

# HITACHI

## SERVICE MANUAL

**FH****No. 0603E****13GA1B****NTSC****FH92XS-2 Chassis****R/C: CLU-254**

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CAUTION: Before servicing this chassis, it is important that the service technician read the "Safety Precaution" and "Product Safety Notice" in this Service Manual.

### SPECIFICATIONS

ANTENNA INPUT IMPEDANCE .....	75 $\Omega$	Sound I • F .....	4.5MHz
CHANNEL COVERAGE RANGE		POWER INPUT .....	120V/60Hz
VHF .....	2~13	POWER RATING .....	69W
UHF .....	14~69	CONVERGENCE .....	Self convergence
CATV		FOCUS .....	Electrostatic
MID BAND .....	A~1ch, A-5~A-1ch	PICTURE TUBE .....	A34JLN60X
SUPER BAND .....	J~Wch	SOUND OUTPUT .....	1W
HYPER BAND .....	W+1~W+28ch	SPEAKER .....	5.5 $\times$ 9cm, 8 $\Omega$
ULTRA BAND .....	W+29~W+84ch	DIMENSIONS (W) .....	37.0cm
INTERMEDIATE FREQUENCIES		(H) .....	35.5cm
Picture I • F Carrier .....	45.75MHz	(D) .....	37.5cm
Sound I • F Carrier .....	41.25MHz	WEIGHT .....	Appr. 10.5kg

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

## SOLID STATE COLOR TELEVISION

**MAY 1993****FUJIAN HITACHI TELEVISION CO., LTD.**

## SAFETY PRECAUTIONS

**NOTICE:** Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis or picture tube.

**WARNING:** Since the chassis of this receiver is connected to one side of AC power supply during operation, whenever the receiver is plugged in, service should not be attempted by anyone unfamiliar with the precautions necessary when working on this type of receiver.

The following precautions should be observed:

1. Do not install, remove, or handle the picture tube in any manner unless shatterproof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep picture tube away from the body while handling.
2. When service is required, an isolation transformer should be inserted between power line and the receiver before any service is performed on a "HOT" chassis receiver.
3. When replacing a chassis in the receiver, all the protective devices must be put back in place, such as barriers, non-metallic knobs, adjustment and compartment covers, shields, isolation resistor-capacitor, etc.
4. When service is required, observe the original lead dress. Extra precaution should be taken to assure correct lead dress in the high voltage circuitry area.
5. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacturer's. Furthermore where a short circuit has occurred, replace those components that indicate evidence of overheating.
6. Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the receiver by the manufacturer has become defective, or inadvertently defeated during servicing.

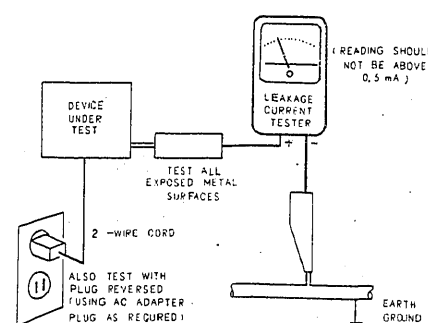
Therefore, the following checks should be performed for the continued protection of the customer and service technician.

## Leakage Current Cold Check

With the AC plug removed from the AC 120V, 60Hz source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC500V), connect one lead to the jumpered AC plug and touch the other lead to each exposed metal part (antennas, screwheads, metal overlays, control shafts, etc.), particularly and exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of  $0.3M\Omega$  and a maximum resistor reading of  $12M\Omega$ . Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

## Leakage Current Hot Check

Plug the AC line cord directly into a AC 120V, 60Hz outlet (do not use an isolation transformer for this check). Turn the AC power switch on. Using a "leakage Current Tester (Simpson Model 229 equivalent)" measure for current from all exposed metal parts of the cabinet (antennas, screwheads, metal overlays, control shaft, etc.), particularly any exposed metal part having a return path to the chassis, to a known earth ground (water pipe, conduit, etc.). Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE RECEIVER TO THE CUSTOMER.

## High Voltage

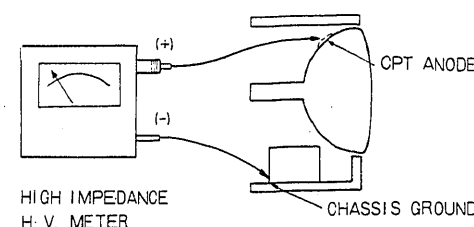
This receiver is provided with a hold down circuit for clearly indicating that voltage has increased in excess of a predetermined value. Comply with all notes described in this Service Manual regarding this hold down circuit when servicing, so that this hold down circuit may correctly be operated.

## Serviceman warning

With minimum Brightness and Contrast, operating high voltage in this receiver is lower than 25.0KV. In case any component having influenced on high voltage is replaced, confirm that high voltage with minimum Brightness and Contrast is lower than 25.0KV.

To measure H. V. use a high impedance H. V. meter. Connect (-) to chassis earth and (+) to the CPT anode button. (See the following connection diagram).

**NOTE:** Turn power switch off without fail before the connection with Anode button is made.



## X-radiation

**TUBE:** The primary source of X radiation in this receiver is the picture tube. The tube utilized for the above mentioned function in this chassis is specially constructed to limit X radiation emissions.

For continued X radiation protection, the replacement tube must be the same type as the original, HITACHI approved type.

When trouble shooting and making test measurements in a receiver with a problem of excessive high voltage, avoid being unnecessarily close to the picture tube and the high voltage component.

Do not operate the chassis longer than is necessary to locate the cause of excessive voltage.

## PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in HITACHI television receiver have special safety related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified with a making of  $\Delta$  on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, X-radiation, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A Subscription to, or additional copies of, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

## TECHNICAL CAUTIONS

## High voltage limiter circuit operation check

1. Connect the high voltage voltmeter between the CPT anode terminal (anode cap) and ground as shown below.
2. Set the AC input voltage to  $132 \pm 3V$ .
3. Receive the broadcast signal and set the contrast level to maximum and brightness to the center. Adjust the screen VR and sub bright VR so that beam current is  $0.75 \pm 0.1mA$ . (The voltage at ABL terminal of FBT-between both ends of C709-should be 10V or less at this time.)
4. Check that the constant high voltage is  $22.0 \pm 2.0kV$  at this time.
5. Set the AC input voltage to  $100 \pm 5V$  and then short circuit both ends of R914.
6. Leave the settings of the contrast, brightness and screen VR as in item 3 and gradually increase the AC input voltage. Check that the picture disappears when the high voltage is less than 28.0 V.
7. Turn the switch of the set off immediately after checking that the picture disappears.
8. Remove the adjustment jig and high voltage voltmeter.

When the high voltage voltmeter is connected/disconnected to/from the anode cap, be sure to turn the switch of the set off. Since a high voltage may remain at the CPT anode, connect/disconnect after the residual high voltage is discharged to the chassis.

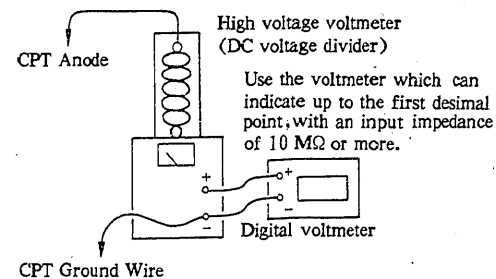


Fig. 1

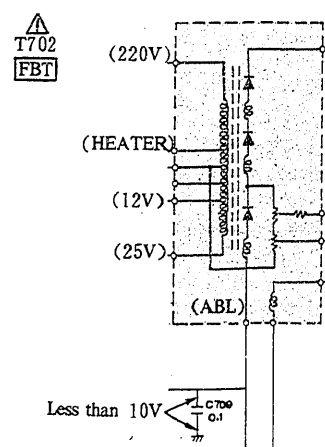


Fig. 2

## CIRCUIT COMPOSITIONS

Block/Circuit		FH92XS-2/FH92XS-1	NOTE
Block	Circuit		
Signal circuit	Antenna circuit	U/V mixed terminal	
	Tuner (US/Canada)	ET-351A.	Refer to 1. ET TUNER (ET-350G) on page 5 of the M1LXU chassis service manual (YK No. 0443E)
	CCD circuit	IC LA7945N	Refer to attached page. (7)
	Audio output circuit	SRPP type (+B=135V) 1W	
	PIF/SIF circuit	SAW+IC LA7674.	Refer to attached page. (12)
	Video/chroma circuit	One chip IC (LA7674)	
Deflection circuit	Vertical/horizontal OSC and drive circuit	This function is included in LA7674	
	Vertical output circuit	Vertical out IC (LA7837)	
	Horizontal output circuit	Discrete (2SD1876)/(2SD1877)	
	FBT	C87LS/C87LM.	
	CPT	A34JLN60X/A51JFC80X	
Power supply circuit	Main power supply circuit	Series type IC regulator (STR-D3035)/(STR30135)	
	Remo-con power supply circuit	Series type regulator	
Channel Selecting circuit	Selecting circuit	Selecting IC LC864024A. (including display and comparator)	Refer to attached page. (6)
	Memory circuit	IC M6M80021L.	Refer to 3-2-2. Memory IC (IC0102) on page 14 of the A1LXU chassis service manual (YK No. 0425EF).

