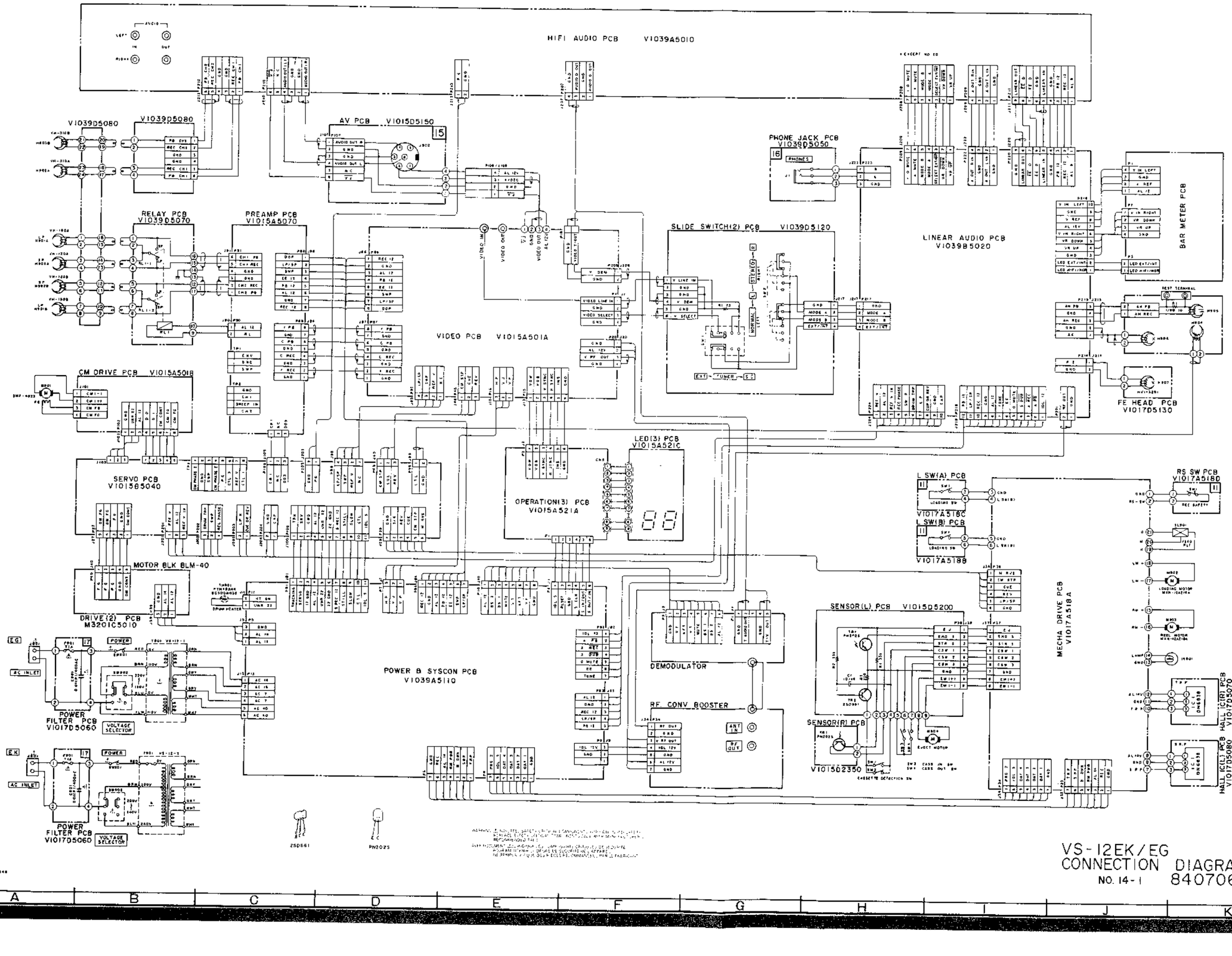
VS-12EK/EG
HIFI AUDIO
BLOCK DIAGRAM
NO. 7-6 840705A

VS-12 EG/EK PRE AMP BLOCK DIAGRAM

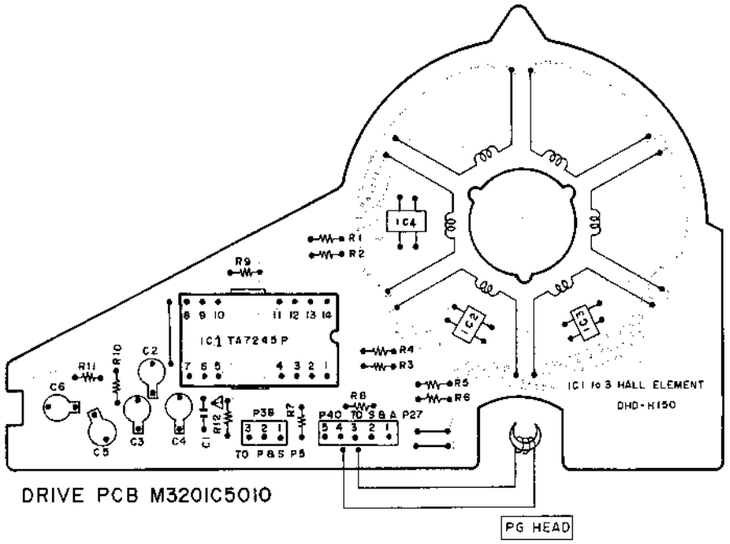
NO.7-7 831110B



VS-12EK/EG



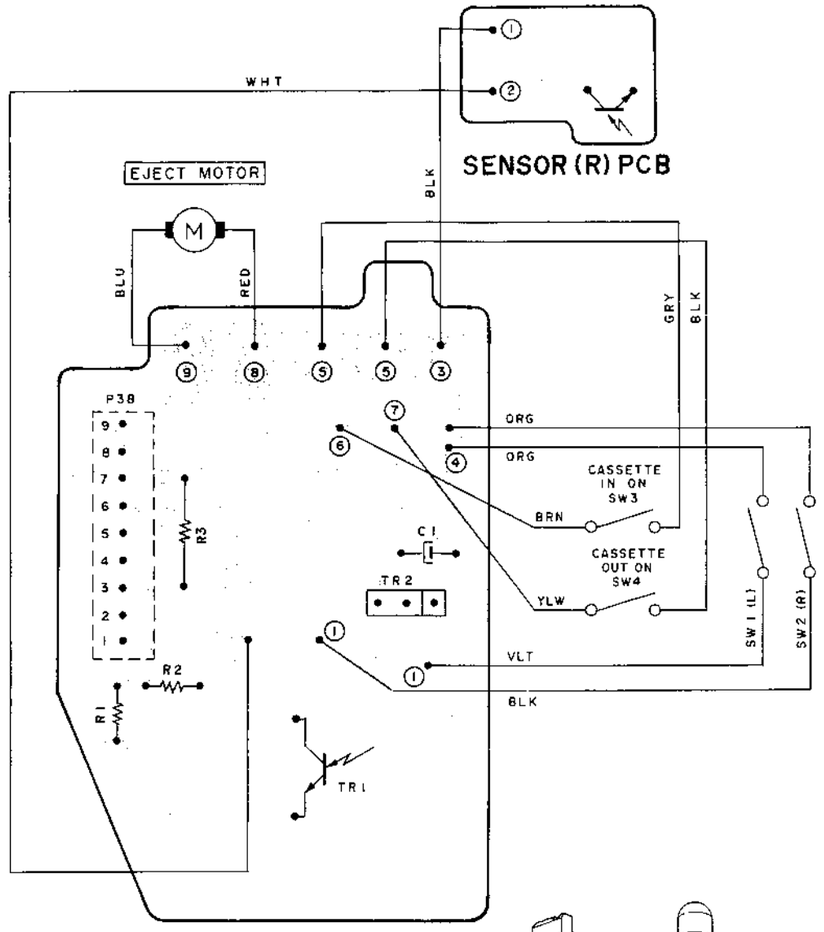
VS-12EK/EG
CONNECTION DIAGRAM
NO. 14-1 840706A



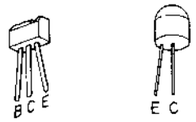
DRIVE PCB M320IC5010

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

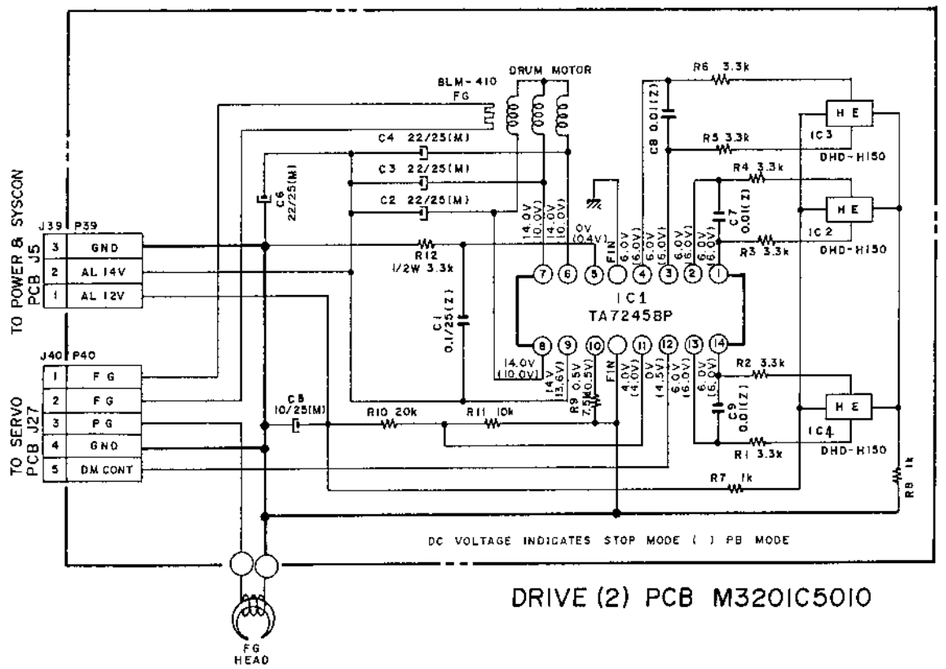
AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT



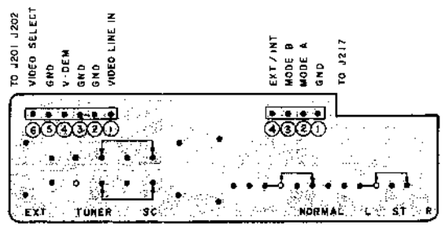
SENSOR (L) PCB V1015D5200



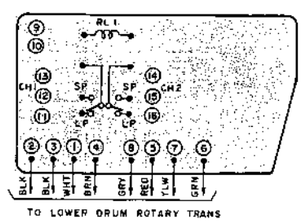
2SD661 PN202S



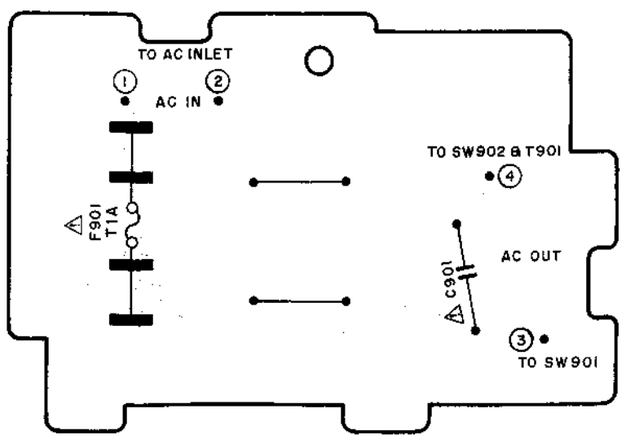
DRIVE (2) PCB M320IC5010



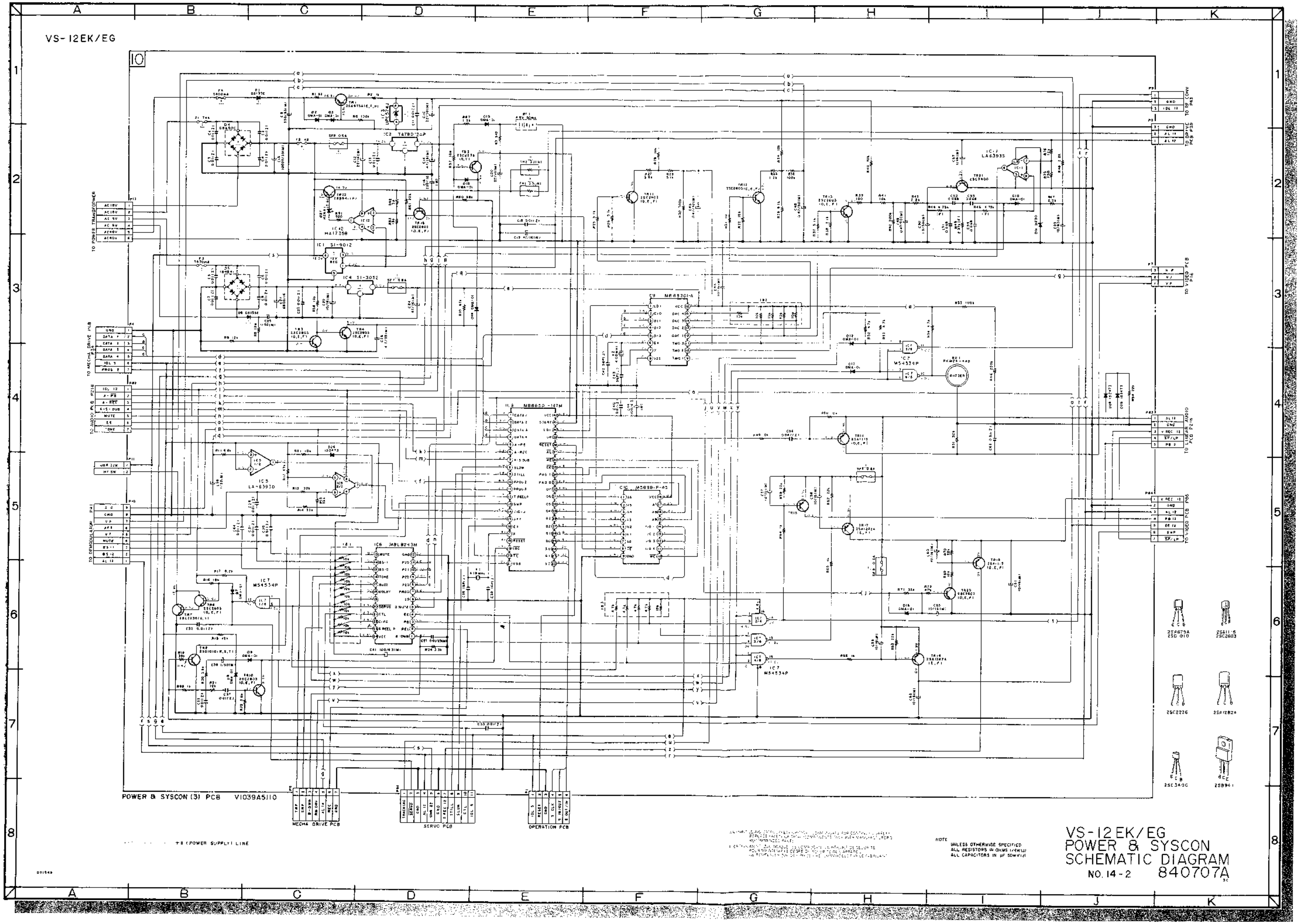
SLIDE SW PCB V1039D5120



RELAY PCB V1039D5070



POWER FILTER PCB V1017D5060


VS-12EK/EG
10
TO POWER TRANSFORMER
TO MECHA DRIVE PCB
TO AUDIO PCB P218
TO DEMODULATOR P41
TO TUNER P43
TO DD/VC PCB P30
TO VIDEO PCB P16
TO LINEAR AUDIO PCB P21A
TO VIDEO PCB P66
IC1 SI-3012
IC2 TA78D12AP
IC4 SI-3052
IC5 LA6393D
IC6 MBL8243M
IC7 M54534P
IC8 MB8850-127M
IC9 MB88301-A
IC10 M58981P-45
IC-J LA6393S
POWER & SYSCON (3) PCB V1039A5110
MECHA DRIVE PCB
SERVO PCB
OPERATION PCB
+B (POWER SUPPLY) LINE
NOTE UNLESS OTHERWISE SPECIFIED ALL RESISTORS IN OHMS (1/6W)(J) ALL CAPACITORS IN μF 50WV(Z)
VS-12EK/EG
POWER & SYSCON
SCHEMATIC DIAGRAM
NO. 14-2 840707A
2SA673A 2SC1010
2SA1115 2SC2603
2SC2226
2SA1282A
2SC3400
2SB941

