PC BOARD Number 132 - VIDEO DRIVER

Retyped 2/10/78
by Jeff Schier

Corrections to PC 132

1) R30, IC-10, and Q4 base; are not supposed to go to +15

2) IC-10 / Pin 7 and other components, on the same wire, should also go to -15 Volt

3) R44 is not grounded

4) IC-2 / Pin 2 and 4, are 'messed up'
   Connect Pin 4 to B-
   Cut B- from Pin 2 and reconnect Pin 2 to : D5 and C3

5) Put resistors in series with the +28Volt and -28 Volt to limit the 40409,40410 power dissipation.

6) Crossed off but was: 'Change c-21 to 0.1 uf cer,or 2 tantalums back to back'. This number is no longer in effect

7) Change R44 to 10k ohms, from 100k ohms (this change is noted on parts list)

8) Change R54 to 220k ohms (this change is noted on parts list)

9) Add 470k ohm resistor,from (C22, R28, R22 junction) to Pin2 of IC-8 . This offsets log circuit,to help linearize the Intensity Input.

10) Change R44 from 10k ohms to 4.7k ohms, (change noted on parts list).

    A) " White Stretch, is ' OFF' , when pot. is C.W.
    B) R46 and R47, control the gain of the Multiply amp. If gain is too high,(too much contrast),Raise their value (in proportion) , and lower C9 by the same proportion, and you will reduce gain.

11) Add 2.7 ohm resistor, in series with B-, to Q2, R51, C18 junction.

12) Change C-18 to 15 uf(microfarad) at 20 Volt, Tantalum. The plus(+) side is the ground side.

13) Change C16 to 15 uf (microFarad) at 25 Volt.

14) Omit C13 (be sure to change R27 ground.).

15) Add a 1 pf (picofarad) capacitor, between IC8/pins 2 and pin 6.

16) Add 33 ohm resistors, instead of jumpers, on the + and - 28 Volt lines, going to the SG4501 voltage regulator.

17) Place a 47 ohm resistor in series with the cathode.

18) Add a 10k ohm resistor in series with G-2

REVISED JAN 16, 1975 [illegible] CPT [illegible] VSD^2

PC 132

all 1/4 W 5% carbon unless marked

IC1 - LM318H
2 - "
3 - "
4 - "
5 - "
6 - "
7 - "
8 - "
9 - CA3083 → ? 30183 (80V)
10 - MC 1595 with heatsink

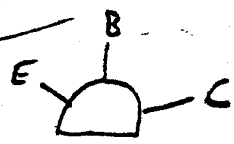
PC132

Q1 - 2N3568. or equiv
2 - 2N3646
3 - 2N5770 } Strapped
4 - 2N5770 } Together
5 - 2N2219A
6 - 2N3646
7 - 2N5770
8 - 2N3646

D1 thru D7 - 1N914A

Note = D7 diode leakage must be less than 1 µA at 15V

D-8 1N914



TOP VIEW

D-9 Zener 1N5248B

R1 - 10K 1%
2 - 10K 1%
3 - 4.7K
4 - 10K 1%
5 - 10K 1%
6 - 4.7K
7 - 10K 1%
8 - 5K 1%
9 - 10K 1%
10 - 5K 1%
11 - 5K 1%
12 - 510Ω }
13 - 510Ω } (470Ω)
14 - 510Ω }
15 - 18K
16 - 1K
17 - 4.7K
18 - 4.7K
19 - 20K 1%
20 - 20K 1%
21 - 10K 1%
22 - 100K
23 - 3.3K
24 - 10K trim
25 - 10K
26 - 10K
27 - 4.7K
28 - 4.7K
29 - 510Ω }
30 - 510Ω } all 510Ω or all 470Ω
31 - 510Ω }
32 - 510Ω }
33 - 100Ω
34 - 220Ω
35 - 220Ω
36 - 1K