## DESCRIPTION OF CIRCUIT

- 一、CHANNEL SELECTING CIRCUIT
- 二、FUNCTION OF CLOSED CAPTION DECODER SYSTEM
- 三、PIF/SIF AND VIDEO/CHROMA AND VERT/HORIZONTAL DRIVE

## 一、CHANNEL SELECTING CIRCUIT

- Selecting Circuit

Fig. shows a block diagram of the channel selection circuit

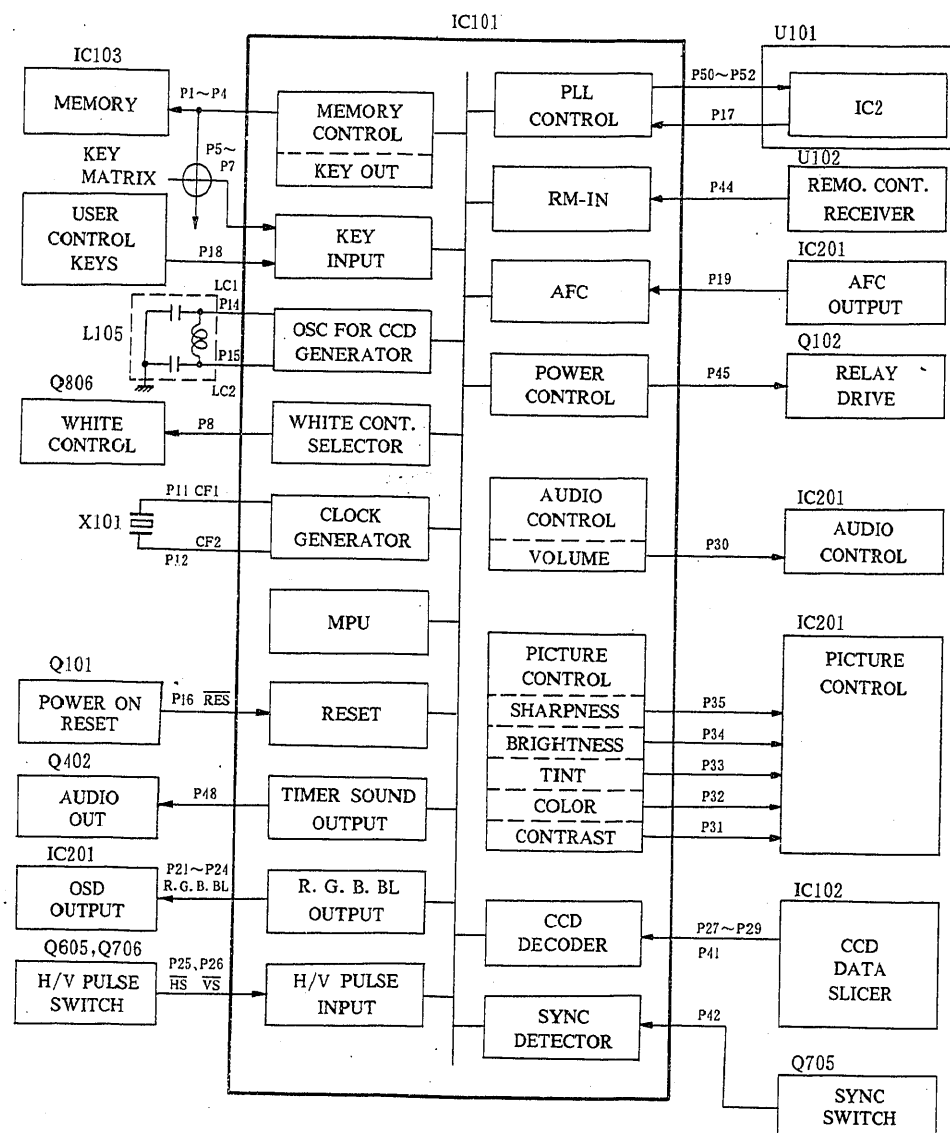


Fig. Block diagram of the channel selection circuit

## 二、FUNCTION OF CLOSED CAPTION DECODER SYSTEM

## 1. Data slicer

Detect the caption data from line 21 and convert to digital signal and send to the decoder IC.

## 2. Decoder/OSD

Decipherment data transferred from the data slicer IC and control screen display.

OSD •Control way of screen display

ROLL-UP, POP-ON, PAINT-ON

•Appoint a place of screen display

•Appoint screen display form.

COLOR, ITALICS, UNDERLINE, FLASH

MODE •CHANNEL 1/CHANNEL 2

•CAPTION/TEXT

## CCD SYSTEM

The Closed Caption Decoder System consists of the two chips, the Data Slicer and OSD/Decoder. (see fig. 1)

## 1. Data Slicer

Data Slicer receives the composite video signal from the IF CIRCUIT IN IC201 and takes data out of the signal. figure 2 shows the block diagram of the Data Slicer.

By generating the H and V sync signal itself, this device takes out the caption signal from Line 21.

Input signals are synchronously separated and sent to the AFC1 stage with the signal generated by dividing VCO output to stabilize the VCO to 32f<sub>u</sub>.

The horizontal C/D (count down) used to divide VCO output during this stage also generates different pulses needed in the device.

The vertical C/D is used to detect the 21st line, discriminate between odd and even fields, and generate pulses needed for the AFC and Vert. sep.

(1) Double AFC

Data Slicer has the standard AFC block and an additional AFC block to synchronize the phases of VCO to run-in-clock. AFC2 compares the phases of the run-in-clock and VCO extracted by the pulses from the horizontal C/D and vertical C/D. Output is passed to the standard AFC block through the LPF to change the VCO phase. This design enables the clock to be regenerated with the frequency and phase synchronous to those of the run-in-clock.

## (2) Data and Clock

Data Slicer detects Line 21 and sends the sliced signal and output from the VCO as a clock the exterior only during the data period (see fig. 3).

In other words, 16 clocks are output for each field. Data and clocks from the Data Slicer are received by the OSD and read by the decoder when the end of transmission signal is transferred.

## 2. Decoder

The Decoder conducts a parity check of the caption data extracted by the Data Slicer, decodes the control code and data code, determines the display format and character attributes (color, italics, underline, and flash), then synthesizes the control data and character code to the display control.

The Decoder has an automatic display on/off.

(1) Display control

The display control receives information as serial data from the decoder to control screen display.

Basic signals of Hsync and Vsync are inputted to set the CCD display position.

The Decoder has the function as follows.

### MODE CONTROL

- ① Caption display ON/OFF
- ② Select CAPTION/TEXT
- ③ Select CHANNEL 1/CHANNEL 2

## OSD CONTROL

- ① Control way of screen display  
ROLL-UP, POP-ON, PAINT-ON
- ② Appoint a place of screen display
- ③ Appoint screen display form  
COLOR, ITALICS, UNDERLINE, FLASH

CCD OSD signal is output from cpu to video/chroma circuit on R. G. B signal.

When under outputted the TV control OSD signal, CCD OSD signal is stopped.

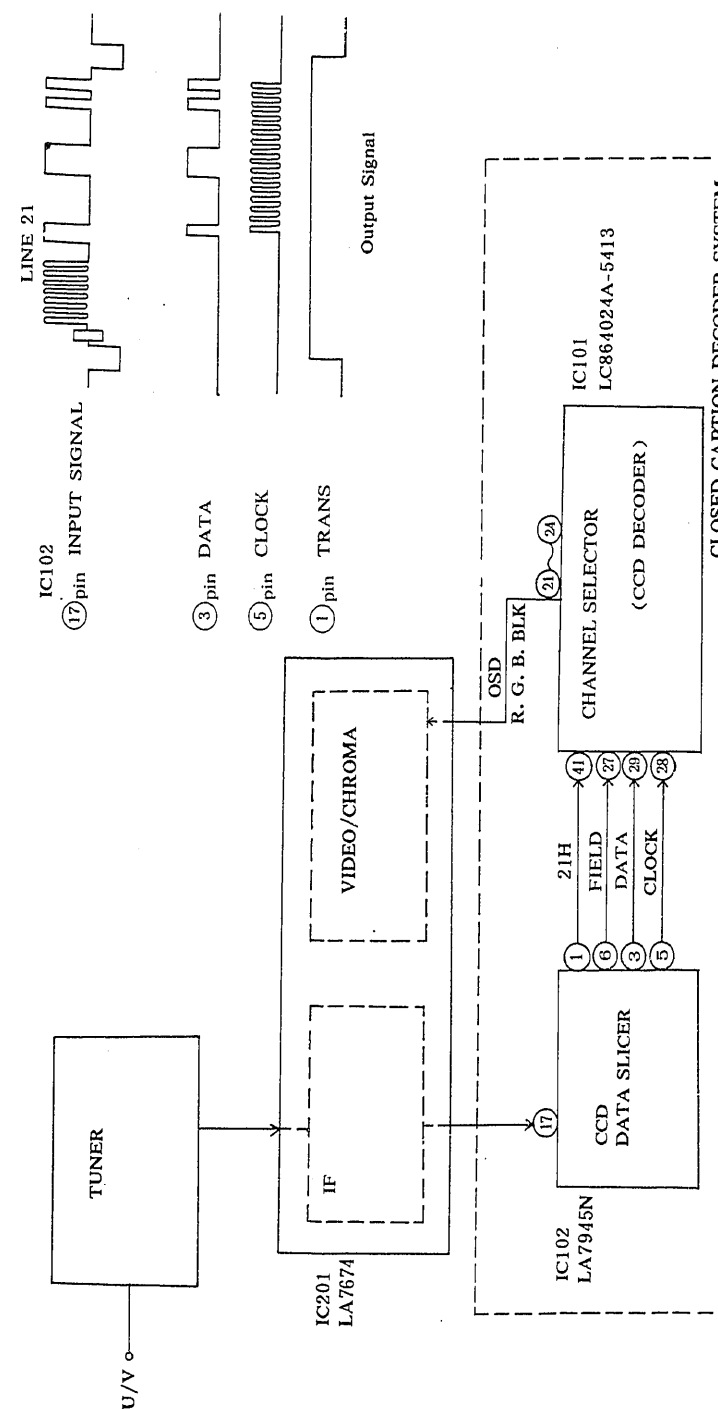


Fig. 1 CLOSED CAPTION DECODER SYSTEM BLOCK DIAGRAM

This chassis uses IC LA7945N in which CCD data is taken from composite video signal.

