SERVICE MANUAL

MODEL 1084P MONITOR

includes 1084P-S SCHEMATIC

JULY, 1988 PN-314890-01

CM 8505
8562
8705
8762
505
515
542
643

commodore COMPUTERS

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

INDICATES "HOT" GROUND.

INDICATES ISOLATED SIGNAL G

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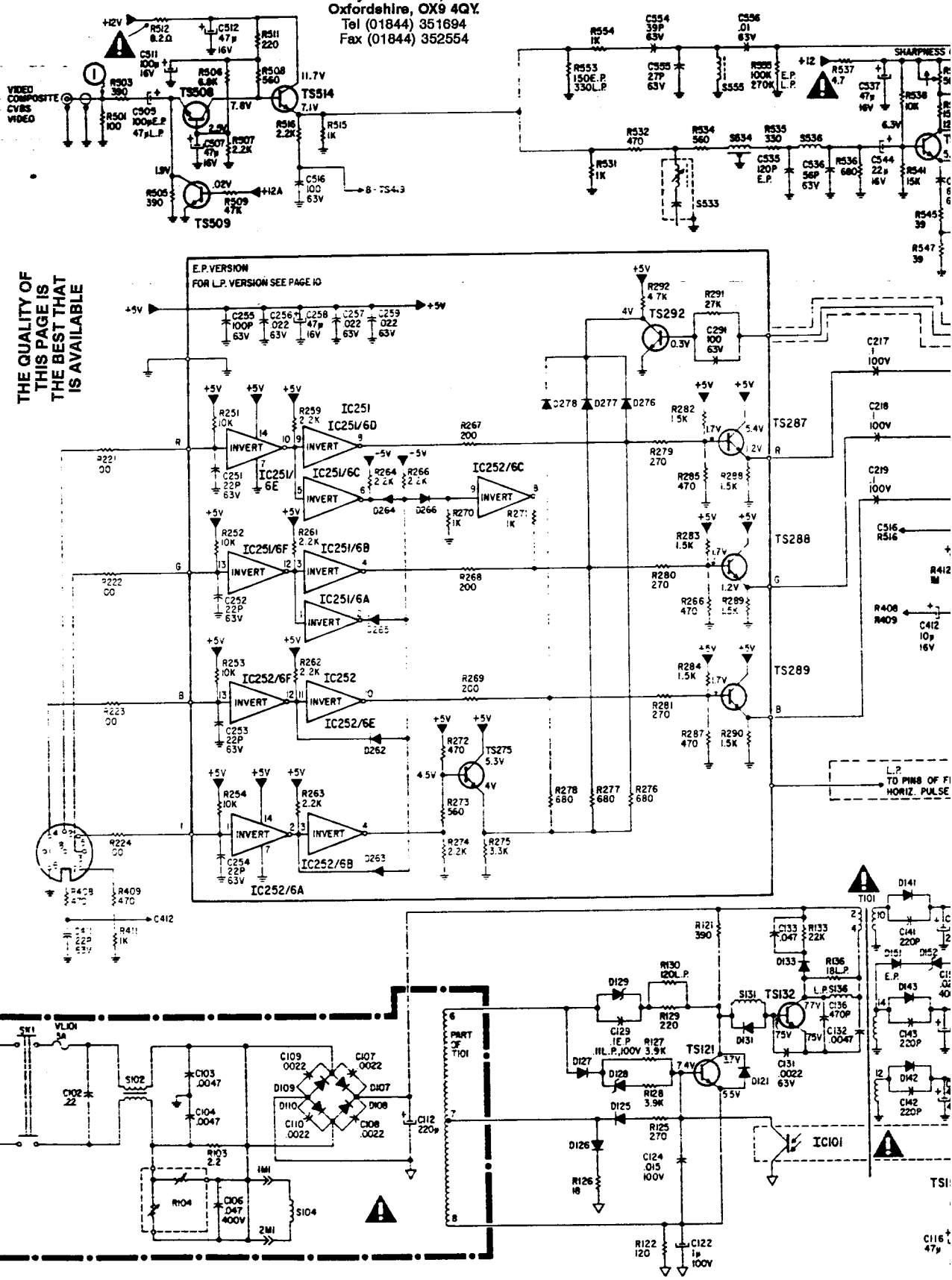
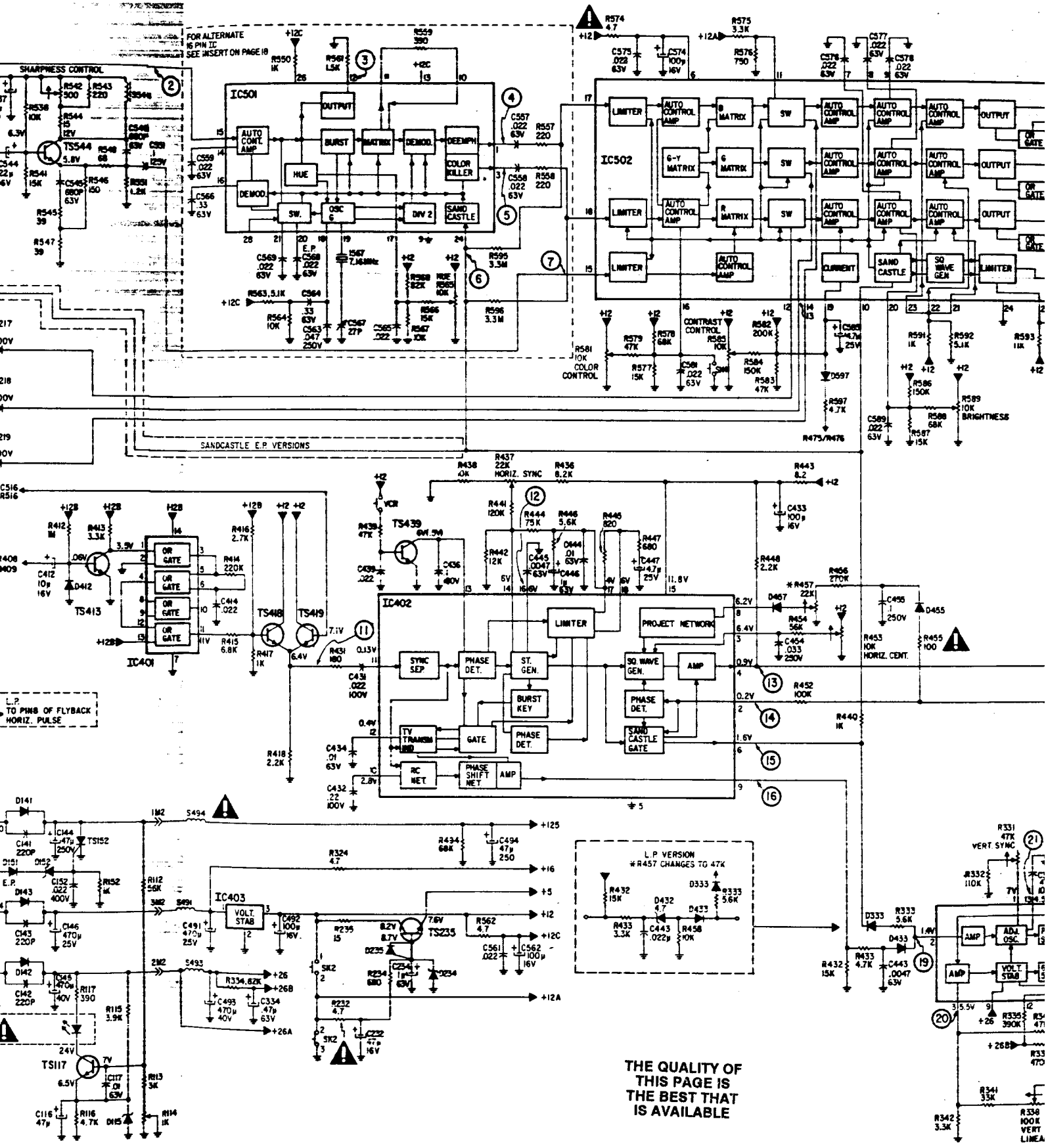


OUND.

SIGNAL GROUND.