R37 - 1K
38 - 100Ω
39 - 1K
40 - 100Ω
41 - 1K
42 - 20K trim
43 - 20K trim
44 4.7K
45 - 10K
46 - 10Ω
47 - 150Ω
48 - 680Ω
49 - 510Ω 1/2W (470)
50 - 510Ω 1/2W (470Ω)
51 - 1K ~~R57 2.2K~~
52 - 1K
53 - 10K
54 - 220K
55 - 510Ω (470Ω)
56 - 1K trim

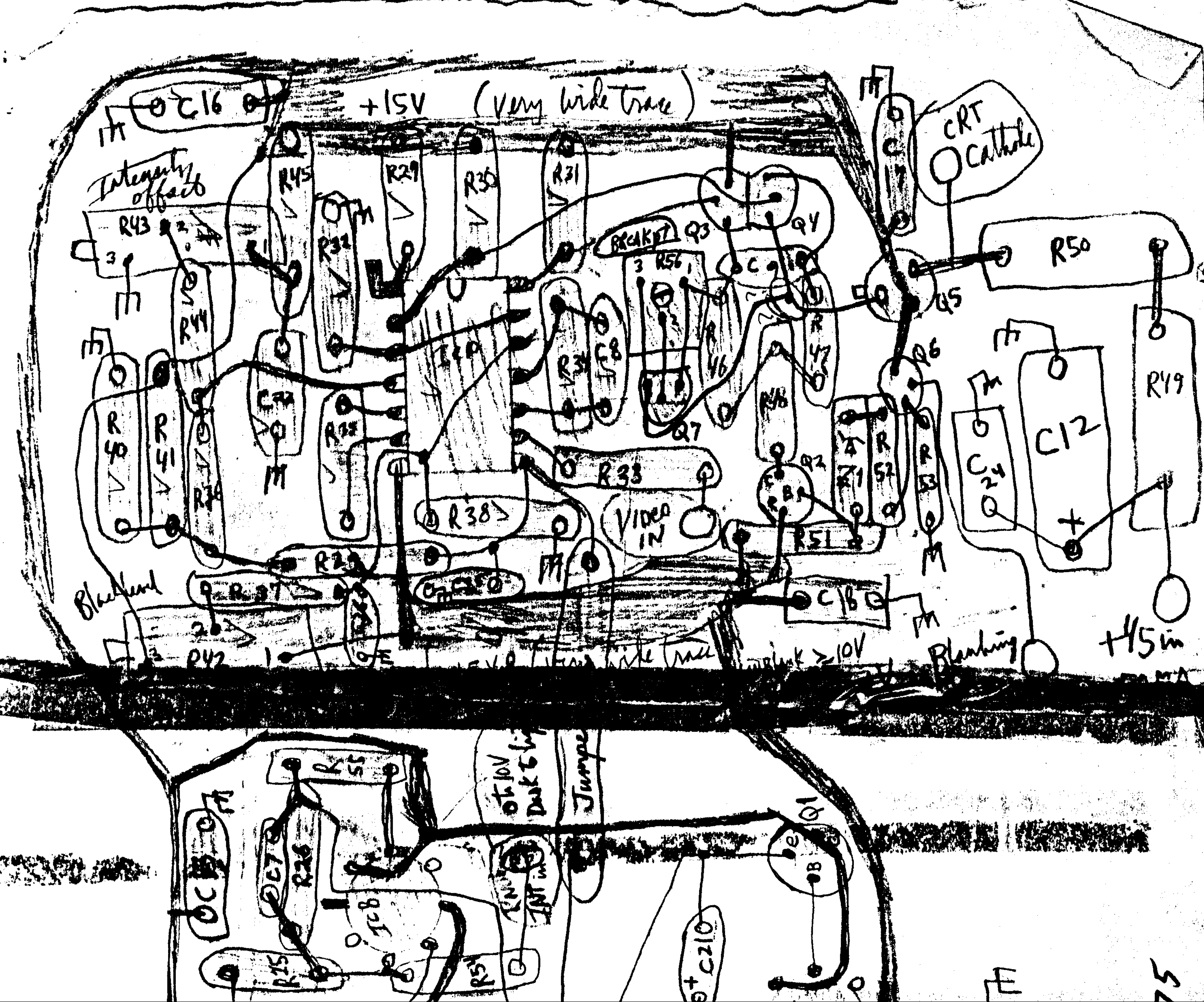
R57 75Ω
R58 1K
R59 10K
R60 10K
R-61 2.7K