LOCATION OF COMPONENTS

IC'S

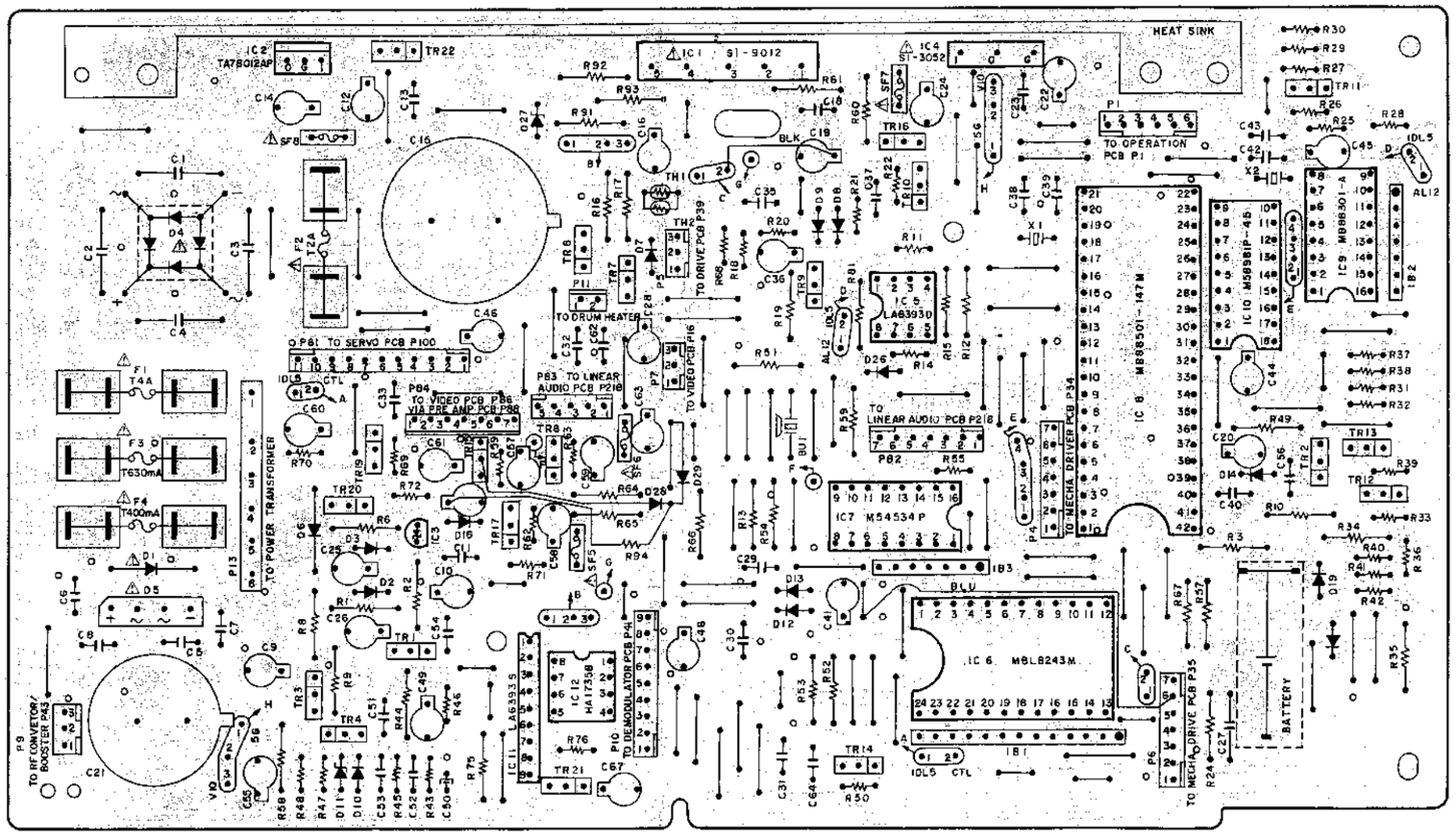
IC1 ····· B1,C1
IC2 ····· A1
IC3 ····· B2
IC4 ····· C1
IC5 ····· C1
IC6 ····· C2
IC7 ····· C2
IC8 ····· D1,D2
IC9 ····· D1
IC10 ····· D1
IC11 ····· B2
IC12 ····· B2

TR'S

TR1 ····· B2
TR2 ····· D2
TR3 ····· A2
TR4 ····· A2,B2
TR7 ····· B1
TR8 ····· B1
TR9 ····· C1
TR10 ····· C1
TR11 ····· D1
TR12 ····· D2
TR13 ····· D2
TR14 ····· C2
TR15 ····· B2
TR16 ····· C1
TR17 ····· B2
TR18 ····· B2
TR19 ····· B2
TR20 ····· A2,B2
TR21 ····· B2
TR22 ····· B1

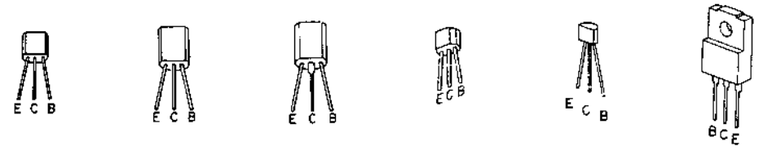
CONNECTORS

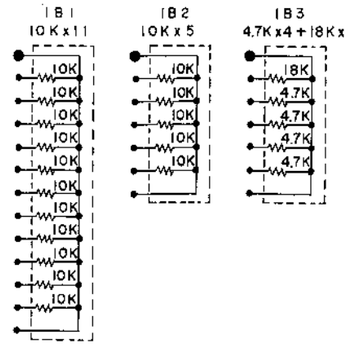
P1 ····· C1,D1
P4 ····· C1,C2
P5 ····· B1
P6 ····· D2
P7 ····· B1
P9 ····· A2
P10 ····· B2
P11 ····· B1
P13 ····· A2
P81 ····· B1
P82 ····· C1,C2
P83 ····· B1
P84 ····· B1,B2



POWER & SYSCON PCB V1039A5110 (2ED)

TR1	2SA675A (E,F,H)
TR2,7	2SC2236 (O,Y)
TR3,4,8,10 to 13,16,20	2SC2603 (D,E,F)
TR9	2SD1010 (R,S,T)
TR14,19	2SA1115 (D,E,F)
TR15,17,18	2SA1282A (E,F)
TR21	2SC3400
TR22	2SB941





WARNING ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SECURITÉ POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

VS-12

= B(POWER SUPPLY) LINE

LED(3) PCB V1015A521C

OPERATION PCB V1015A521A

DC VOLTAGE INDICATES AT STOP MODE
DC VOLTAGE INDICATED IN ( ) IS SP PB MODE

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
POWER TRANSFORMER IS DIFFERENT ACCORDING TO AREA

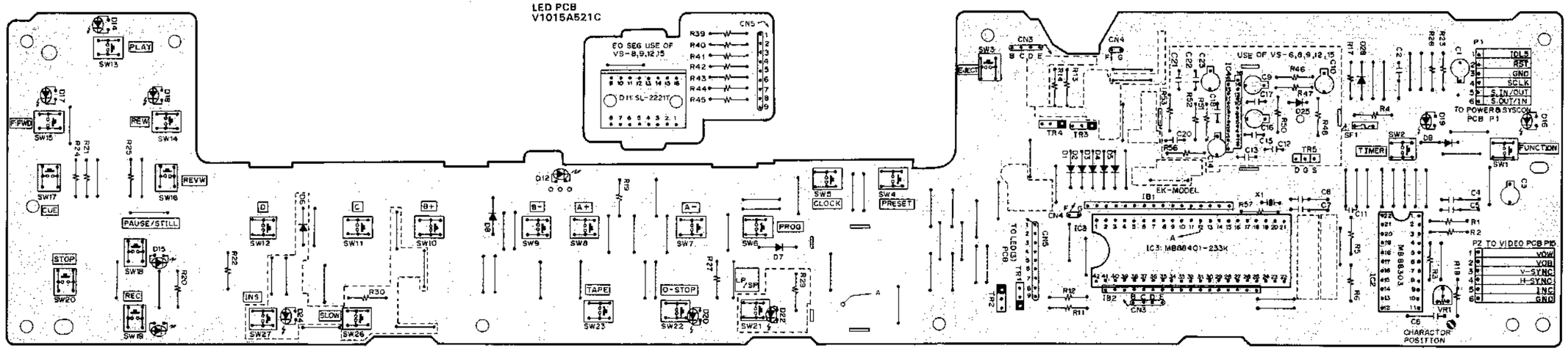
WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

VS-12EG/EK OPERATION SCHEMATIC DIAGRAM

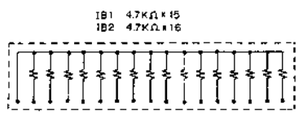
NO. 14-3 831113C

LED PCB
V1015A521C



OPERATION PCB V1015A521A

IB1 4.7KΩ×15
IB2 4.7KΩ×16



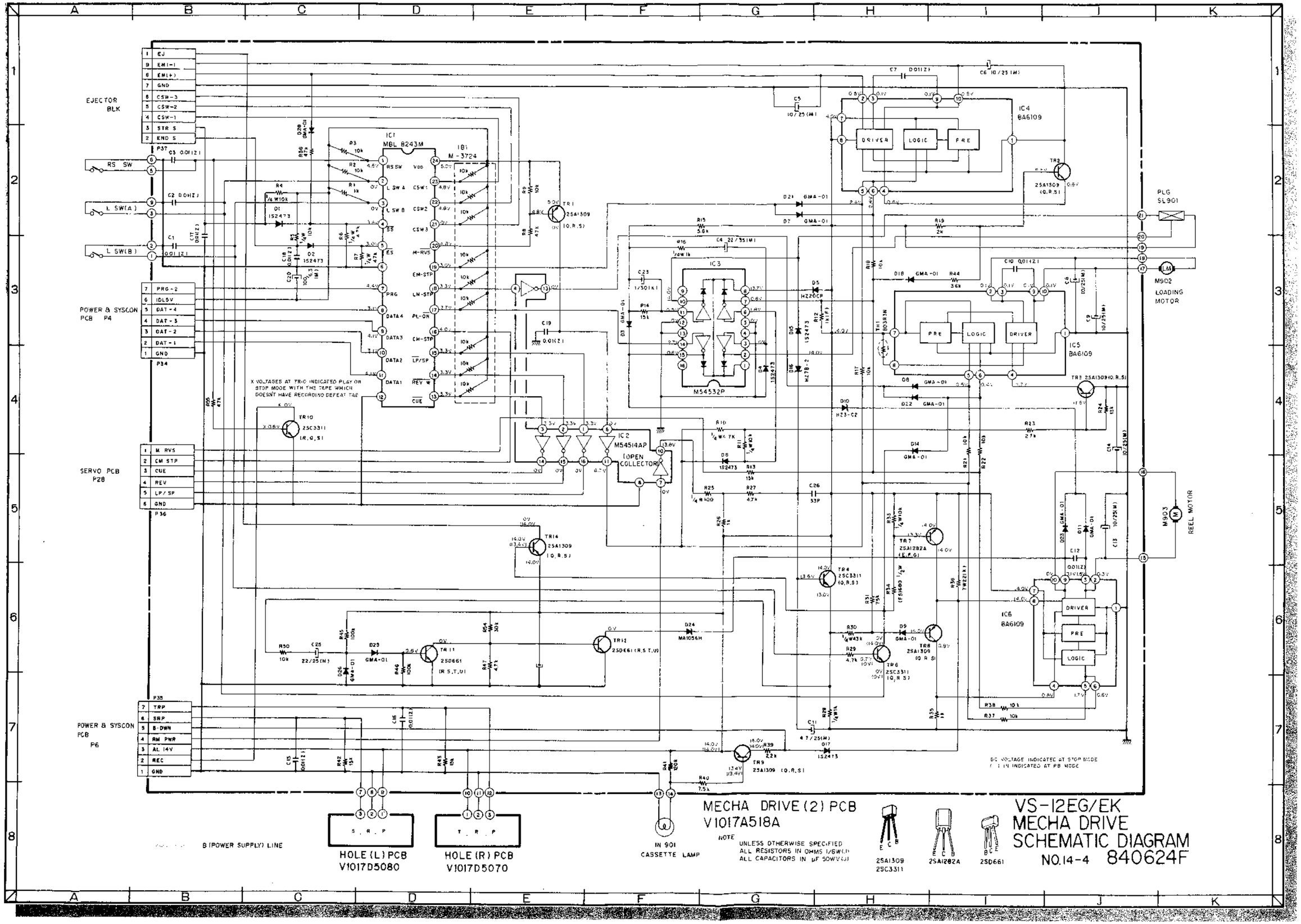
2SB641 2SJ40

TR1 to 4 ..... 2SB641
TR5 ..... 2SJ40

: PNP TRANSISTOR

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠ IDENTIFIE LES COMPOSANTS CRITIQUES DE SECURITE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

