

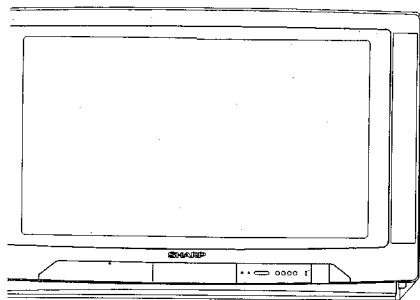
56FW-53H
66FW-53H
76FW-53H

SHARP

SERVICE MANUAL

SEMSX6FW53H/7

DA-100 (50Hz) - CHASSIS



56FW-53H
66FW-53H
76FW-53H

PAL SYSTEM COLOUR TELEVISION

56FW-53H

66FW-53H

MODELS 76FW-53H

In the interests of user safety (required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used

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SHARP CORPORATION

56FW-53H
66FW-53H
76FW-53H

ELECTRICAL SPECIFICATIONS

• Power Input220-240 Volts AC 50 Hz

• Power Consumption
Normal Operating166 W
Stand-by Operating1W max.

• Audio Power

Output Rating

Front L (internal)10+10 W (M.P.O.)
Front R (internal).....10+10 W (M.P.O.)
Central (except 56FW-53H).....10 W (M.P.O.)

Speakers

Front L.....8 ohms 10 W
Front R.....8 ohms 10 W
Central (except 56FW-53H).....

• White Level

• Convergence.....Self Converting Sys

• FocusBi-Potencial Electro

• Sweep.....Magn

• Intermediate Frequencies

Picture IF Frequency.....38.9 M

Sound Carrier Trap.....33.4 M

Adjacent Sound Carrier Trap40.4 M

Adjacent Picture Carrier Trap31.9 M

• Aerial Input Impedance75 Unbalan

• Tuning Ranges48.25 MHz to 855.25 M
CATV Special Channels

Specifications are subject to change without prior notice.

WARNING

The chassis in this receiver is partially hot. Use an isolation transformer between the line cord plug and power receptacle, when servicing this chassis.

To prevent electric shock, do not remove cover. No user-serviceable parts inside. Refer servicing to qualified service personnel.

IMPORTANT SERVICE NOTES

Maintenance and repair of this receiver should be carried out by qualified service personnel only.

SERVICING OF HIGH VOLTAGE SYSTEM AND PICTURE TUBE

When servicing the high voltage system, remove static charge from it by connecting a 10 k ohm resistor in series with a insulated wire (such a test probe) between picture tube ground tad and high voltage lead (AC line cord should be disconnected from AC outlet).

1. Picture tube in this receiver employs integral implosion protection.
2. Replace with tube of the same type number for continued safety.
3. Do not lift picture tube by the neck.
4. Handle the picture tube only when wearing shatterproof goggles and after discharging the high voltage completely.

X-RAY

This receiver is designed so that any X-Ray radiation is kept to an absolute minimum. Since certain malfunctions or servicing may produce potentially hazardous radiation with prolonged exposure at close range, the following precautions should be observed:

1. When repairing the circuit, be sure not to increase the high voltage to more than 32.0 kV (at beam 1300 μ A) for the set.
2. To keep the set in a normal operation, be sure to make it function on 29.30 kV \pm 1.5 kV (at beam 1300 μ A) in the case of the set. The set has been factory adjusted to the above mentioned high voltage.
If there is a possibility that the high voltage fluctuates as result of the repairs, never forget to check for such high voltage after the work.
3. Do not substitute a picture tube with unauthorized types and/or brands which may cause excess X-Ray radiation.

BEFORE RETURNING THE RECEIVER

Before returning the receiver to the user, perform the following safety checks:

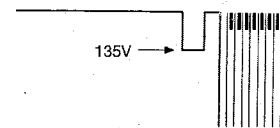
1. Inspect all lead insulation to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.
2. Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment covers or shields, insulation resistor-capacity networks, mechanical insulators, etc.

SERVICE ADJUSTMENTS

All the adjustments required for this chasis will be done in Service Mode, except G2 and Focus.

• G2 ADJUSTMENT

1. Receive cross hatch pattern signal
2. Set contrast to 80/100 and brightness to 40/100.
3. Connect the oscilloscope to the red cathode and adjust G2 to read 135V on the sensor pulse as in below drawing:



NOTE:

Oscilloscope should be adjusted for vertical TV field trigger and synchronized with video signal.

ov _____

• SERVICE MODE FUNCTION

This mode function is provided to assist with the settings of those adjustment that may vary from one Picture Tube another, or between models.

In order to use the Service Mode

1. Connect Test Pattern signal to antenna terminal.
2. Press main switch to "OFF".
3. Press volume-down and channel-up buttons and main switch to "ON" simultaneously.
4. Service mode is now entered.

The required adjustments can then be made from the Remote Control Unit.