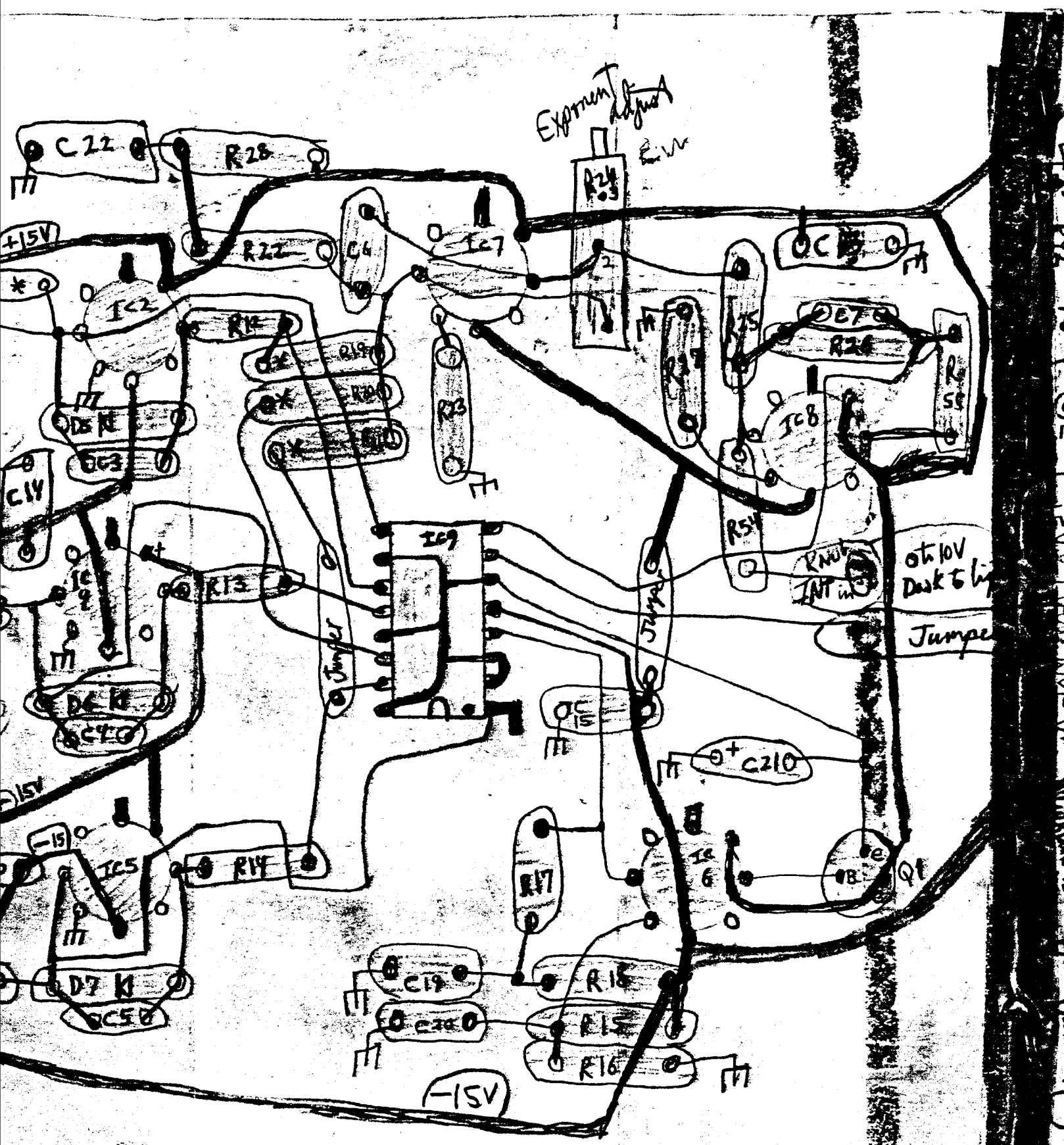
DISKS:
C1 - 47pF
C2 - 47pF
3 - 47pF
4 - 47pF
5 - 47pF
6 - 10pF
7 - 10pF
8 - 100pF ✡
9 - 100pF ✡