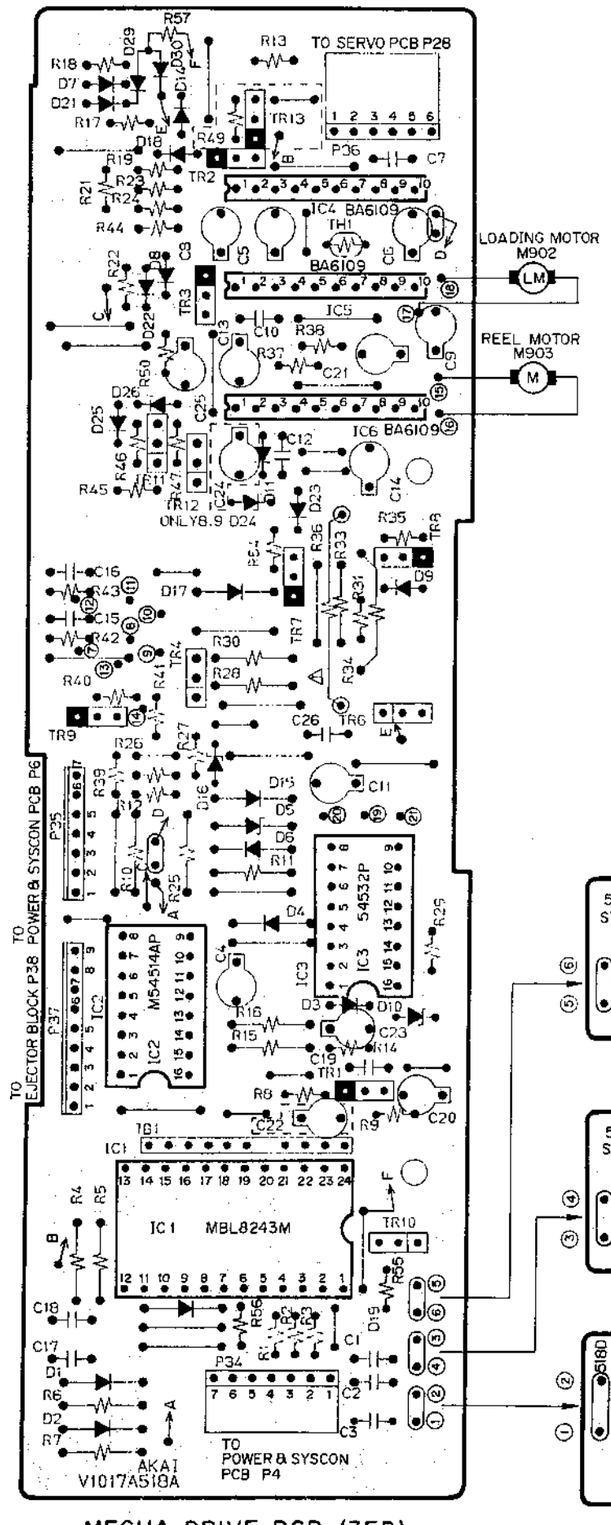


MECHA DRIVE (2) PCB
V1017A518A

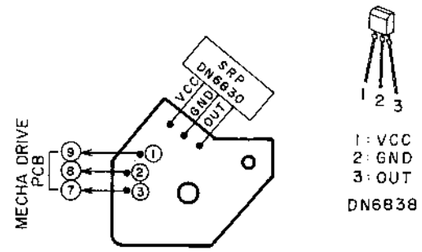
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50WV(J)

2SA1309 2SC3311 (E C B)
2SA1282A (E C B)
2SD661 (B C E)

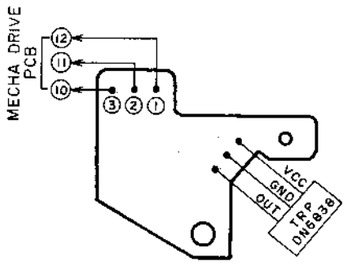
VS-12EG/EK
MECHA DRIVE SCHEMATIC DIAGRAM
NO.14-4 840624F



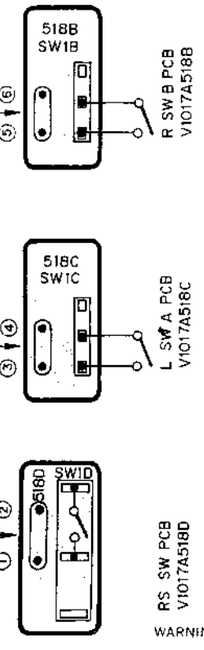
MECHA DRIVE PCB (3ED)
V1017A518A



HALL IC(L) PCB V1017D5080



HALL IC(R) PCB V1017D5070



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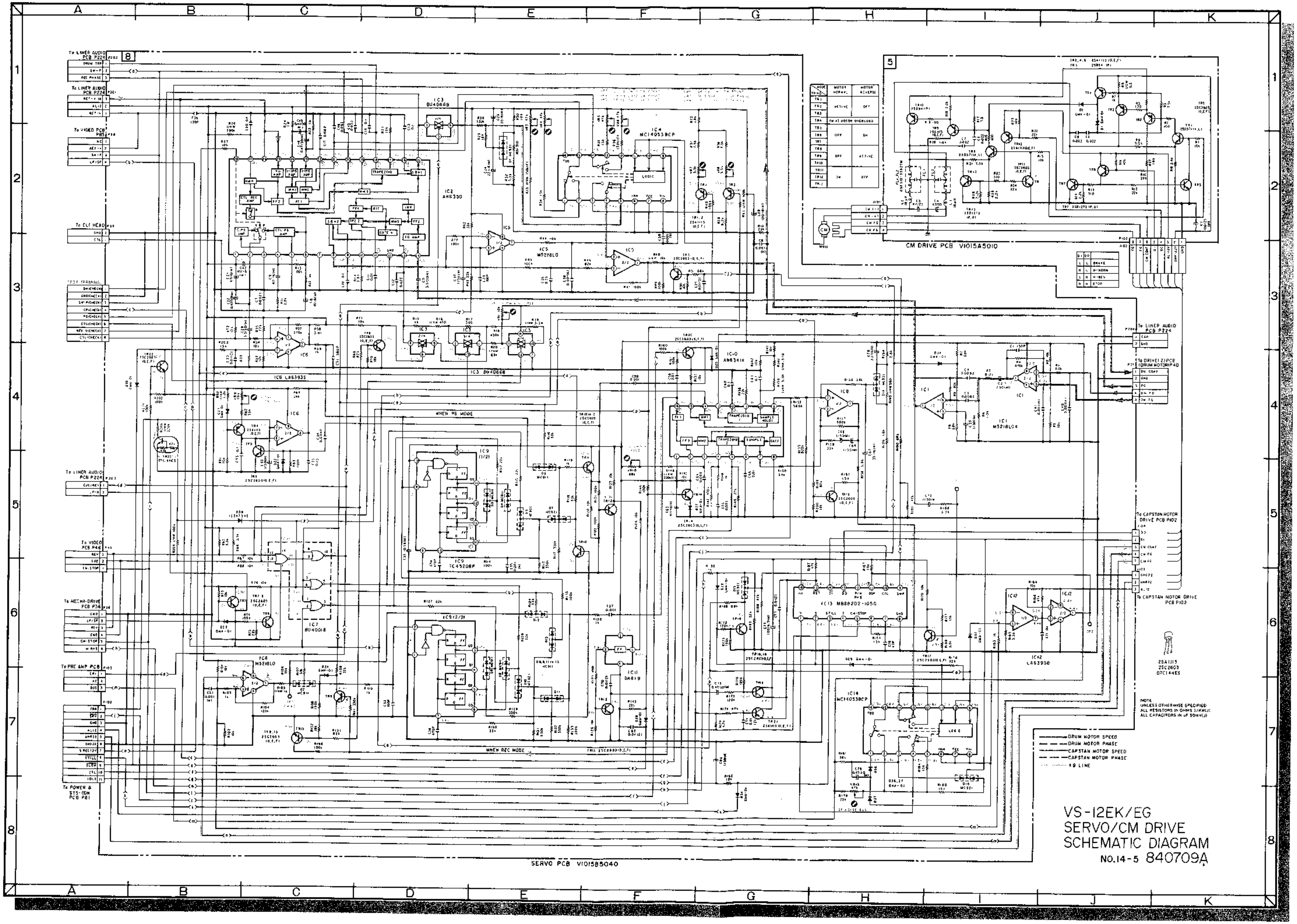
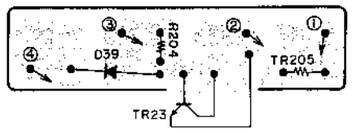
AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

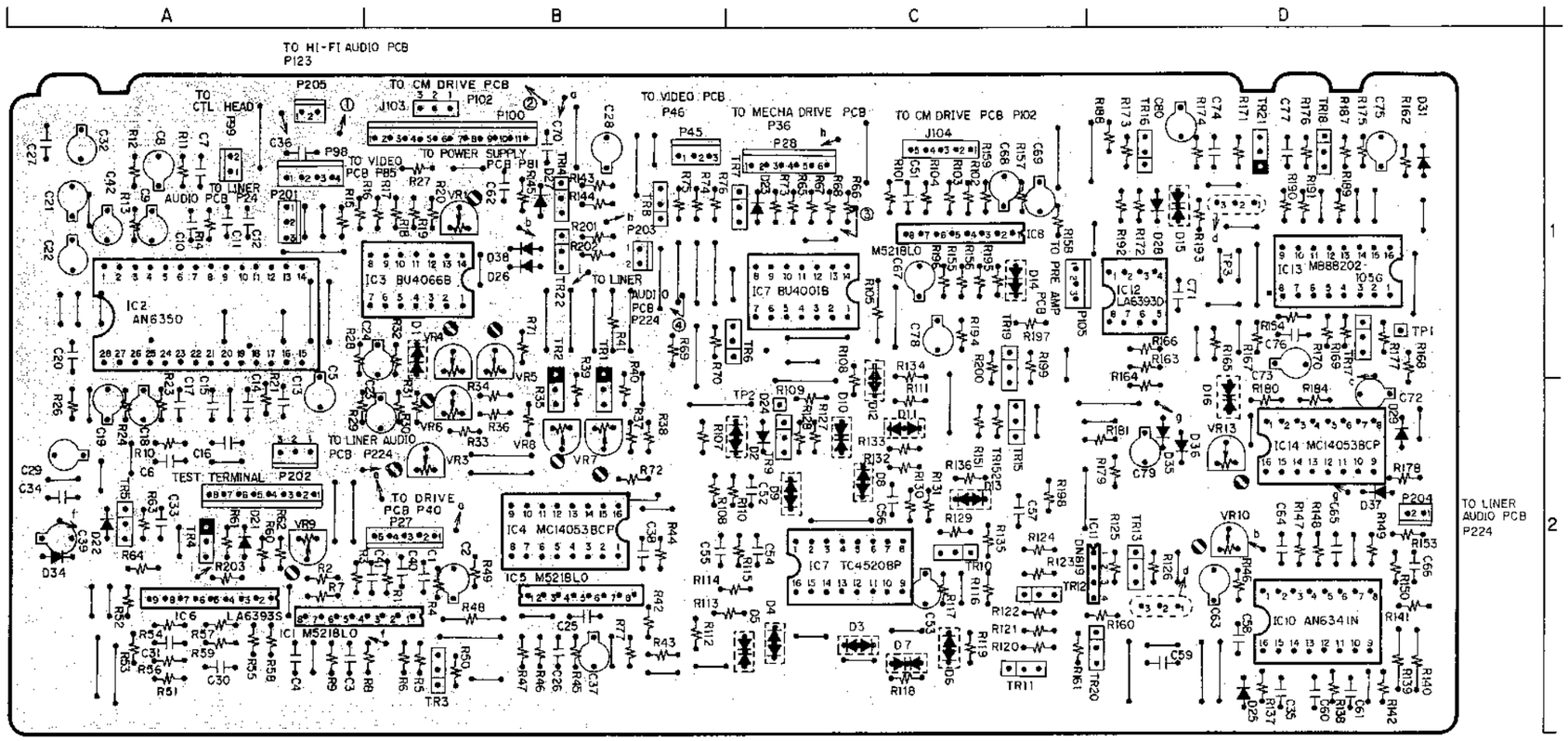


VS-12EK/EG
SERVO/CM DRIVE
SCHEMATIC DIAGRAM
NO.14-5 840709A
SERVO PCB VI015B5040
CM DRIVE PCB VI015A5010



28A1115
2SC2603
DTC144ES

TR1, 2, 4, 21 ..... 2SA1115 (D, E, F)
TR3, 5 to 20, 22 ..... 2SC2603 (D, E, F)
TR23 ..... DTC144ES



SERVO PCB V1015B5040(7ED)

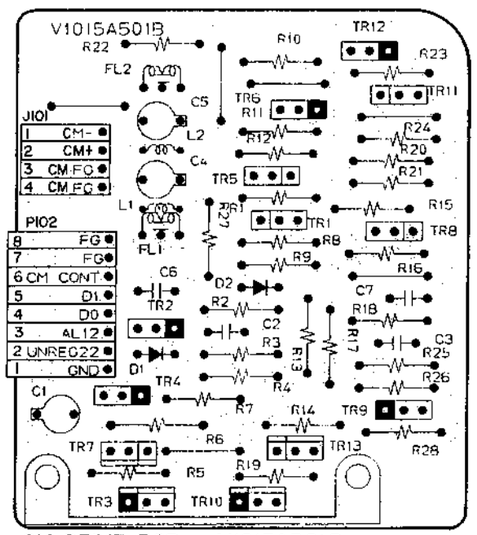
LOCATION OF COMPONENTS

VR1	SP Drum Moter Normal Speed
VR3	SP CH-2 PB Switching Point
VR4	LP CH-2PB Switching Point
VR5	LP CH-1PB Switching Point
VR6	SP CH-1PB Switching Point
VR7	SP CUE/REV Color Phase
VR8	LP CUE/REV Color Phase
VR9	SP Tracking Preset
VR10	SP Capstun Motor Normal
VR13	SP Noise Bar Speed

IC	
IC1	A2, B2
IC2	A1
IC3	B1
IC4, 5	B2
IC6	A2
IC7, 8	C1
IC9	C2
IC10, 11	D2
IC12, 13	D1
IC14	D2

TR	
TR1 to3	B2
TR4, 5	C1
TR6, 7	C1
TR8	B1
TR9 to 12	C2
TR13	D2
TR14	B1
TR15	C2
TR16 to 18	D1
TR19	C1
TR20	D2
TR21	D1
TR22	B1
TR23	A1 (other PCB)

TERMINAL	
P27	B2
P28	C1
P45	B1
P98, 99	A1
P100	B1
P105	C1
P201	A1
P202	A2
P203	B1
P204	D2
P205	A1
J103	B1
J104	C1
TEST TERMINAL	A2