The only buttons required are the following:

Up/Down-channel for movement in adjustment options menu; Up/Down-volume are used to carry out and adjust in said menu; ON/OFF is used to memorize a new adjustment.

Adjustment menu is as follows:

- | | |
|--|---|
| - SERVICE SOFTWARE AND HEXADECIMAL COUNTER DISPLAY | SW ON XXXX SW OFF XXXX HOURS ON XXXX |
| - HORIZONTAL SHIFT | |
| - EAST WEST WIDTH | |
| - PIN PHASE | - GREEN CUT OFF |
| - PIN AMP | - BLUE CUT OFF |
| - UPPER CORNER CORRECTION | - ALTER NVM PAGE / ALTER NVM POSITION / |
| - LOWER CORNER CORRECTION | ALTER VNM VALUE |
| - VERTICAL LINEARITY | - TELETXT MIX MODE CONTRAST |
| - VERTICAL AMPLITUDE | - TELETXT CONTRAST |
| - S CORRECTION | - OSD CONTRAST |
| - VERTICAL SHIFT | - DVCO ADJUSTMENT (Only PAL) |
| - RED GAIN | - DVCO ADJUSTMENT (Only NTSC) |
| - GREEN GAIN | - AGC ADJUSTMENT |
| - BLUE GAIN | - AFT ADJUSTMENT |
| - GREEN GAIN | - OPC VALUE (Not Available in this model) |
| To exit service mode, press main switch to OFF | - AUTOINSTALLATION ON/OFF |

Adjustment Note:

All the adjustments for Geometries are bases on internal pattern (fig. 1)

The procedure for making adjustments is as follows:

Horizontal

- Adjust HORIZONTAL SHIFT
- Adjust E-W WIDTH
- Adjust PIN PHASE
- Adjust PIN AMPLITUDE
- Adjust UPPER CORNER CORRECTION
- Adjust LOWER CORNER CORRECTION

Vertical

- Adjust VERTICAL AMPLITUDE
- Adjust S-CORRECTION
- Adjust VERTICAL SHIFT
- Adjust VERTICAL LINEARITY

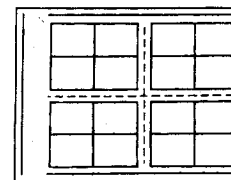


Fig. 1

HORIZONTAL SHIFT

Internal pattern signal will be displayed.
When volume-up button is pressed, picture moves to the left.
When volume-down is pressed, picture moves to the right.
Adjust the horizontal location to obtain picture centering (fig. 2).

E-W WIDTH

Internal pattern signal will be displayed.
When volume-up button is pressed, horizontal scanning increases.
When volume-down is pressed, horizontal scanning decreases.
Adjust the horizontal amplitude to obtain 9% overscan (fig. 3).

PIN PHASE

Internal pattern signal will be displayed.
When volume-up button is pressed, slide pincushion changes.
When volume-down is pressed, slide pincushion changes.
Adjust the PIN PHASE to obtain condition as in (fig. 4).

PIN AMPLITUDE

Internal pattern signal will be displayed.
When volume-up button is pressed, slide pincushion changes from pincushion to barrel shape.
When volume-down is pressed, slide pincushion changes from barrel to pincushion shape.
Adjust the PIN AMPLITUDE to obtain condition as in (fig. 5).

UPPER CORNER CORRECTION

Internal pattern signal will be displayed.
When volume-up button is pressed, slide pincushion changes from pincushion to barrel shape.
When volume-down is pressed, slide pincushion changes from barrel to pincushion shape.
Adjust the UPPER CORNER CORRECTION to obtain condition as in (fig. 6).

LOWER CORNER CORRECTION

Internal pattern signal will be displayed.
When volume-up button is pressed, slide pincushion changes from pincushion to barrel shape.
When volume-down is pressed, slide pincushion changes from barrel to pincushion shape.
Adjust the LOWER CORNER CORRECTION to obtain condition as in (fig. 7).

VERTICAL LINEARITY

Internal pattern signal will be displayed.
When volume-up button is pressed, upper picture scanning decreases and lower picture scanning increases.
When volume-down is pressed, upper picture scanning increases and lower picture scanning decreases.
Adjust the vertical symmetry to obtain symmetrical scanning between upper and lower picture (fig. 8).

VERTICAL AMPLITUDE

Internal pattern signal will be displayed.
When volume-up button is pressed, vertical size of picture increases.
When volume-down is pressed, vertical size of picture decreases.
Adjust the the vertical size to obtain overscan (fig. 9).

