4. TOTR.

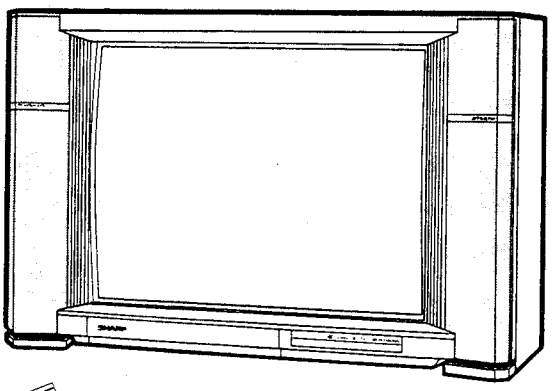
DV-28071S

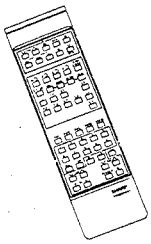
SHARP SERVICE MANUAL SERVICE-ANLEITUNG

SEAADV28071S/

D 3000 CHASSIS

PAL/SECAM SYSTEM COLOUR TELEVISION
PAL/SECAM SYSTEM FARBFERNSEHGERÄT





MODEL MODELL DV-28071S

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.

Im Interesse der Benutzer-Sicherheit (in einigen Länder durch Sicherheitzvorschriften gefordert) sollte dieses Gerät wieder auf seinen ursprünglichen Zustand eingestellt und nur die vorgeschriebenen Teile verwendet werden.

CONTENTS

INHALT

SHARP CORPORATION

714

ELECTRICAL SPECIFICATIONS

Aerial Input Impedance ..... 75 ohm unbalanced
Convergence ..... Self Converging System
Focus ..... Bi - potential electrostatic
Audio Power Output Rating ..... 10 Watt (M.P.O.)x2
Intermediate Frequencies
Picture IF Carrier Frequency ..... 38.9 MHz
Sound IF Carrier Frequency ..... 33.16 MHz / 33.4 MHz
Colour Sub-Carrier Frequency ..... 34.47 MHz (Nominal)

Power Input ..... 220 Volts AC 50 Hz
Power Consumption ..... 93 Wh
Speaker Size ..... 8 cm x 16 cm (Oval)
Voice Coil Impedance ..... 8 ohms x 2 units
Sweep Deflection ..... Magnetic
Tuning Ranges ..... VHF-Channels 2 to 12
UHF-Channels 21 to 69
CATV Special Channels

Specifications are subject to change without prior notice.

TECHNISCHE DATEN

Antennen-
Eingangsimpedanz ..... 75 ohm unsymmetrisch
Konvergenz ..... Selbstkonvergierendes System
Sharfeinstellung ..... Bi - Potential elektrostatisch
Ton-Ausgangsleistung ..... 10 Watt (M.P.O.) x 2
Zwischenfrequenzen
Bild-ZF-Trägerfrequenz ..... 38,9 MHz
Ton-ZF-Trägerfrequenz ..... 33,16 MHz / 33,4 MHz
Farb-Hilfsträgerfrequenz ..... 34,47 MHz (Nominal)

Netzspannung ..... 220 V Netzstrom, 50 Hz
Leistungsaufnahme ..... 93 Wh
Lautsprechergröße ..... 8 cm x 16 cm (Oval)
Schwingspulenimpedanz ..... 8 ohm x 2 st.
Ablenkung ..... Magnetisch
Abstimmbereiche ..... VHF-Kanäle 2 bis 12
.....UHF-Kanäle 21 bis 69
Sonderkanäle

Anderungen vorbehalten

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.

WARNUNG

Das Chassis dieses Empfangsgerätes steht teilweise unter hohen Spannungen. Bei Wartungsarbeiten an diesem Chassis muß deshalb ein Isolationstransformator zwischen dem Netzkabelstecker und der Steckdose verwendet werden.
Um elektrische Schläge zu vermeiden, darf das Abdeckgehäuse nicht entfernt werden. Im Inneren des Gerätes befinden sich keine von Benutzer einstellbaren Teile. Wartung und Reparaturarbeiten müssen qualifiziertem Service-Personal überlassen werden.

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 an insulated wire (such as a test probe) between picture tube ground tag 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 30.0 kV (at beam 1100 μA) for the set.**
2. **To keep the set in a normal operation, be sure to make it function on 24.5 kV ± 1.5 kV (at beam 1100 μA) 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 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.

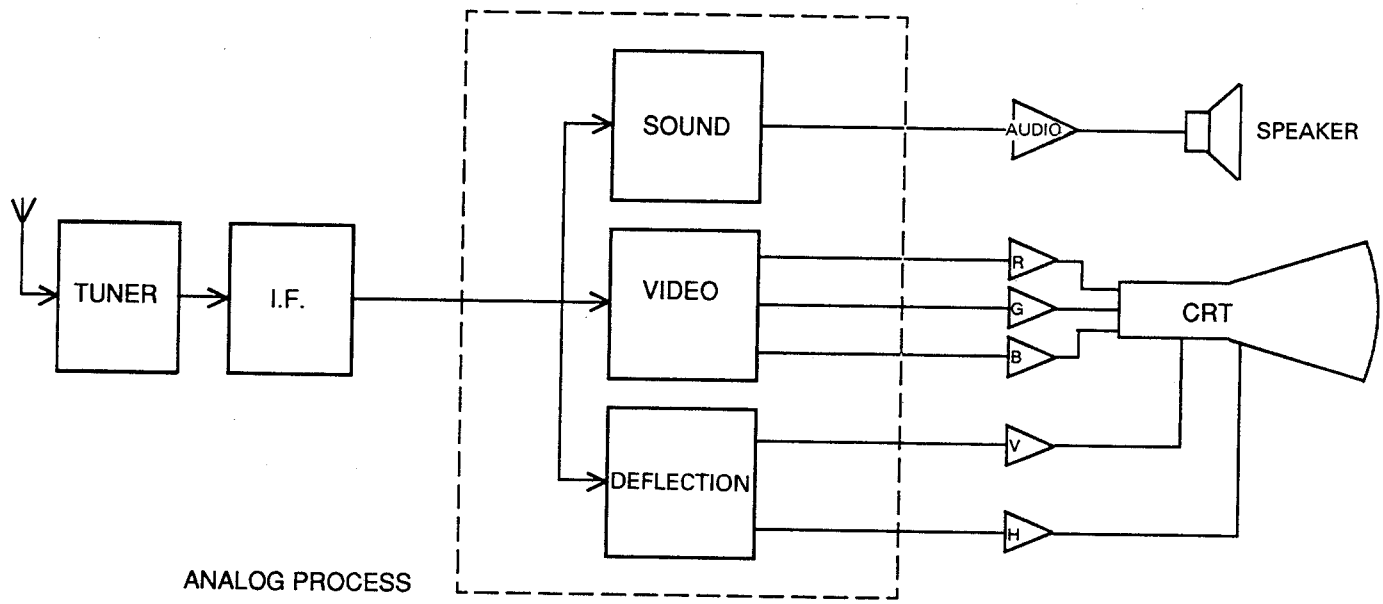
1. **Inspect all lead insulation to make certain that leads are not pinched or that hardware is not lodged between the chassis and other metal parts in the receiver.**
2. **Inspect all protective devices such as non-metallic control knobs, insulating fishpapers, cabinet backs, adjustment and compartment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

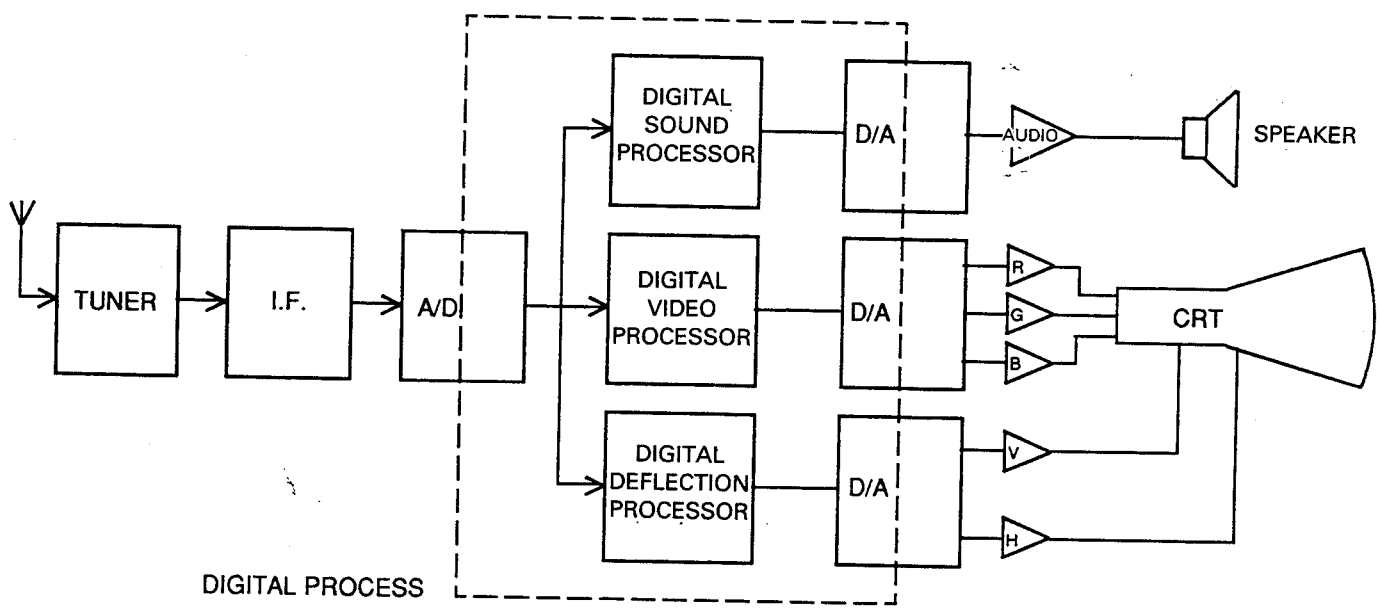
NEW TECHNOLOGY

DIGITAL TV SHARP

FUNCTIONAL CONCEPTS:

The function of a digital TV differs from a conventional analog one in the processing of the Video composite signal coming out from the IF Unit and entering (decoded) into amplifiers for Picture, Sound, Deflection and R.G.B..