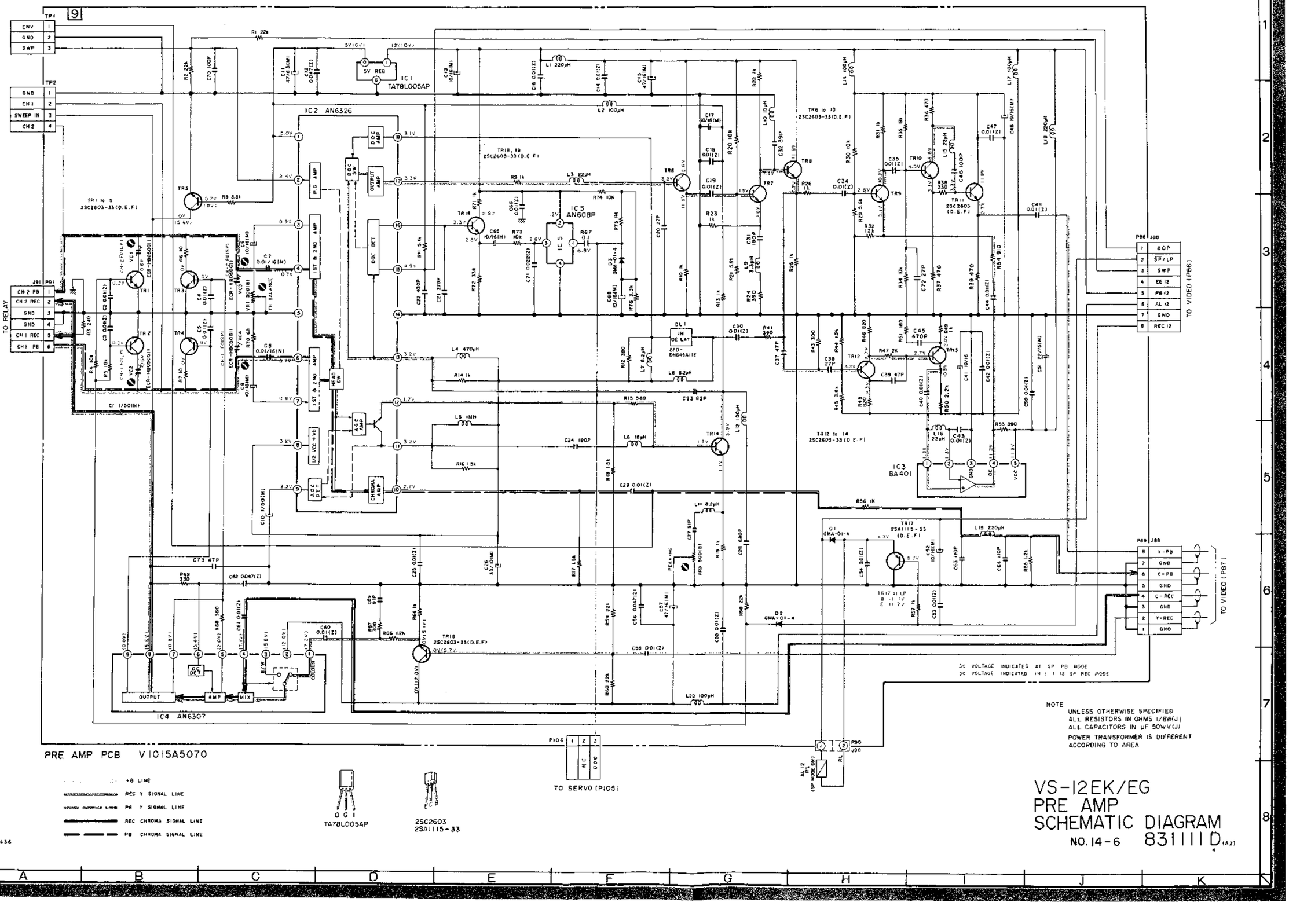
CM DRIVE PCB V1015A501B

TR1,8
2SD571(K,L)
TR2,4,6,9,12
2SA1115(D,E,F)
TR3,10
2SB941(P)
TR5,11
2SC2603(D,E,F)
TR7,13
2SD1273(P,Q)

= PNP TRANSISTOR
= NPN TRANSISTOR

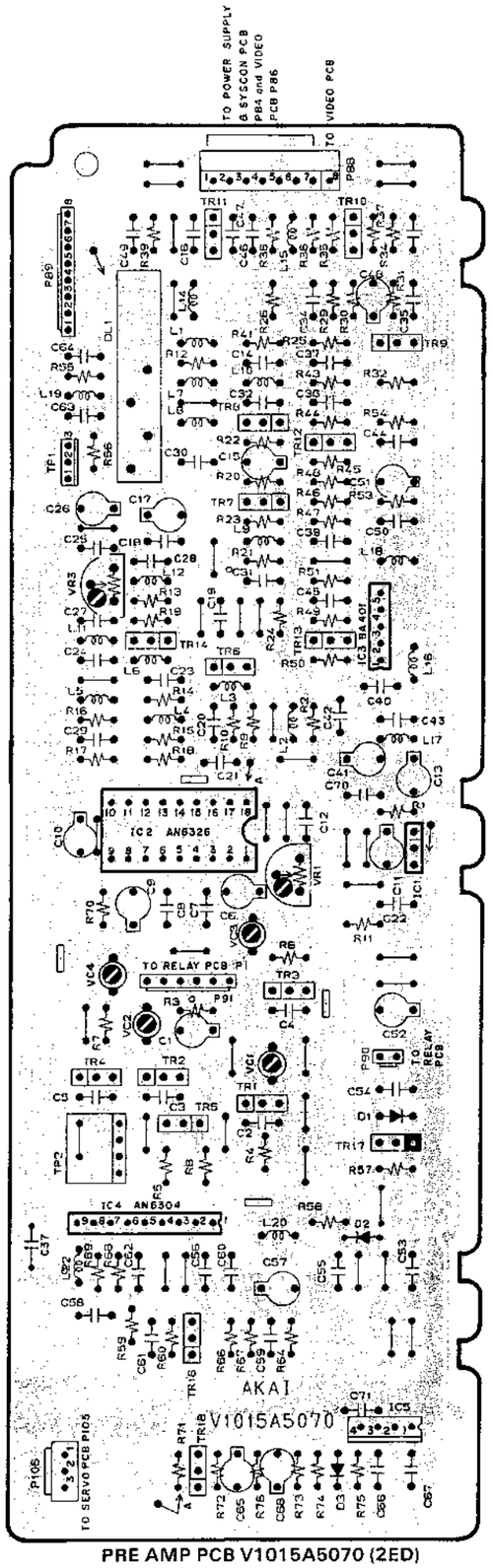
2SD571 2SA1115 2SC2603 2SB941 2SD1273

VS-12



VS-12EK/EG
PRE AMP
SCHEMATIC DIAGRAM

NO. 14-6 8311111 D(A2)



PRE AMP PCB V1015A5070 (2ED)

TR1 to TR14, TR16, TR18, TR19 ..... 2SC2603 (D, E, F)
TR17..... 2SA1115 (D, E, F)

2SA1115
2SC2603

VC1 LP CH2 Fo
VC2 LP CH1 Fo
VC3 SP CH2 Fo
VC4 SP CH1 Fo
VR1 CHANNEL BALANCE
VR3 PEAKING

= PNP TRANSISTOR

= NPN TRANSISTOR

TR1,201,201b .....
..... 2SC3383(S,T)
TR2to7,9to19,22,23,152,
152b,153,153b .....
....2SC2603(D,E,F)
TR8.....2SA1115(D,E,F)
TR20,21....2SJ103(GR,BL)

LOCATION OF IC'S

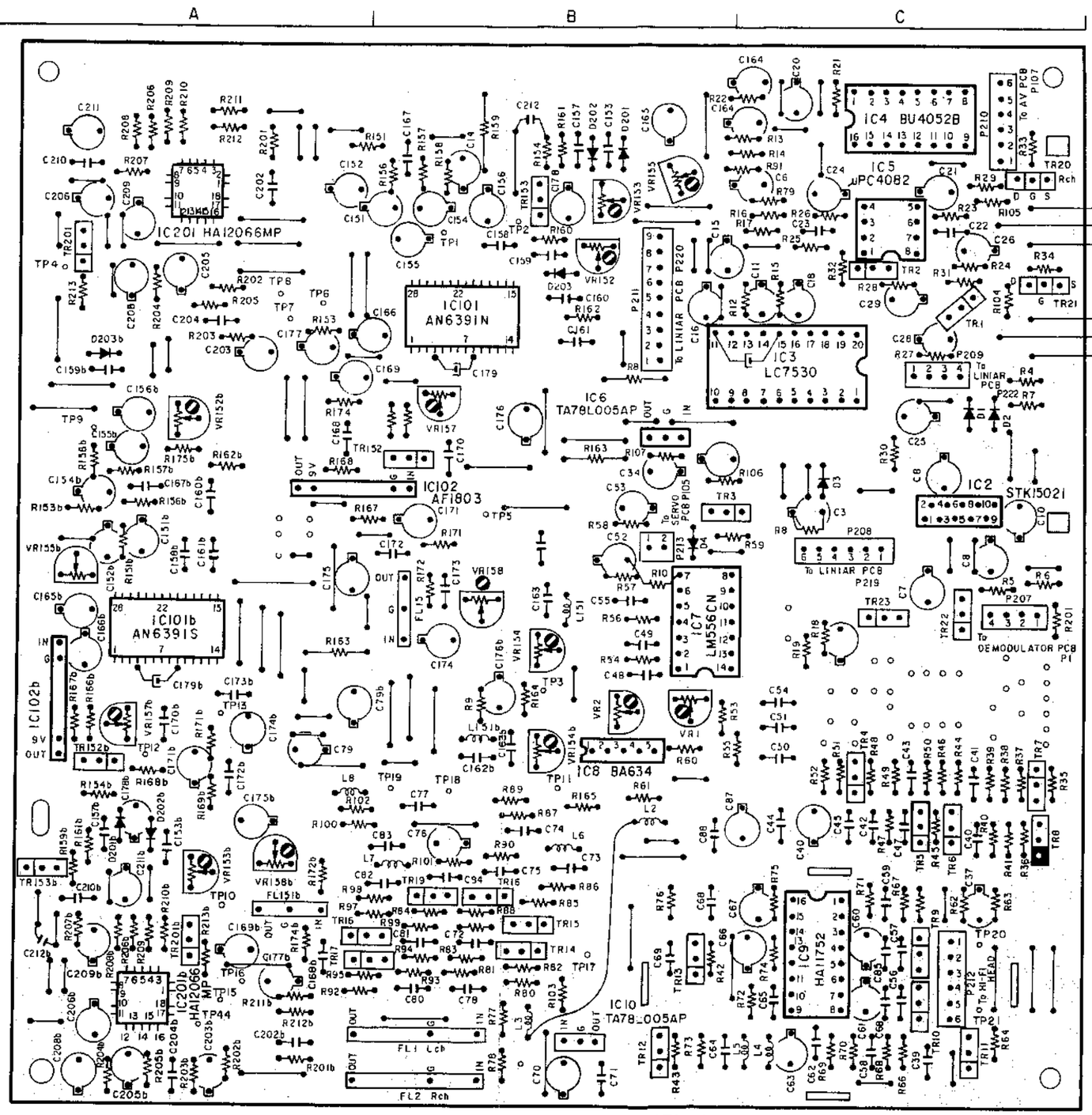
IC2.....2C
IC3.....1C,1B
IC4.....1C
IC5.....1C
IC6.....2B
IC7.....2B
IC8.....2B,3B
IC9.....3C
IC10.....3B
IC101.....1B
IC101b.....2A
IC102.....2A,2B
IC102b.....2A
IC201.....1A
IC201b.....3A

LOCATION OF TR'S

TR1.....1C
TR2.....1C
TR3.....2B,2C
TR4.....3C
TR5.....3C
TR6.....3C
TR7.....3C
TR8.....3C
TR9.....3C
TR10.....3C
TR11.....3C
TR12.....3B
TR13.....3B
TR14.....3B
TR15.....3B
TR16.....3B
TR17.....3B
TR18.....3B
TR19.....3B
TR20.....1C
TR21.....1C
TR22.....2C
TR23.....2C
TR152.....2B
TR152b.....3A
TR153.....1B
TR153b.....3A
TR201.....1A
TR201b.....3A

LOCATION OF CONNECTOR

P207.....2C
P208.....2C
P209.....1C
P210.....1C
P211.....1B
P212.....3C
P213.....2B



HIFI AUDIO PCB
V1039A5010

VR1.....AUDIO SW SWP
VR2.....
VR152.....CARRIER(L)
VR152b....CARRIER(R)
VR153.....DEVIATION(L)
VR153b....DEVIATION(R)
VR154.....FM REC CURRENT(L)
VR154b....FM REC CURRENT(R)
VR155.....EE LEVEL(L)
VR155b....EE LEVEL(R)
VR157.....PB LEVEL (L)
VR157b....PB LEVEL (R)
VR158.....AUDIO DOC (L)
VR158b....AUDIO DOC (R)

2SC3383(S,T) 2SC2603(D,E,F)
2SA1115(D,E,F)

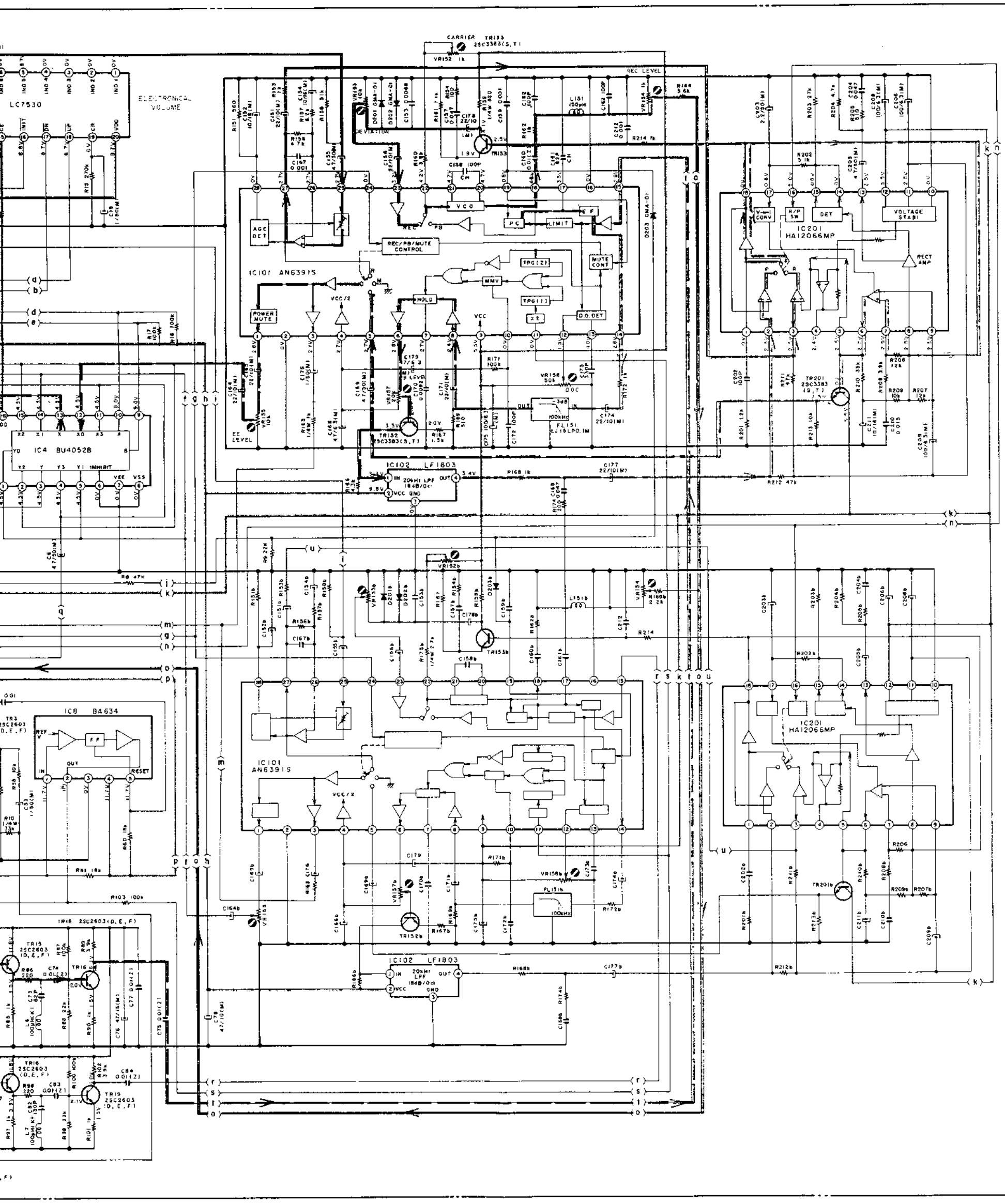
2SJ103(GR,BL)