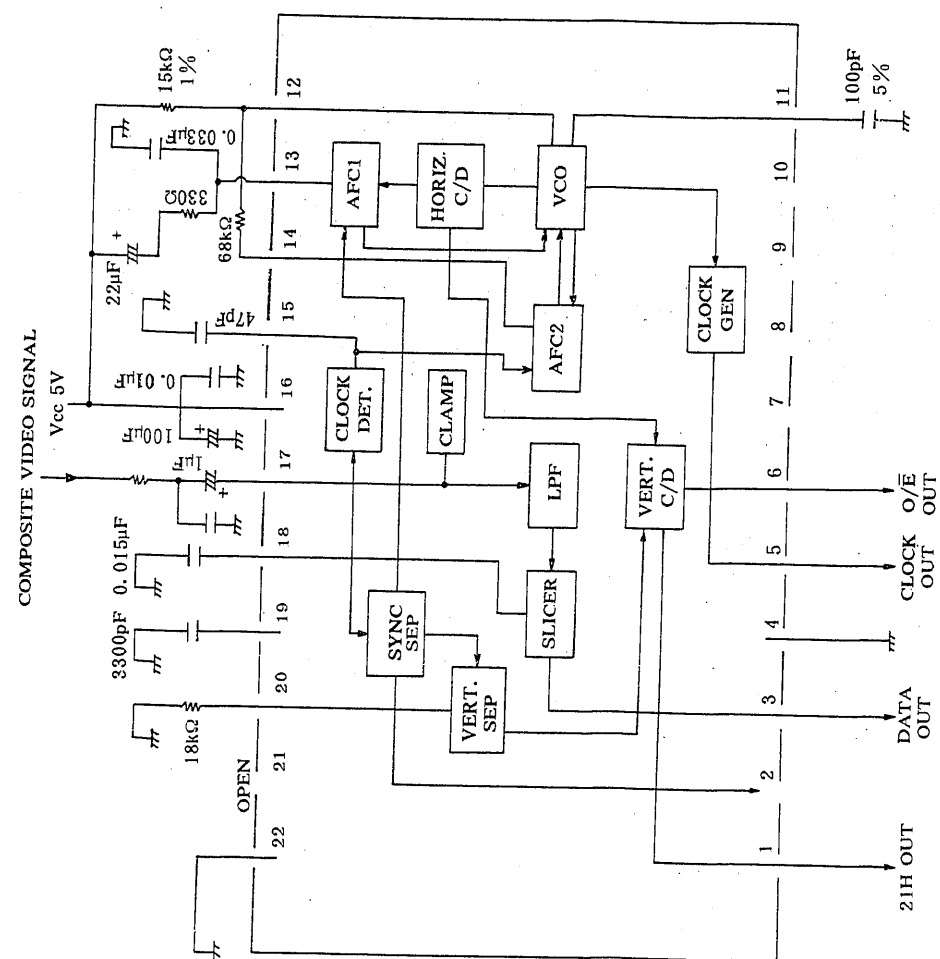
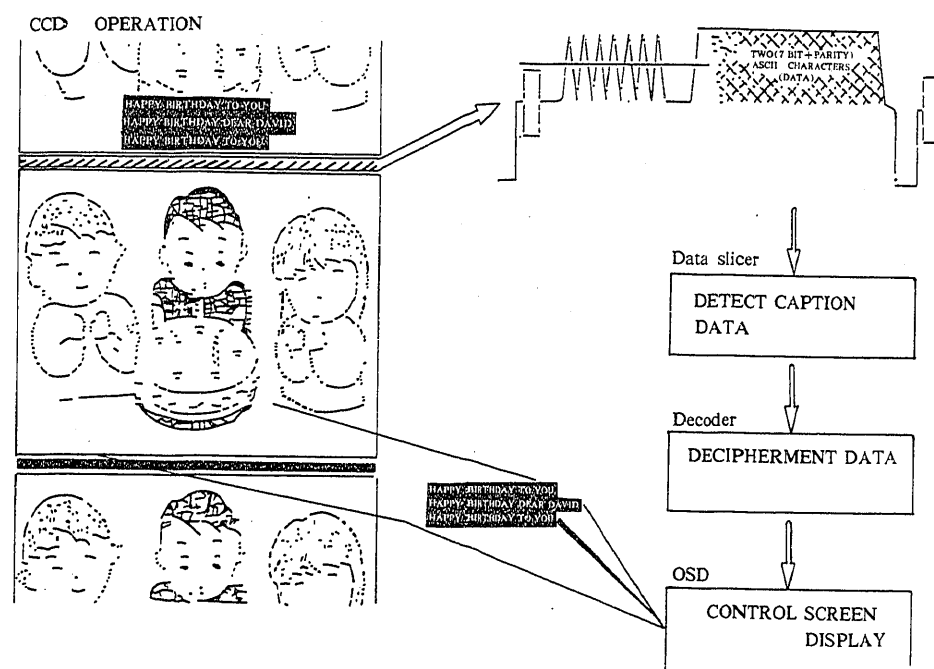
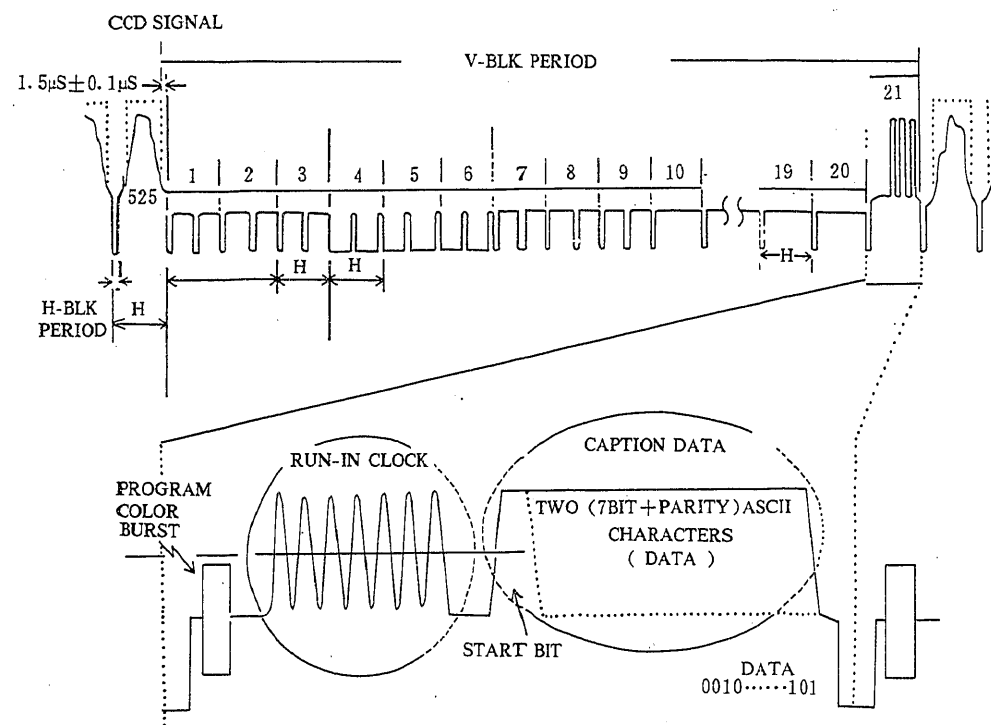


Fig2. CCD data slicer IC



### III. PIF/SIF AND VIDEO/CHROMA AND VERT/HORIZONTAL DRIVE

This chassis uses IC LA7674 in which the PIF/SIF, VIDEO/CHROMA and VERTICAL/HORIZONTAL drive functions are integrated in a signal chip. The composition of each block is shown below.