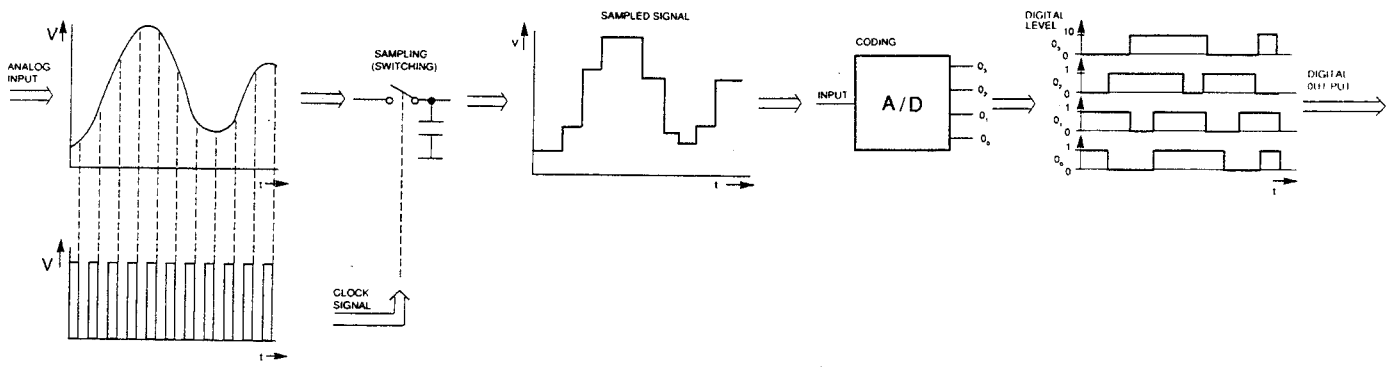
DIGITALIZATION OF ANALOG SIGNALS:

A/D CONVERTER

The first step is to chop the analog signal up into sample signals. This can be achieved by periodically opening and closing a circuit controlled by a clock signal. The signal obtained is then stored in a capacitor which maintains this information long enough to be converted into digital.

The converter contains predetermined voltage levels which serve as a reference point to compare them with the chopped signal and to assign a binary code for each sample.

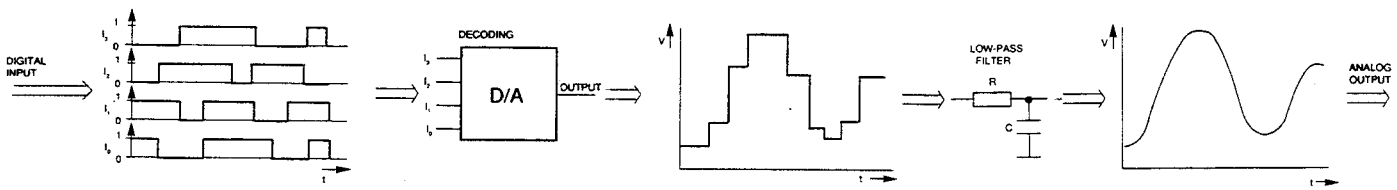
A/D CONVERTER



D/A CONVERTER

The inverse process now takes place. When a binary code is introduced into the D/A converter, it assigns a voltage value to each code, which through continued succession of codes generates a series of voltage values which produce a waveform. To obtain the original analog signal, the waveform should be filtered through a Low-Pass filter. The final resultant waveform quality of this A/D and D/A process depends upon the number of bits of the converters and the sampling frequency which should be at least double that of the sampled signal.

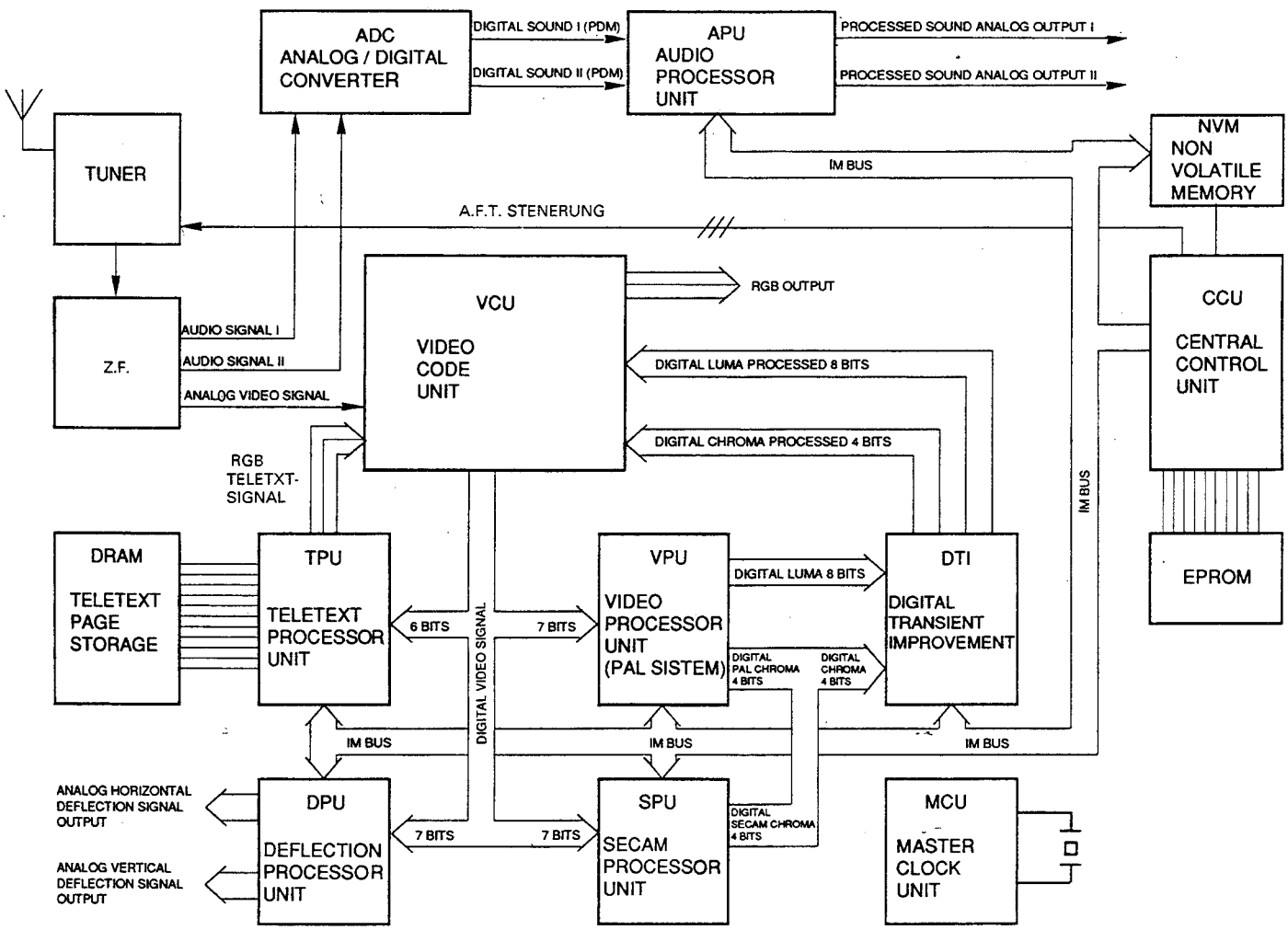
D/A CONVERTER



DIGITAL PROCESS

The centre of the system is the microprocessor Central Control Unit (CCU) which communicates with the integrated circuits by means of the IMBUS communications network.
This network allows the CCU to read and write information data in each integrated circuit. The CCU acts as "Master" and the rest of the integrated circuits as "Slaves".
The IMBUS consists of three signal lines: CL is the clock signal line which synchronizes the communications and when this happens, the frequency of the signal is 17 KHz approx.
ID is the identification signal line. Each integrated circuit has an assigned code, all being connected in parallel to the IMBUS. This line determines which unit the CCU is communicating with. D is the data lines which are read and written by the CCU.
CL and ID lines are unidirectional, i.e., the communication comes from CCU to the other units. D line is bidirectional i.e., reading or writing.
The outputs of IMBUS at the CCU are open drained which require resistances on each positive line.

BASIC SIGNAL FLOW



IMBUS
CL: CLOCK LINE
ID: IDENTIFICATION LINE
D: DATA LINE

The microprocessor is linked to two memories: An EPROM memory that contains CCU program software, which repeats itself constantly in a sequential manner.
The NVM memory that stores channel data, brightness and volume controls, etc., which can be modified by the user through the Remote Control Unit.
It also stores data referring to S and E-W parabola corrections. The data can only be modified by Technical Service staff and not by the user.