= PNP(2SA,2SB)TYPE TRANSISTOR

= NPN(2SC,2SD)TYPE TRANSISTOR

VS-12EK/EG

EXT AUDIO IN L ch
EXT AUDIO IN R ch
TO LINEAR AUDIO P219
P208
VR UP 1
VR DN 2
SELECT EXT/INT 3
MODE A 4
MODE B 5
A MUTE 6
TO DEMODU PCB P42
P207
AUDIO DEMO 3
GND 2
AUDIO DEMO 1
GND 4
AUDIO OUT L ch
AUDIO OUT R ch
TO AV PCB P107
P210
A OUT Rch 1
GND 2
GND 3
A OUT Lch 4
NC 5
VJ 6
TO LINEAR AUDIO PCB P222
P209
A OUT Rch 4
GND 3
A OUT Lch 2
GND 1
TO LINEAR AUDIO PCB P220
P211
AL 9V 1
REC 12V 2
PB12V 3
GND 4
LINEAR IN 5
GND 6
EED 7
EED 8
LINEAR OUT 9
TO HIFI AUDIO HEAD
P212
TO SERVO PCB P205
P213
GND 2
PG 1
IC2 TK15012
IC3 LC7530
IC4 BU4066
IC5 μPC4082C
IC6 T47BL005AP
IC7 LM556CN
IC9 HA11752
IC10 TA78L005AP
TR20 2SJ103(GR,BL)
TR21 2SJ103(GR,BL)
TR22,23 2SC2603(D,E,F)
TR1 2SC3383(S,T)
TR2 2SC3383(S,T)
TR4 to 7 2SC2603(D,E,F)
TR8 2SA1115(D,E,F)
TR9 2SC2603(D,E,F)
TR3 2SC2603(D,E,F)
TR10 2SC2603(D,E,F)
TR11 2SC2603(D,E,F)
TR12,13 2SC2603(D,E,F)
TR14 2SC2603(D,E,F)
TR15 2SC2603(D,E,F)
TR16 2SC2603(D,E,F)
TR17 2SC2603(D,E,F)
TR18 2SC2603(D,E,F)
TR16,17 2SC2603(D,E,F)
TO METER, HEADPHONE
AUDIO SWING
HIFI AUDIO PCB V1039A5010
+B (POWER SUPPLY) LINE
REC (L ch)
PB (L ch)



2SA1115
2SC2603

2SC3383

2SJ103

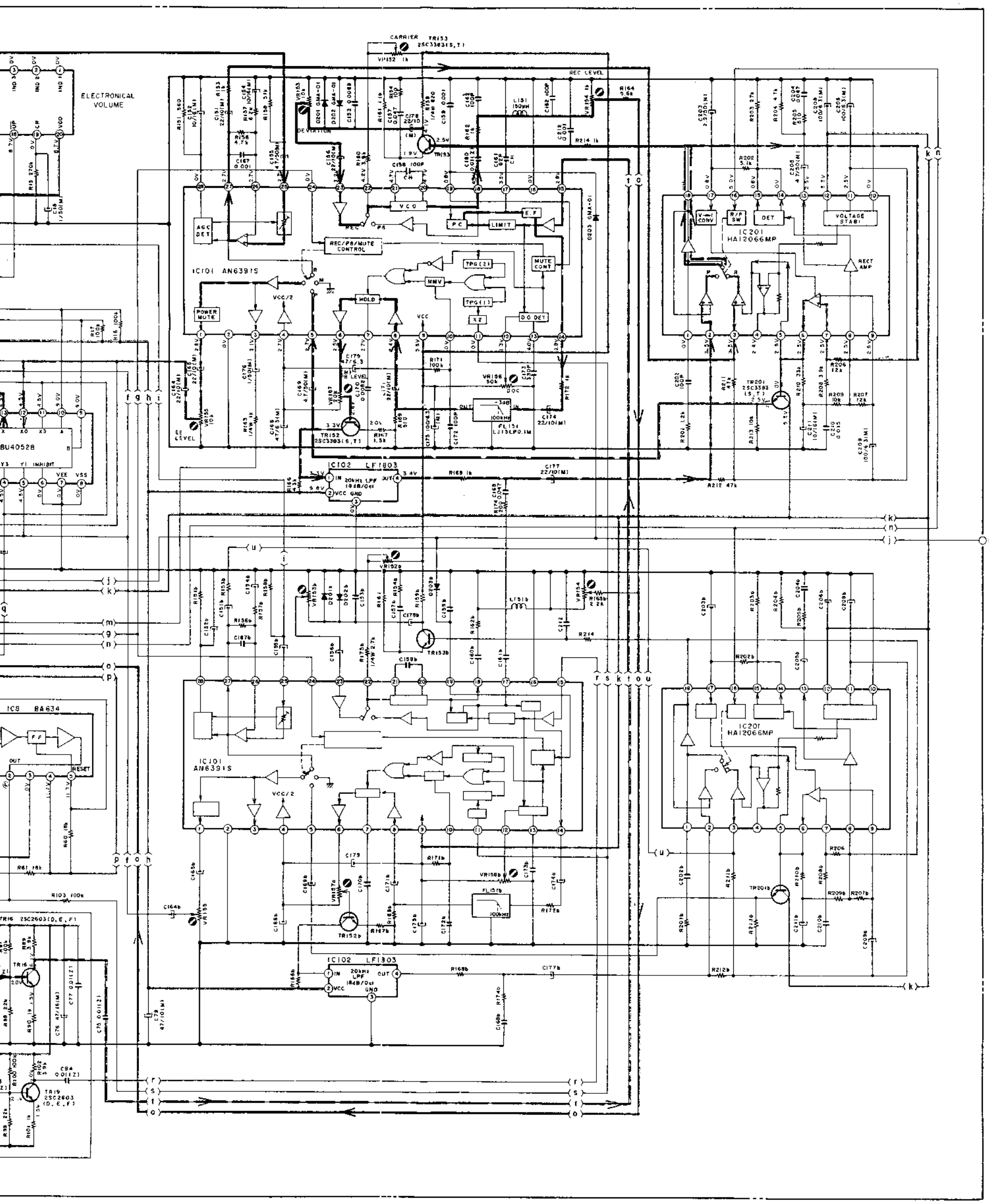
WARNING ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT ⚠ IL INDIQUE LES COMPOSANTES CRITIQUES DE SECURITE POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W (1/2)
ALL CAPACITORS IN μF 50WV (1)

VS-12EK/EG
HIFI AUDIO
SCHEMATIC DIAGRAM
NO. 14-8 840710B

IC2 TK15012
IC3 LC7530
IC4 BU4052B
IC5 μPC4082C
IC6 TA78L005AP
IC7 LM556CN
IC8 BA634
IC9 HA11752
IC10 TA78L005AP
EXT AUDIO IN Lch
EXT AUDIO IN Rch
TO LINEAR P219
VR UP
VR DN
SELECT EXT/INT
MODE A
MODE B
A MUTE
D MUTE
TO DEMODU PCB P42
AUDIO DEMO
GND
AUDIO DEMO
GND
AUDIO OUT Lch
AUDIO OUT Rch
TO AV PCB P107
A OUT Rch
GND
GND
A OUT Lch
NC
VJ
TO LINEAR AUDIO PCB P222
A OUT Rch
GND
A OUT Lch
GND
TO METER HEADPHONE
TO LINEAR AUDIO PCB P220
AL 9V
REC 12V
PB 12V
GND
LINEAR IN
GND
EEO
EED
LINEAR OUT
AUDIO SWING
TO HIFI AUDIO HEAD
TO SERVO PCB P205
GND
PG
HIFI AUDIO PCB V1039A5010 (2ED)
+B (POWER SUPPLY) LINE
REC (L ch)
PB (L ch)
2SA1115
2SC2603



2SA1115
2SC2603

2SC3383

2SJ103

WARNING ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SECURITE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL, NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT.

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(1J)
ALL CAPACITORS IN μF 50WV(1H)

VS-12EK/EG
HIFI AUDIO (2ED)
SCHEMATIC DIAGRAM
NO. 14-9 840710A
4C

TR1,201,201b .....
.....2SC3383(S,T)
TR2to7,9to19,22,23,152,
152b,153,153b .....
....2SC2603(D,E,F)
TR8.....2SA1115(D,E,F)
TR20,21....2SJ103(GR,BL)

LOCATION OF IC'S

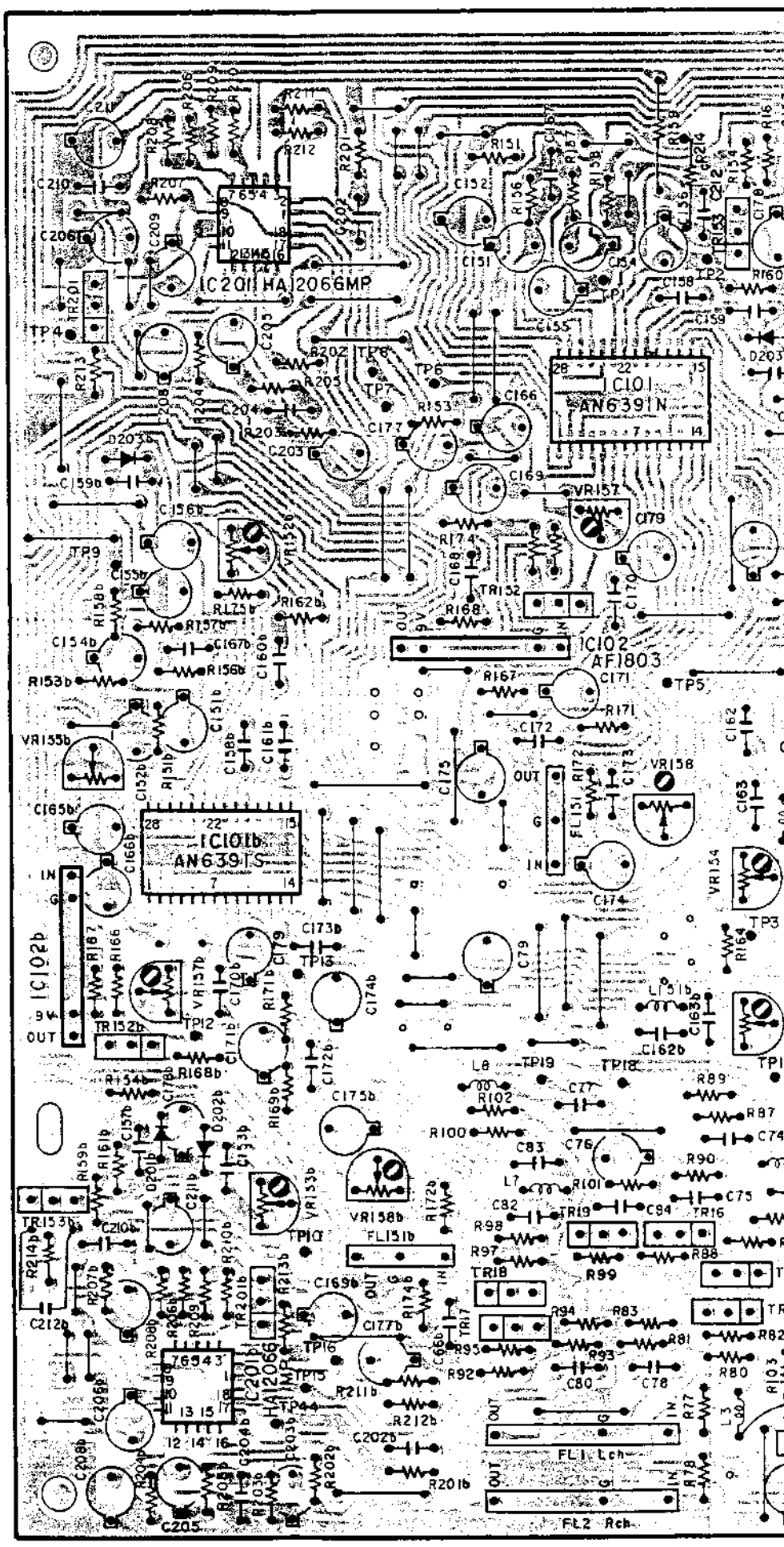
IC2.....2C
IC3.....1C,1B
IC4.....1C
IC5.....1C
IC6.....2B
IC7.....2B
IC8.....2B,3B
IC9.....3C
IC10.....3B
IC101.....1B
IC101b.....2A
IC102.....2A,2B
IC102b.....2A
IC201.....1A
IC201b.....3A

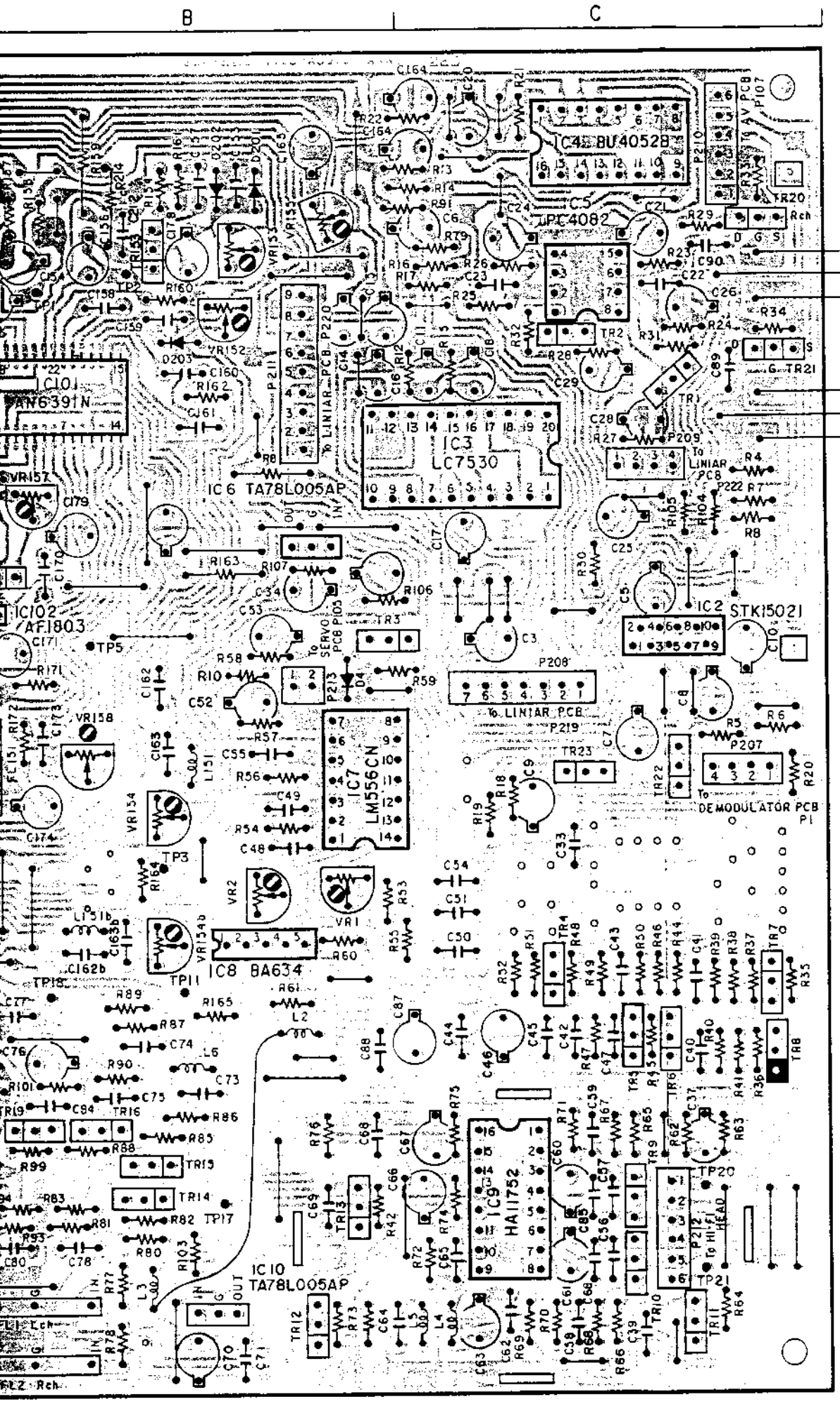
LOCATION OF TR'S

TR1.....1C
TR2.....1C
TR3.....2B,2C
TR4.....3C
TR5.....3C
TR6.....3C
TR7.....3C
TR8.....3C
TR9.....3C
TR10.....3C
TR11.....3C
TR12.....3B
TR13.....3B
TR14.....3B
TR15.....3B
TR16.....3B
TR17.....3B
TR18.....3B
TR19.....3B
TR20.....1C
TR21.....1C
TR22.....2C
TR23.....2C
TR152.....2B
TR152b.....3A
TR153.....1B
TR153b.....3A
TR201.....1A
TR201b.....3A