PIF/SIF section safety

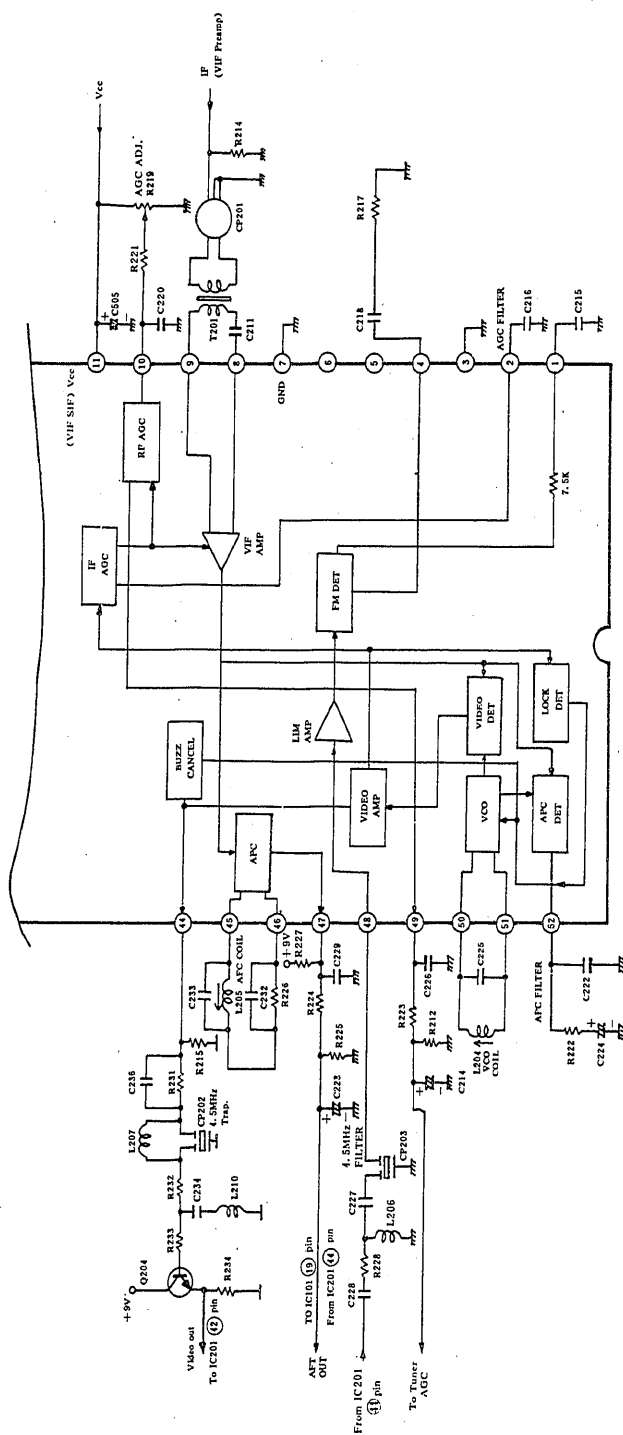


Fig. PIF/SIF Section

Video/chroma section

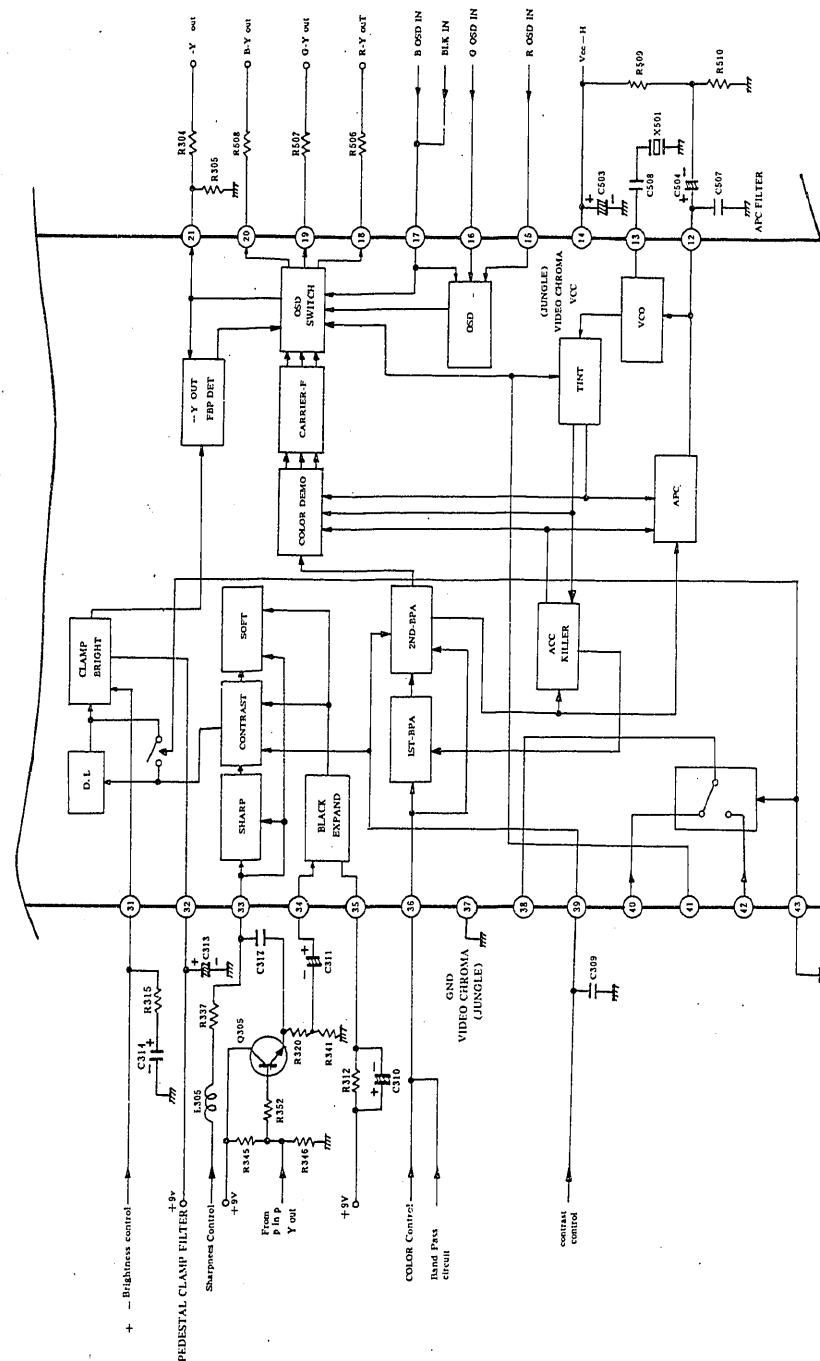


Fig. Video/Chroma section

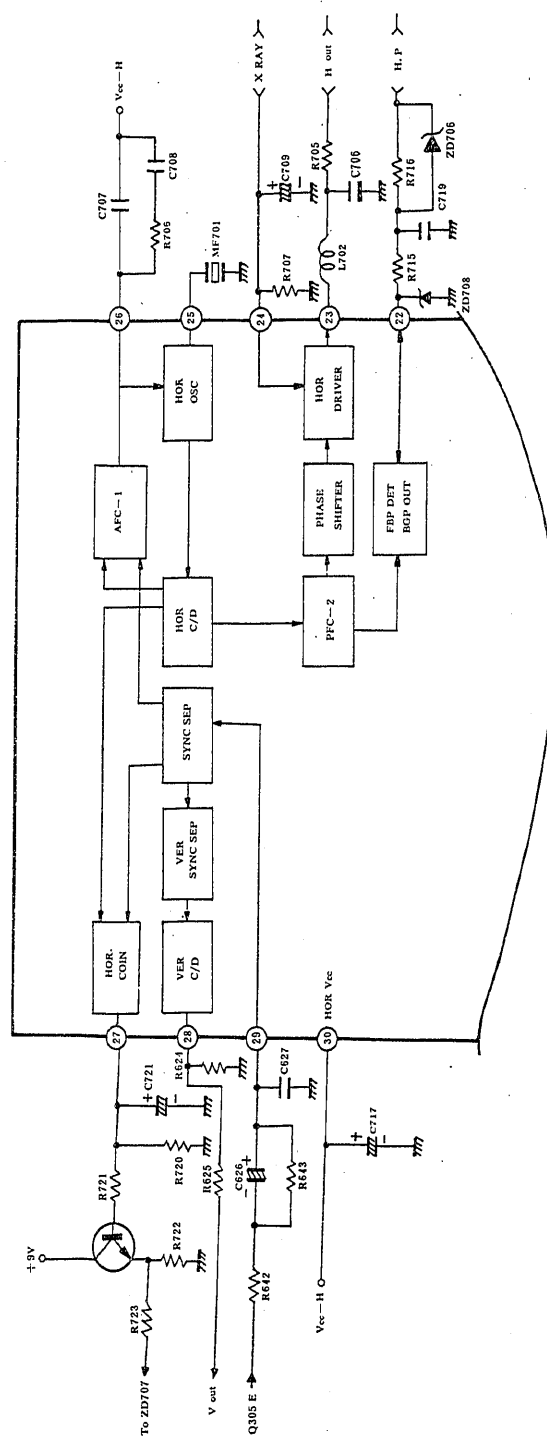

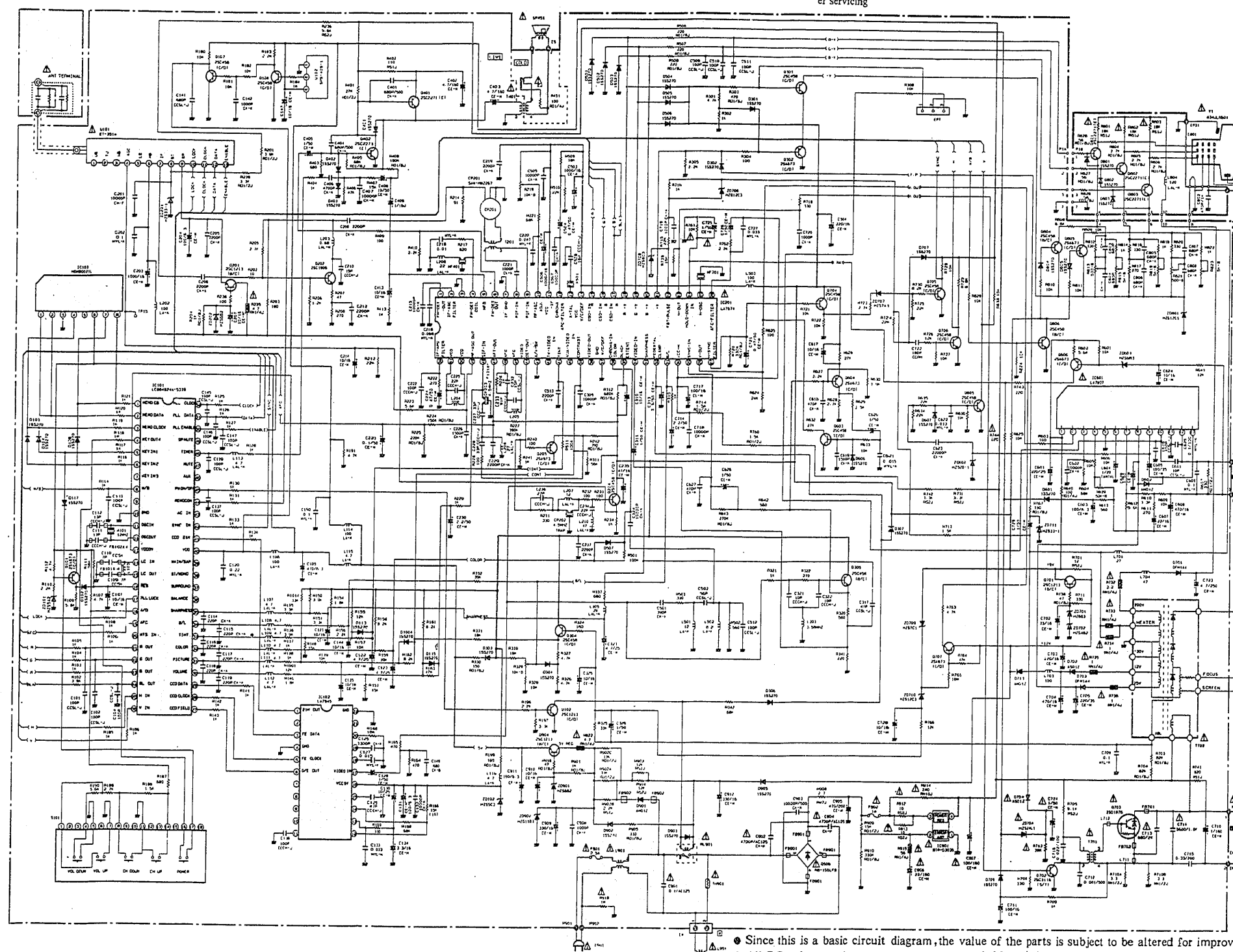


Fig. vertical/horizontal drive section



### BASIC CIRCUIT DIAGRAM

**PRODUCT SAFETY NOTE:** Components marked with a  and shaded have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** of this Service Manual. Don't degrade the safety of the receiver through improper servicing.