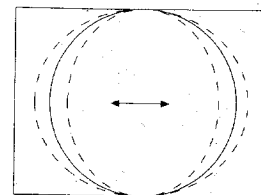


Fig. 2

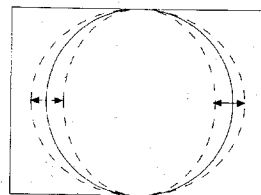


Fig. 3

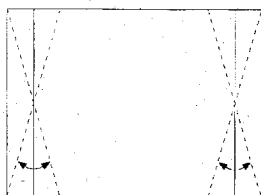


Fig. 4

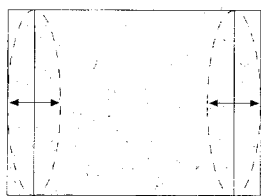


Fig. 5

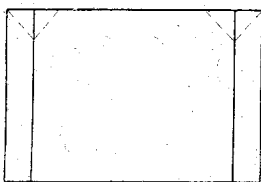


Fig. 6



Fig. 7

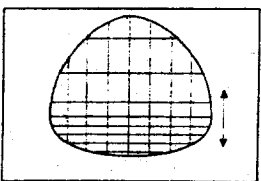


Fig. 8

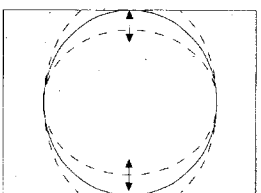


Fig. 9

9 - S-CORRECTION

- Internal pattern signal will be displayed.
- When volume-up button is pressed, upper and lower scanning decreases, and center scanning increases.
- When volume-down is pressed, upper and lower scanning increases, and center scanning decreases.
- Adjust the S-correction to obtain a balance between upper, lower and center (fig. 10).

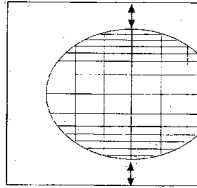


Fig. 10

10 - VERTICAL SHIFT

- Internal pattern signal will be displayed.
- When volume-up button is pressed, picture moves up.
- When volume-down is pressed, picture moves down.
- Adjust the the horizontal location to obtain picture centering (fig. 11).

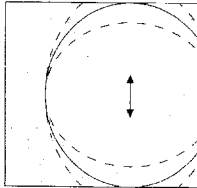


Fig. 11

COLOUR ADJUSTMENT

The following adjustments are only required when the Picture Tube is changed.

1. RED CUT OFF / GREEN CUT OFF / BLUE CUT OFF

- Adjust G2
- Tune a white card.
- Adjust colour to minimum.
- Position colourimeter in the center of screen.
- Adjust brightness and contrast to obtain a luminance of ≈ 20 NITS.
- Operate in Service Mode and select location RED CUT OFF / GREEN CUT OFF / BLUE CUT OFF, to obtain colour coordinates:
 $X=0.290 \pm 0.015$ $Y=0.284 \pm 0.015$

To increase press volume-up button and to decrease press volume down button

| | |
|---------------|------------------------------|
| RED CUT OFF | alter "X" coordinate |
| GREEN CUT OFF | alter "Y" coordinate |
| BLUE CUT OFF | alter "X" and "Y" coordinate |

- The changes introduced can be memorized by pressing button "O" on TV set

2. RED GAIN / GREEN GAIN / BLUE GAIN

- Using brightness and contrast buttons, select a luminance of $f \approx 110$ NITS.
- Operate again in Service Mode and select location RED GAIN / GREEN GAIN / BLUE GAIN, to obtain colour coordinates:
 $X = 0.290 \pm 0.015$ $Y = 0.284 \pm 0.015$

To increase press volume-up button and to decrease press volume-down button.

| | |
|------------|------------------------------|
| RED GAIN | alter "X" coordinate |
| GREEN GAIN | alter "Y" coordinate |
| BLUE GAIN | alter "X" and "Y" coordinate |

- The changes introduced can be memorized by pressing button "O" on TV set.
- Exit Service Mode and check colour coordinates "X" and "Y" at 20 and 110 NITS. It may be necessary to repeat procedure 1 and 2 of COLOUR ADJUSTMENT.

ACCESS TO NVM

Press CH[^] to move in the following sequence:

ALTER NVM PAG → ALTER NVM POS → ALTER NVM
to alter presetting adjustments, press up/down-volume buttons on ALTER NVM VAL.

⚠ CAUTION: Do not change NVM VALUE to avoid risk of serious damages to TV set.

CONTRAST ADJUSTMENT

Up/down-volume buttons are used to adjust the contrast following items:

- TELETEXT MIX MODE CONTRAST
- TELETEXT CONTRAST
- OSD CONTRAST

DVCO ADJUSTMENT (PAL)

- Receive Philips pattern signal.
- When Stand-by button is pressed (Remote Control Unstart automatically the adjustment.

DVCO ADJUSTMENT (NTSC)

Adjustment not required.

AUTO INSTALLATION OFF/ON

When ON is selected, the TV will perform the autoinstallat sequence as soon as service mode is removed.

PROTECTIONS CANCEL

- Connect Test Pattern signal to antenna terminal.
- Press main switch to OFF.
- Press volume-down and channel-up buttons and main switch to ON simultaneously.
- "Service software Vxx.xx" appears on screen.
- Press main switch to OFF.