LOCATION OF CONNECTOR

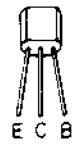
P207.....2C
P208.....2C
P209.....1C
P210.....1C
P211.....1B
P212.....3C
P213.....2B



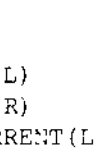


VR1..... AUDIO SW SWP
VR2.....
VR152.....CARRIER(L)
VR152b....CARRIER(R)
VR153.....DEVIATION(L)
VR153b....DEVIATION(R)
VR154.....FM REC CURRENT(L)
VR154b....FM REC CURRENT(R)
VR155.....EE LEVEL(L)
VR155b....EE LEVEL(R)
VR157.....PB LEVEL (L)
VR157b....PB LEVEL (R)
VR158.....AUDIO DOC (L)
VR158b....AUDIO DOC (R)

2SA1115(D,E,F)
2SC2603(D,E,F)



2SC3383(S,T)



2SJ103(GR,BL)

B
= PNP(2SA,2SB)TYPE TRANSISTOR

B
= NPN(2SC,2SD)TYPE TRANSISTOR

HIFI AUDIO PCB (2ED)
V1039A5010

VS-12

IC 1 AN6310
IC 2 HA11703
IC 3 AN6360
IC 4 AN6362
IC 7 HD14053BP
IC 501 BA7022
IC 505 MC14070BCP
IC 510 NE555P
IC 511 TA78L005AP
IC 515 AN6608P
WHEN SP MODE
WHEN LP MODE
=REC Y-SIGNAL LINE
=PB Y-SIGNAL LINE
=REC CHROMA SIGNAL LINE
=PB CHROMA SIGNAL LINE

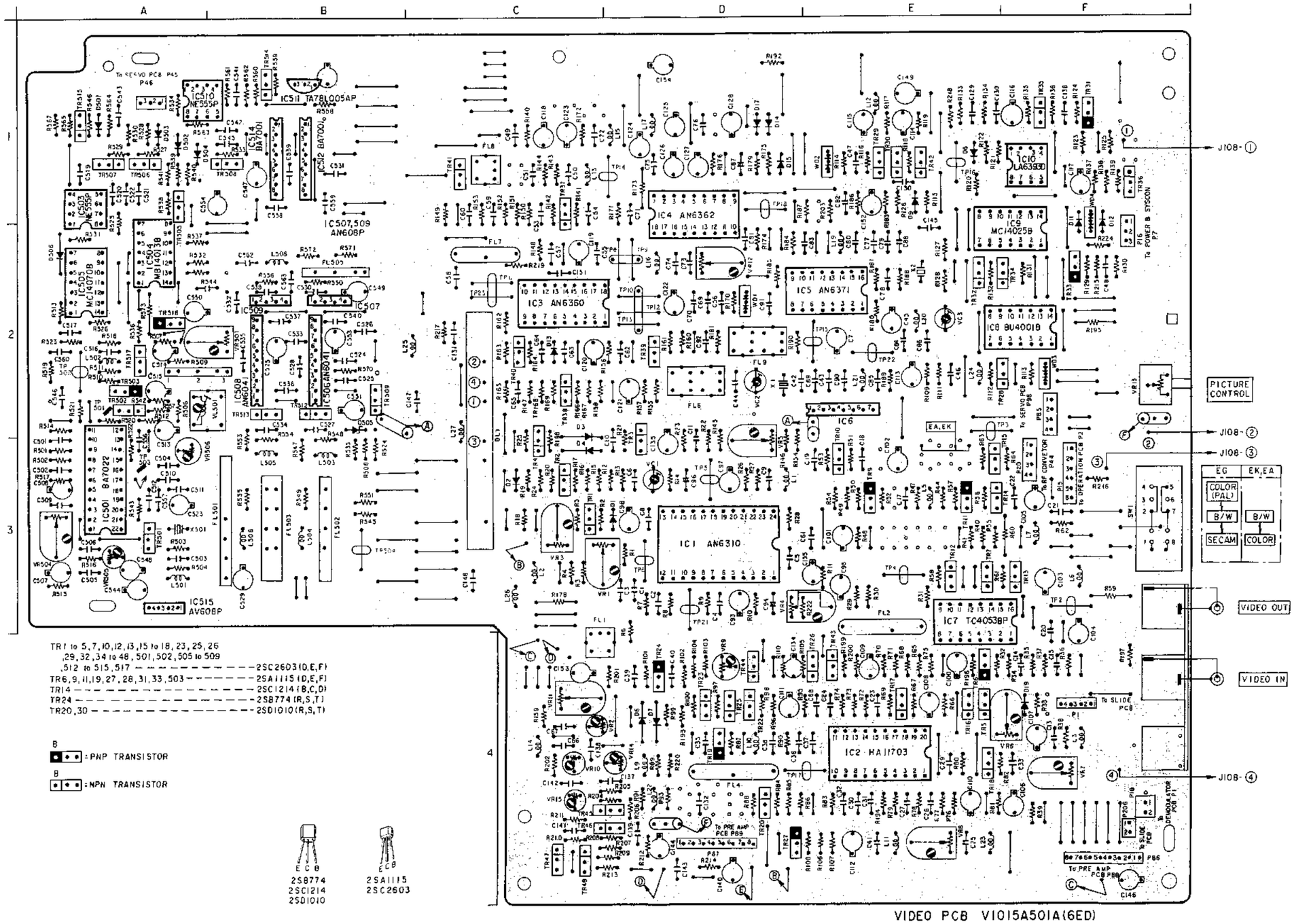
VS-12 EG/EK VIDEO SCHEMATIC DIAGRAM

NO. 14-9 831107D

VIDEO PCB V1015A501A

NOTE

UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μF 50 WV(J)
(FS) = FAIL SAFE RESISTORS



TR1 to 5, 7, 10, 12, 13, 15 to 18, 23, 25, 26
, 29, 32, 34 to 48, 501, 502, 505 to 509
, 512 to 515, 517 ---------- 2SC2603(D,E,F)
TR6, 9, 11, 19, 27, 28, 31, 33, 503 ---------- 2SA1115(D,E,F)
TR14 ---------- 2SC1214(B,C,D)
TR24 ---------- 2SB774(R,S,T)
TR20, 30 ---------- 2SD1010(R,S,T)

B
:PNP TRANSISTOR

B
:NPN TRANSISTOR

E C B
2SB774
2SC1214
2SD1010

E C B
2SA1115
2SC2603

VIDEO PCB V1015A501A(6ED)

LOCATION OF COMPONENTS

IC's

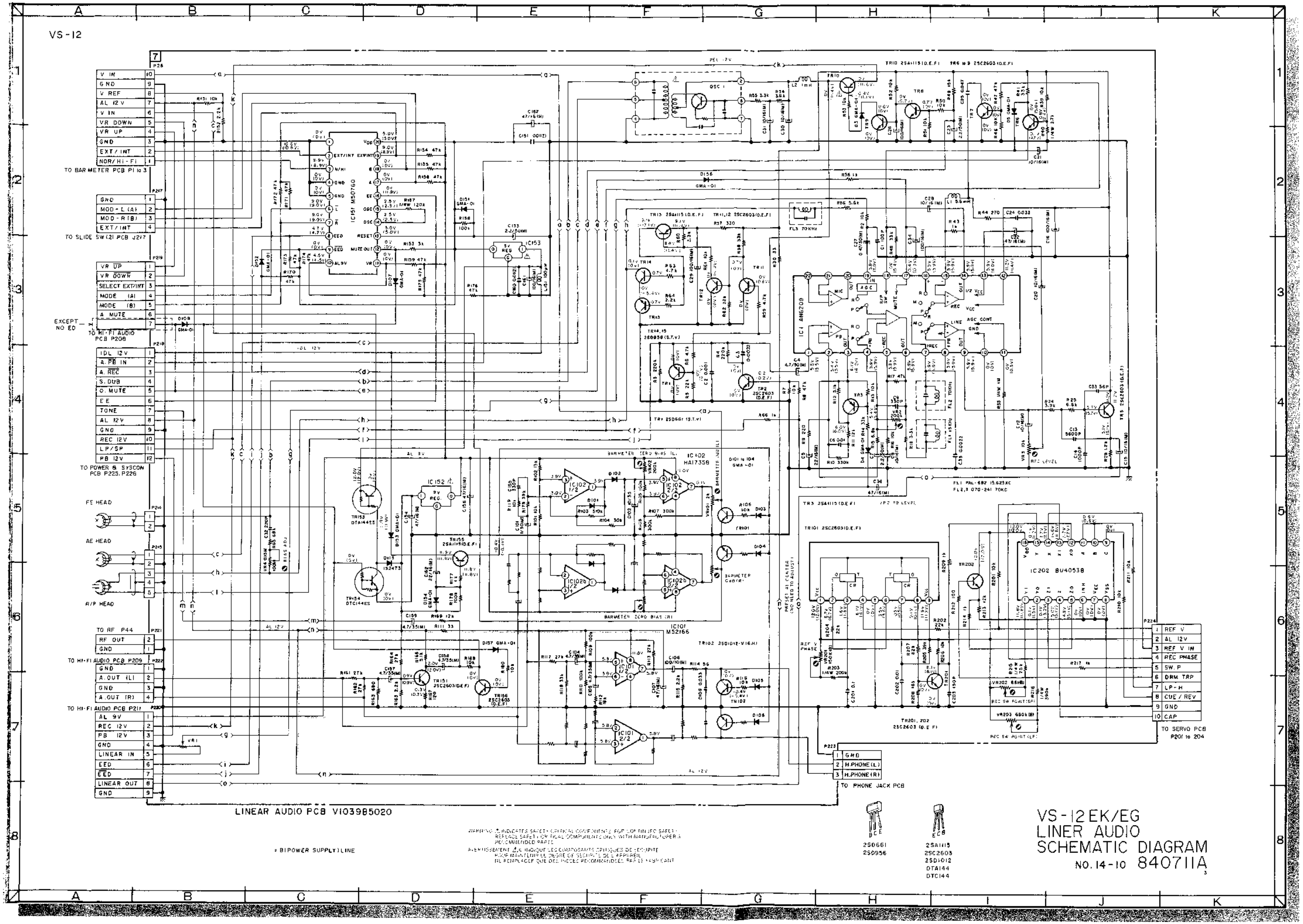
IC1 ---------- D3
IC2 ---------- E4
IC3 ---------- C2
IC4 ---------- D1
IC5,6 ---------- E2
IC7 ---------- E4
IC8 ---------- F2
IC9,10 ---------- F1
IC501 ---------- A3
IC503 ---------- A1
IC504,505 ---------- A2
IC506 to 509 ---------- B2
IC510 ---------- A1
IC512,514 ---------- B1
IC515 ---------- A3

TR's

TR1,2,4 ---------- C3
TR3 ---------- D2
TR5,6 ---------- E4
TR7,9 to 12,14,15 ---------- E3
TR13 ---------- F3
TR16 to 18 ---------- E4
TR19 to 27 ---------- D4
TR28 ---------- F2
TR29,30 ---------- E1
TR31 ---------- F1
TR32,34 ---------- E2
TR33 ---------- F2
TR35,36 ---------- F1
TR37 ---------- C1
TR38,40 ---------- C2
TR39 ---------- D2
TR41 ---------- C1
TR42 ---------- E1
TR43 ---------- E4
TR44 ---------- D4
TR45 to 48 ---------- C4
TR501 ---------- A3
TR502,503 ---------- A2
TR505 to 507 ---------- A1
TR508 ---------- B1
TR509,512,513 ---------- B2
TR514 ---------- B1
TR515 ---------- A1
TR517 ---------- A2

CONNECTORS

P1 ---------- F4
P15 ---------- F3
P16 ---------- F1
P18 ---------- F4
P20 ---------- F3
P46 ---------- A1
P85 ---------- F2
P86 ---------- F4
P87 ---------- D4
P206 ---------- F4


VS-12
LINEAR AUDIO PCB V1039B5020
VS-12 EK/EG
LINER AUDIO
SCHEMATIC DIAGRAM
NO. 14-10 840711A
TO BAR METER PCB P1 to 3
TO SLIDE SW(2) PCB J217
TO HI-FI AUDIO PCB P208
TO POWER & SYSCON PCB P225, P226
TO RF P44
TO HI-FI AUDIO PCB P209
TO HI-FI AUDIO PCB P211
TO PHONE JACK PCB
TO SERVO PCB P201 to 204
FE HEAD
AE HEAD
R/P HEAD
IC151 M50760
IC1 AN6209
IC202 BU4053B
IC102 HA17358
IC101 M5216S
2SD661
2SD956
2SA1115
2SC2603
2SD1012
DTA144
DTC144
FL1 PAL-682 15.625KC
FL2,3 070-241 70KC

PARTS LOCATION

TRANSISTOR

TR1	A2	TR13	A3
TR2	A2	TR14	A2
TR3	B2	TR15	A2
TR5	B2	TR151	B2
TR6	C3	TR153	D2
TR7	C3	TR154	D2
TR8	A3	TR155	D2
TR9	A3	TR156	C2
TR10	A3	TR101	C1
TR11	A3	TR101b	C2
TR12	A3	TR201	E2
TR102	B1	TR202	E3
TR102b	B2		