In order to operate in the service functions, press the service button found in the interior of the TV set and adjust the required controls by means of the Remote Control Unit.
The Television push buttons can also be used, as their specific functions change in this operation mode. Having seen how the microprocessor communicates with the rest of the integrated circuits, we now see how the Video signals process is followed.

The Composite Video Signal coming from the IF unit is fed into the VCU, part of which is an A/D converter. Once digitalized, the signal is fed in parallel into the Synchro Processor DPU, Video Processor VPU, Secam Processor SPU and Teletext Processor TPU.
The Synchro Processor DPU takes deflection information out and makes the required signal corrections controlled by the microprocessor.
The integrated circuit contains a D/A converter that provides analog outputs in order to excite the Horizontal and Vertical Amplifiers.

The Video Processor VPU separates the Luma and Chroma signals and then processes them separately. If the signal received is not PAL, then the Chroma process in the VPU becomes deactivated and the Secam Processor SPU starts functioning. The output of VPU and SPU is fed into the DTI whose mission is to improve picture quality of sudden colour transitions.

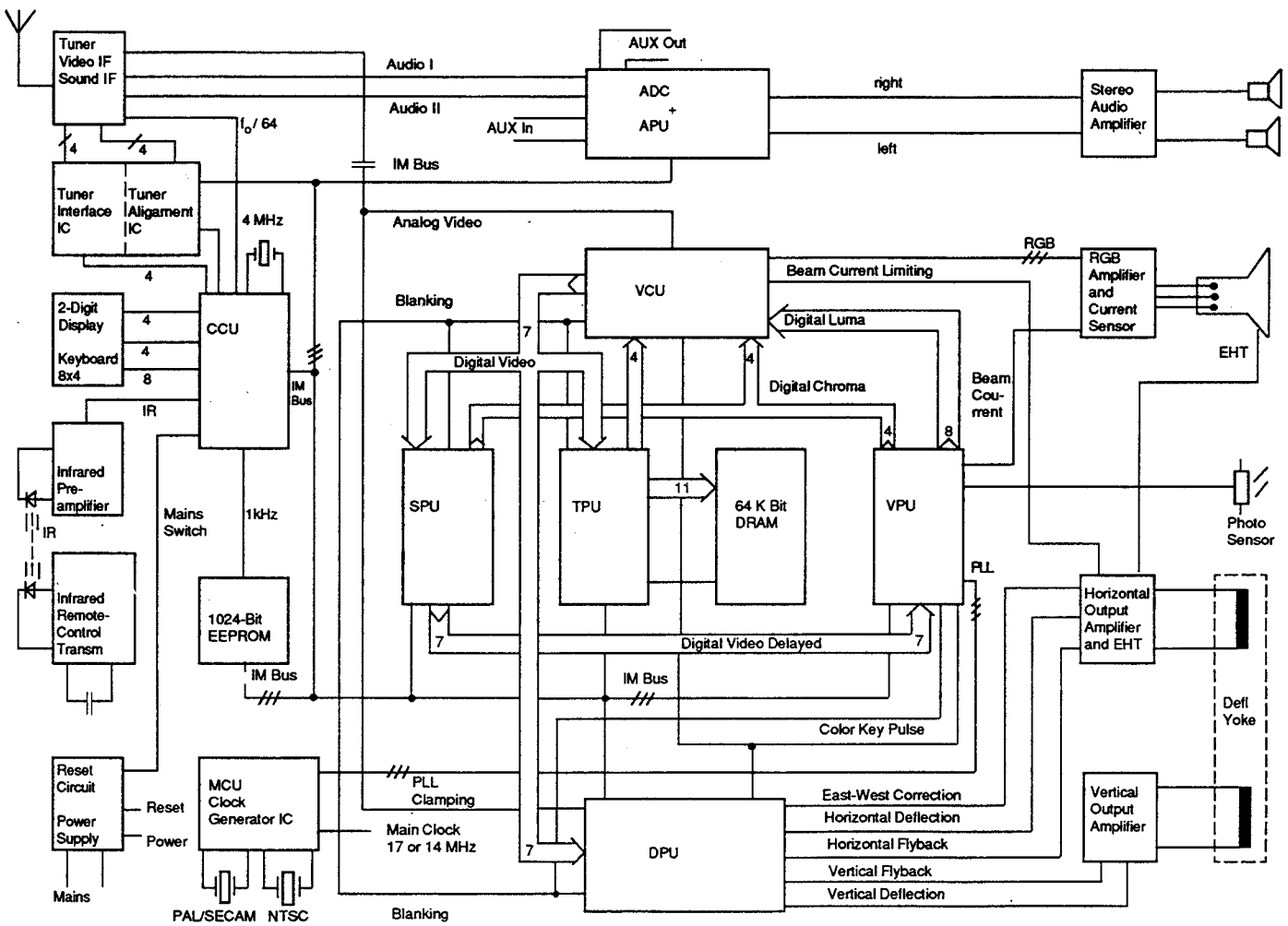
The output of the DTI is fed into the VCU again, which now transforms the digital signal to analog and codified RGB.
The Teletext Processor Unit TPU functions with certain independence, due to its DRAM memory, where available page information can be stored. The output of this integrated circuit is not digital as it has been converted into analog and is obtained in RGB form. This signal is fed into the VCU and depending on the microprocessor commands, the VCU will switch the RGB signal provided by the DTI or the Teletext RGB. Both signals can also be mixed.

All this complex digital data processing has to be synchronized. To achieve this a MCU clock is used, oscillating at a frequency of 17.7 MHz.
The MCU is interconnected to all the integrated circuits involved in the signal processing.
The function of the Audio is also governed by the microprocessor CCU and communicates with said module by means of the IM Bus.

The Audio Signal is fed into the ADC which is an analog to PDM (Pulse Density Modulator) converter and this output is connected to the Audio Processor Unit APU, where all volume, balance, tone and stereo corrections are made. This Unit has a decodifier and the output is in analog mode in order to excite the Audio Amplifiers.
In addition, the CCU has control on the AFT and will automatically correct any drifts of frequency.
As it can be appreciated by the above explanation the system is completely modular, which facilitates the additional attachment of other features to the Television in the future.

STANDARD VERSION OF DIGITAL CTV

(with remote control, equipped for PAL, SECAM and Teletext reception)



SERVICE ADJUSTMENT

PIF/AFT/SIF/AGC/+B ADJUSTMENT

1. VCO T204 for Picture

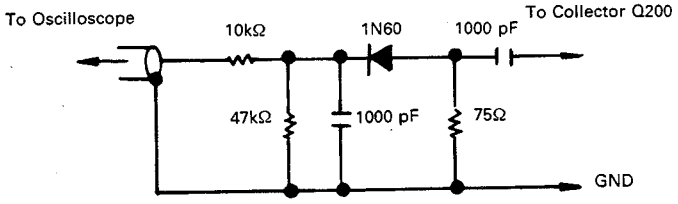
1. Apply 3V DC to pin 16 of IC200.
2. Measure and record voltage at pin 25 of IC200.
3. Apply carrier frequency of 38.9 MHz to pins 8 and 9 of IC200.
4. Adjust T204 to obtain same voltage value as step 2.

2. S detector T206 5.5 MHz for Sound

1. Apply carrier frequency of 5.5 MHz to pin 13 of IC200.
2. Connect DC voltmeter to pin 19 of IC200.
3. Adjust T206 to obtain 4.5 V at pin 19 of IC200.

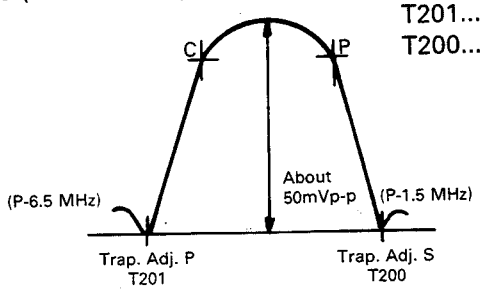
3. Trap T201, T200

1. Connect sweep generator output to TUNER Test Point.
2. Connect response cable with detector to collector line of Q200 (see diagram).



3. Adjust T200 (S-Trap) and T201 (P-Trap) so that traps are (P + 1.5 MHz) and (P-6.5 MHz).

T201.....TRAP1
T200.....TRAP2



4. S2 Adjustment T208 5.74 MHz

1. Connect carrier frequency of 5.74 MHz to pin 8 of IC201.
2. Connect Voltmeter to pin 8 of IC201.
3. Adjust T208 to obtain 3V DC.

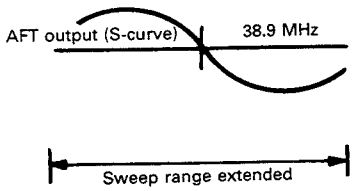
5. S-Level Adjustment R-231

1. Apply 3V DC to pin 6 of IC200.
2. Connect Stereo signal to base of Q201 (CH1, L+R) (CH2, 2R).
3. Connect oscilloscope to pin 22 of IC301 (IGR Unit).
4. Adjust R231 to obtain OV(rms).