10 - 15µF/20V } Tantalum
11 - 15µF/20V }
12 - 22/50V
13 - .1 }
14 - .1 }
15 - .1 } Ceramic
16 - .1 }
17 - .1 }

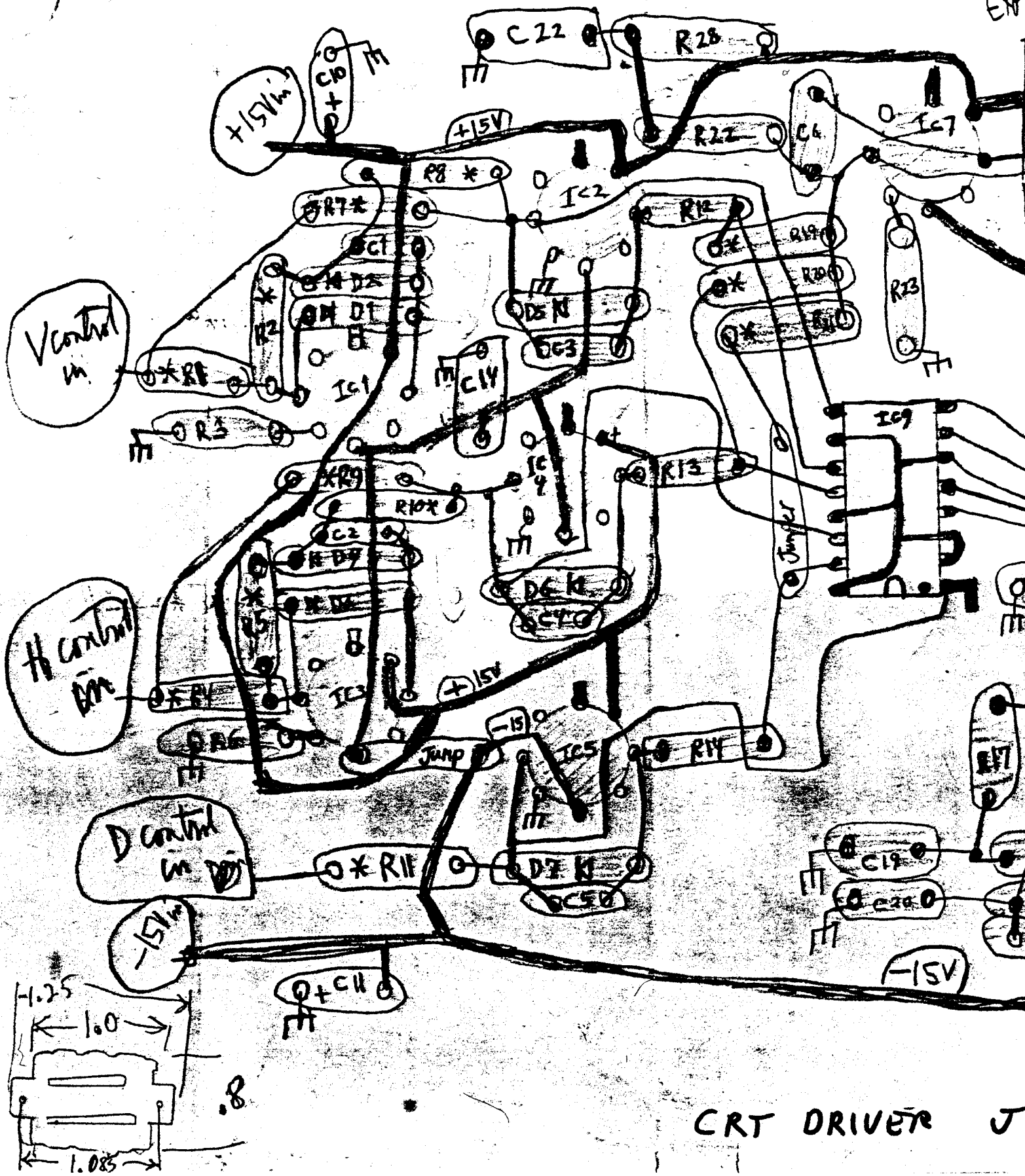
C18 - .1 }
C19 - .1 } Ceram
20 - .1 }
(Tant) 21 - 15µF/20V
22 - .1 }
23 - .1 } Ceram
24 - .1 }
25 - 220pF DISK
26 - 220pF
C27 - .1µf
C28 - .1µf