8CM542/CM8562/CM8762 SCHEMATIC DIAGRAM

NOTE: IC501 Alternate 16 Pin IC. See Insert Page 18



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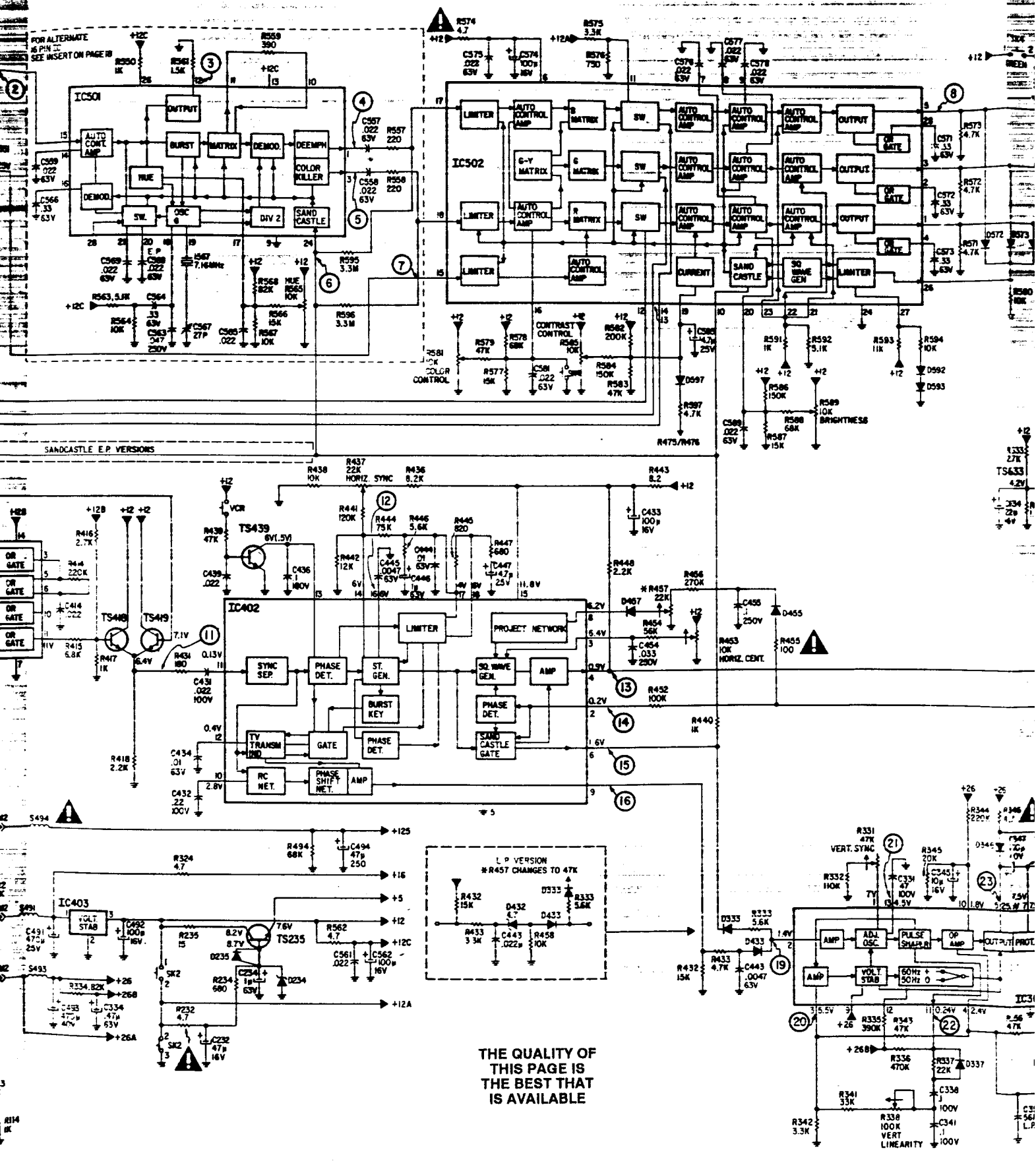
8CM542/CM8562/CM8762 SCHEMATIC DIAGRAM

NOTE: IC501 Alternate 16 Pin IC, See Insert Page 18



(Parts List - Pgs. 23, 24, 25)

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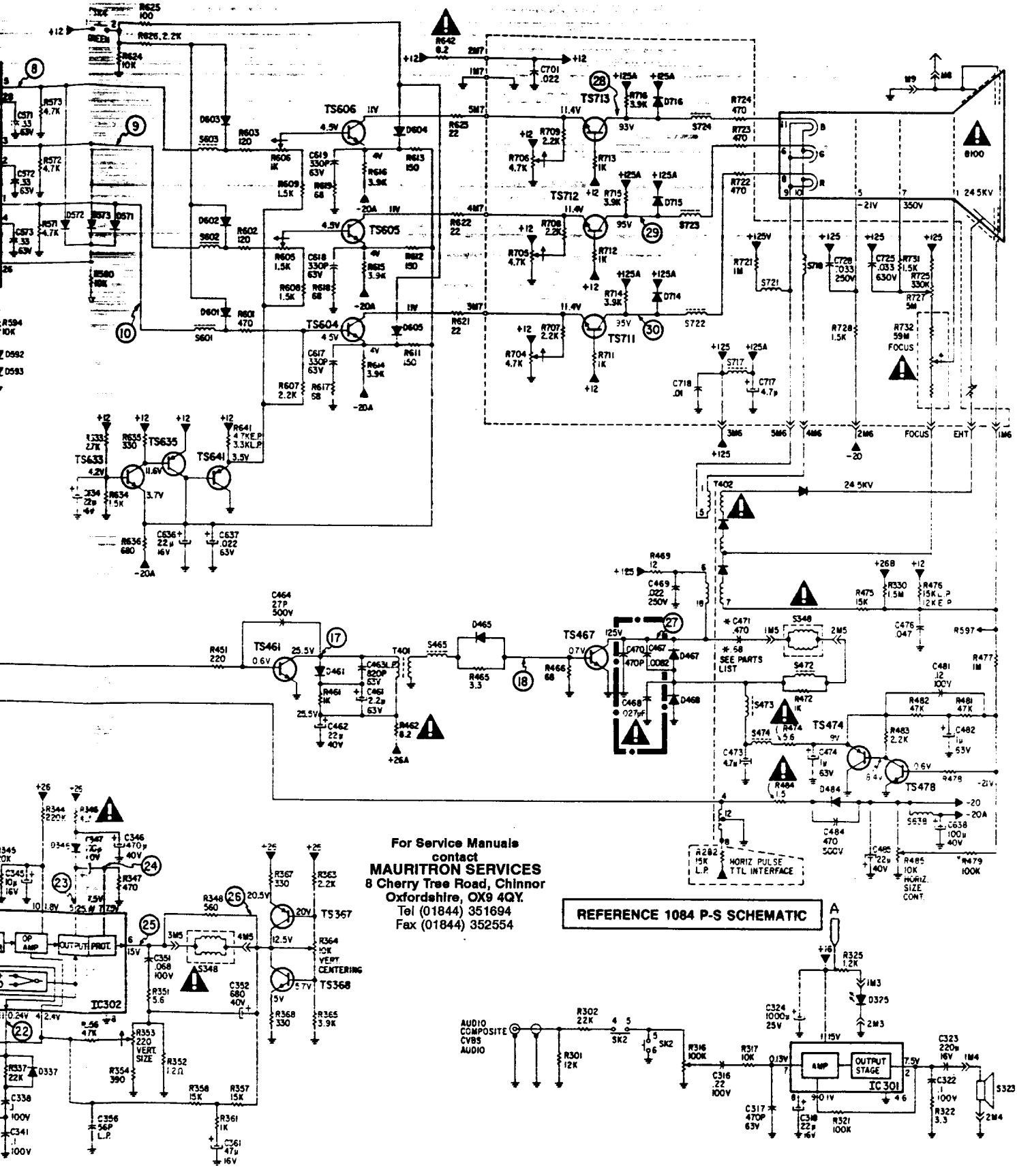