AGC ADJUSTMENT

- Tune the TV into DM10 (pattern generator).
- Adjust the signal strenght to 57 dB μ v.
- Press the stand-by button on the Remote Control (red button).
The TV will perform automatically the AGC Adjustment

AFT ADJUSTMENT

- Tune the TV into CH69 (pattern generator).
- Press the stand-by button on the Remote Control (red button).
The TV will perform automatically the AGC Adjustment

DESCRIPTION OF SCHEMATIC DIAGRAM

SAFETY NOTE:

DISCONNECT THE AC PLUG FROM THE AC OUTLET BEFORE REPLACING PARTS. SEMICONDUCTOR HEAT SINKS SHOULD BE REGARDED AS POTENTIAL SHOCK HAZARDS WHEN THE CHASSIS IS OPERATING.

IMPORTANT SAFETY NOTICE:

PARTS MARKED WITH "⚠" () ARE IMPORTANT FOR MAINTAINING THE SAFETY OF THE SET, BE SURE TO REPLACE THESE PARTS WITH SPECIFIED ONES FOR MAINTAINING THE SAFETY AND PERFORMANCE OF THE SET.

DEVICE PRECAUTION:

THE AREA ENCLOSED BY THIS LINE (■ ■) IS DIRECTLY CONNECTED WITH AC MAINS VOLTAGE. WHEN SERVICING THE AREA, CONNECT AN ISOLATING TRANSFORMER. BETWEEN TV RECEIVER AND AC LINE TO ELIMINATE HAZARD OF ELECTRIC SHOCK.

NOTE:

1. The unit of resistance "ohm" is omitted (K = 1000 ohms, M = Megaohm).
2. All resistors are 1/8 watt, unless otherwise noted.
3. All capacitors are μF , unless otherwise noted (P = $\mu\mu\text{F}$).
4. The capacitor with Part No. RC-FZ9XXXBMNJ is designed to withstand 63V

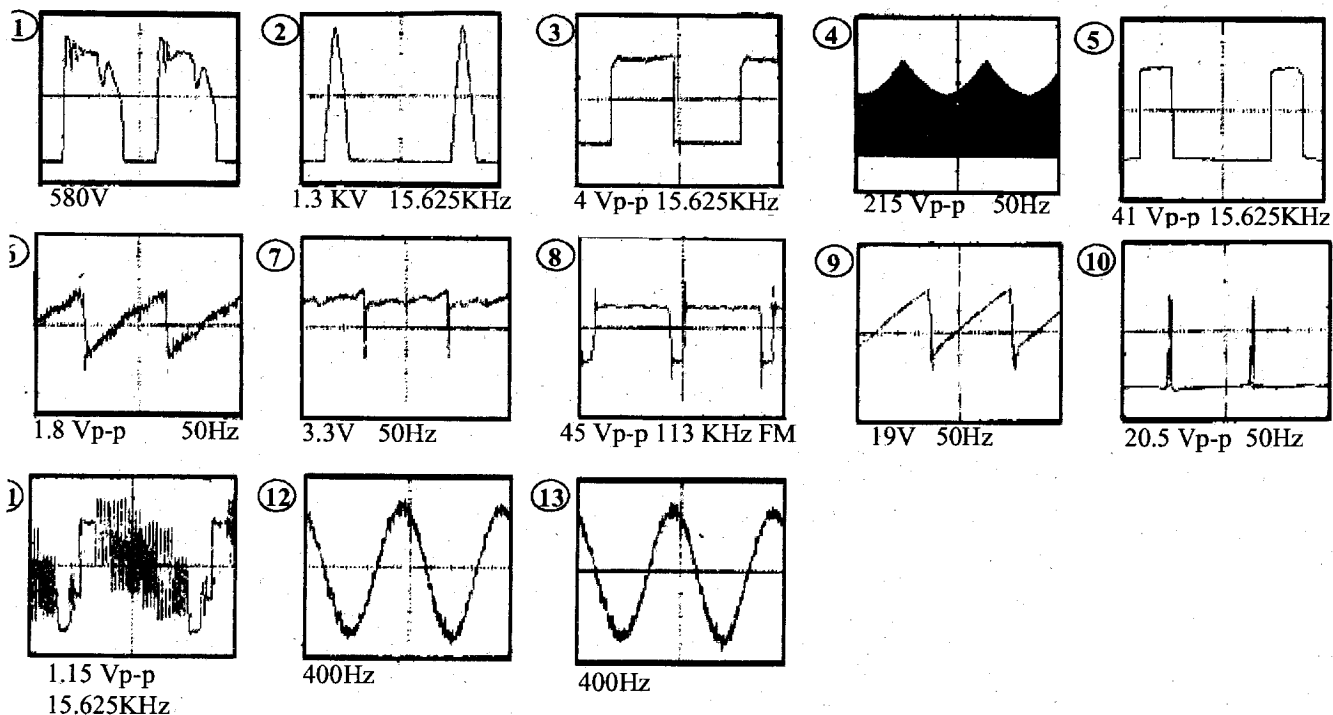
WAVEFORM MEASUREMENT CONDITION

Colour bar generator signal of 70 dB from RF input.