6. AFT Adjust T205

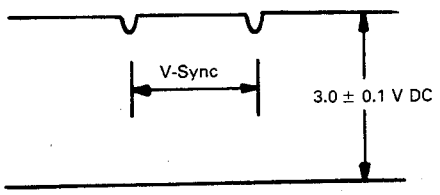
Coarse Adjustment

1. Connect sweep generator output to TUNER Test Point (T.P.).
2. Apply 3V DC to pin 6 of IC200.
3. Connect response lead (containing 10K ohm resistor in series) to pin 6 of IC200.
4. Adjust T205 to align Picture marker (38.9 MHz) of S-curve with base line.



Fine Adjustment

1. Receive CH12 (Real CH mode)
2. Set AFT mode to Off
3. Connect DC voltmeter to pin 16 of IC200.
4. Adjust T205 to obtain 3V DC ± 0.1 V.



7. RF AGC R219

1. Receive colour bar signal (signal strength: 53 dB).
2. Connect DC voltmeter to Test Point 201 (RF AGC).
3. Set AGC-VR (R219) to maximum position (memory).
4. Adjust R219 to obtain a voltage of 0.1V below maximum voltage (step 3).

+B Adjustment R716 + B150 V

1. Receive monoscope pattern signal.
2. Set contrast control to maximum (100%) position and brightness control to centre position (50%).
3. Connect DC voltmeter to cathode of D601.
4. Adjust R716 to obtain a voltage of 150 V ± 0.5 V.

SERVICE MODE

Most of the adjustments required by this TV set can be made through the Remote Control Unit or by means of the push buttons on the television itself.
The first step is to remove the rear cover and press the service button (S1401) found on the Video Unit (PWB-B). When in Service Mode "SHARP Software Service Ver" will appear on the screen.
The required adjustments can then be made from the Remote Control Unit. Having finalized the adjustments, the service button should be pressed again to restore the television to its normal function.
In Service Mode the Remote Control buttons change their function. The only buttons required are the following: +CH/–CH for movement in adjustment options menu; +V/–V are used to carry out an adjustment in said menu; ON/OFF is used to memorize a new adjustment.
Adjustment menu is as follows:

1. Horizontal Phase Shift
2. Blanking Phase Shift
3. Vertical Phase
4. Vertical Size
5. S-Correction
6. Vertical Symmetry
7. Horizontal amplitude
8. East/West 1
9. Trapezoid 1
10. East/West 2
11. Trapezoid 2
12. Chroma-Luma Delay
13. VCO adjust
14. G2 adjustment (adj. by potentiometer in FBT)
15. Cut Off Red
16. Cut Off Green
17. Cut Off Blue
18. Drive Red
19. Drive Green
20. Drive Blue

Adjustment Note:

The procedure for making adjustments to East/West and Trapezoidal Corrections is as follows:

– Set Horizontal Amplitude to minimum.
– Set East/West 2 to minimum.
– Set Trapezoid 2 to minimum.
– Adjust East/West 1.
– Adjust Trapezoid 1.
– Adjust East/West 2.
– Adjust Trapezoid 2.
– Adjust Horizontal Amplitude.

1. Horizontal Phase Shift
a) Receive Philips pattern signal.
b) When volume-up button is pressed, picture moves to the right, and horizontal blanking appears on r.h.s.
c) When volume-down button is pressed, picture moves to the left, and horizontal blanking appears on l.h.s.
d) Adjust the horizontal phase to obtain a position where no horizontal blanking appears on either side (fig. 1).

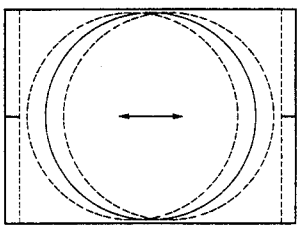


fig. 1

2. Horizontal Blanking Phase Shift
a) Receive Philips pattern signal.
b) When volume-up button is pressed, picture moves to the right.
c) When volume-down button is pressed, picture moves to the left.
d) Adjust the horizontal location to obtain picture centering (fig. 2).

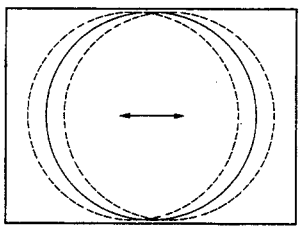


fig. 2

3. Vertical Phase
No adjustment required.

4. Vertical Size
a) Receive Philips pattern signal.
b) When volume-up button is pressed, vertical size of picture increases.
c) When volume-down button is pressed, vertical size of picture decreases.
d) Adjust the vertical size to obtain overscan (fig. 3).

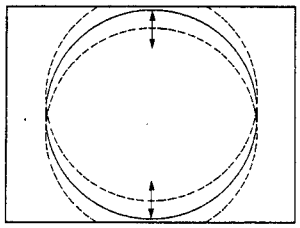


fig. 3

5. S-Correction
a) Receive Philips pattern signal.
b) When volume-up button is pressed, upper and lower scanning decreases, and center scanning increases.
c) When volume-down button is pressed, upper and lower scanning increases, and center scanning decreases.
d) Adjust the S-correction to obatin a balance between upper, lower and center (fig. 4).

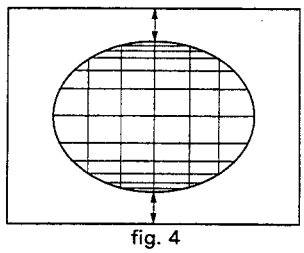


fig. 4

6. Vertical Symmetry
a) Receive Philips pattern signal.
b) When volume-up button is pressed, upper picture scanning decreases and lower picture scanning increases.
c) When volume-down button is pressed, upper picture scanning increases and lower picture scanning decreases.
d) Adjust the Vertical symmetry to obtain symmetrical scanning between upper and lower picture (fig. 5).

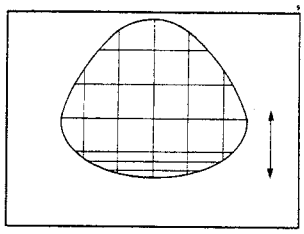


fig. 5

7. Horizontal Amplitude (except 21" model)
a) Receive Philips pattern signal.
b) When volume-up button is pressed, horizontal scanning increases.
c) When volume-down button is pressed, horizontal scanning decreases.
d) Adjust the horizontal amplitude to obtain 9% overscan (fig. 6).

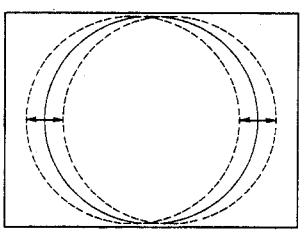


fig. 6

8. East/West 1
a) Receive Philips pattern signal.
b) When volume-up button is pressed, side pincushion changes from pincushion to barrel shape.
c) When volume-down button is pressed, side pincushion changes from barrel to pincushion shape.
d) Adjust the East/West 1 to obtain condition as in fig. 7.

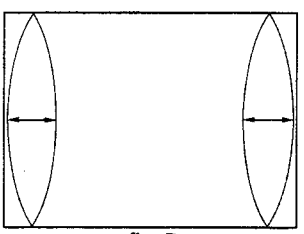


fig. 7

9. Trapezoid 1
a) Receive Philips pattern signal.
b) When volume-up button is pressed, side pincushion changes.
c) When volume-down button is pressed, side pincushion changes.
d) Adjust the Trapezoid 1 to obtain condition as in fig. 8.

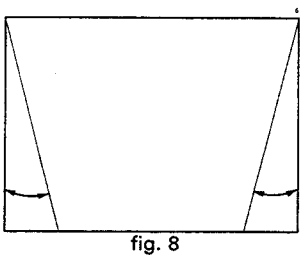


fig. 8

10. East/West 2
a) Receive Philips pattern signal.
b) When volume-up button is pressed, side pincushion changes.
c) When volume-down button is pressed, side pincushion changes.
d) Adjust the East/West 2 to obtain condition as in fig. 9.

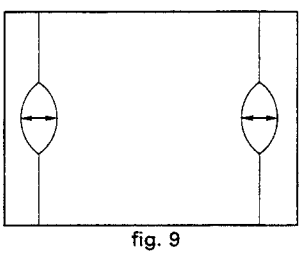


fig. 9

11. Trapezoid 2
a) Receive Philips pattern signal.
b) When volume-up button is pressed, side pincushion changes.
c) When volume-down button is pressed, side pincushion changes.
d) Adjust the Trapezoid 2 to obtain condition as in fig. 10.

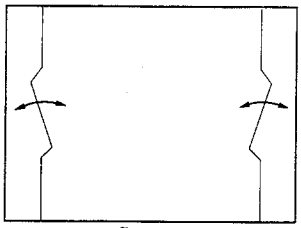


fig. 10

12. Chroma-Luma Delay
a) Receive Philips pattern signal.
b) When volume-up button is pressed, luma phase delays.
c) When volume-down button is pressed, chroma phase delays.
d) Adjust the Chroma-Luma delay.

13. VCO Adjustment
a) Receive Philips pattern signal.
b) When volume-up button is pressed, VCO changes to high frequency.
c) When volume-down button is pressed, VCO changes to low frequency.
d) Adjust VCO to 4.43 MHz.

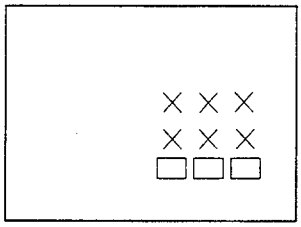


fig. 11

14. G2 Adjustment
a) Receive monoscope pattern signal.
b) First step, change mode to cutoff red.
c) Adjust the value on the screen to 63 by the volume up/down button. (fig. 12).
d) Second step, change mode to cutoff green.
e) Same method as step (c).
f) Third step, change mode to cutoff blue.
g) Same method as step (c).
h) Change mode to G2 Adjust.
i) Adjust the screen VR (G2) to obtain value of 20-40, three values for RGB appear on the screen (fig. 11).