IC'S

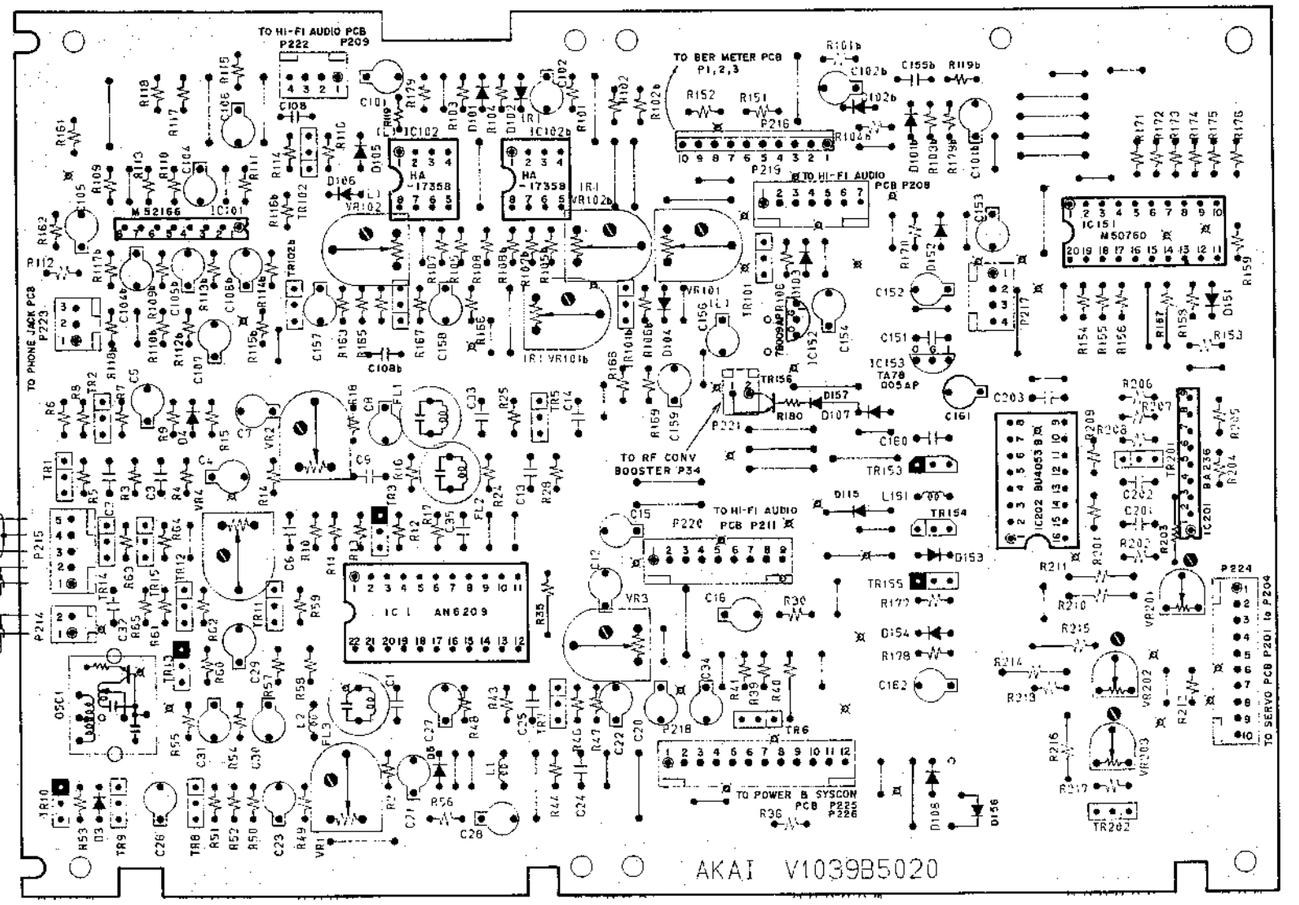
IC 1	B3
IC 101	A1
IC 102	B1
IC 102b	B1
IC 151	E1
IC 152	C2
IC 153	D2
IC 201	E2
IC 202	D2

R/P HEAD

AE HEAD

FE HEAD

VR1.....EE LEVEL
VR2.....P.B LEVEL
VR3.....REC LEVEL
VR101....BAR METER 0dB(L)
VR101b...BAR METER 0dB(R)
VR102....BAR METER ZERO BIAS (L)
VR102b...BAR METER ZERO BIAS (R)
VR201... REF V PHASE
VR202... REC SW POINT(LP)
VR203... REC SW POINT(SP)



2SA1115
2SC2603
2SD1012
DTA114ES
DTC114ES

2SD661
2SD958

TR1 ---------- 2SD661
TR2,5 to 9,11,12,101,101b 201,202,151,156 ---------- 2SC2603
TR3,10,13,155 ---------- 2SA1115
TR14,15 ---------- 2SD958
TR153 ---------- DTA114ES
TR154 ---------- DTC114ES
TR102,102b ---------- 2SD1012

LINEAR AUDIO PCB V1039B5020 (2ED)

B PNP TRANSISTOR

B NPN TRANSISTOR

PARTS LOCATION

TRANSISTOR

TR1	A2	TR13	A3
TR2	A2	TR14	A2
TR3	B2	TR15	A2
TR5	B2	TR151	B2
TR6	C3	TR153	D2
TR7	C3	TR154	D2
TR8	A3	TR155	D2
TR9	A3	TR156	C2
TR10	A3	TR101	C1
TR11	A3	TR101b	C2
TR12	A3	TR201	E2
TR102	B1	TR202	E3
TR102b	B2		

IC'S

IC 1	B3
IC 101	A1
IC 102	B1
IC 102b	B1
IC 151	E1
IC 152	C2
IC 153	D2
IC 201	E2
IC 202	D2

PB/REC HEAD

AE HEAD

FE HEAD

VR1.....EE LEVEL
VR2.....P.B LEVEL
VR3.....REC LEVEL
VR101....BAR METER 0dB(L)
VR101b...BAR METER 0dB(R)
VR102....BAR METER ZERO BIAS (L)
VR102b...BAR METER ZERO BIAS (R)
VR201... REF V PHASE
VR202... REC SW POINT(LP)
VR203... REC SW POINT(SP)

2SA1115
2SC2603
2SD1012
DTA114ES
DTC114ES

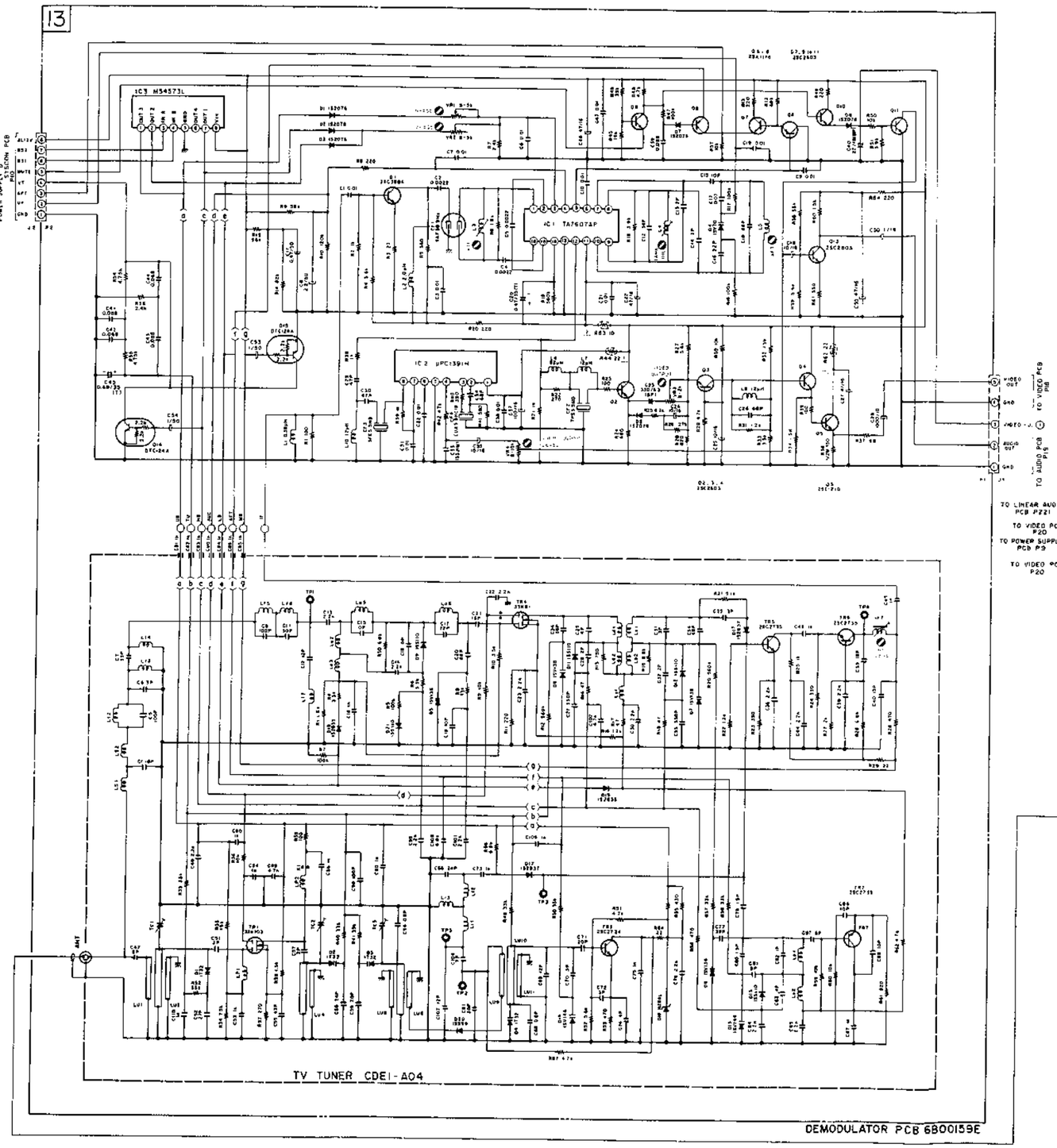
2SD661
2SD958

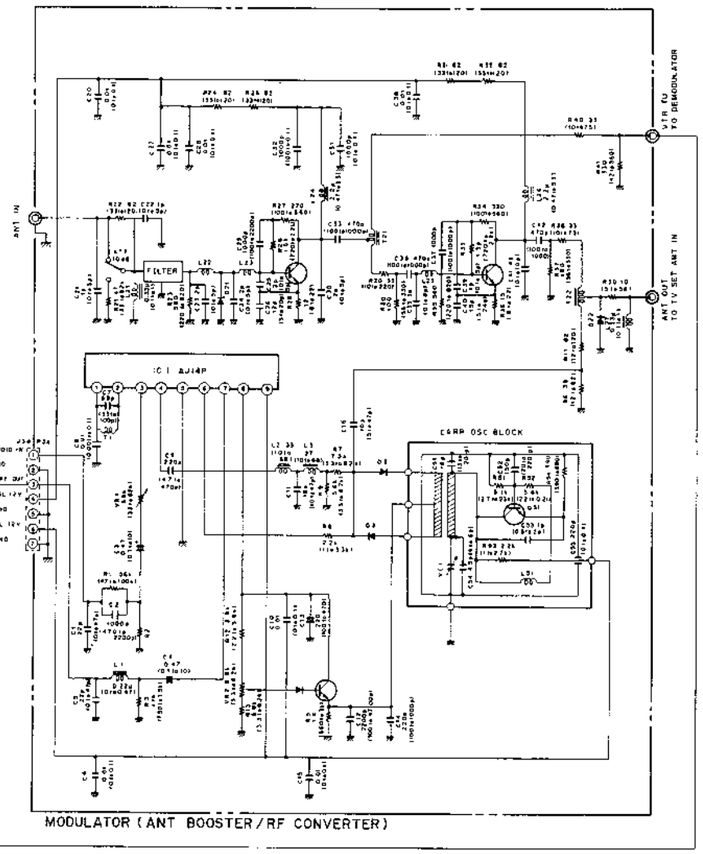
TR1 ---------- 2SD661
TR2,5 to 9,11,12,101,101b 201,202,151,156 ---------- 2SC2603
TR3,10,13,155 ---------- 2SA1115
TR14,15 ---------- 2SD958
TR153 ---------- DTA114ES
TR154 ---------- DTC114ES
TR102,102b ---------- 2SD1012

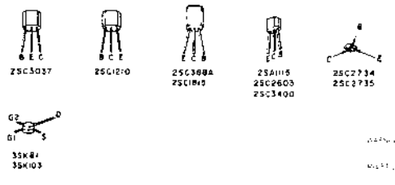
LINEAR AUDIO PCB V1039B5020

B PNP TRANSISTOR

B NPN TRANSISTOR



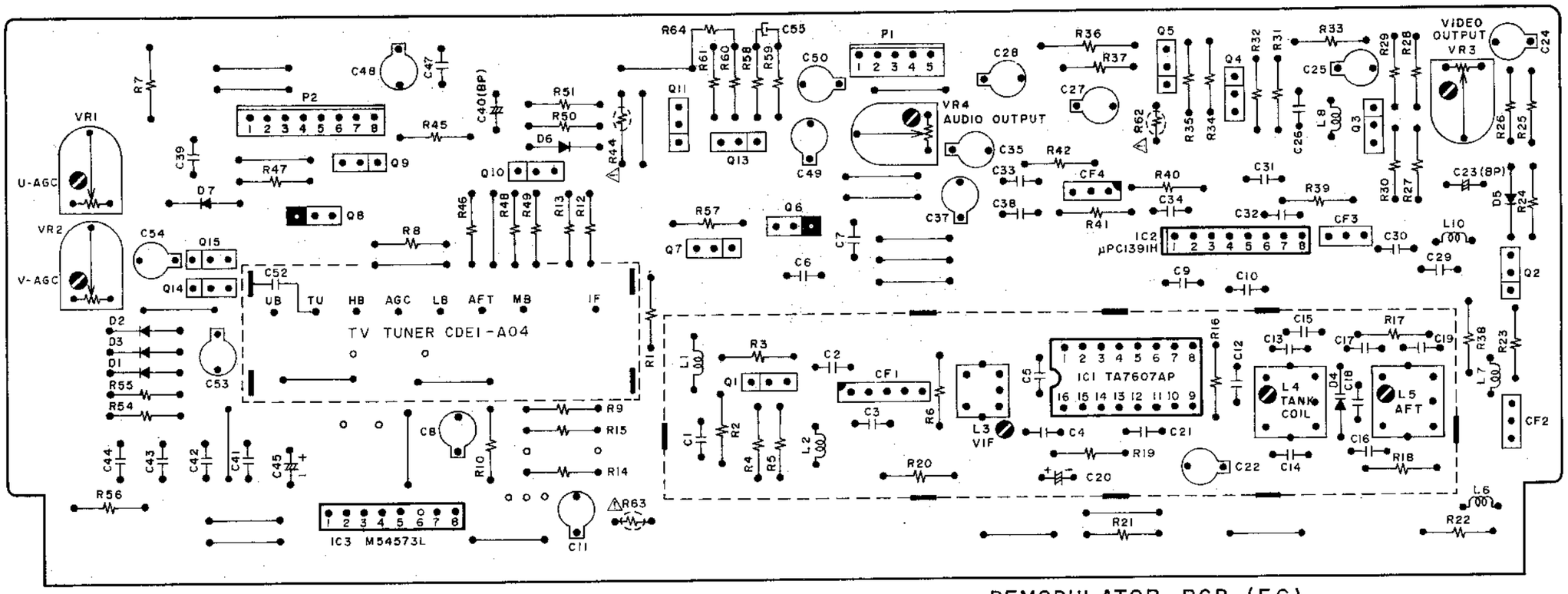




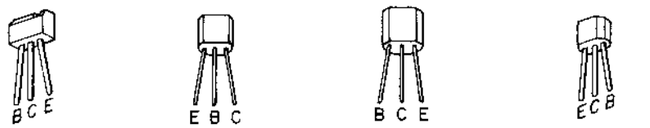
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W (J)
ALL CAPACITORS IN μF 50 WV (J)

VS-12 EG DEMODULATOR SCHEMATIC DIAGRAM

NO. 14-11 840713A



DEMODULATOR PCB (EG)



DTC124A　2SC388A　2SC1210　2SA1115 2SC2603

Q1 ---------- 2SC388A
Q2,3,4,7,9,10,11,13 -- 2SC2603 (D,E)
Q5 ---------- 2SC1210 (D,E)
Q6,8 ---------- 2SA1115 (D,E)
Q14,15 ---------- DTC124A