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8 Cherry Tree Road, Chinnor
Oxfordshire, OX9 4QY.
Tel (01844) 351694
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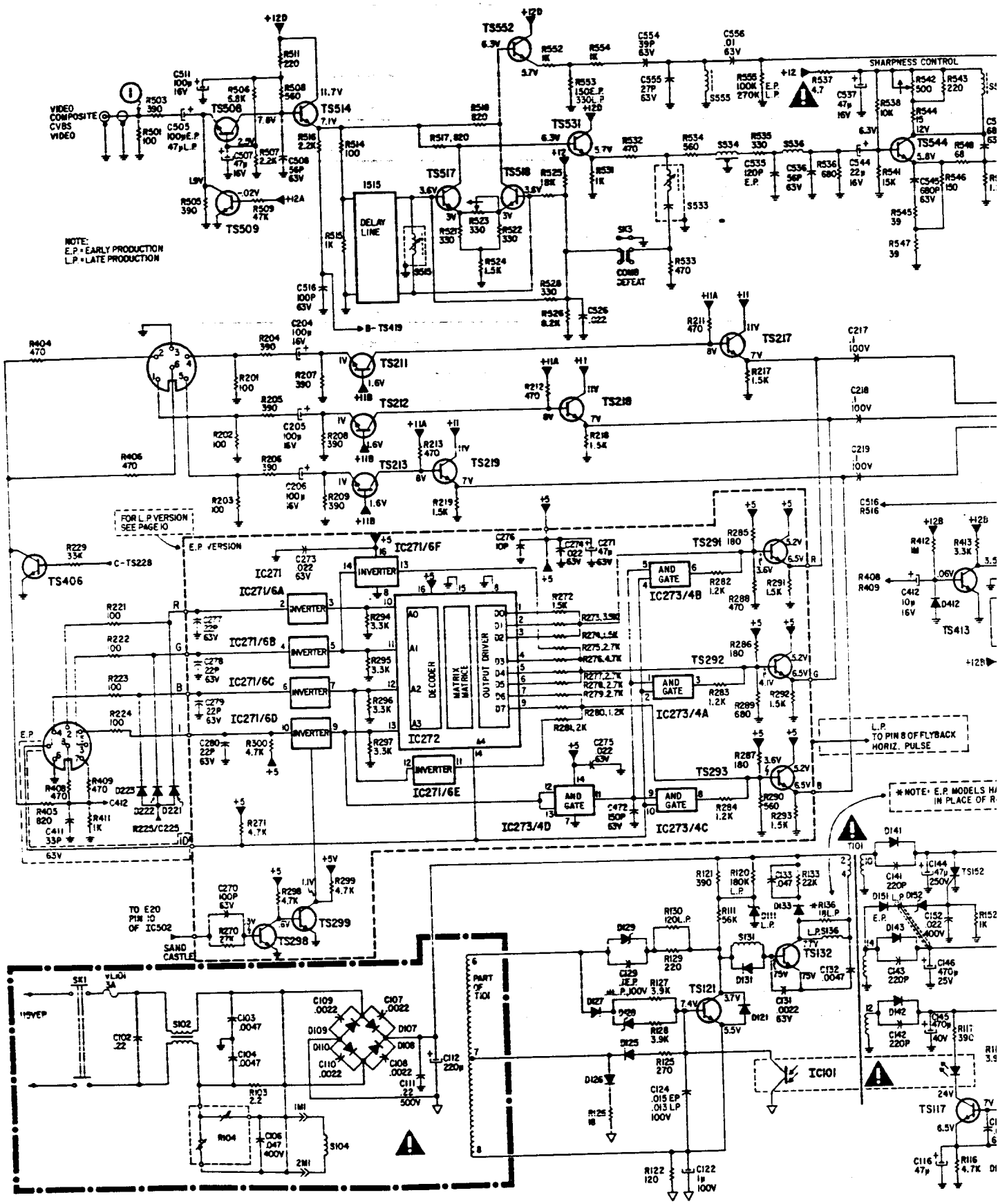
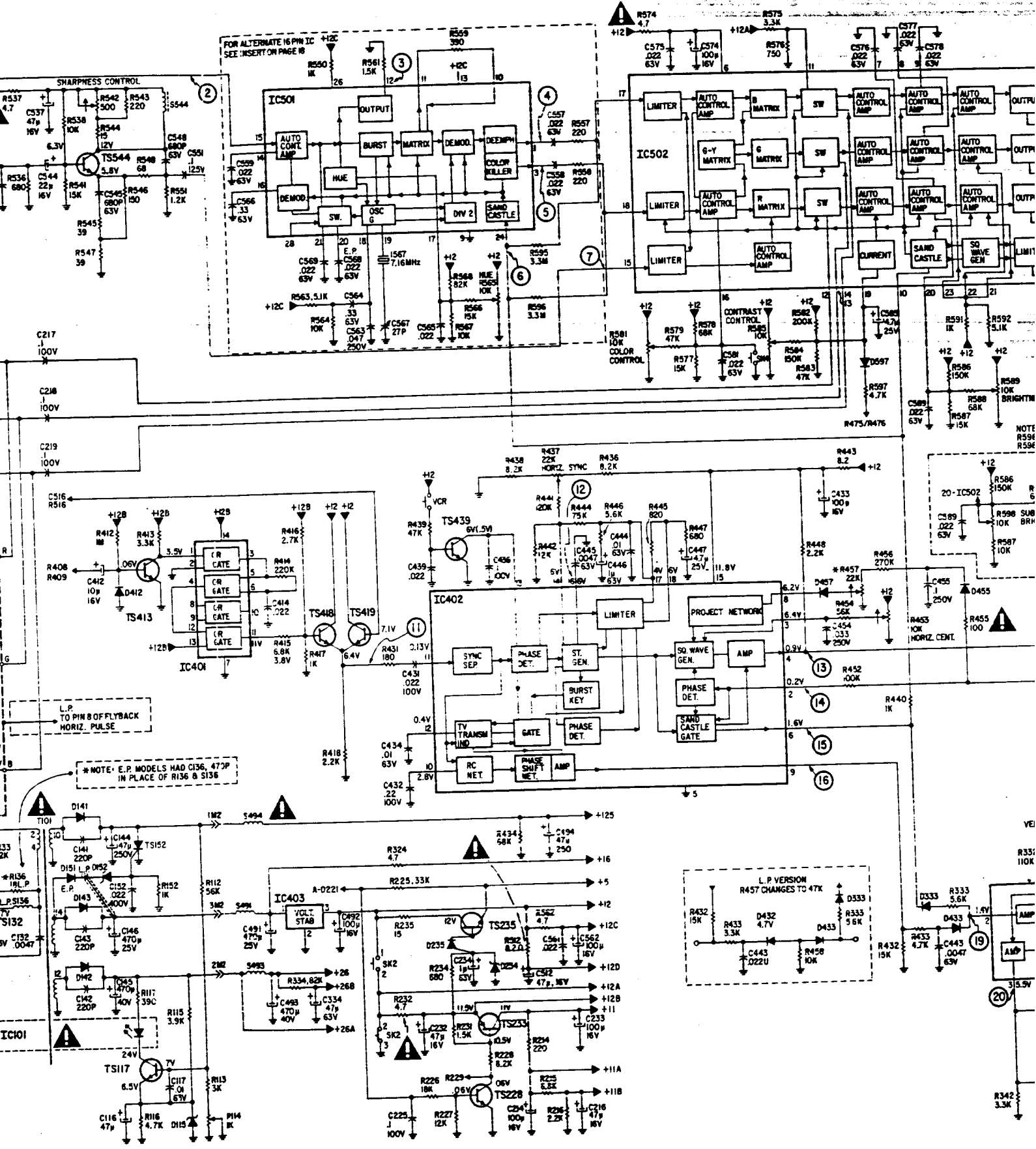


8CM505/8CM515/8CM643/CM8505/CM8705 SCHEMATIC DIAGRAM

GROUND.

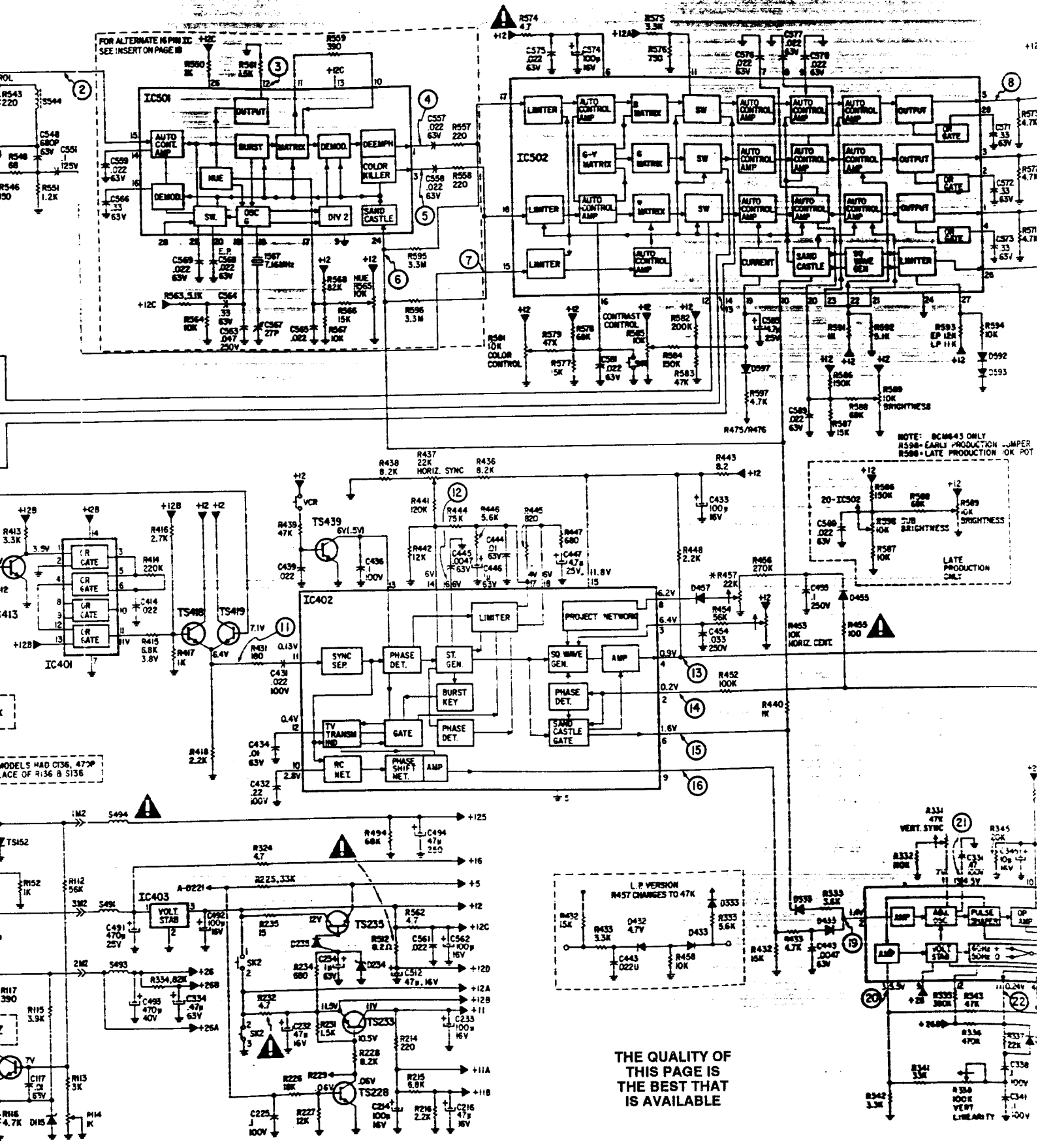
TED SIGNAL GROUND.