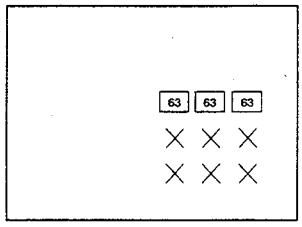


fig. 12

15. Cutoff red
a) Receive monoscope pattern signal.
b) Wait for stable picture.

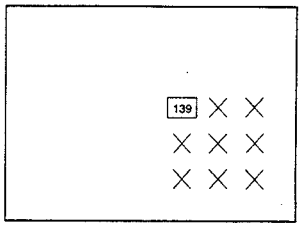


fig. 13

16. Cutoff green
a) Receive monoscope pattern signal.
b) Wait for stable picture.

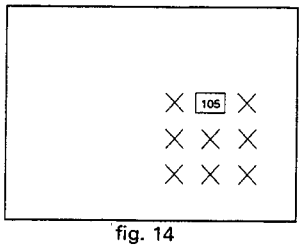


fig. 14

17. Cutoff blue
a) Receive monoscope pattern signal.
b) Wait for stable picture.

18. Drive Red
a) Receive monoscope pattern signal.
b) Adjust value on the picture to 139 (fig. 13).
c) Wait for stable picture.

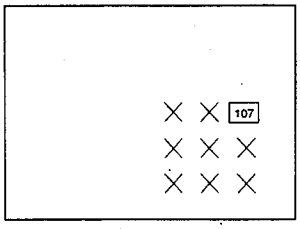
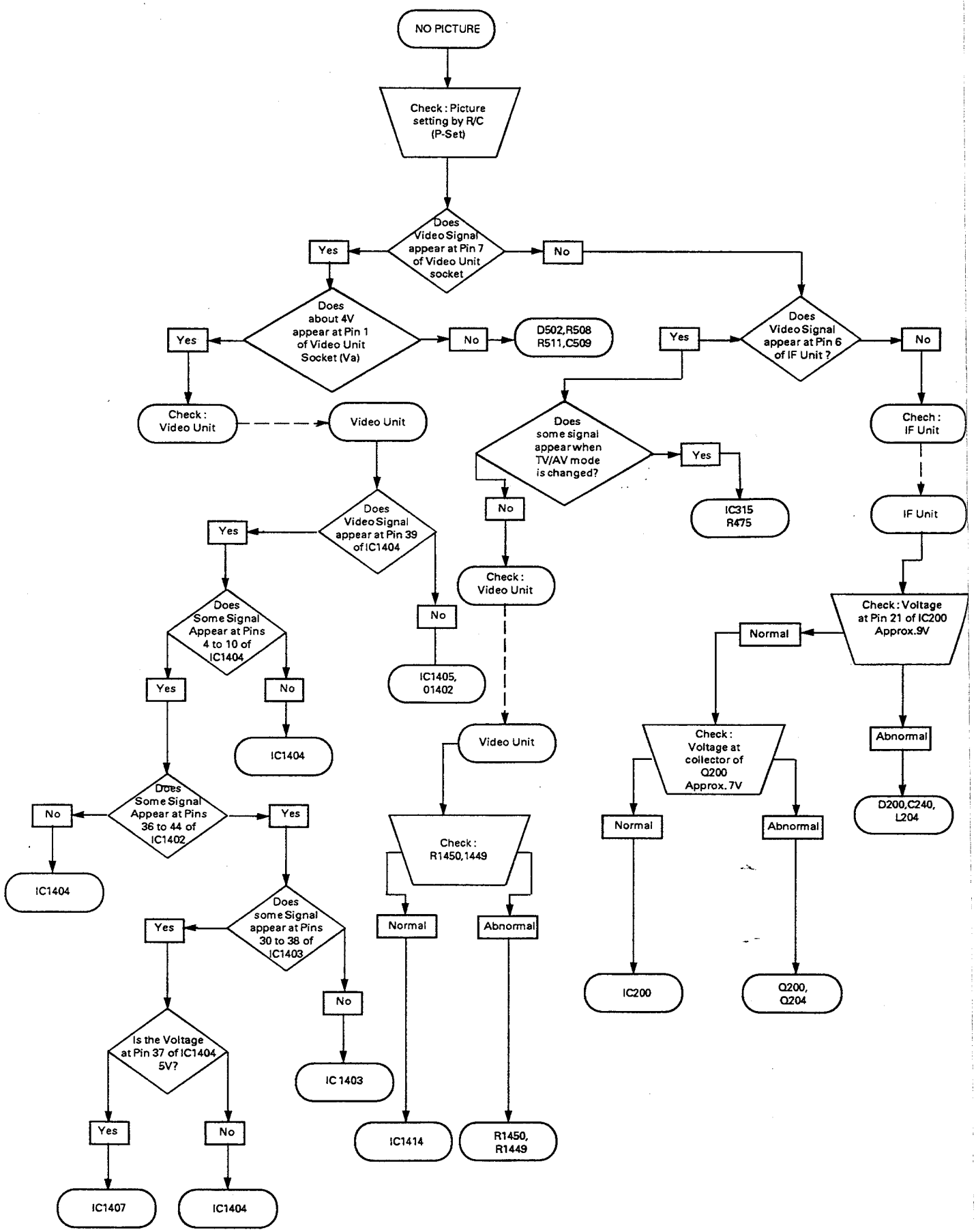