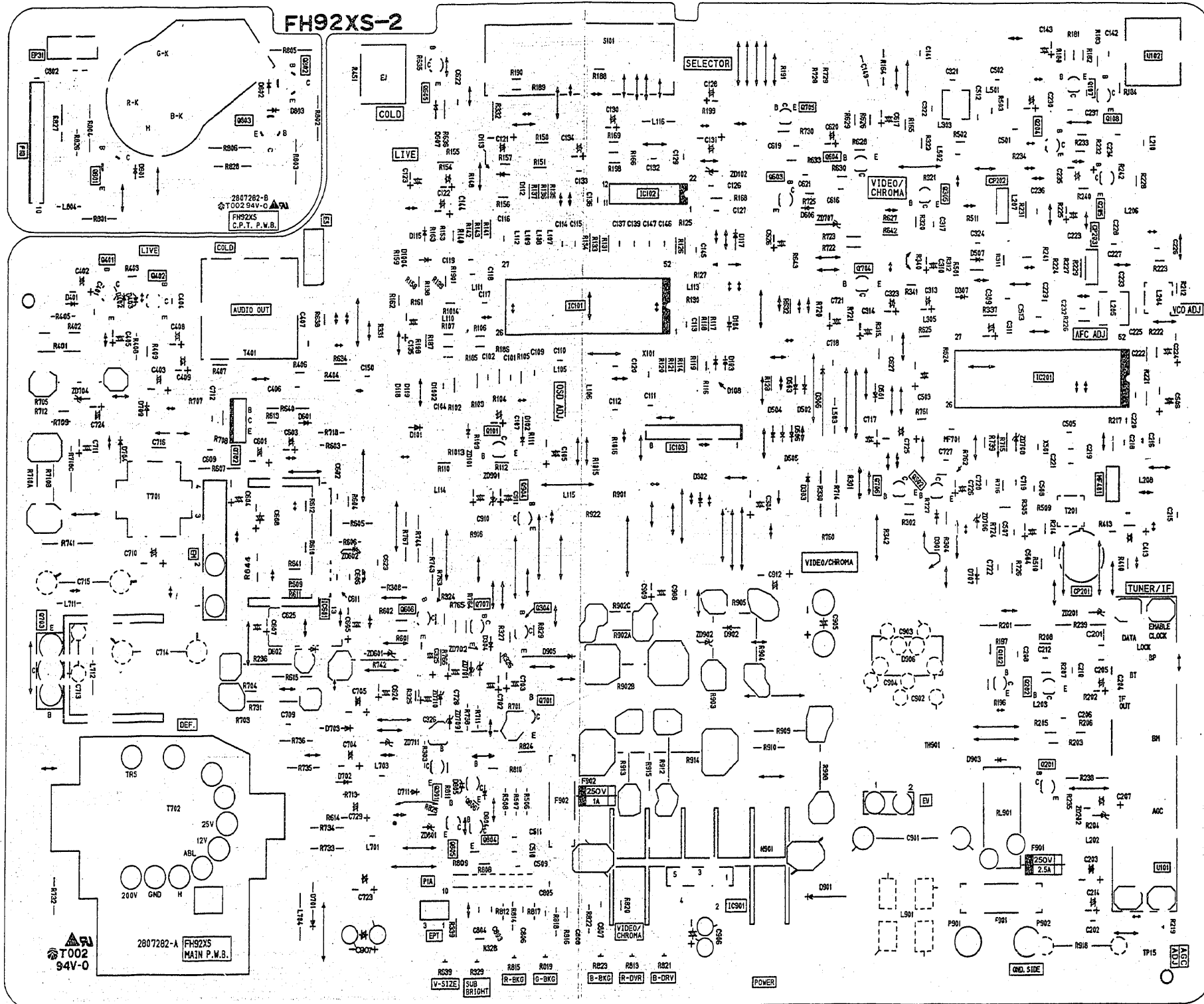
- Since this is a basic circuit diagram, the value of the parts is subject to be altered for improvement.
  - All DC voltage to be measured with a tester(100K $\Omega$ /V).
- Voltage taken on a complex color bar signal including a standard color bar signal.

**13GA1B**

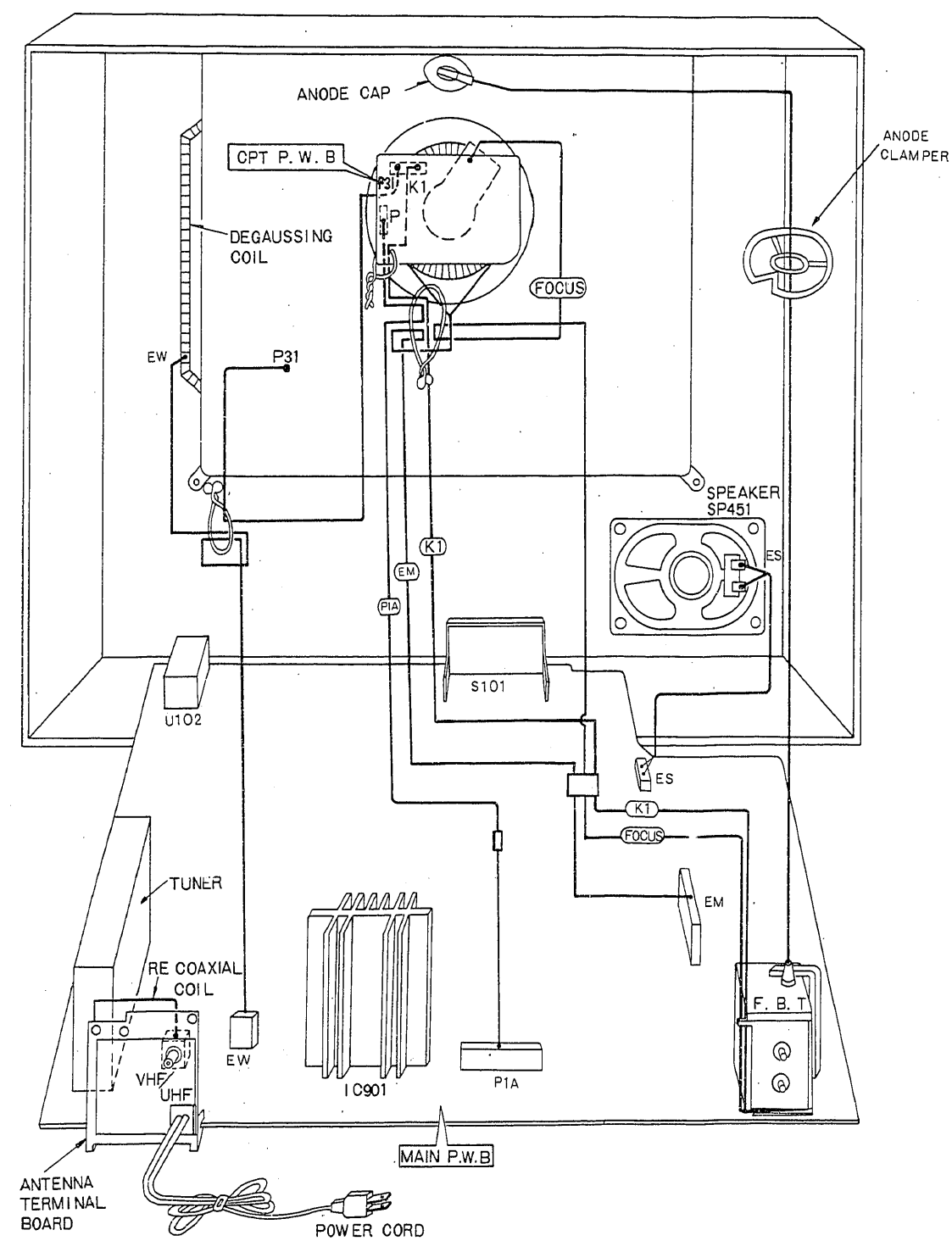
PRINTED WIRING BOARD

CPT P. W. BOARD

MAIN P. W. BOARD



## WIRING DIAGRAM



## REPLACEMENT PARTS LIST

PRODUCT SAFETY NOTE: Components marked with a  $\Delta$  have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.

ABBREVIATIONS: Capacitors.....CD; Ceramic disk, PF; Polyester film, EL; Electrolytic, PP; Polypropylene, FR; Paper, TA; Tantalum  
Resistors ..... CF; Carbon film, CC; Carbon composition, MF; Metal oxide film, VR; Variable resistor, WW; Wire wound, FR; Fuse resistor

SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
CAPACITORS					
C101	0890074	CD 100PF $\pm 5\%$ 50V	C203	0800082	EL 1000 $\mu$ F 16V
C102	0890074	CD 100PF $\pm 5\%$ 50V	C204	0800047	EL 100 $\mu$ F 6.3V
C104	0890074	CD 100PF $\pm 5\%$ 50V	C205	0244105	CD 2200PF $\pm 10\%$ 50V
C105	0800072	EL 470 $\mu$ F 6.3V	C206	0244105	CD 2200PF $\pm 10\%$ 50V
C107	0800015	EL 10 $\mu$ F 16V	C207	0800015	EL 10 $\mu$ F 16V
C109	FH0248147	CD 7PF $\pm 0.25$ PF 50V	C208	0244105	CD 2200PF $\pm 10\%$ 50V
C110	FH0248147	CD 7PF $\pm 0.25$ PF 50V	C210	0890116	CD 15PF $\pm 5\%$ 50V
C111	0246443	CD 13PF $\pm 5\%$ 50V	C212	0244105	CD 2200PF $\pm 10\%$ 50V
C112	0246443	CD 13PF $\pm 5\%$ 50V	C214	0800015	EL 10 $\mu$ F 16V
C113	0890074	CD 100PF $\pm 5\%$ 50V	C215	0244141	CD 0.01 $\mu$ F $\pm 10\%$ 50V
C114	0890078	CD 220PF $\pm 10\%$ 50V	C216	0880055	PF 0.068 $\mu$ F $\pm 10\%$ 50V
C115	0890078	CD 220PF $\pm 10\%$ 50V	C218	0880044	PF 0.01 $\mu$ F $\pm 10\%$ 50V
C116	0890078	CD 220PF $\pm 10\%$ 50V	C219	0244105	CD 2200PF $\pm 10\%$ 50V
C117	0890078	CD 220PF $\pm 10\%$ 50V	C220	0880053	PF 0.047 $\mu$ F $\pm 10\%$ 50V
C118	0890078	CD 220PF $\pm 10\%$ 50V	C221	0890087	CD 1000PF $\pm 10\%$ 50V
C119	0890078	CD 220PF $\pm 10\%$ 50V	C222	0246464	CD 100PF $\pm 5\%$ 50V
C120	0880062	PF 0.22 $\mu$ F $\pm 10\%$ 50V	C223	0800101	EL 0.1 $\mu$ F 50V
C121	0800015	EL 10 $\mu$ F 16V	C224	0800001	EL 0.47 $\mu$ F 50V
C122	0800009	EL 4.7 $\mu$ F 25V	C225	0890118	CD 22PF $\pm 5\%$ 50V
C123	0800009	EL 4.7 $\mu$ F 25V	C226	0890089	CD 1500PF $\pm 10\%$ 50V
C126	0244107	CD 3300PF $\pm 10\%$ 50V	C227	0890121	CD 33PF $\pm 5\%$ 50V
C127	0880046	PF 0.015 $\mu$ F $\pm 10\%$ 50V	C228	0890121	CD 33PF $\pm 5\%$ 50V
C128	0800003	EL 1 $\mu$ F 50V	C229	0244105	CD 2200PF $\pm 10\%$ 50V
C129	0890123	CD 47PF $\pm 5\%$ 50V	C230	0800005	EL 2.2 $\mu$ F 50V
C130	0800009	EL 4.7 $\mu$ F 25V	C232	0890063	CD 15PF $\pm 5\%$ 50V
C131	0800047	EL 100 $\mu$ F 6.3V	C233	0246463	CD 91PF $\pm 5\%$ 50V
C132	0244171	CD 0.01 $\mu$ F $\pm 80-20\%$ 50V	C234	0890118	CD 22PF $\pm 5\%$ 50V
C133	0880051	PF 0.033 $\mu$ F $\pm 10\%$ 50V	C235	0800041	EL 47 $\mu$ F 16V
C135	0800015	EL 10 $\mu$ F 16V	C236	0890119	CD 27PF $\pm 5\%$ 50V
C136	0246464	CD 100PF $\pm 5\%$ 50V	C237	0244105	CD 2200PF $\pm 10\%$ 50V
C137	0890074	CD 100PF $\pm 5\%$ 50V	C304	0800058	EL 220 $\mu$ F 16V
C139	0890074	CD 100PF $\pm 5\%$ 50V	C309	0244171	CD 0.01 $\mu$ F $\pm 80-20\%$ 50V
C141	0248700	CD 680PF $\pm 5\%$ 50V	C310	0800015	EL 10 $\mu$ F 16V
C142	0890087	CD 1000PF $\pm 10\%$ 50V	C311	0800003	EL 1 $\mu$ F 50V
C143	0800015	EL 10 $\mu$ F 16V	C313	0800007	EL 3.3 $\mu$ F 50V
C144	0800015	EL 10 $\mu$ F 16V	C314	0800005	EL 2.2 $\mu$ F 50V
C145	0890074	CD 100PF $\pm 5\%$ 50V	C317	0890089	CD 47PF $\pm 5\%$ 50V
C146	0890074	CD 100PF $\pm 5\%$ 50V	C321	0890114	CD 10PF $\pm 0.5$ PF 50V
C147	0890074	CD 100PF $\pm 5\%$ 50V	C322	0890114	CD 10PF $\pm 0.5$ PF 50V
C148	0890085	CD 680PF $\pm 10\%$ 50V	C323	0800009	EL 4.7 $\mu$ F 25V
C150	0880057	PF 0.1 $\mu$ F $\pm 10\%$ 50V	C324	0244171	CD 0.01 $\mu$ F $\pm 80-20\%$ 50V
C201	0244171	CD 0.01 $\mu$ F $\pm 80-20\%$ 50V	C325	0800015	EL 10 $\mu$ F 16V
C202	0880057	PF 0.1 $\mu$ F $\pm 10\%$ 50V	C326	0800003	EL 1 $\mu$ F 50V
			C401	0243511	CD 680PF $\pm 10\%$ 500V

PRODUCT SAFETY NOTE: Components marked with a  $\Delta$  have special characteristics important to safety. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE of this Service Manual. Don't degrade the safety of the receiver through improper servicing.


SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
C402	0253455	EL 4.7 $\mu$ F 160V	C711	0800049	EL 100 $\mu$ F 16V
C403	0253455	EL 4.7 $\mu$ F 160V	C712	0244501	CD 1000PF $\pm 10\%$ 500V
C404	0243511	CD 680PF $\pm 10\%$ 500V	$\Delta$ C713	0244209	CD 680PF $\pm 10\%$ 2000V
C405	0800003	EL 1 $\mu$ F 50V	$\Delta$ C714	0299731	PP 5800PF $\pm 5\%$ 1600V
C406	0244109	CD 4700PF $\pm 10\%$ 50V	C715	0299932	PP 0.33 $\mu$ F $\pm 10\%$ 200V
C407	0244141	CD 0.01 $\mu$ F $\pm 10\%$ 50V	C716	0279851	PF 0.022 $\mu$ F $\pm 10\%$ 100V
C408	0800018	EL 10 $\mu$ F 50V	C717	0800049	EL 100 $\mu$ F 16V
C409	0253952	EL 1 $\mu$ F 160V	C718	0244171	CD 0.01 $\mu$ F $\pm 80-20\%$ 50V
C413	0800015	EL 10 $\mu$ F 16V	C719	0890087	CD 1000PF $\pm 10\%$ 50V
C501	0890082	CD 390PF $\pm 10\%$ 50V	C720	0890087	CD 1000PF $\pm 10\%$ 50V
C502	0890071	CD 58PF $\pm 5\%$ 50V	C721	0800001	EL 0.47 $\mu$ F 50V
C503	0800082	EL 1000 $\mu$ F 16V	C722	0248106	CD 180PF $\pm 5\%$ 50V
C504	0800001	EL 0.47 $\mu$ F 50V	C723	0259171	EL 4.7 $\mu$ F 250V
C505	0244171	CD 0.01 $\mu$ F $\pm 80-20\%$ 50V	$\Delta$ C724	0800003	EL 1 $\mu$ F 50V
C506	0800082	EL 1000 $\mu$ F 16V	$\Delta$ C725	0800003	EL 1 $\mu$ F 50V
C507	0244171	CD 0.01 $\mu$ F $\pm 80-20\%$ 50V	C726	0800005	EL 2.2 $\mu$ F 50V
C508	0246445	CD 16PF $\pm 5\%$ 50V	C727	0880051	PF 0.033 $\mu$ F $\pm 10\%$ 50V
C509	0890074	CD 100PF $\pm 5\%$ 50V	C728	0800015	EL 10 $\mu$ F 16V
C510	0890074	CD 100PF $\pm 5\%$ 50V	C729	0800003	EL 1 $\mu$ F 50V
C511	0890074	CD 100PF $\pm 5\%$ 50V	C802	0245605	CD 470PF $\pm 10\%$ 1000V
C512	0890074	CD 100PF $\pm 5\%$ 50V	C803	0890085	CD 680PF $\pm 10\%$ 50V
C513	0244105	CD 2200PF $\pm 10\%$ 50V	C804	0890085	CD 680PF $\pm 10\%$ 50V
C601	0800059	EL 220 $\mu$ F 25V	C805	0890085	CD 680PF $\pm 10\%$ 50V
C602	0244141	CD 0.01 $\mu$ F $\pm 10\%$ 50V	C806	0890085	CD 680PF $\pm 10\%$ 50V
C603	0800047	EL 100 $\mu$ F 6.3V	C807	0890085	CD 680PF $\pm 10\%$ 50V
C604	0292716	TA 1 $\mu$ F $\pm 10\%$ 20V	C808	0890085	CD 680PF $\pm 10\%$ 50V
C605	0800052	EL 100 $\mu$ F 35V	$\Delta$ C801	0279832	PP 0.1 $\mu$ F $\pm 20\%$ 125V
C606	0890074	CD 100PF $\pm 5\%$ 50V	$\Delta$ C802	0248495	CD 4700PF $\pm 80-20\%$ AC250V
C607	0800023	EL 22 $\mu$ F 16V	C903	0244571	CD 0.01 $\mu$ F $\pm 100-0\%$ 500V
C608	0800074	EL 470 $\mu$ F 16V	$\Delta$ C804	0248495	CD 4700PF $\pm 80-20\%$ AC250V
C609	0880057	PF 0.1 $\mu$ F $\pm 10\%$ 50V	C905	0253891	EL 470 $\mu$ F 200V
C611	0890061	CD 10PF $\pm 0.5$ PF 50V	$\Delta$ C806	0253957	EL 22 $\mu$ F 160V
C616	0890083	CD 470PF $\pm 10\%$ 50V	$\Delta$ C807	0253960	EL 100 $\mu$ F 160V
C617	0800015	EL 10 $\mu$ F 16V	C908	0890087	CD 1000PF $\pm 10\%$ 50V
C619	0890089	CD 1500PF $\pm 10\%$ 50V	C909	0800066	EL 330 $\mu$ F 16V
C620	0800003	EL 1 $\mu$ F 50V	C910	0800015	EL 10 $\mu$ F 16V
C621	0880046	PF 0.015 $\mu$ F $\pm 10\%$ 50V	C911	0800047	EL 100 $\mu$ F 6.3V
C622	0880051	PF 0.033 $\mu$ F $\pm 10\%$ 50V	C912	0800066	EL 330 $\mu$ F 16V
C623	0244173	CD 0.022 $\mu$ F $\pm 80-20\%$ 50V	RESISTORS		
C624	0800015	EL 10 $\mu$ F 16V	R1014	0700061	CF 33K OHM $\pm 5\%$ 1/16W
C625	0279859	PF 0.1 $\mu$ F $\pm 10\%$ 100V	R102	0700048	CF 3.9K OHM $\pm 5\%$ 1/16W
C626	0800003	EL 1 $\mu$ F 50V	R103	0700041	CF 1K OHM $\pm 5\%$ 1/16W
C627	0890083	CD 470PF $\pm 10\%$ 50V	R104	0700041	CF 1K OHM $\pm 5\%$ 1/16W
C628	0800003	EL 1 $\mu$ F 50V	R105	0700041	CF 1K OHM $\pm 5\%$ 1/16W
C702	0800032	EL 33 $\mu$ F 16V	R106	0700041	CF 1K OHM $\pm 5\%$ 1/16W
C703	0800058	EL 220 $\mu$ F 16V	R107	0700049	CF 4.7K OHM $\pm 5\%$ 1/16W
C704	0800074	EL 470 $\mu$ F 16V			
C705	0800061	EL 220 $\mu$ F 35V			
C709	0880057	PF 0.1 $\mu$ F $\pm 10\%$ 50V			
C710	0253952	EL 1 $\mu$ F 160V			