NOTE: IC501 Alternate 16 Pin IC, see Insert page 18



8CM505/8CM515/8CM643/CM8505/CM8705 SCHEMATIC DIAGRAM

NOTE: IC501 Alternate 16 Pin IC, see Insert page 18



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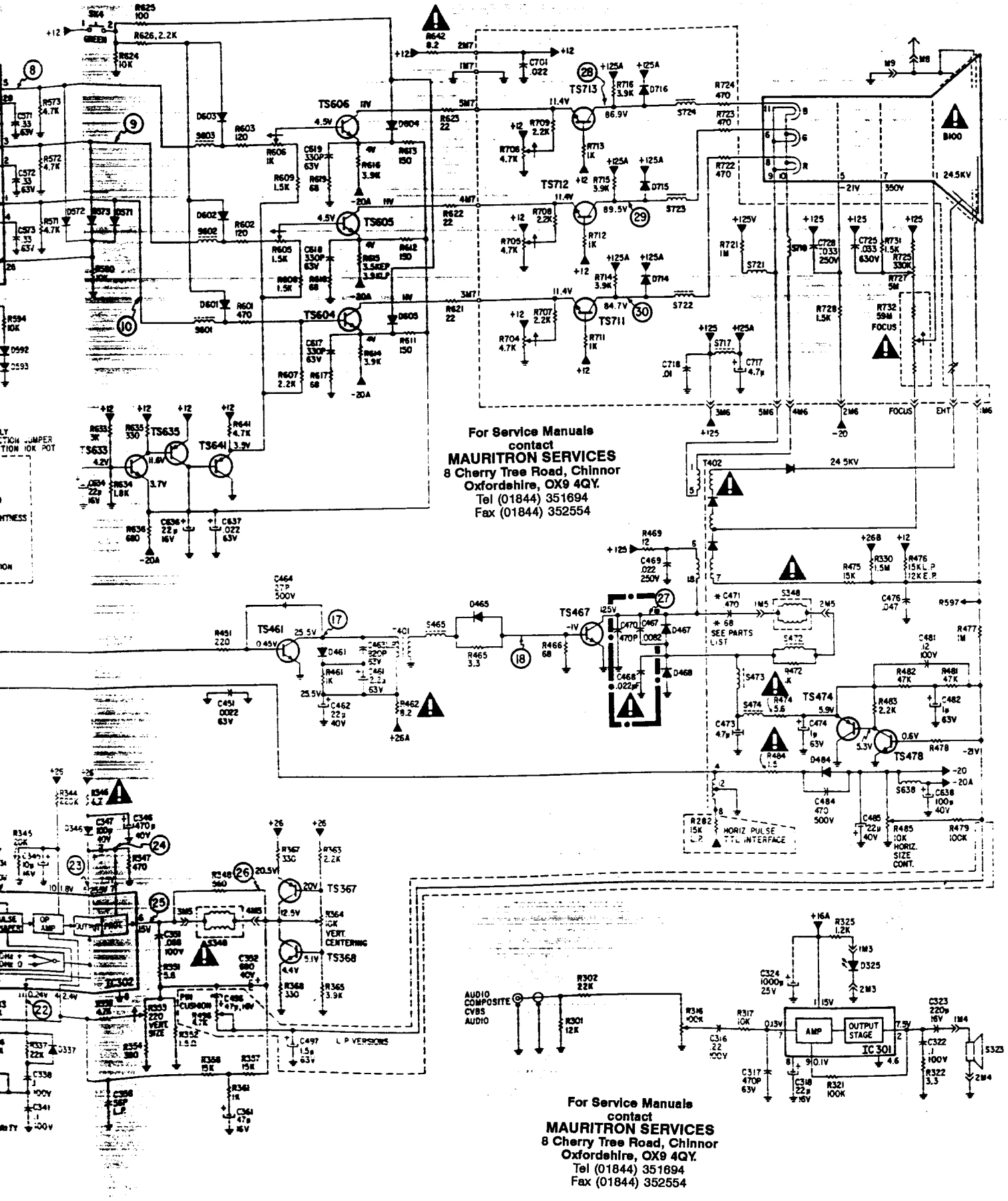

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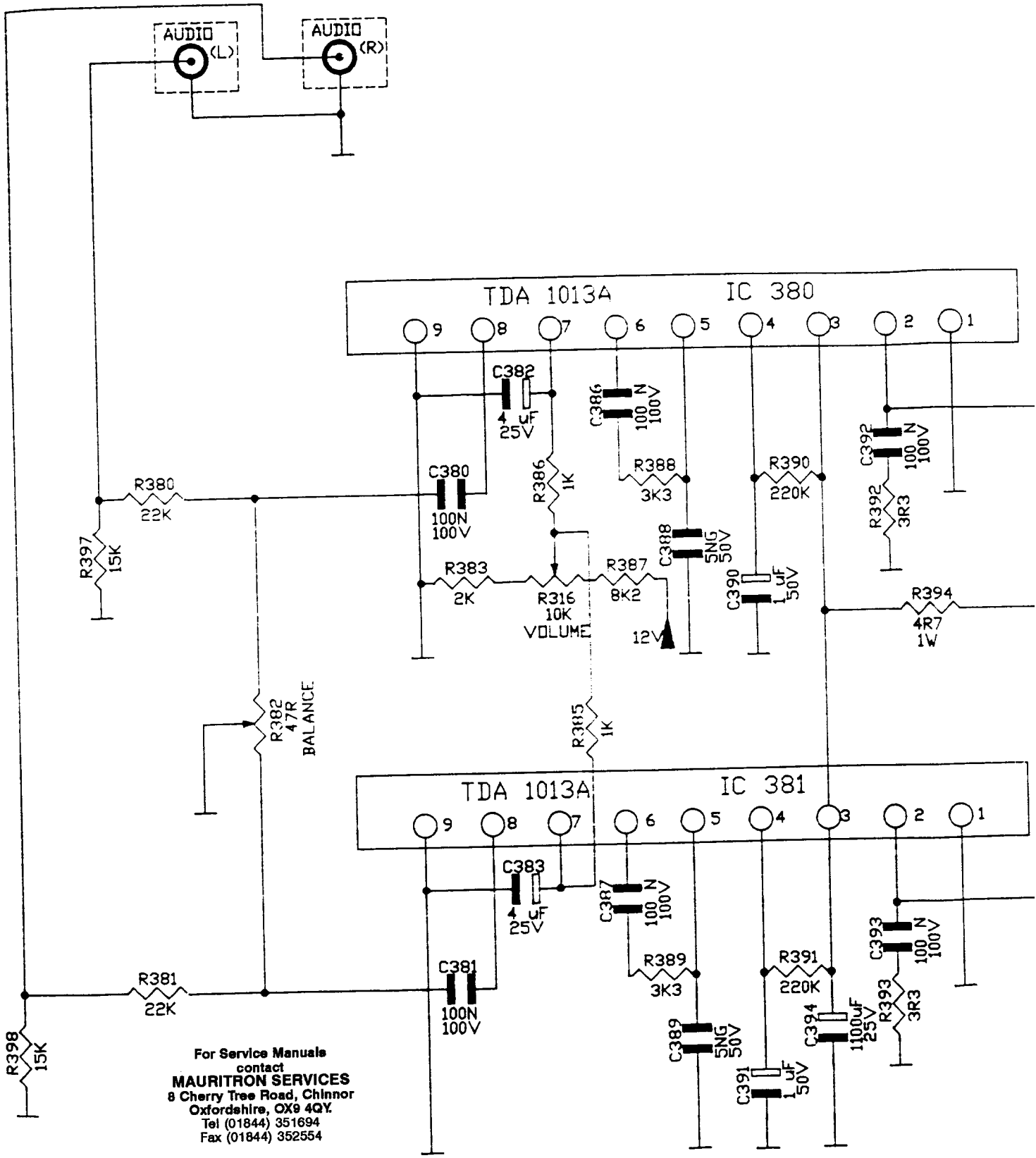
AUDIO (L)
AUDIO (R)
TDA 1013A
IC 380
9
8
7
6
5
4
3
2
1
C382
4.7uF 25V
C386
100N 100V
C392
100N 100V
R386
1K
R388
3K3
R390
220K
R392
3R3
C380
100N 100V
R380
22K
R397
15K
C388
5NG 50V
R383
2K
R316
10K VOLUME
R387
8K2
12V
C390
1uF 50V
R394
4R7 1W
R382
47R BALANCE
R385
1K
TDA 1013A
IC 381
C383
4.7uF 25V
C387
100N 100V
C393
100N 100V
R389
3K3
R391
220K
C381
100N 100V
R381
22K
C389
5NG 50V
C394
1100uF 25V
R393
3R3
C391
1uF 50V
R398
15K
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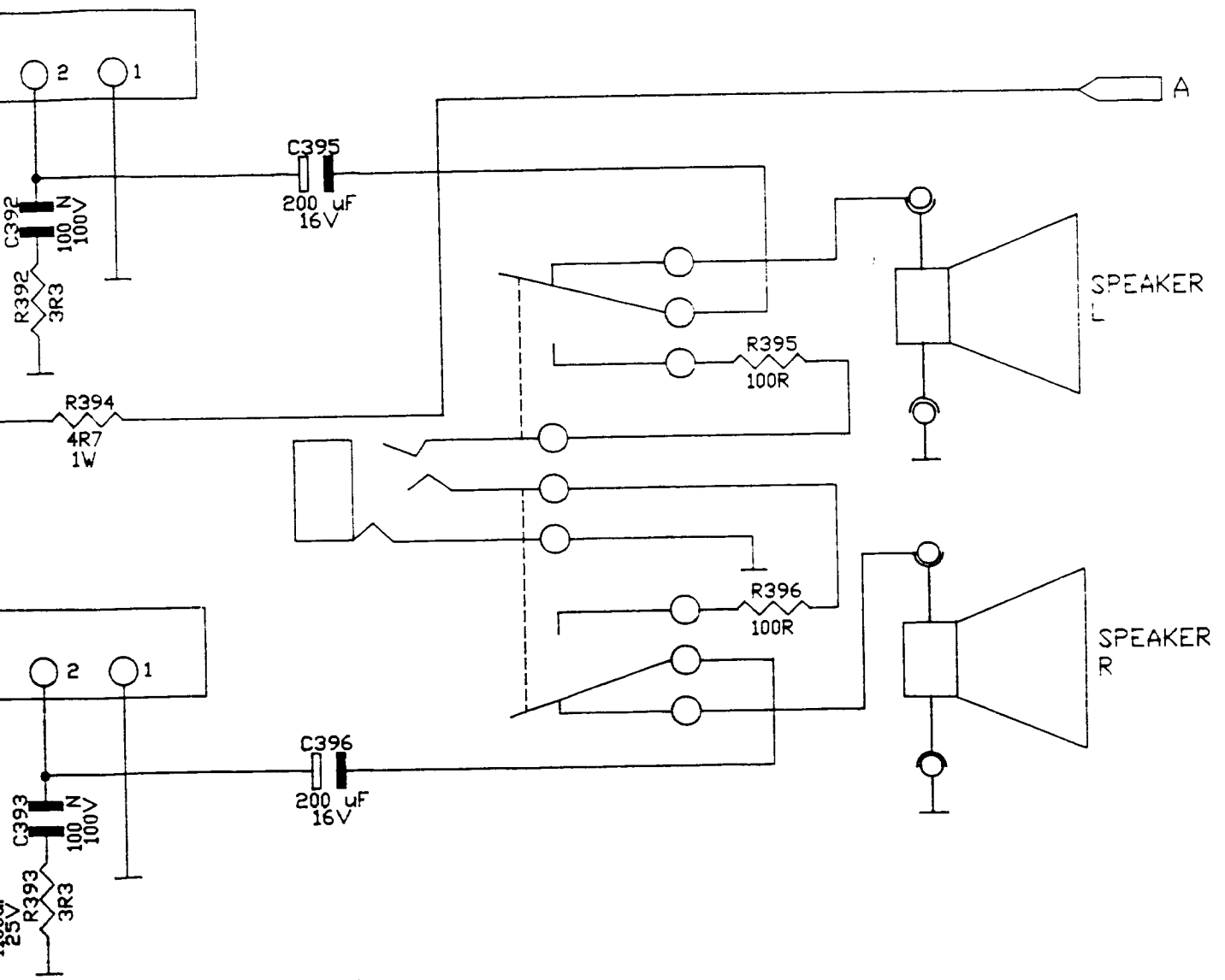