COMP CAPS - ADJ FOR HF BANDWIDTH

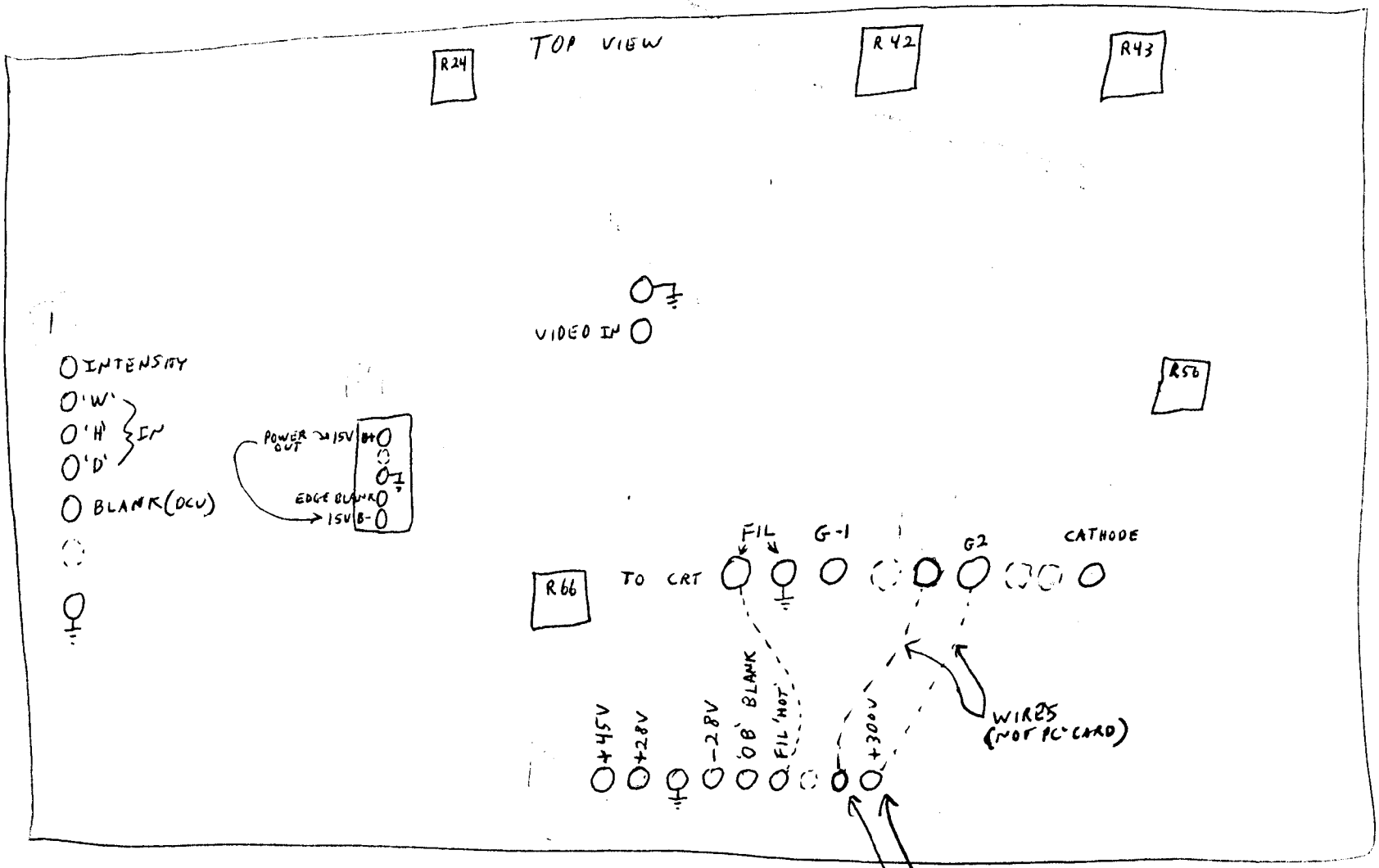

C16
+15V (Very wide trace)
CRT Cathode
Intensity offset
R43
R45
R29
R30
R31
R32
R44
R40
R41
R34
R33
R35
R36
R37
R38
R42
R46
R47
R49
R50
R51
R52
R53
R55
R56
R15
R26
R54
C7
C8
C12
C18
C21
C24
Q1
Q2
Q3
Q4
Q5
Q6
Q7
IC8
Video IN
Blanking
+15 in
Jumper
Blackened



CRT DRIVER JAN 16/75


C22
R28
+15V in
C10
+15V
R22
C4
IC7
R8
IC2
R7
R12
C1
R19
R20
R23
D2
D1
R2
DS N
DG3
V control in
R1
IC1
C14
R3
IC9
R13
R9
IC4
R10
C2
D7
D6
H control in