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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
R108	0700041	CF 1K OHM $\pm$ 5% 1/16W	R183	0700045	CF 2.2K OHM $\pm$ 5% 1/16W
R109	0700051	CF 5.6K OHM $\pm$ 5% 1/16W	R184	0700041	CF 1K OHM $\pm$ 5% 1/16W
R110	0700045	CF 2.2K OHM $\pm$ 5% 1/16W	R185	0700041	CF 1K OHM $\pm$ 5% 1/16W
R111	0700064	CF 56K OHM $\pm$ 5% 1/16W	R186	0700041	CF 1K OHM $\pm$ 5% 1/16W
R112	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R187	0700038	CF 680 OHM $\pm$ 5% 1/16W
R114	0700041	CF 1K OHM $\pm$ 5% 1/16W	R188	0700043	CF 1.5K OHM $\pm$ 5% 1/16W
R116	0700041	CF 1K OHM $\pm$ 5% 1/16W	R189	0700046	CF 2.7K OHM $\pm$ 5% 1/16W
R117	0700041	CF 1K OHM $\pm$ 5% 1/16W	R190	0700051	CF 5.6K OHM $\pm$ 5% 1/16W
R118	0700041	CF 1K OHM $\pm$ 5% 1/16W	R1901	0700055	CF 12K OHM $\pm$ 5% 1/16W
R119	0700041	CF 1K OHM $\pm$ 5% 1/16W	R191	0700049	CF 4.7K OHM $\pm$ 5% 1/16W
R120	0700041	CF 1K OHM $\pm$ 5% 1/16W	R196	0700045	CF 2.2K OHM $\pm$ 5% 1/16W
R121	0700041	CF 1K OHM $\pm$ 5% 1/16W	R197	0700047	CF 3.3K OHM $\pm$ 5% 1/16W
R125	0700041	CF 1K OHM $\pm$ 5% 1/16W	R198	0700065	CF 68K OHM $\pm$ 5% 1/16W
R126	0700041	CF 1K OHM $\pm$ 5% 1/16W	R199	0100047	CF 180 OHM $\pm$ 5% 1/8W
R127	0700041	CF 1K OHM $\pm$ 5% 1/16W	R201	0113764	CF 3.9K OHM $\pm$ 5% 1/2W
R128	0700041	CF 1K OHM $\pm$ 5% 1/16W	R202	0700014	CF 10 OHM $\pm$ 5% 1/16W
R130	0700041	CF 1K OHM $\pm$ 5% 1/16W	R203	0700031	CF 180 OHM $\pm$ 5% 1/16W
R131	0700041	CF 1K OHM $\pm$ 5% 1/16W	R204	0100065	CF 1.0K OHM $\pm$ 5% 1/8W
R133	0700041	CF 1K OHM $\pm$ 5% 1/16W	R205	0700046	CF 2.7K OHM $\pm$ 5% 1/16W
R134	0700041	CF 1K OHM $\pm$ 5% 1/16W	R206	0700042	CF 1.2K OHM $\pm$ 5% 1/16W
R135	0700047	CF 3.3K OHM $\pm$ 5% 1/16W	R207	0700023	CF 47K OHM $\pm$ 5% 1/16W
R136	0700048	CF 3.9K OHM $\pm$ 5% 1/16W	R208	0700033	CF 270 OHM $\pm$ 5% 1/16W
R137	0700041	CF 1K OHM $\pm$ 5% 1/16W	R212	0700058	CF 22K OHM $\pm$ 5% 1/16W
R138	0700041	CF 1K OHM $\pm$ 5% 1/16W	R214	0187040	CF 91 OHM $\pm$ 5% 1/16W
R139	0700054	CF 10K OHM $\pm$ 5% 1/16W	R217	0700039	CF 820 OHM $\pm$ 5% 1/16W
R140	0700044	CF 1.3K OHM $\pm$ 5% 1/16W	R219	0150114	VR 10K OHM-B RS-6
R141	0700041	CF 1K OHM $\pm$ 5% 1/16W	R221	0700065	CF 68K OHM $\pm$ 5% 1/16W
R142	0700041	CF 1K OHM $\pm$ 5% 1/16W	R222	0700033	CF 270 OHM $\pm$ 5% 1/16W
R143	0700041	CF 1K OHM $\pm$ 5% 1/16W	R223	0700051	CF 5.6K OHM $\pm$ 5% 1/16W
R148	0700056	CF 15K OHM $\pm$ 5% 1/16W	R224	0100117	CF 150K OHM $\pm$ 5% 1/8W
R150	0700048	CF 3.9K OHM $\pm$ 5% 1/16W	R225	0100121	CF 220K OHM $\pm$ 5% 1/8W
R151	0700047	CF 3.3K OHM $\pm$ 5% 1/16W	R226	0700041	CF 1K OHM $\pm$ 5% 1/16W
R153	0700056	CF 15K OHM $\pm$ 5% 1/16W	R227	0100127	CF 390K OHM $\pm$ 5% 1/8W
R154	0700044	CF 1.8K OHM $\pm$ 5% 1/16W	R228	0700027	CF 100 OHM $\pm$ 5% 1/16W
R155	0700055	CF 12K OHM $\pm$ 5% 1/16W	R229	0700041	CF 1K OHM $\pm$ 5% 1/16W
R156	0700045	CF 2.2K OHM $\pm$ 5% 1/16W	R231	0700034	CF 330 OHM $\pm$ 5% 1/16W
R157	0700054	CF 10K OHM $\pm$ 5% 1/16W	R232	0700027	CF 100 OHM $\pm$ 5% 1/16W
R158	0700053	CF 8.2K OHM $\pm$ 5% 1/16W	R233	0700027	CF 100 OHM $\pm$ 5% 1/16W
R159	0700062	CF 39K OHM $\pm$ 5% 1/16W	R234	0700041	CF 1K OHM $\pm$ 5% 1/16W
R161	0700053	CF 8.2K OHM $\pm$ 5% 1/16W	$\Delta$ R235	0119687	FR 4.7 OHM $\pm$ 5% 1/4W
R162	0700053	CF 8.2K OHM $\pm$ 5% 1/16W	R236	0110263	MF 5.6K OHM $\pm$ 5% 2W
R163	0700063	CF 47K OHM $\pm$ 5% 1/16W	R238	0700027	CF 100 OHM $\pm$ 5% 1/16W
R164	0700036	CF 470 OHM $\pm$ 5% 1/16W	R239	0113762	CF 3.3K OHM $\pm$ 5% 1/2W
R165	0700036	CF 470 OHM $\pm$ 5% 1/16W	R240	0700027	CF 100 OHM $\pm$ 5% 1/16W
R166	0174595	MF 15K OHM $\pm$ 5% 1/16W	R241	0700041	CF 1K OHM $\pm$ 5% 1/16W
R168	0700057	CF 18K OHM $\pm$ 5% 1/16W	R242	0100055	CF 390 OHM $\pm$ 5% 1/8W
R169	0700034	CF 330 OHM $\pm$ 5% 1/16W	R301	0700048	CF 4.7K OHM $\pm$ 5% 1/16W
R180	0700054	CF 10K OHM $\pm$ 5% 1/16W	R302	0700041	CF 1K OHM $\pm$ 5% 1/16W
R181	0700054	CF 10K OHM $\pm$ 5% 1/16W	R303	0100057	CF 470 OHM $\pm$ 5% 1/8W
R182	0700054	CF 10K OHM $\pm$ 5% 1/16W	R304	0700027	CF 100 OHM $\pm$ 5% 1/16W