1084 P-S SCHEMATIC

ADJUSTMENT PROCEDURES

Adjustment Notes:
unless otherwise specified:
1. An isolation transformer must be used when servicing this unit.
2. Line voltage maintained at 120Vac, 60Hz.
3. The unit should be allowed to warm up for at least 30 minutes prior to making any adjustments.
4. Voltages measured with repect to ground.
5. Signal injection point is the Video In Jack.

R496 Pincushion Adjustment (8CM643 only)
1. Inject a cross-hatch pattern and set Brightness Control (R598) and Contract Control (R585) to their mechanical centers.
2. Adjust R496 so that 14 blocks correspond to a width of 26cm.
3. Horizontal Amplitude and Centering Adjustment
4. Vertical Amplitude and Centering Adjustment

R598 Sub-Brightness Control Adjustment (8CM643 only)
(Dual Trace Oscilloscope required)
1. Inject a signal with a white raster to input connector.
2. Adjust G2 (R727) and Contrast Control to minimum. Adjust Brightness Control to mechanical center.
3. Connect a DC coupled probe from Channel A of the oscilloscope to pin 1 of IC502.
4. Connect a DC coupled probe from Channel B of the oscilloscope to the emitter of TS641.
5. Adjust the Sub-Brightness (R598) to place the top of the video Signal (Channel A) at the same voltage level as the emitter of TS641 (Channel B).
6. Adjust Red (R705), Green (R705) and Blue (R706) cut off controls to set pins 6, 8, and 11 of Picture Tube at 100 volts each.
7. Advance G2 control (R727) until screen just begins to illuminate.
8. If the electron guns of the CRT are balanced, you should get a dull gray raster. However, if one color is more predominant than the others, adjust the cut-off controls of other 2 corresponding guns as required to obtain a gray raster.

Power Supply Adjustment
1. With the unit off, set the Volume Control (R316), Contrast Control (R585), and Brightness Control (R589) to minimum.
2. Preset R114 to mechanical center.
3. Connect a voltmeter across C494 and turn on the unit.
4. Adjust R114 for a reading of 125V on the meter.

Horizontal Synchronization Adjustment
1. Inject a cross-hatch pattern signal and short C434.
2. Adjust the horizontal sync with R437.
3. Remove the short from C434.

Vertical Synchronization Adjustment
1. Inject a cross-hatch pattern signal and short C434.
2. Adjust the vertical sync with R331.
3. Remove the short C434.

Horizontal Amplitude and Centering Adjustment
1. Inject a cross-hatch pattern signal and set the Brightness Control (R589) and Contrast Control (R585) to their mechanical centers.
2. Adjust R485 so that 14 blocks correspond to a width of 26cm.
3. Adjust R453 to center display horizontally.

Vertical Amplitude and Centering Adjustment
1. Inject a cross-hatch pattern and set the Brightness Control (R585) to their mechanical centers.
2. Adjust R353 so that 10 blocks correspond to a height of 18.5cm.
3. Adjust R364 to center the display vertically.

Chrominance Adjustment
(Note: pin nos. in parenthesis indicate alternate 16-pin IC.)
1. Inject a color bar pattern signal and adjust the secondary controls for normal viewing. Place SK3 (not used in CM8562, CM8762, 8CM542) in the off position.
2. Connect an oscilloscope to pin 15 of IC502 and adjust S533 for minimum amplitude of the chrominance signal that is presrnt on the various brightness steps of the luminance signal.
3. Short pins 9 (3) and 17 (11) of IC501.
4. Adjust C567 to minimize the chroma as visible on the screen.
5. Remove the shorting clips from pins.

Comb Filter Adjustment
(CM8505/CM8705/8CM505/8CM515/8CM643 ONLY)
1. Inject a color bar pattern signal and place the Comb Filter Switch (SK3 in the on position).
2. Connect an oscilloscope to the emitter of TS531 and adjust R523 and S515 for minimum amplitude of the chrominance signal. For optimum performance, repeat the adjustment.

Focus Adjustment
1. Inject a cross-hatch pattern signal and set the Brightness Control (R589) to minimum and the Contrast control (R585) to maximum.
2. Adjust R732 for optimum focus.

X-Ray Protection Circuit Adjustment
1. Inject a color bar pattern signal and set the Brightness and Contrast Controls to minimum.
2. Connect a voltmeter between the wiper of R457 and ground.
3. Adjust R457 for a reading of 6.9V.

Note: The following adjustments need only be performed if the CRT has been replaced. Minor corrections for purity and convergence may be accomplished through the use of the Purity and Convergence Assembly located on the neck of the CRT.

Color Purity Adjustment (Refer to Figure 1)
1. Loosen the yoke clamp screw and slide the yoke back away from the rubber wedges.
2. Remove the rubber wedges (G) and slide the yoke forward until it rests firmly against the bell of the CRT.
3. Tighten the yoke clamp screw slightly so that the yoke can still be moved with some friction.
4. Place the multi-pole Purity and Convergence Assembly in the position shown in Figure 1.
5. Tighten screw (A) and turn securing ring (B) counter-clockwise. Position the unit so that it faces in an East/West direction and degauss the instrument.
6. Turn on the power and inject a cross-hatch pattern signal. Allow a 10 minute warm-up period.
7. Roughly adjust the static convergence, using tabs C and D.
8. Set the Vertical Centering Control (R364) to its mechanical center. Disconnect R723 and R724 to turn off the green and blue guns.

9. Adjust the two-pole purity rings (E) to center the red vertical and horizontal lines.
10. Inject a white pattern signal and move the deflection yoke to obtain a full red raster.
11. Turn on the green and blue guns by reconnecting R723 and R724. If a uniformly white raster does not appear, minor adjustments may be made by adjusting the purity rings (E).
12. Inject a cross-hatch pattern signal to ensure that the yoke is not tilted. If necessary, rotate the yoke to obtain a level raster.
13. Tighten screw F and adjust R364 for proper vertical centering. Proceed to the Static Convergence Adjustment.