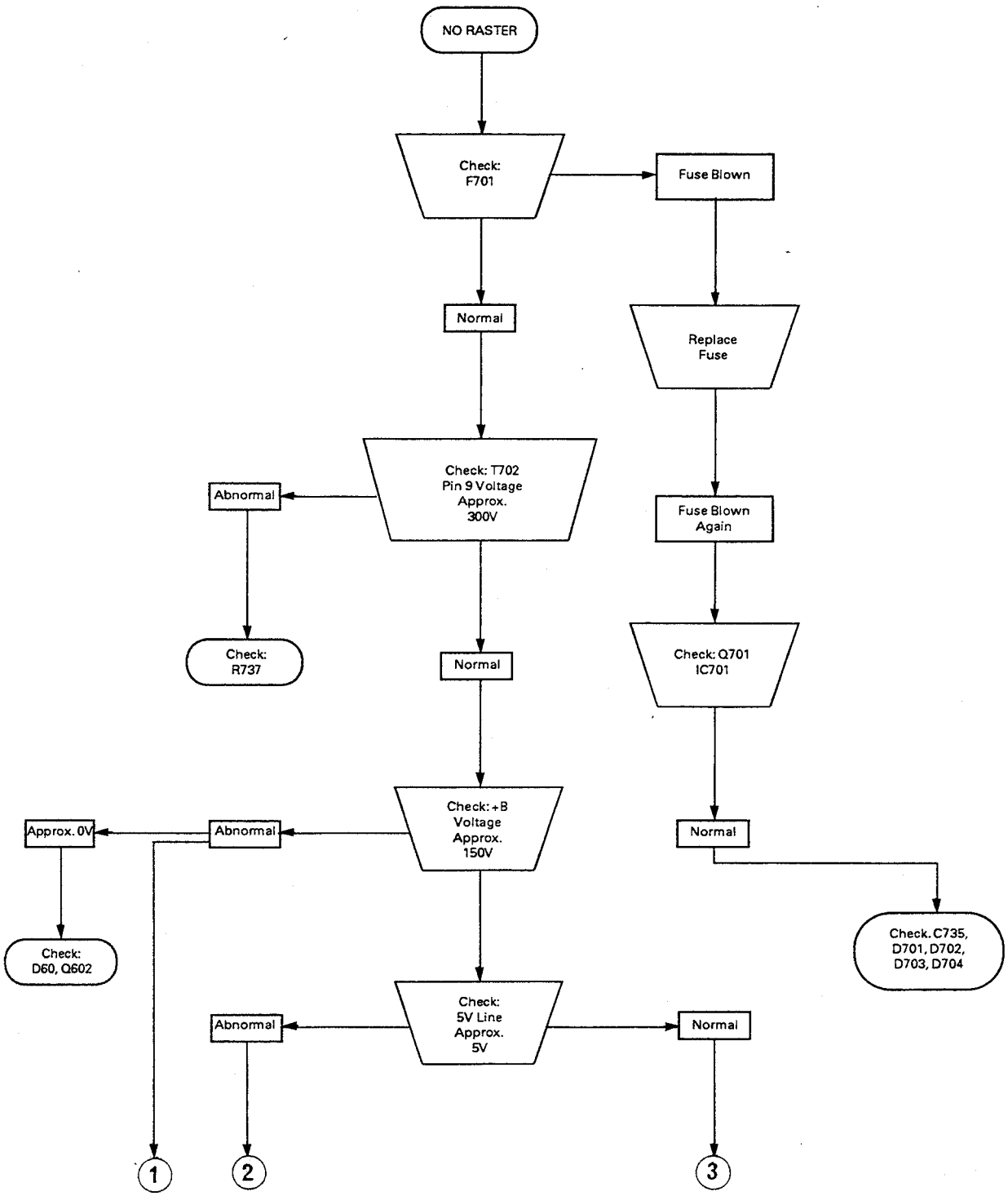
fig. 15

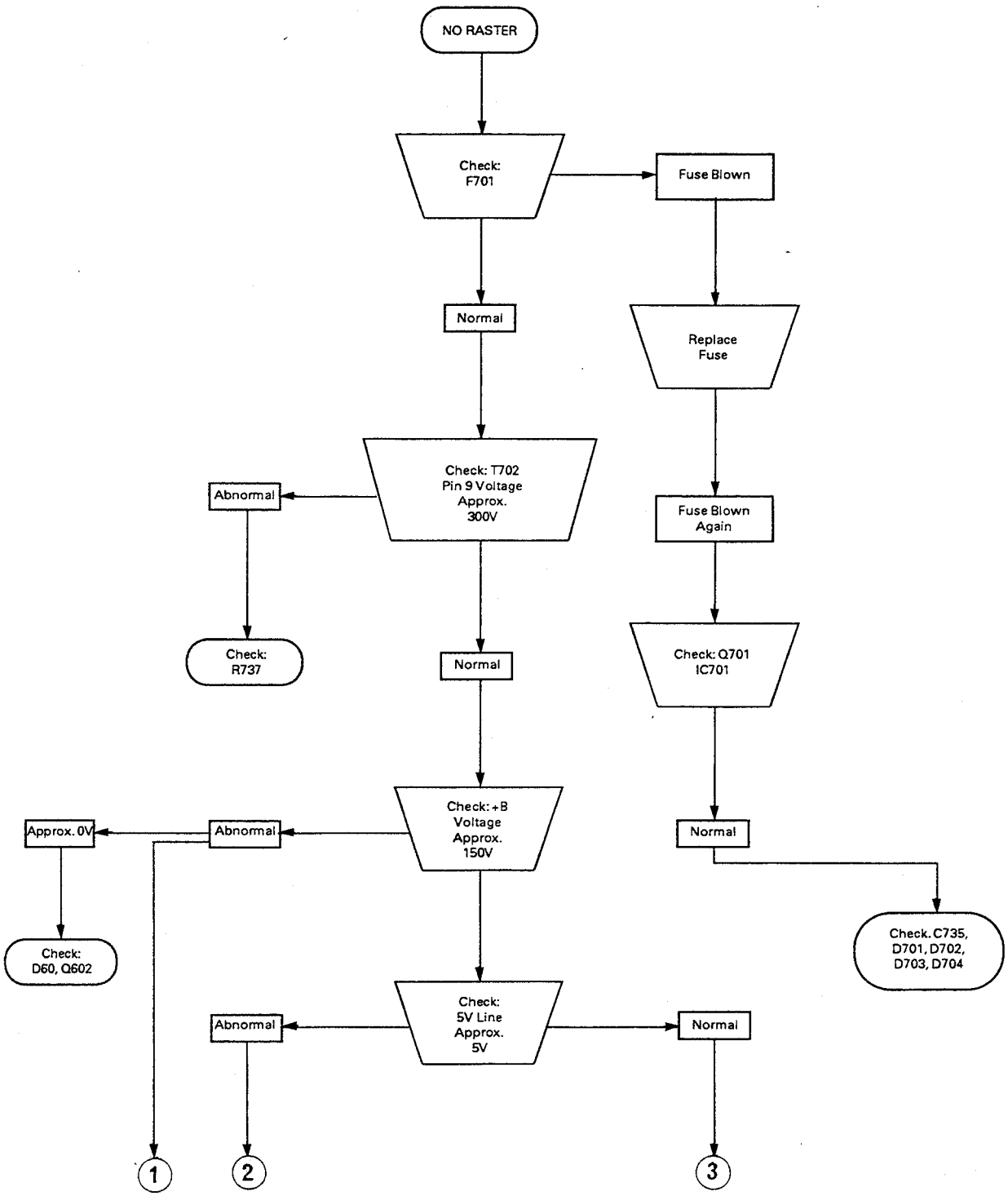
19. Drive Green
a) Receive monoscope pattern signal.
b) Adjust value on the picture to 105 (fig. 14).
c) Wait for stable picture.

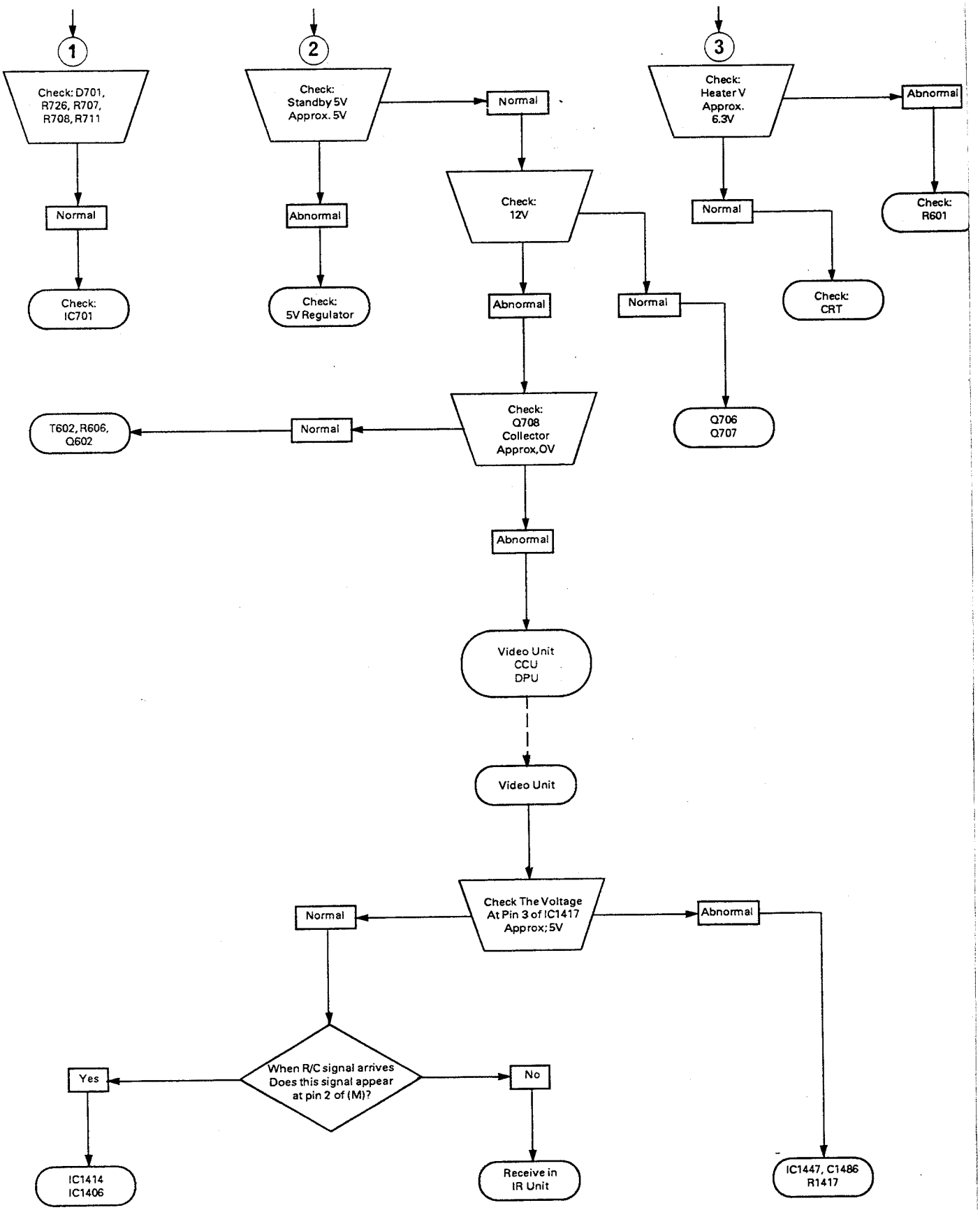
20. Drive Blue
a) Receive monoscope pattern signal.
b) Adjust value on the picture to 107 (fig. 15)
c) Wait for stable picture.