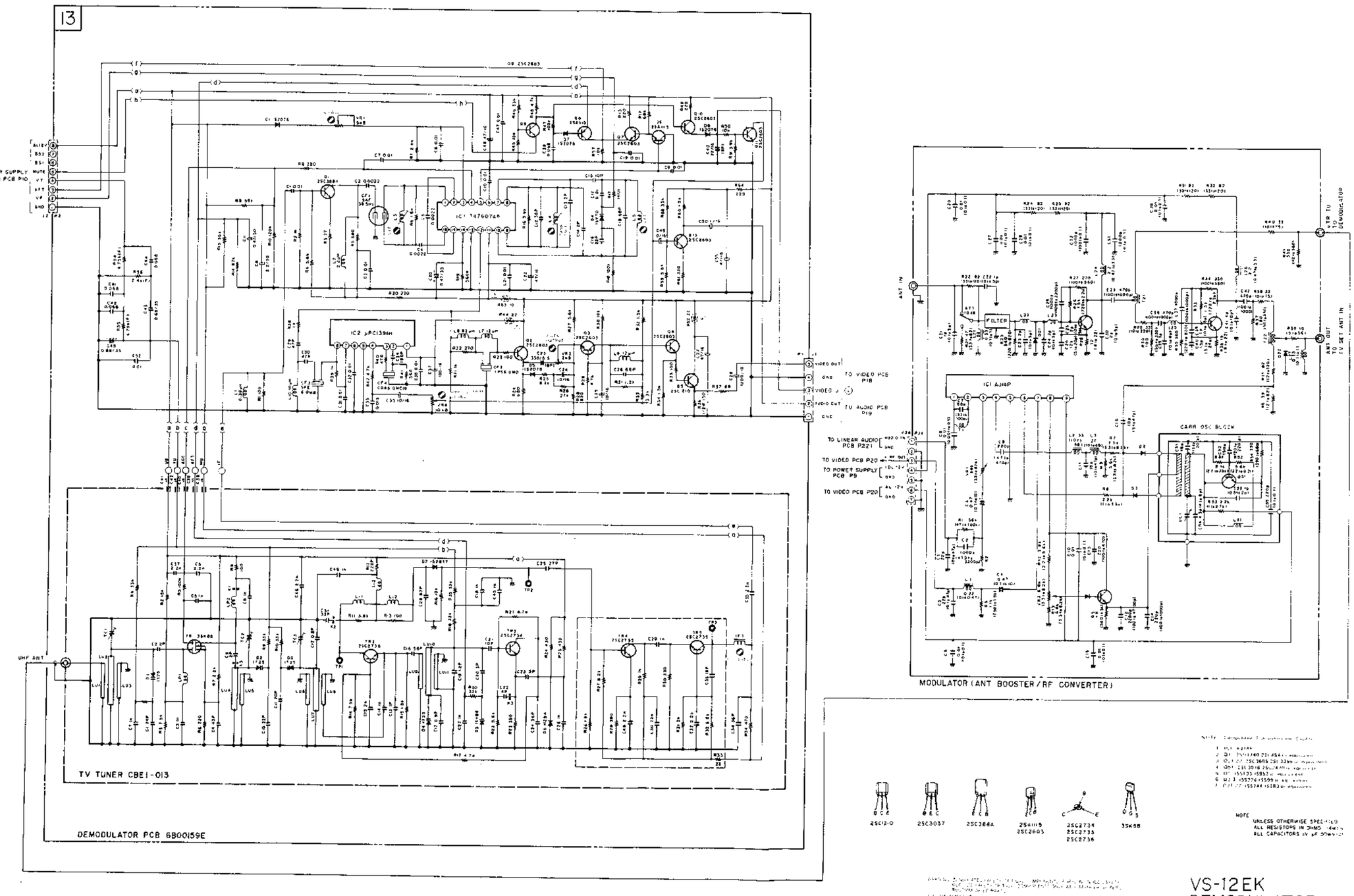
B = PNP TRANSISTOR

B = NPN TRANSISTOR

WARNING ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SECURITE POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL. NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT

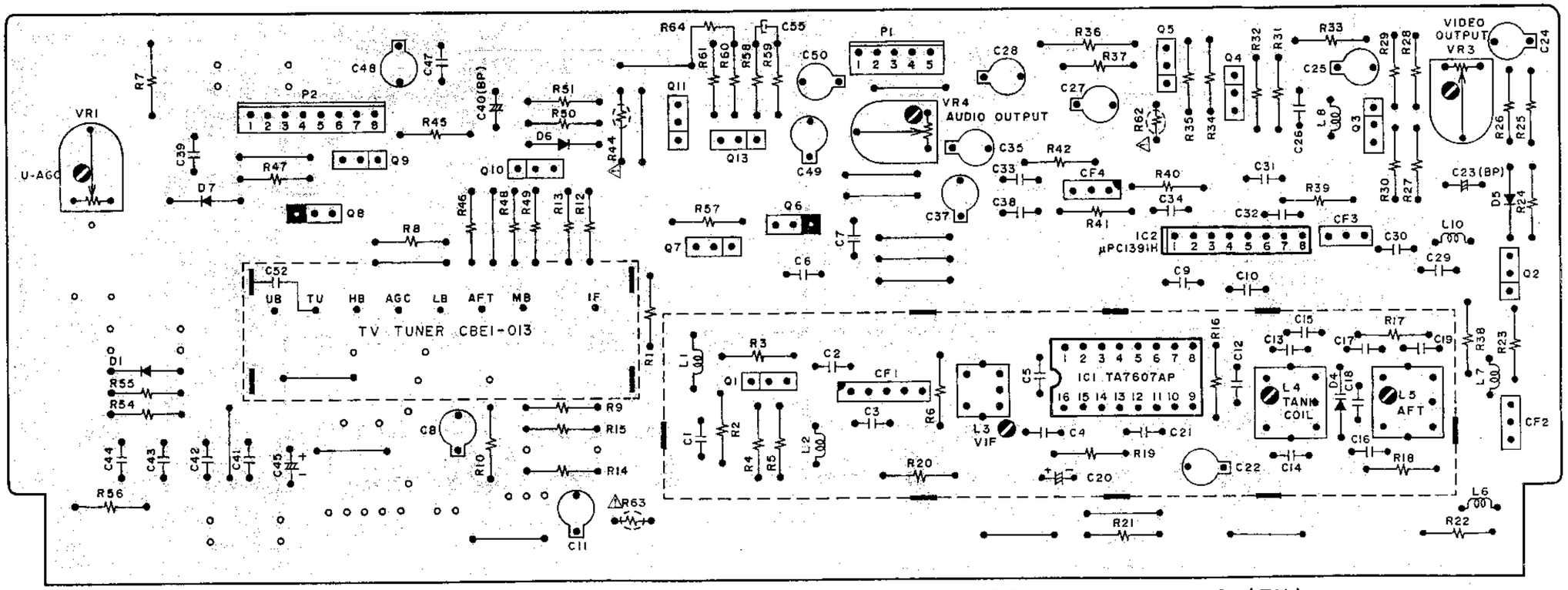
VS-12



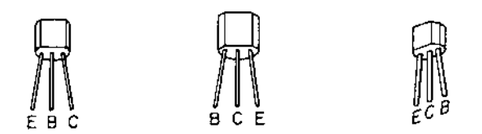
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W ±5%
ALL CAPACITORS IN μF 50WV ±20%

VS-12EK DEMODULATOR SCHEMATIC DIAGRAM

NO.14-12 840714A



DEMODULATOR PCB (EK)



Q1 – – – – – – – – – – – – 2SC388A
Q2,3,4,7,9,10,11,13 – – 2SC2603 (D,E)
Q5 – – – – – – – – – – – – 2SC1210 (D,E)
Q6,8 – – – – – – – – – – 2SA1115 (D,E)

B = PNP TRANSISTOR

B = NPN TRANSISTOR

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

14

LED UNIT

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12

OUT_1 OUT_2 OUT_3 OUT_4 OUT_5 OUT_6 OUT_7 OUT_8 OUT_9 OUT_{10} OUT_{11} OUT_{12}

V_{IN} GND VR MAX V_{CC} IC ADJ

RO 82k

RO 82k

P1

V IN (L)	4
GND	3
V REF	2
AL 12 V	1

TO LINEAR AUDIO PCB P216

P2

V IN (R)	1
VR DOWN	2
VR UP	3
GND	4

TO LINEAR AUDIO PCB P216

SW1 SW2

P3

LED EXT/INT	1
LED HI-FI/NOR	2

TO LINEAR AUDIO PCB P216

R1 680 D2 LD-603MG

R2 2k

EXT/IN D1 LD101VR

HI-FI

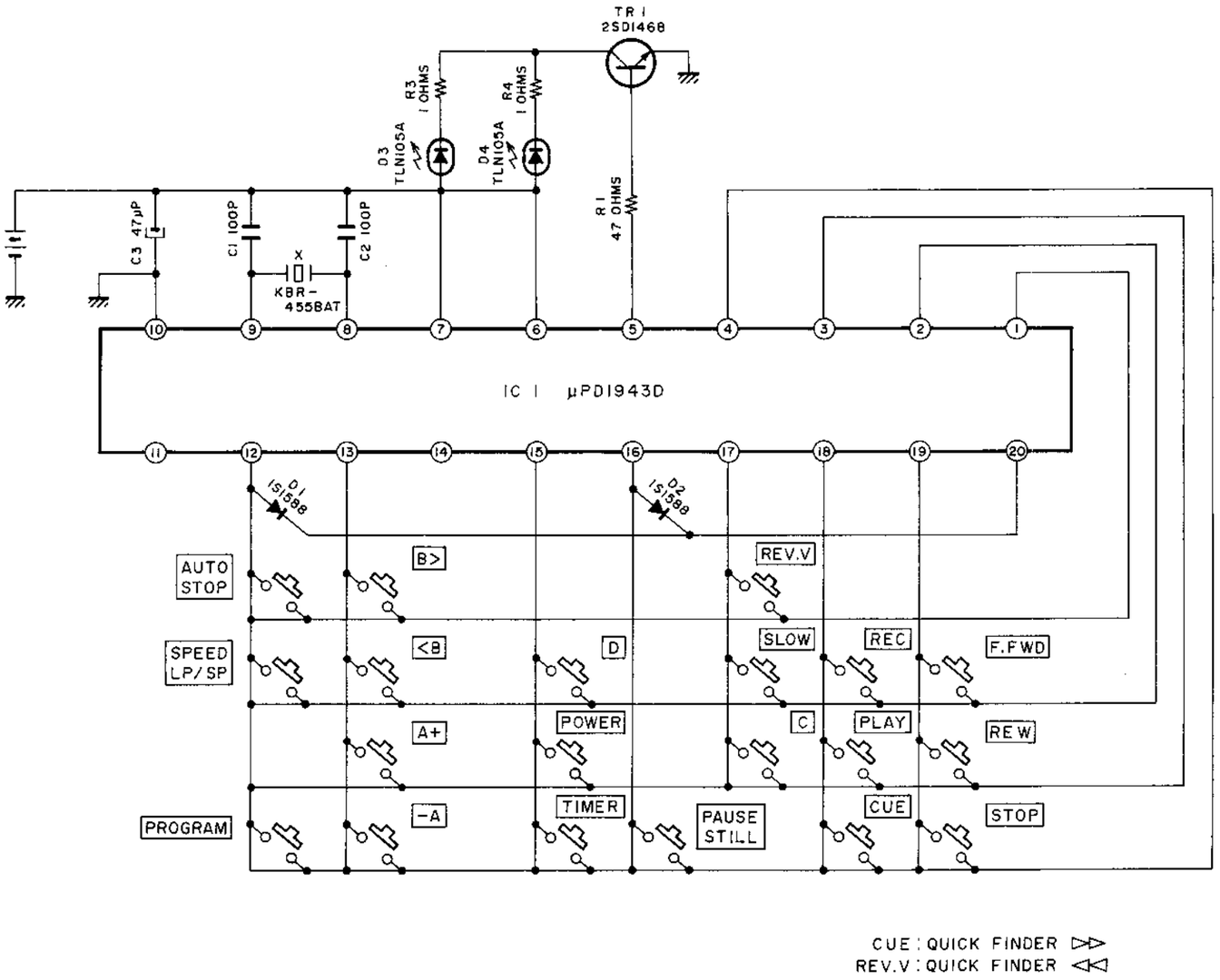
+ −

REC LEVEL

BAR METER PCB LT1127

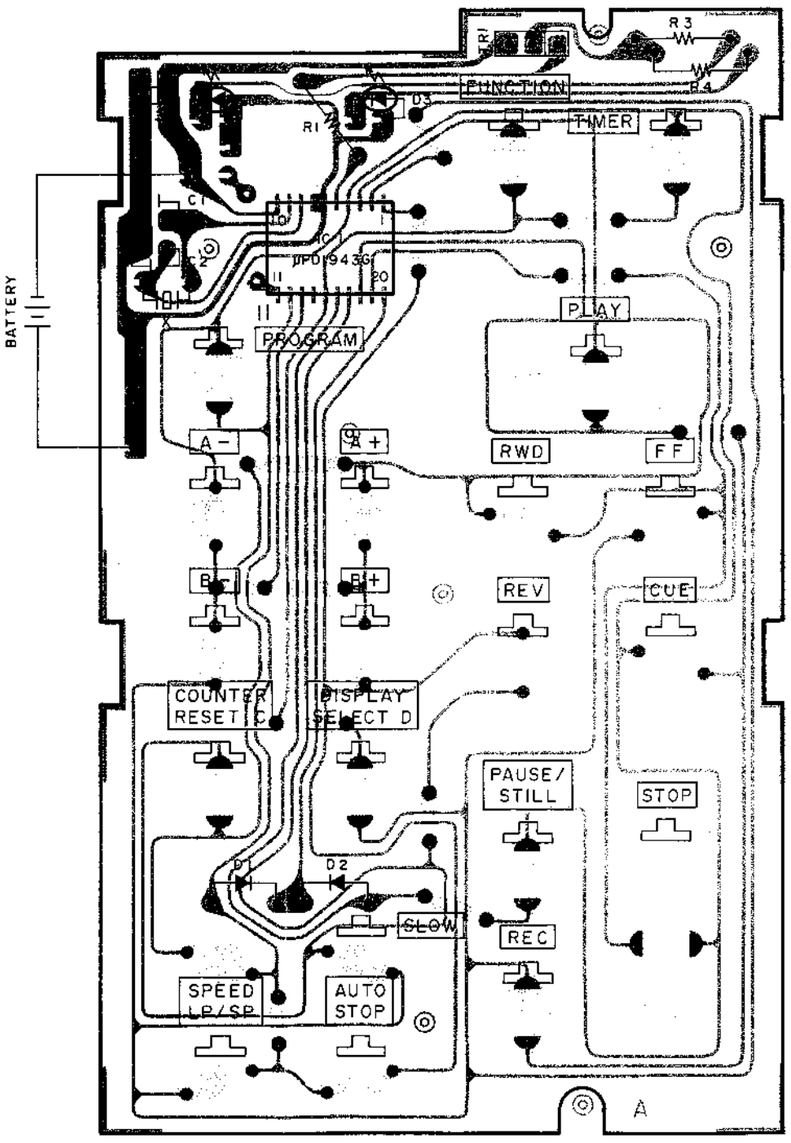
VS-12EK/EG BAR METER SCHEMATIC DIAGRAM

NO.14-13 840712A(A3)



CUE : QUICK FINDER ▷▷
REV.V : QUICK FINDER ◁◁

2SD1468



REMOCON TRANSMITTER PCB

2SD1468

TR 1 ---- 2SD1468

RC-T12
REMOCON TRANSMITTER
SCHEMATIC DIAGRAM

NO.14-14 840715A (A4)