CAUTION

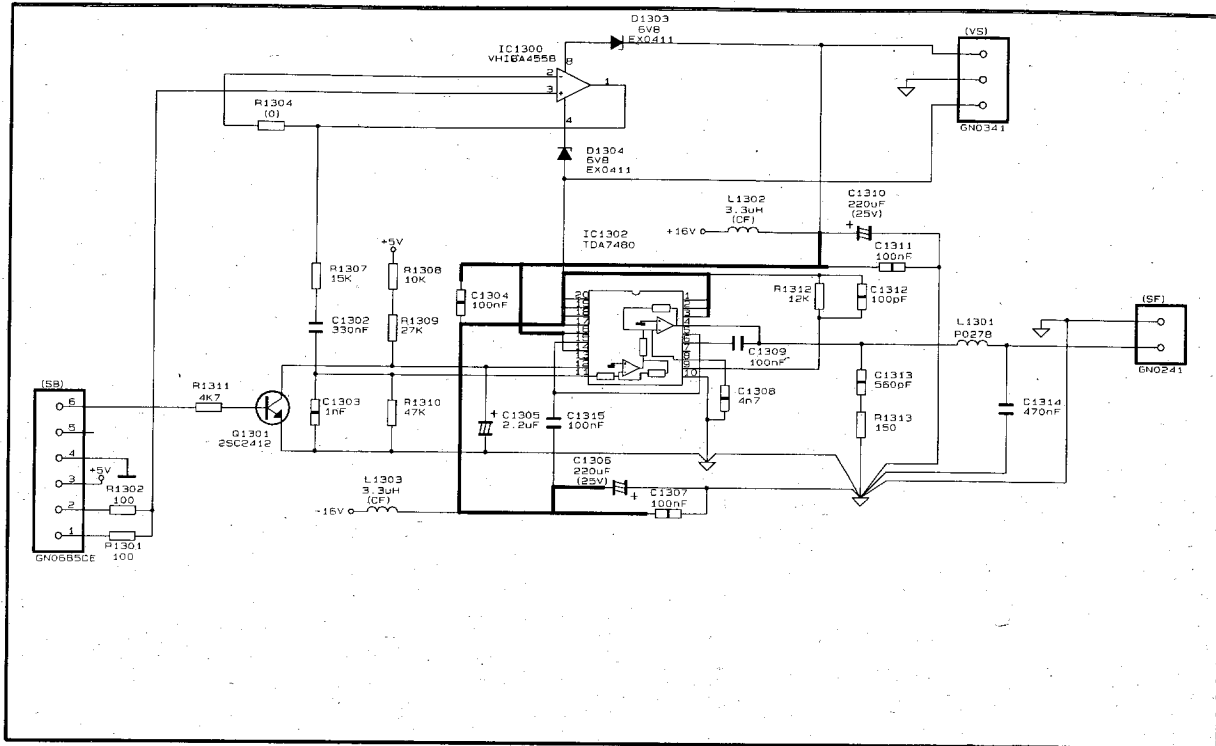
This circuit diagram is original one, therefore there may be a slight difference from yours.