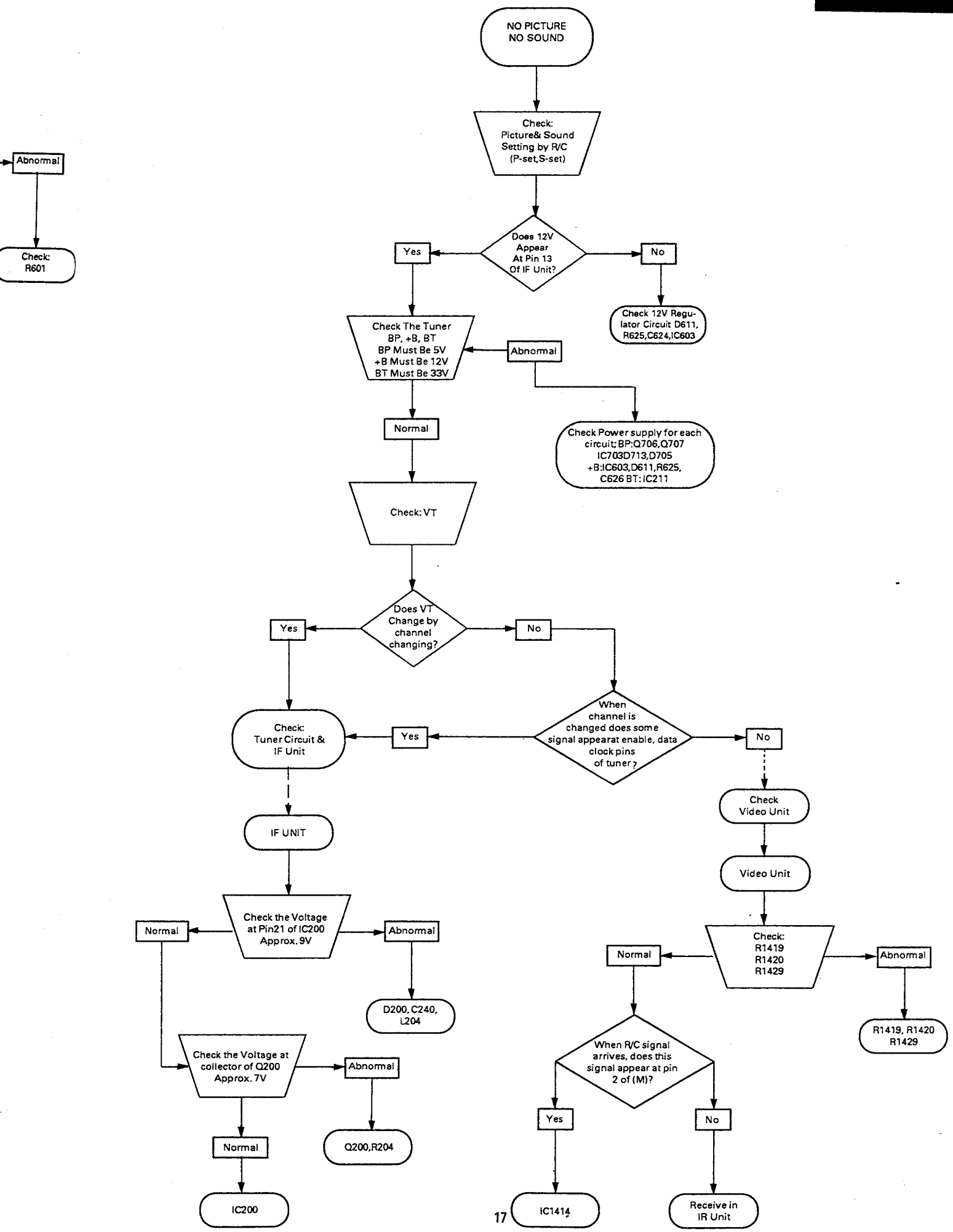
TROUBLESHOOTING TABLES

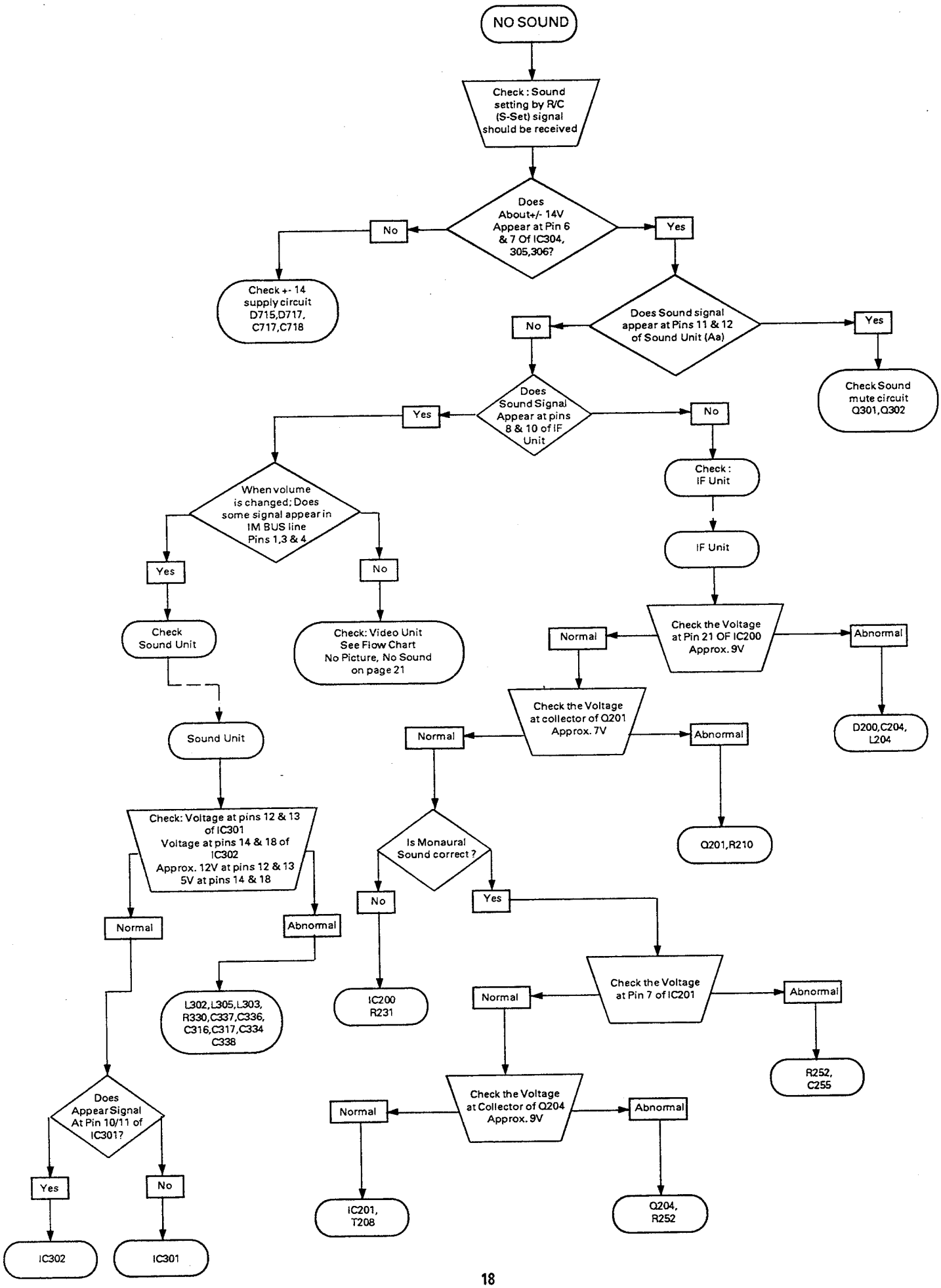


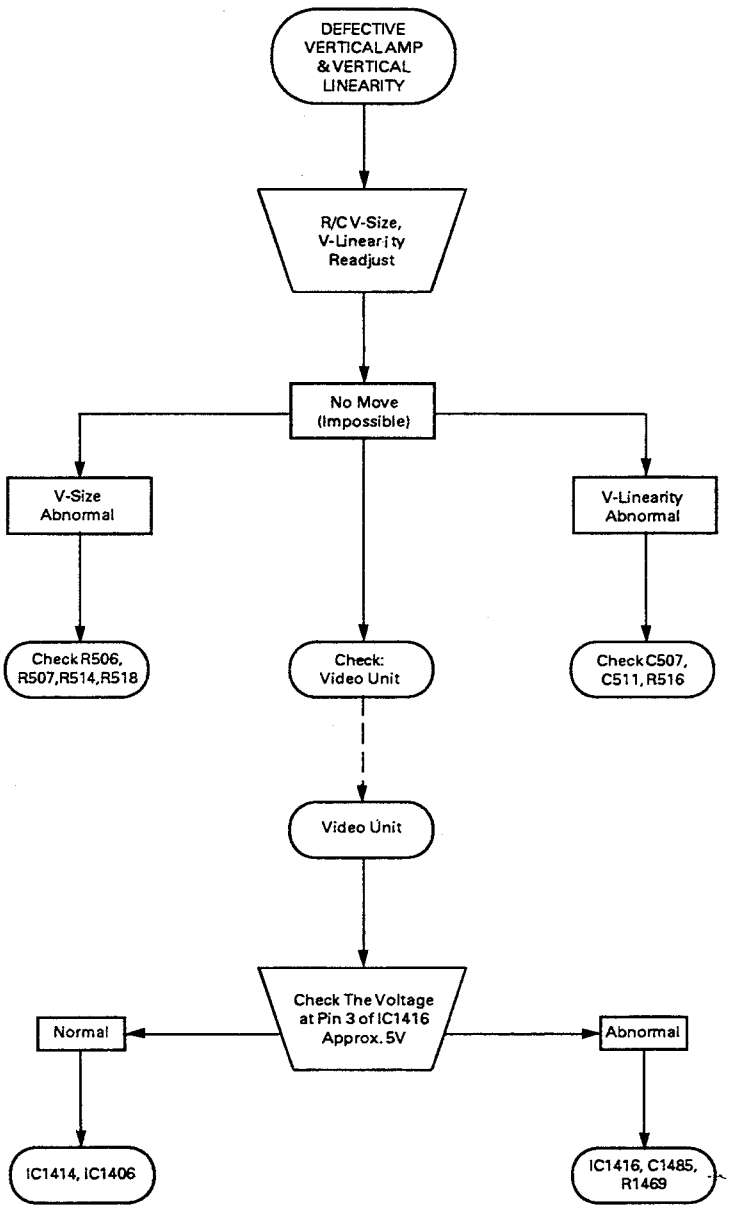

NO RASTER
Check: F701
Fuse Blown
Normal
Replace Fuse
Check: T702 Pin 9 Voltage Approx. 300V
Abnormal
Fuse Blown Again
Check: R737
Normal
Check: Q701 IC701
Check: +B Voltage Approx. 150V
Approx. 0V
Abnormal
Normal
Check: D60, Q602
Check. C735, D701, D702, D703, D704
Check: 5V Line Approx. 5V
Abnormal
Normal
1
2
3