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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
R305	0700045	CF 2.2K OHM $\pm$ 5% 1/16W	R610	0700047	CF 3.3K OHM $\pm$ 5% 1/16W
R308	0700054	CF 10K OHM $\pm$ 5% 1/16W	R611	0700034	CF 330 OHM $\pm$ 5% 1/16W
R311	0700064	CF 56K OHM $\pm$ 5% 1/16W	R612	0700051	CF 5.6K OHM $\pm$ 5% 1/16W
R312	0100133	CF 680K OHM $\pm$ 5% 1/8W	R613	0700037	CF 560 OHM $\pm$ 5% 1/16W
R315	0700041	CF 1K OHM $\pm$ 5% 1/16W	R615	0119733	MF 1.5 OHM $\pm$ 5% 1W
R320	0700037	CF 560 OHM $\pm$ 5% 1/16W	R624	0187098	CF 24K OHM $\pm$ 5% 1/16W
R321	0700041	CF 1K OHM $\pm$ 5% 1/16W	R625	0700027	CF 100 OHM $\pm$ 5% 1/16W
R322	0700033	CF 270 OHM $\pm$ 5% 1/16W	R626	0700059	CF 27K OHM $\pm$ 5% 1/16W
R324	0700031	CF 180 OHM $\pm$ 5% 1/16W	R627	0700045	CF 2.2K OHM $\pm$ 5% 1/16W
R325	0700061	CF 33K OHM $\pm$ 5% 1/16W	R628	0700046	CF 2.7K OHM $\pm$ 5% 1/16W
R326	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R629	0700043	CF 1.5K OHM $\pm$ 5% 1/16W
R327	0700049	CF 4.7K OHM $\pm$ 5% 1/16W	R630	0700048	CF 3.9K OHM $\pm$ 5% 1/16W
R328	0700054	CF 10K OHM $\pm$ 5% 1/16W	R632	0700059	CF 27K OHM $\pm$ 5% 1/16W
R329	0150114	VR 10K OHM-B RS-6	R633	0700054	CF 10K OHM $\pm$ 5% 1/16W
R330	0100045	CF 150 OHM $\pm$ 5% 1/8W	R634	0700058	CF 22K OHM $\pm$ 5% 1/16W
R331	0700057	CF 18K OHM $\pm$ 5% 1/16W	R635	0700058	CF 22K OHM $\pm$ 5% 1/16W
R332	0700062	CF 39K OHM $\pm$ 5% 1/16W	R636	0700054	CF 10K OHM $\pm$ 5% 1/16W
R337	0700038	CF 680 OHM $\pm$ 5% 1/16W	R638	0700054	CF 10K OHM $\pm$ 5% 1/16W
R339	0700057	CF 18K OHM $\pm$ 5% 1/16W	R639	0150116	VR 50K OHM-B RS-6
R341	0700032	CF 220 OHM $\pm$ 5% 1/16W	R640	0114131	CF 100 OHM $\pm$ 5% 1/4W
R342	0700065	CF 68K OHM $\pm$ 5% 1/16W	R641	0700055	CF 12K OHM $\pm$ 5% 1/16W
R401	0113785	CF 27K OHM $\pm$ 5% 1/2W	R642	0700037	CF 560 OHM $\pm$ 5% 1/16W
R402	0110122	MF 110 OHM $\pm$ 5% 1W	R643	0100123	CF 270K OHM $\pm$ 5% 1/8W
R403	0700038	CF 680 OHM $\pm$ 5% 1/16W	R644	0100073	CF 2.2K OHM $\pm$ 5% 1/8W
R404	0700041	CF 1K OHM $\pm$ 5% 1/16W	R701	0700034	MF 12 OHM $\pm$ 5% 2W
R405	0100109	CF 68K OHM $\pm$ 5% 1/8W	R703	0100111	CF 82K OHM $\pm$ 5% 1/8W
R406	0700063	CF 47K OHM $\pm$ 5% 1/16W	R704	0100111	CF 82K OHM $\pm$ 5% 1/8W
R407	0700056	CF 15K OHM $\pm$ 5% 1/16W	R705	0110268	MF 9.1K OHM $\pm$ 5% 2W
R408	0100119	CF 180K OHM $\pm$ 5% 1/8W	R708	0700034	CF 330 OHM $\pm$ 5% 1/16W
R409	0700027	CF 100 OHM $\pm$ 5% 1/16W	R709	0700041	CF 1K OHM $\pm$ 5% 1/16W
R410	0700045	CF 2.2K OHM $\pm$ 5% 1/16W	R710A	0113688	CF 3.3 OHM $\pm$ 5% 1/2W
R413	0700041	CF 1K OHM $\pm$ 5% 1/16W	R710B	0113688	CF 3.3 OHM $\pm$ 5% 1/2W
R451	0114131	CF 100 OHM $\pm$ 5% 1/4W	R711	0700034	CF 330 OHM $\pm$ 5% 1/16W
R501	0700067	CF 100K OHM $\pm$ 5% 1/16W	$\Delta$ R712	0700062	CF 39K OHM $\pm$ 5% 1/16W
R502	0700037	CF 560 OHM $\pm$ 5% 1/16W	R713	0700043	CF 1.5K OHM $\pm$ 5% 1/16W
R503	0700034	CF 330 OHM $\pm$ 5% 1/16W	R714	0113754	CF 1.5K OHM $\pm$ 5% 1/2W
R506	0100049	CF 220 OHM $\pm$ 5% 1/8W	R715	0700058	CF 22K OHM $\pm$ 5% 1/16W
R507	0100049	CF 220 OHM $\pm$ 5% 1/8W	R716	0700041	CF 1K OHM $\pm$ 5% 1/16W
R508	0100049	CF 220 OHM $\pm$ 5% 1/8W	R718	0700034	CF 330 OHM $\pm$ 5% 1/16W
R509	0700057	CF 18K OHM $\pm$ 5% 1/16W	R720	0100125	CF 330K OHM $\pm$ 5% 1/8W
R510	0700058	CF 22K OHM $\pm$ 5% 1/16W	R721	0700054	CF 10K OHM $\pm$ 5% 1/16W
R511	0700067	CF 100K OHM $\pm$ 5% 1/16W	R722	0700054	CF 10K OHM $\pm$ 5% 1/16W
R601	0700054	CF 10K OHM $\pm$ 5% 1/16W	R723	0700046	CF 2.7K OHM $\pm$ 5% 1/16W
R602	0700051	CF 5.6K OHM $\pm$ 5% 1/16W	R724	0700058	CF 22K OHM $\pm$ 5% 1/16W
R603	0700027	CF 100 OHM $\pm$ 5% 1/16W	R725	0700058	CF 22K OHM $\pm$ 5% 1/16W
R604	0700065	CF 68K OHM $\pm$ 5% 1/16W	R726	0700055	CF 12K OHM $\pm$ 5% 1/16W
R605	0700054	CF 10K OHM $\pm$ 5% 1/16W	R727	0700054	CF 10K OHM $\pm$ 5% 1/16W
R606	0700054	CF 10K OHM $\pm$ 5% 1/16W	R728	0700054	CF 10K OHM $\pm$ 5% 1/16W
R607	0113737	CF 330 OHM $\pm$ 5% 1/2W	R729	0700052	CF 6.8K OHM $\pm$ 5% 1/16W
R609	0700054	CF 10K OHM $\pm$ 5% 1/16W	R730	0700053	CF 8.2K OHM $\pm$ 5% 1/16W

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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
Q605	2320596	TR 2SC458 C/D	D701	2338162	DI DFM 1A4
Q606	2320637	TR 2SA673 C/D	D702	2339491	DI AS01Z
Q701	2320646	TR 2SC1213 B/C	D703	2338162	DI DFM 1A4
Q702	2326216	TR 2SC3116 S/T	△D704	2339481	DI AS01Z
△Q703	2327501	TR 2SD1876	D707	2338321	DI 1SS270 TA
Q704	2320596	TR 2SC458 C/D	D709	2338321	DI 1SS270 TA
Q705	2320596	TR 2SC458 C/D	D711	2339491	DI AM01Z
Q706	2320596	TR 2SC458 C/D	D801	2338321	DI 1SS270 TA
Q707	2320637	TR 2SA673 C/D	D802	2338321	DI 1SS270 TA
Q801	2321993	TR 2SC2271 E	D803	2338321	DI 1SS270 TA
Q802	2321993	TR 2SC2271 E	D804	2338321	DI 1SS270 TA
Q803	2321993	TR 2SC2271 E	D805	2338321	DI 1SS270 TA
Q804	2320591	TR 2SC458 B/C	D901	2339491	DI AM01Z
Q805	2320637	TR 2SA673 C/D	D902	2338321	DI 1SS270 TA
Q806	2320591	TR 2SC458 B/C	D903	2338321	DI 1SS270 TA
Q904	2320646	TR 2SC1213 B/C	D905	2338321	DI 1SS270 TA
DIODES			△D906	2332794	DI RB-156 LFB
			ZD101	2339832	ZD HZS5A2
			ZD102	2339839	ZD HZS5C3
			ZD201	2339971	ZD HZS33-1
			ZD202	2339845	ZD HZS6B2
			ZD601	2339846	ZD HZS6B3
			ZD602	2339921	ZD HZS20-1
			ZD701	2339846	ZD HZS6B3
			ZD702	2339825	ZD HZS4B2
			△ZD704	2339211	ZD HZS24-1L
D1004	2338321	DI 1SS270 TA	ZD706	2339889	ZD HZS12C3
D102	2338321	DI 1SS270 TA	ZD707	2339851	ZD HZS7A1
D103	2338321	DI 1SS270 TA	ZD708	2339849	ZD HZS6C3
D104	2338321	DI 1SS270 TA	ZD709	2339857	ZD HZS7C1
D108	2338321	DI 1SS270 TA	ZD710	2339889	ZD HZS12C3
D113	2338321	DI 1SS270 TA	ZD711	2339971	ZD HZS33-1
D115	2338321	DI 1SS270 TA	ZD902	2339876	ZD HZS11B3
D117	2338321	DI 1SS270 TA	THERMISTORS		
D301	2338321	DI 1SS270 TA			
D302	2338321	DI 1SS270 TA			
D303	2338321	DI 1SS270 TA			
D304	2338321	DI 1SS270 TA			
D306	2338321	DI 1SS270 TA			
D307	2338321	DI 1SS270 TA			
D401	2338321	DI 1SS270 TA			
D402	2338321	DI 1SS270 TA			
D403	2338321	DI 1SS270 TA			
D501	2338321	DI 1SS270 TA	△TH901	2340521	PTC THERMISTOR
D502	2338321	DI 1SS270 TA	COILS		
D503	2338321	DI 1SS270 TA			
D504	2338321	DI 1SS270 TA			
D505	2338321	DI 1SS270 TA			
D506	2338321	DI 1SS270 TA			
D507	2338321	DI 1SS270 TA			
D601	2338321	DI 1SS270 TA			
D602	2339491	DI AM01Z			
D606	2338321	DI 1SS270 TA			
D607	2338321	DI 1SS270 TA			
			L105	2164362	COIL 22μH
			L106	2122253	LA AXIAL COIL 100μH
			L107	2122938	LAL AXIAL COIL 4.7μH
			L108	2122938	LAL AXIAL COIL 4.7μH

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SYMBOL NO.	PART NO.	DESCRIPTION	SYMBOL NO.	PART NO.	DESCRIPTION
FB902	2771892	FERRITE BEADS CORE			
J451	FH2663143	2J CONNECTOR WITH WIRE			
N1002	3731081	PURSE LOCK $\phi 10$			
N1004	3705233	ANODE CLAMP			
N1005	FH3728273	PURSE LOCK $\phi 8$			
N1006	3763751	SK BINDER			
△N3004	FH2984301	U/V MIXER			
N601A	452 883	M3 * 12 SCREW(PAN WASHER)			
N601B	FH6431002	NUT M3			
N702A	4520883	M3 * 12 SCREW(PAN WASHER)			
N702B	FH6431002	NUT M3			
N901A	4520883	M3 * 12 SCREW(PAN WASHER)			
N901B	FH6431002	NUT M3			
P1A	FH2980535	10P CONNECTOR WITH 9 WIRE			
△RL901	2640571	POWER RELAY (S)			
S101	FH2634291	KEY SW UNIT			
△SP451	FH5752015	SPEAKER 90 * 60			
△U101	FH2428541	TUNER ET-351A			
U102	2381126	R/C RECEIVING ASS			
X101	FH2168931	CRYSTAL 12MHz			
X501	2790444	CRYSTAL 3.58MHz			
△V1	2356031	CPT A34JLN60X			
△	FH5716073	CPT A34KPU02XX			

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# HITACHI

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