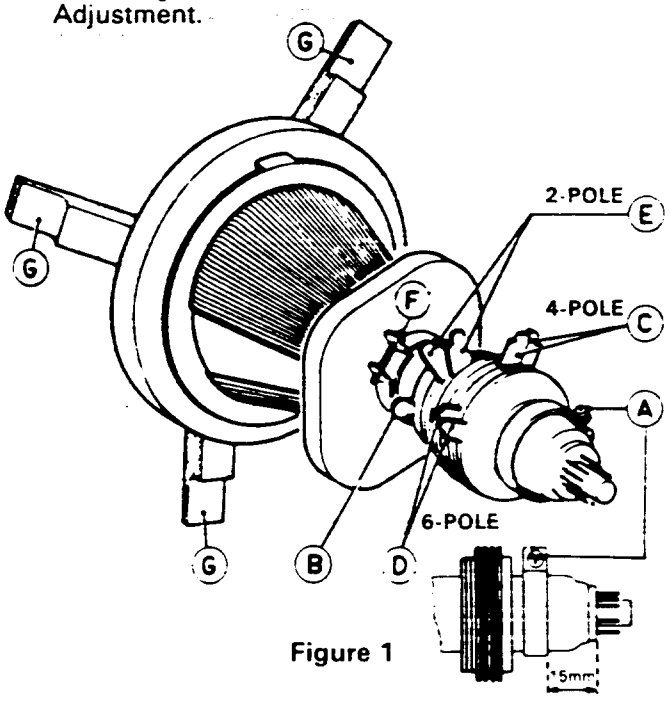

Figure 1

Static Convergence Adjustment

1. Inject a crosshatch pattern signal and allow a 10 minute warm-up period.
2. Turn off the green gun by disconnecting R723. Turn locking ring (B) counterclockwise.
3. Slowly spread, and if necessary, rotate the 4-pole magnetic rings (C) to converge red and blue lines at the center of the screen.
4. Reconnect R723 to turn on the green gun and disconnect R724 to turn off the blue gun.
5. Slowly spread, and if necessary, rotate the 6-pole magnetic rings (D) to converge the red and green lines at the center of the screen.
6. Reconnect R724 to turn on the blue gun.
7. For optimum performance, repeat steps 1 through 6. Proceed to the Dynamic Convergence Adjustment.

Dynamic Convergence Adjustment

1. Inject a cross-hatch pattern signal and turn off the green gun by disconnecting R723.
2. Tilt the yoke up and down to acheive the best convergence of the red and blue vertical lines at the 6 and 12 o'clock and the red and blue horizontal lines at the 3 and 9 o'clock positions (see Figure 2).
3. When the correct position has been found, place a rubber wedge between the CRT. If the yoke is tilted up, place wedge 1 as shown in Figure 3a; if it is tilted down, place wedge 1 as shown in Figure 4a.
4. Tilt the yoke to the left and right to find the point of best possible convergence of the red and blue lines at the edges, top, and bottom of the screen as shown in Figure 5.
5. When the correct position is located, place wedges 2 and 3 as shown in Figure 3b or 4b.
6. Remove wedge 1 and place it in the final position as shown in Figure 3c or 4c. Reconnect resistor R723 to turn on the green gun.

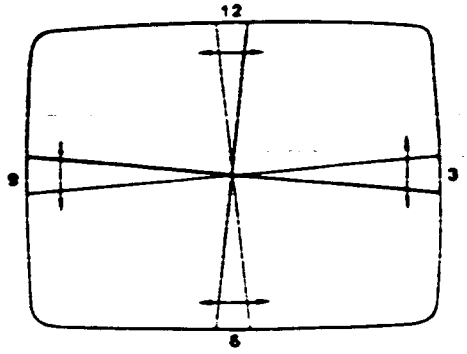

Figure 2 — Tilt yoke up or down to converge Red and Blue vertical lines at 6 and 12 o'clock positions, and Blue horizontal lines at 3 and 9 o'clock positions.

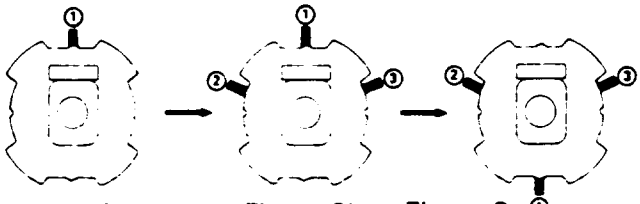

Figure 3a Figure 3b Figure 3c

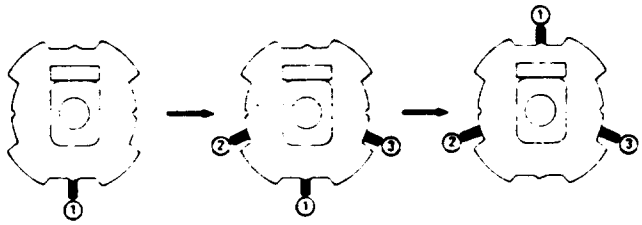

Figure 4a Figure 4b Figure 4c

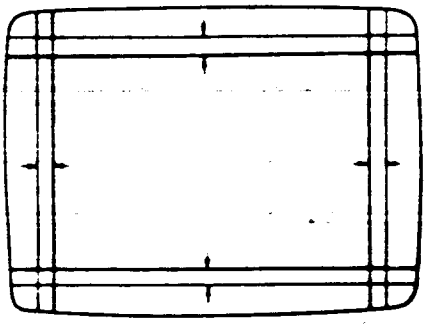

Figure 5 - Tilt yoke left or right to converge Red and Blue horizontal lines at the 6 and 12 o'clock positions, and Red and Blue vertical lines at the 3 and 9 o'clock positions.

Note: A computer delivering RGB TTL output (IBM or Apple) should be used to properly test the RGB circuitry. However, if a computer is not available, the following procedure may be used.
EXCEPTION: CM8562/CM8762/8CM542 does not accept Analog RGB or X-RGB signals.

RGB INTERFACE P.C. BOARD CHECKS FOR ALL MODELS (Except CM8562/CM8762/8CM542)

Late Production RGB Interface models are IBM Compatible only after Feb. 87.
Early Production models accept Apple (X-RGB) or IBM (RGB-1) prior to Feb. 2, 1987.

The purpose of this board is to accept RGB TTL signal inputs (RGB—I or X-RGB) and develope the R, G, and B signals in the monitor. By grounding the control input (Pin 1 of 8 pin Din Plug) the interface circuit will decode X-RGB to equal RGB-I signals in the monitor.

Interface P.C. Board Check

1. If either Apple (X-RGB) or IBM (RGB-I) signals are available as a TTL input the interface operation in the other signal mode may be checked. By grounding the control input on each color the other mode will appear. Pins 2, 3, 4, and 5 the 8 Pin Din Jack are high level when open. Use the cross reference chart for this cross color check.
2. To confirn proper operation of the RGB Interface Board, refer to the following truth table and ground the pins as shown. A voltmeter may be used to determine whether the output levels are high (1) or low (0). (Refer to schematic for pin nos.).
3. Another quick check may be done using a sine or square wave generator. A 1 to 3 kHz square wave (2Vp-p) may be injected into the pins of the DIN jack in the truth table. Color flashes should be visible on the screen which correspond to the pin or pins connected to the signal generator. Pin 2 should give red flashes, pin 3 green flashes, etc. when in the IBM mode. The colors will vary when pin 1 is grounded along with any of the others because the Apple colors are not the same as the IBM colors.

APPLE TRUTH TABLE

INPUTS					OUTPUTS									
DIN PLUG PINS					IC272 PINS								IC271 PINS	
(I) 5	(B) 4	(G) 3	(R) 2	* 1	1	2	3	4	5	6	7	9	11	13
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	1	0	0	1	0	0	1	0	0	0
0	0	1	0	0	0	1	0	0	0	0	0	1	0	1
0	0	1	1	0	1	1	0	1	0	0	1	1	0	1
0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
0	1	0	1	0	1	0	0	1	1	0	1	0	1	0
0	1	1	0	0	0	1	0	0	1	0	0	1	1	1
0	1	1	1	0	1	1	0	1	1	0	1	1	1	1
1	0	0	0	0	0	0	1	0	0	1	0	0	0	0
1	0	0	1	0	1	0	1	1	0	1	1	0	0	0
1	0	1	0	0	0	1	1	0	0	1	0	1	0	1
1	0	1	1	0	1	1	1	1	0	1	1	1	0	1
1	1	0	0	0	0	0	1	0	1	1	0	0	1	0
1	1	0	1	0	1	0	1	1	1	1	1	0	1	0
1	1	1	0	0	0	1	1	0	1	1	0	1	1	1
1	1	1	1	0	1	1	1	1	1	1	1	1	1	1

* IBM/APPLE switching line. (open=IBM; ground=APPLE)

IBM TRUTH TABLE

INPUTS					OUTPUTS									
DIN PLUG PINS					IC272 PINS								IC271 PINS	
(I) 5	(B) 4	(G) 3	(R) 2	* 1	1	2	3	4	5	6	7	9	11	13
0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
0	0	0	1	1	1	1	1	0	0	0	0	0	0	0
0	0	1	0	1	0	0	0	1	1	1	0	0	0	1
0	0	1	1	1	1	1	1	0	1	0	0	0	0	1
0	1	0	0	1	0	0	0	0	0	0	1	1	1	0
0	1	0	1	1	1	1	1	0	0	0	1	1	1	0
0	1	1	0	1	0	0	0	1	1	1	1	1	1	1
0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	1	0	0	0	0	0	0	0
1	0	1	0	1	0	0	0	1	1	1	0	0	0	1
1	0	1	1	1	1	1	1	1	1	1	0	0	0	1
1	1	0	0	1	0	0	0	0	0	0	1	1	1	0
1	1	0	1	1	1	1	1	0	0	0	1	1	1	0
1	1	1	0	1	0	0	0	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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RGB-TTL INPUTS (8 PIN DIN)

Color Decoding Chart

Levels shown are with monitor driven by computer.