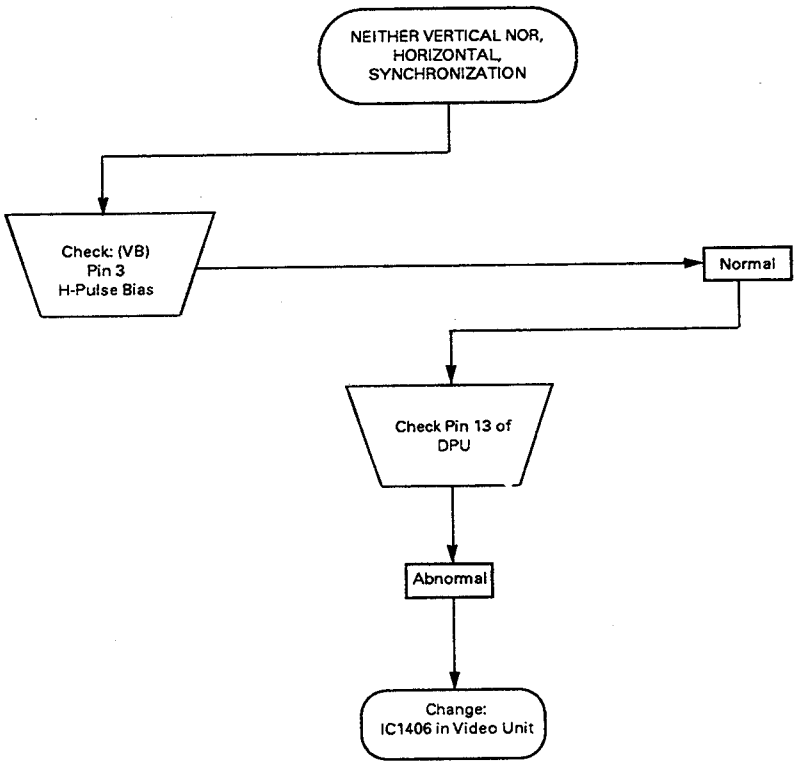

NO RASTER
Check: F701
Fuse Blown
Normal
Replace Fuse
Check: T702 Pin 9 Voltage Approx. 300V
Abnormal
Fuse Blown Again
Check: R737
Normal
Check: Q701 IC701
Check: +B Voltage Approx. 150V
Approx. 0V
Abnormal
Normal
Check: D60, Q602
Check. C735, D701, D702, D703, D704
Check: 5V Line Approx. 5V
Abnormal
Normal
1
2
3

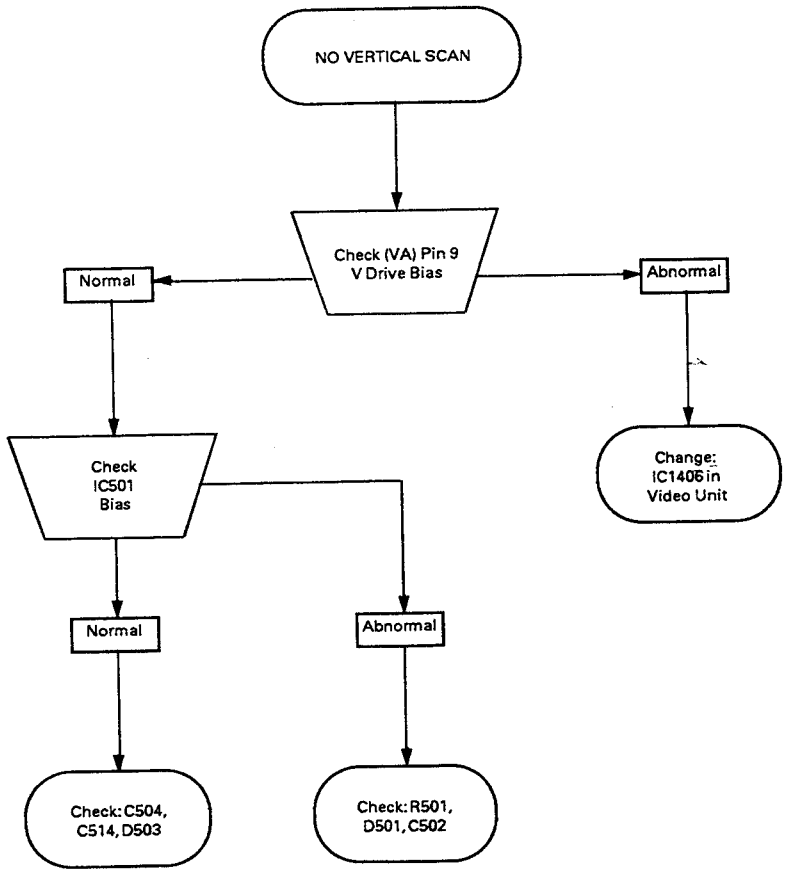

1
Check: D701, R726, R707, R708, R711
Normal
Check: IC701
2
Check: Standby 5V Approx. 5V
Abnormal
Check: 5V Regulator
Normal
Check: 12V
Abnormal
Check: Q708 Collector Approx,0V
Normal
T602, R606, Q602
Abnormal
Video Unit CCU DPU
Video Unit
Check The Voltage At Pin 3 of IC1417 Approx; 5V
Normal
When R/C signal arrives Does this signal appear at pin 2 of (M)?
Yes
IC1414 IC1406
No
Receive in IR Unit
Abnormal
IC1447, C1486 R1417
3
Check: Heater V Approx. 6.3V
Abnormal
Check: R601
Normal
Check: CRT
Normal
Q706 Q707


NO PICTURE
NO SOUND
Check:
Picture& Sound
Setting by R/C
(P-set,S-set)
Does 12V
Appear
At Pin 13
Of IF Unit?
Yes
No
Check 12V Regu-
lator Circuit D611,
R625,C624,IC603
Check The Tuner
BP, +B, BT
BP Must Be 5V
+B Must Be 12V
BT Must Be 33V
Abnormal
Check Power supply for each
circuit; BP:Q706,Q707
IC703D713,D705
+B:IC603,D611,R625,
C626 BT: IC211
Normal
Check: VT
Does VT
Change by
channel
changing?
Yes
No
When
channel is
changed does some
signal appearat enable, data
clock pins
of tuner?
Yes
No
Check:
Tuner Circuit &
IF Unit
IF UNIT
Check
Video Unit
Video Unit
Check the Voltage
at Pin21 of IC200
Approx. 9V
Normal
Abnormal
D200, C240,
L204
Check:
R1419
R1420
R1429
Normal
Abnormal
R1419, R1420
R1429
Check the Voltage at
collector of Q200
Approx. 7V
Abnormal
Q200,R204
Normal
IC200
When R/C signal
arrives, does this
signal appear at pin
2 of (M)?
Yes
No
IC1414
Receive in
IR Unit
Abnormal
Check:
R601


NO SOUND
Check : Sound setting by R/C (S-Set) signal should be received
Does About+/- 14V Appear at Pin 6 & 7 Of IC304, 305,306?
No
Yes
Check +- 14 supply circuit D715,D717, C717,C718
Does Sound signal appear at Pins 11 & 12 of Sound Unit (Aa)
No
Yes
Check Sound mute circuit Q301,Q302
Does Sound Signal Appear at pins 8 & 10 of IF Unit
Yes
No
When volume is changed; Does some signal appear in IM BUS line Pins 1,3 & 4
Check : IF Unit
IF Unit
Yes
No
Check Sound Unit
Check: Video Unit See Flow Chart No Picture, No Sound on page 21
Check the Voltage at Pin 21 OF IC200 Approx. 9V
Normal
Abnormal
D200,C204, L204
Check the Voltage at collector of Q201 Approx. 7V
Normal
Abnormal
Q201,R210
Sound Unit
Check: Voltage at pins 12 & 13 of IC301
Voltage at pins 14 & 18 of IC302
Approx. 12V at pins 12 & 13
5V at pins 14 & 18
Is Monaural Sound correct ?
No
Yes
Normal
Abnormal
L302,L305,L303, R330,C337,C336, C316,C317,C334 C338
IC200 R231
Check the Voltage at Pin 7 of IC201
Normal
Abnormal
R252, C255
Does Appear Signal At Pin 10/11 of IC301?
Check the Voltage at Collector of Q204 Approx. 9V
Normal
Abnormal
Yes
No
IC302
IC301
IC201, T208
Q204, R252


DEFECTIVE VERTICAL AMP & VERTICAL LINEARITY
R/C V-Size, V-Linearity Readjust
No Move (Impossible)
V-Size Abnormal
V-Linearity Abnormal
Check R506, R507, R514, R518
Check: Video Unit
Check C507, C511, R516
Video Unit
Check The Voltage at Pin 3 of IC1416 Approx. 5V
Normal
Abnormal
IC1414, IC1406
IC1416, C1485, R1469


NEITHER VERTICAL NOR, HORIZONTAL, SYNCHRONIZATION
Check: (VB) Pin 3 H-Pulse Bias
Normal
Check Pin 13 of DPU
Abnormal
Change: IC1406 in Video Unit


NO VERTICAL SCAN
Check (VA) Pin 9 V Drive Bias
Normal
Abnormal
Check IC501 Bias
Change: IC1406 in Video Unit
Normal
Abnormal
Check: C504, C514, D503
Check: R501, D501, C502