SCHEMATIC DIAGRAM

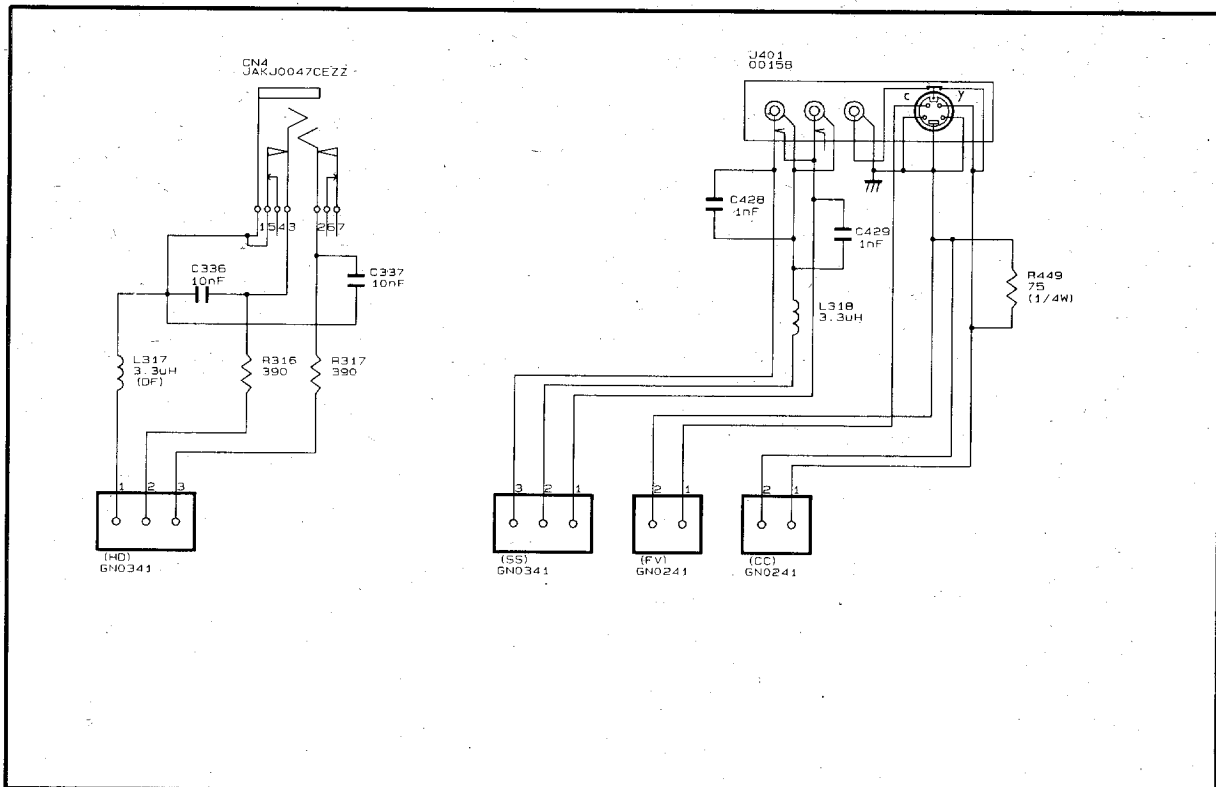


56FW-53H
66FW-53H
76FW-53H

SCHEMATIC DIAGRAM

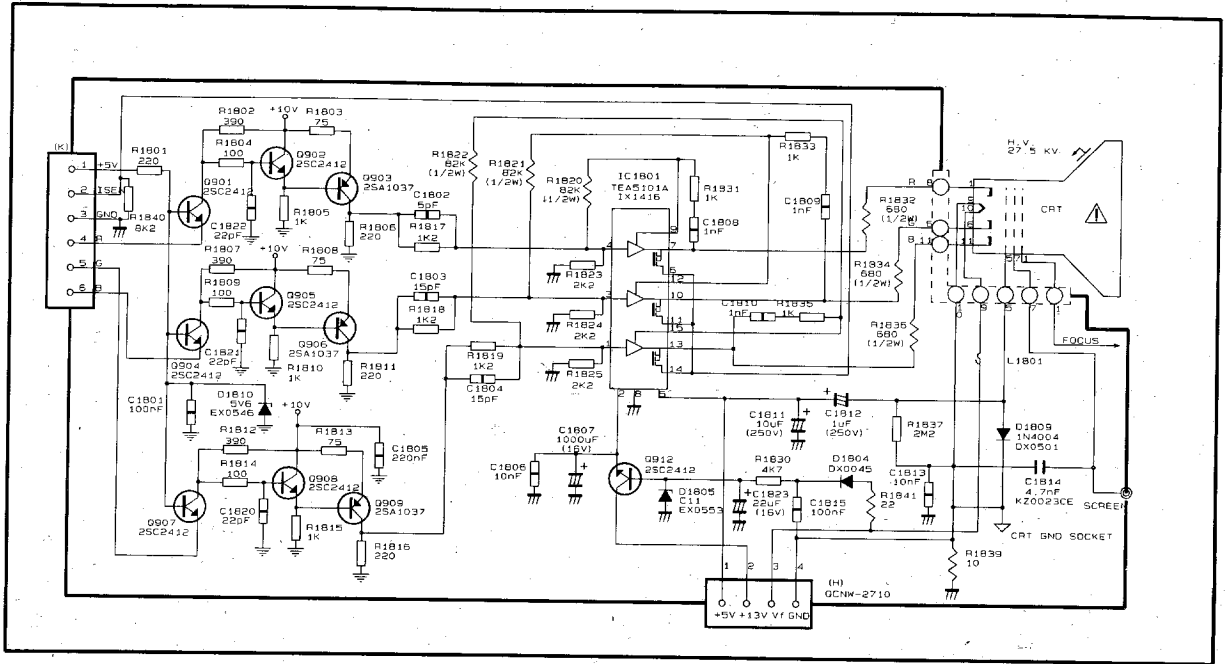


CENTRAL SPEAKER UNIT (66/76FW-53H)