APPLE X-RGB	Pin 5	4	3	2	IBM RGB-I
BLACK	0	0	0	0	BLACK
MAGENTA	0	0	0	1	RED
DARK BLUE	0	0	1	0	GREEN
PURPLE	0	0	1	1	BROWN
DARK GREEN	0	1	0	0	BLUE
GREY 1	0	1	0	1	MAGENTA
MIDDLE BLUE	0	1	1	0	CYAN
LIGHT BLUE	0	1	1	1	WHITE
BROWN	1	0	0	0	GREY
ORANGE	1	0	0	1	LIGHT RED
GREY 2	1	0	1	0	LIGHT GREEN
PINK	1	0	1	1	LIGHT YELLOW
GREEN	1	1	0	0	LIGHT BLUE
YELLOW	1	1	0	1	LIGHT MAGENTA
AQUA	1	1	1	0	LIGHT CYAN
WHITE	1	1	1	1	INTENSIFIED WHITE

TTL Levels
Low (0) = Zero to .8 volts
High (1) = 2.4 to 5 volts

Pin 1 is Apple/IBM Control Line
Low (0) = Apple, High (1) = IBM Colors

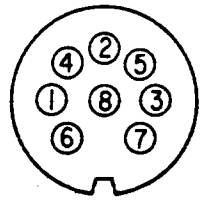
Apple is a registered trademark of Apple Computers

ADJUSTMENT PROCEDURES (Continued)

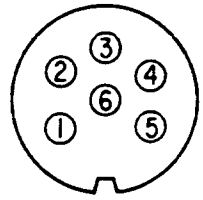
RGB 8 and 6 Pin DIN Sockets

PIN ASSIGNMENTS

PIN NO.	TTL INPUT 8 PIN SIGNAL	ANALOG 6 PIN SIGNAL
*1	IBM Open/Apple Gnd.	Green
2	Red	Horiz. Sync
3	Green	Ground
4	Blue	Red
5	Intensity	Blue
6	Ground	Vert. Sync
7	Horiz. Sync	
8	Vert. Sync	



TTL INPUT



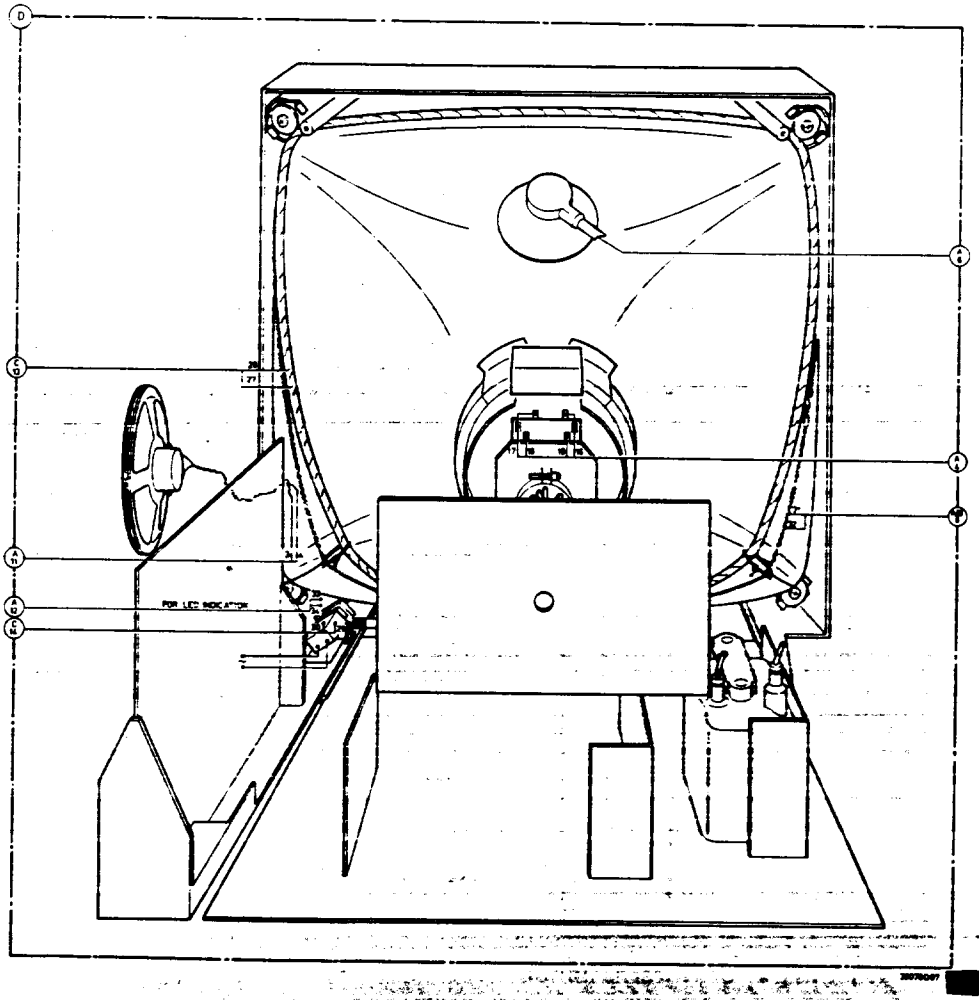
*ANALOG INPUT

When using these sockets before connecting the equipment, place the RGB/Composite Switch in the RGB position.

***Not used in CM8562/CM8762/8CM542**

INTERCONNECT DIAGRAM

Note: To Remove Power Board Depress Locking Clip Located on Bottom of Cabinet Beneath Power Board.

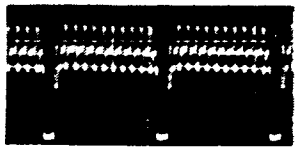


SPECIFICATIONS

CRT size	13 inch diagonal
CRT Deflection Angle	90 degrees
CRT Mask Pitch:	
-8CM505/CM8505/CM8705	0.65mm
-8CM515/8CM542/CM8562/CM8762	0.42mm
-8CM643	0.39mm
CRT Light Transmission:	
-CM8505/CM8705	56%
-8CM505/8CM515/8CM643	46%
-8CM542/CM8562/CM8762	46%
Power Requirements	115Vac/60Hz
Power Consumption	75W max.
Degaussing	Automatic (when switching on set)
Video Input Signals:	
CM8505/CM8705/8CM505/8CM515/8CM643	RGB anolog 0.7, composite sync, 6 pin connector
Composite video	1Vp-p, negative sync, RCA connector
	RGB-1 TTL, separate horiz. and vert. sync, 8 pin connector
Horizontal Scanning Frequency	15734Hz
Horizontal Frequency Drift	1 % max.
Horizontal Flyback Time	12uS max.
Horizontal Blanking Time	12uS max
Vertical Scanning Frequency	47-62.5Hz
Vertical Frequency Drift	1% max.
Vertical Flyback Time	0.95mS max.
Vertical Blanking Time	(21H) 1.33mS
RGB Amp Bandwidth	8MHz min.
RGB Amp Bandwidth (8CM643)	15MHz min.
Resolution:	
-Vertical	240 lines
-CM8505/CM8705 Horizontal	390 dots
-8CM505 Horizontal	390 dots
-8CM515/CM8562 Horizontal	640 dots
-8CM542/8CM643	690 dots
Character Display:	
-CM8505/CM8705	1000 characters (40 x 25)
-8CM505	1600 characters (64 x 25)
-8CM515/8CM542/CM8562/CM8762/8CM643	2000 characters (80 x 25)
Overshoot/Undershoot	5% max.
Black Level Shift	3% max.
Audio Input Signal	150mV eff.
Audio Input Impedance	10k
Audio Output Power	1W a 5% distortion
Audio Frequency Range	300Hz - 7kHz
Audio S/N Ratio	40dB min.
Operating Humidity Range	less than 80%
Dimensions (HxWxD)	320x350x387mm

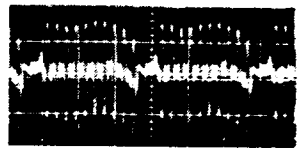
* Specifications subject to change without notice.