R4
R5
IC3
+15V
R6
-15
Jump
IC5
R14
R17
D control in
R11
D7
C5
C19
C20
-15V in
C11
-15V
1.25
1.0
1.085
.8
CRT DRIVER

PC-132 CHICAGO



PC Board 132 - Video Driver - Corrections(conitnued)

2/10/78

Corrections- continued

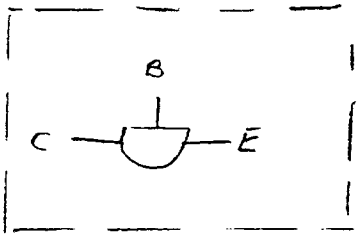
19) Reduce the value of R61

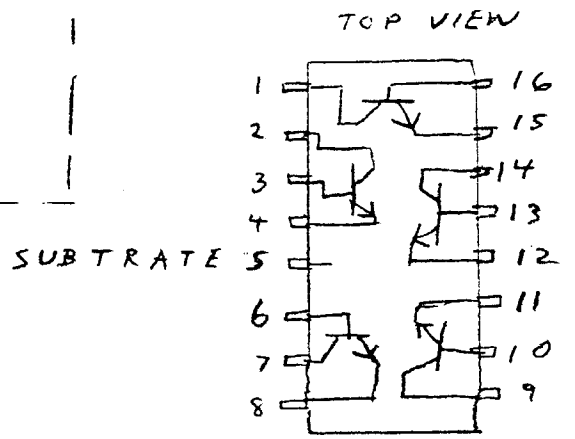
20) Put a limit potentiometer, on the intensity (DCU) , and bias potentiometer, to set Ext Int. at specific range

21) Add a resistor in series with the +45 Volt input.