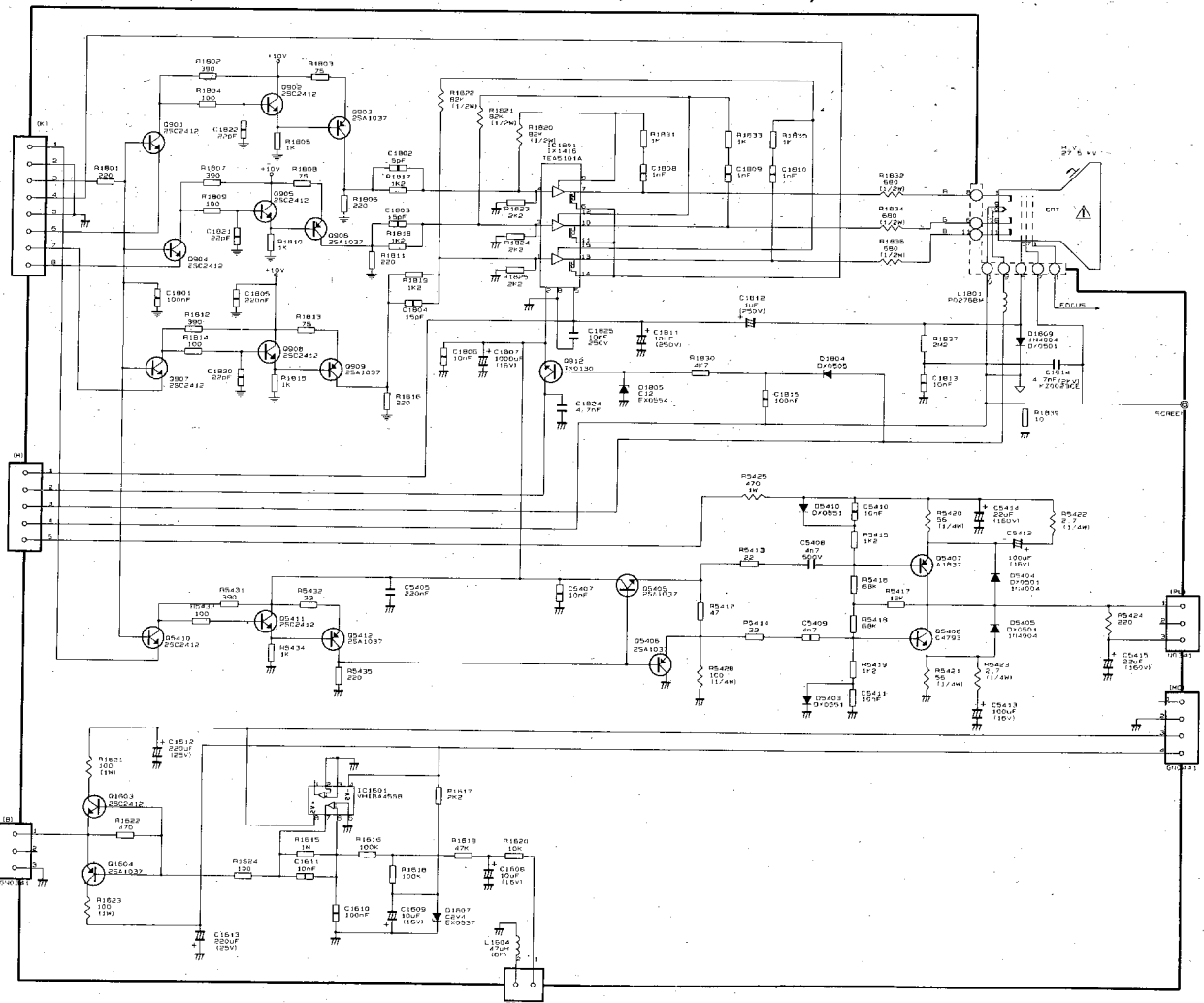


FRONT AV UNIT (ALL)