WAVEFORMS

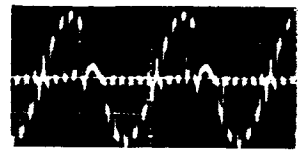


1. .7Vp-p 20μS

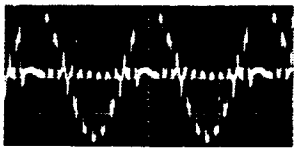
2. .1Vp-p 20μS



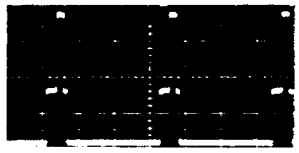
3. .65Vp-p 20μS



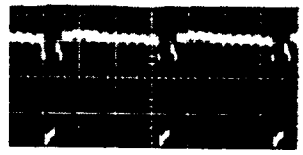
4. .45Vp-p 20μS



5. .7Vp-p 20μS



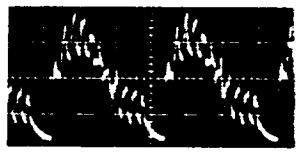
6. 10.2Vp-p 20μS



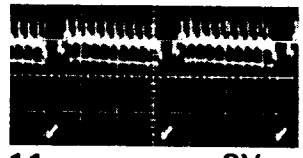
7. .25Vp-p 20μS

8. 2.5Vp-p 20μS

9. 1.4Vp-p 20μS

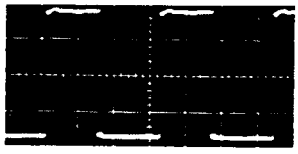


10. 1.75Vp-p 20μS

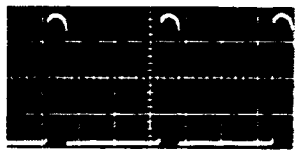


11. .8Vp-p 20μS

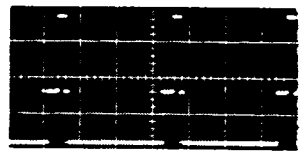
12. 3.2Vp-p 20μS



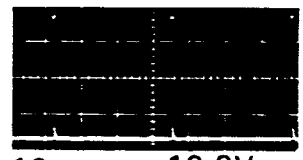
13. 1.7Vp-p 20μS



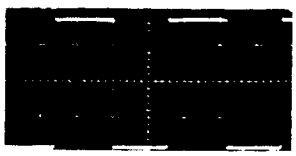
14. 5.8Vp-p 20μS



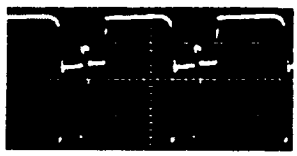
15. 10.3Vp-p 20μS



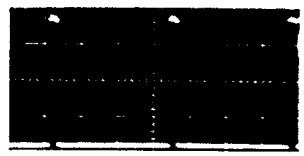
16. 10.2Vp-p 5mS



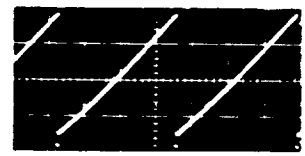
17. 48Vp-p 20μS



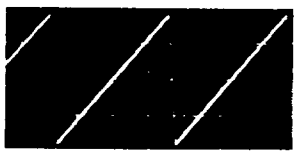
18. 11.5Vp-p 20μS



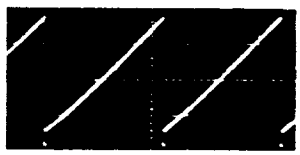
19. 19Vp-p 5mS



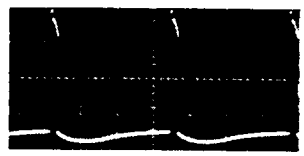
20. 11Vp-p 5mS



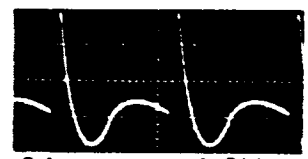
21. 2Vp-p 5mS



22. 11.3Vp-p 5mS



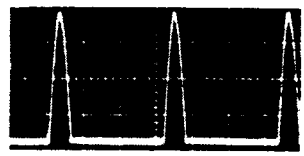
23. 24Vp-p 5mS



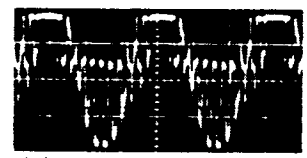
24. 1.9Vp-p 5mS

25. 47Vp-p 5mS

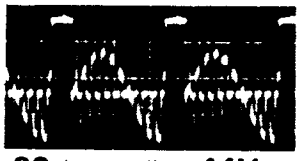
26. 4Vp-p 5mS



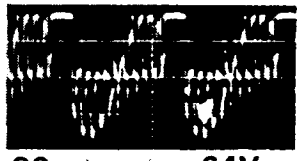
27. 100Vp-p 20μS



28. 65Vp-p 20μS



29. 44Vp-p 20μS



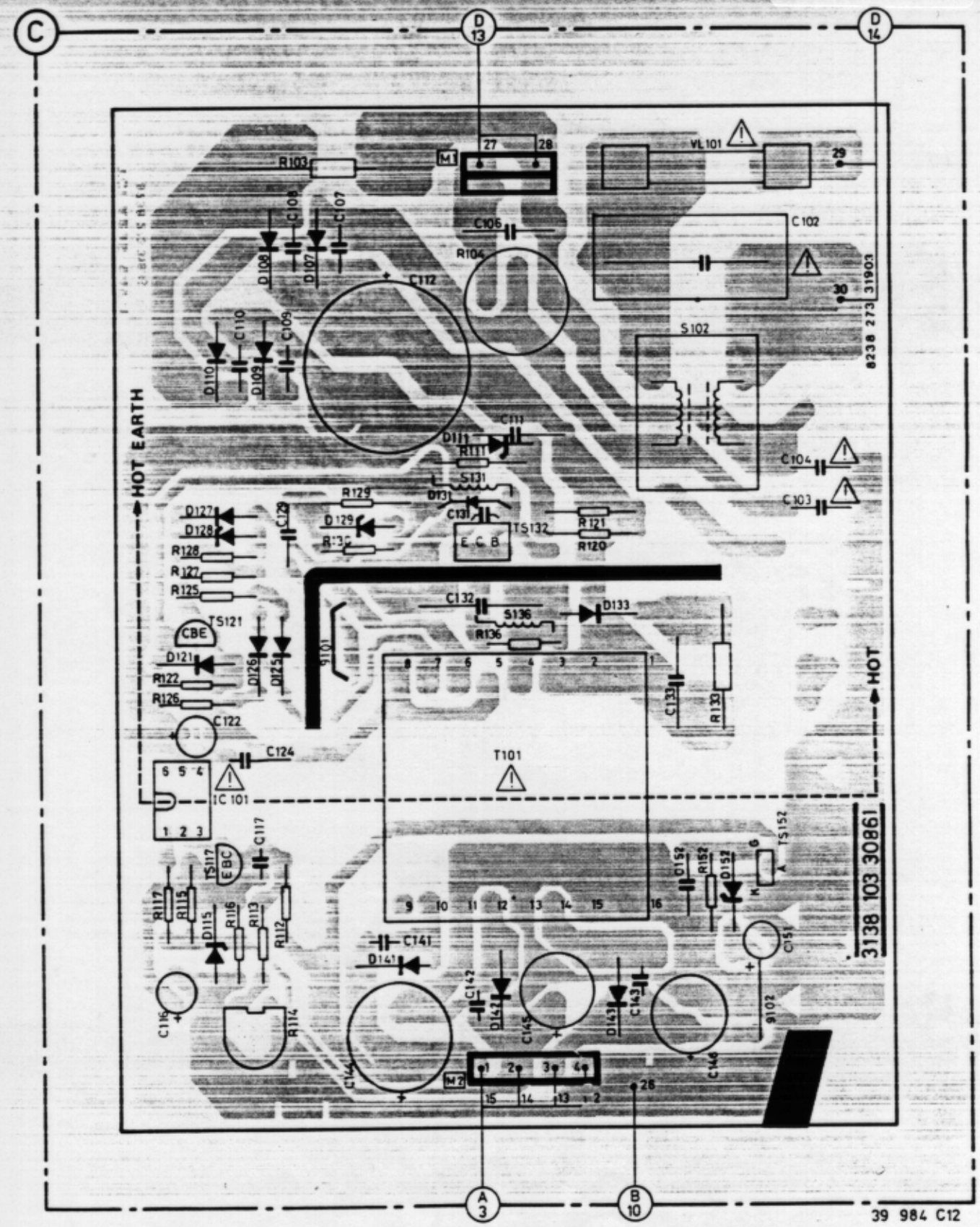
30. 64Vp-p 20μS

WAVEFORM NOTES
UNLESS OTHERWISE SPECIFIED:

1. WAVEFORMS TAKEN UNDER THE CONDITIONS SPECIFIED THE SCHEMATIC NOTES.
2. SWEEP/TIME CM SETTINGS ARE SHOWN JUST BELOW PHOTOS. ALL PHOTOS WERE TAKEN WITH THE SWEEP TIME CONTROLS IN THE CALIBRATED POSITION. HORIZONTAL POSITIONING OF THE WAVEFORMS WAS ADJUSTED FOR MAXIMUM CLARITY.

POWER SUPPLY P.C. BOARD (Late Production Version)
(viewed from component side)

THE QUALITY OF THIS PAGE IS THE BEST THAT IS AVAILABLE



THE QUALITY OF THIS PAGE IS THE BEST THAT IS AVAILABLE

POWER SUPPLY P.C. BOARD (Early Production Version)
(viewed from component side)