SCHEMATIC DIAGRAM



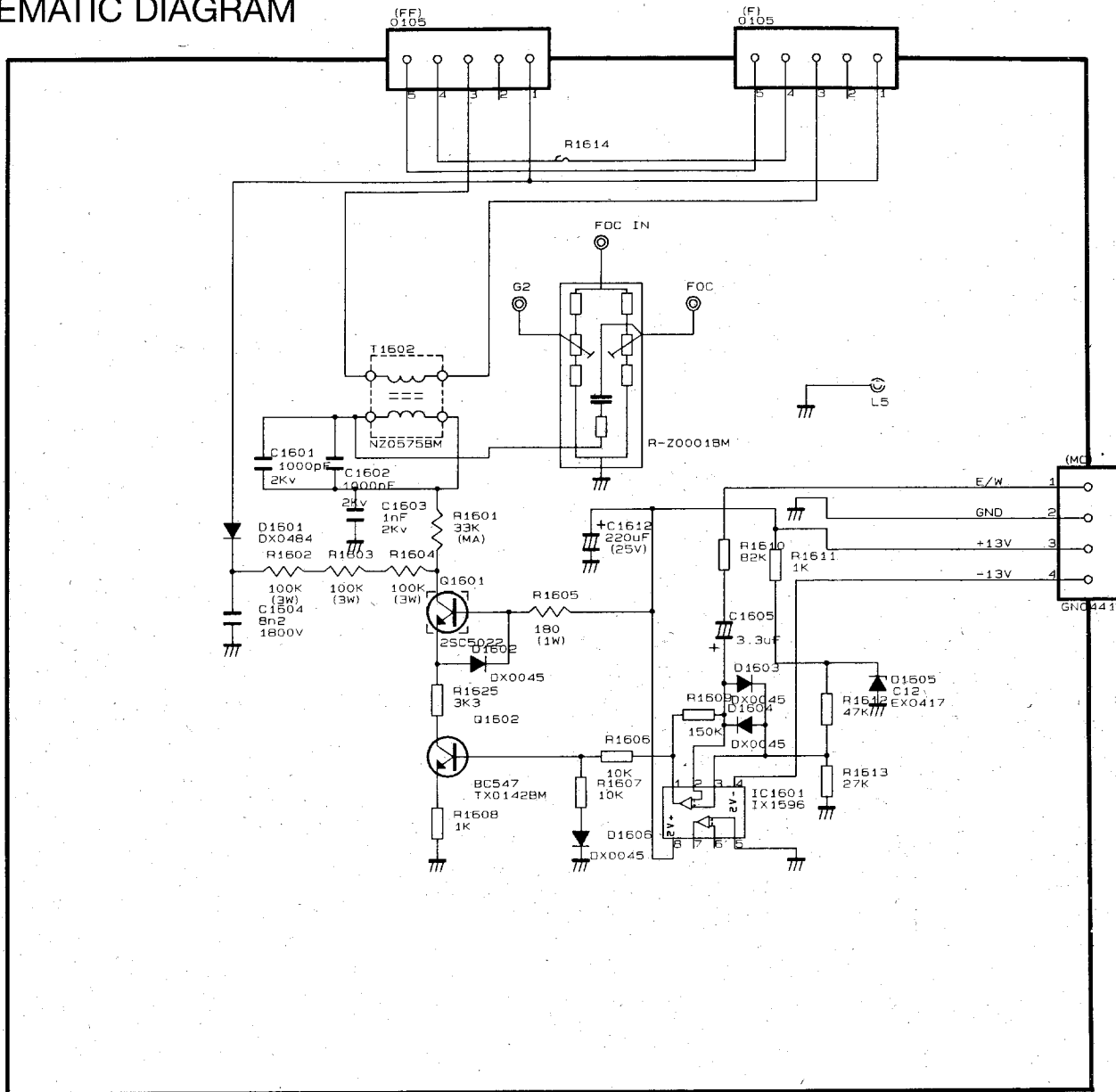
SOCKET UNIT (56FW-53H)



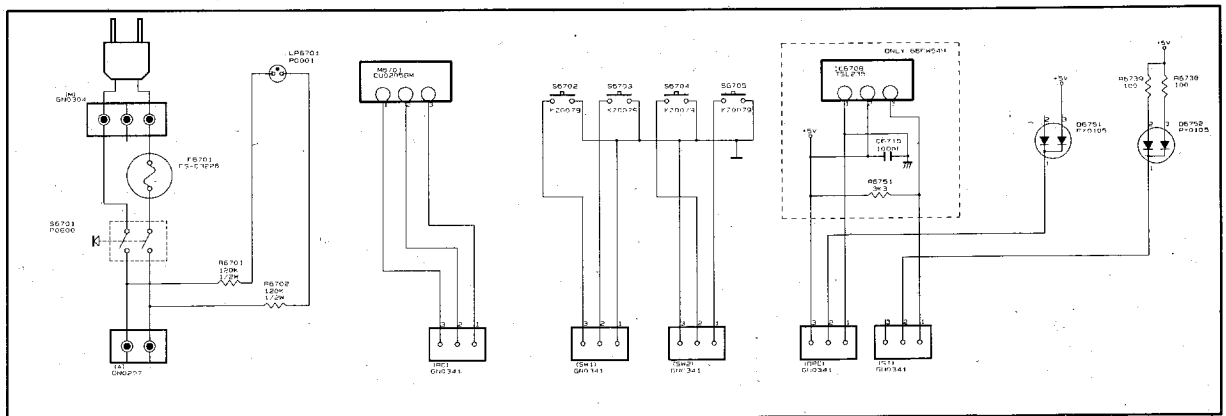
SOCKET UNIT (66/76FW-53H)

56FW-53H
66FW-53H
76FW-53H

SCHEMATIC DIAGRAM



DEFLECTION UNIT (76FW-53H)



CONTROL UNIT (ALL)