Pinout for CA-3083

CA3083 - GENERAL PURPOSE, HIGH CURRENT NPN TRANSISTOR ARRAY





PC132 Parts List - High Resolution CRT Driver
with V,H,D^2 Correction

Revised Jan. 16, 1975 Retyped Jeffrey Schier 6/1/78

Note: All resistor values are 5% ¼ Watt unless otherwise noted

Integrated Circuits

IC 1 - LM318H
IC 2 - LM318H
IC3 to IC8 - LM318H
IC 9 - CA3083 (? 30183 ,80 Volt)
IC 10 - MC1595 with heat sink
IC 11 - SG4501

Transistors

Q1 - 2N3568 or equivalent
Q2 - 2N3646
Q3 - 2N5770 (note Q3 and Q4 should
Q4 - 2N5770 be strapped together)
Q5 - 2N2219A
Q6 - 2N3646
Q7 - 2N5770 Q9 - 40409
Q8 - 2N3646 Q10 - 40410

Diodes

D1 to D7 - 1N914A
(note : Diode leakage must be less than 1 uA at 15 Volt reverse bias)
D8 - 1N914
D9 - Zener 1N5248B

Resistors - (Values in ohms)

R1 - 10K 1%
R2 - 10K 1%
R3 - 4.7K
R4 - 10K 1%
R5 - 10K 1%
R6 - 4.7K
R7 - 10K 1%
R8 - 5K 1%
R9 - 10K 1%
R10 - 5K 1%
R11 - 5K 1%
R12 to R14 - 510 (possibly changed to 470 ohm)
R15 - 18K
R16 - 1K
R17 - 4.7K
R18 - 4.7K

Resistors (continued)

R19 - 20K 1%
R20 - 20K 1%
R21 - 10K 1%
R22 - 100K
R23 - 3.3K
R24 - 10K trim
R25 - 10K
R26 - 10K
R27 - 4.7K
R28 - 4.7K
R29 to R32 - All 510 ohm or all are 470 ohm
R33 - 100
R34 - 220
R35 - 220
R36 - 1K
R37 - 1K
R38 - 100
R39 - 1K
R40 - 100
R41 - 1K
R42 - 20K trim
R43 - 20K trim
R44 - 4.7K
R45 - 100K
R46 - 10
R47 - 100
R48 - 680
R49 - 510 ½ Watt (or 470)
R50 - 510 ½ Watt (or 470)
R51 - 1K
R52 - 1K
R53 - 10K
R54 - 220K
R55 - 510
R56 - 1K trim
R57 - 75
R58 - 1K
R59 - 10K
R60 - 10K
R61 - 2.7K
R62 - Dale 0.5 ohm 1%, 1 Watt
R63 - Dale 0.5 ohm 1% 1 Watt
R64 - 75

CRT DRIVER 1/16/75

alignment

Note: System should be warmed up for 5 minutes before alignment is attempted.

(1) Intensity offset – Tube Not cut off
HIN = 0V
Vin = 0V
Din = 0V
intensity pot all the way down
adjust R45 for NO visible picture or NO video on CRT cathode

(2) Black level – Self explanatory

(3) Low level Exponent adjust – adjust Tube cutoff
(Low level intensity) (set intensity to zero and just turn CRT spot out)
R56 all the way CCW – .7 volt pin 12, IC 10, Video in guided Black level is SET sizes and intensity for a picture. (very low level, small size)
adjust "Exponent adjust" for constant visual intensity as picture changes size.

(4) Break pt adj – adjust Size or intensity until shading error appears
try adjusting R56 until best shading vs. intensity occurs

11) ADD 2.15Z [illegible] SERIES WITH B- TO Q-2, R-51, C-18

12) CHANGE C-18 TO 15uf 20V TANT (+ IS GND SIDE)

RUTT ELECTROPHYSICS
21-29 West 4th Street, New York, N.Y., 10012 (212) 982-8300

13) Change C-16 TO 15uf 25V

14) OMIT C-13 (BE SURE TO CHANGE R-27 GND)

5) PUT RESISTORS IN SERIES WITH ± 28V TO LIMIT 4040 9 & 10 DISSAPATION

~~6) Change C-21 TO 10uf 50V, OR 2 IN [illegible] BACK TO BACK~~

7) " R-44 TO 10K FROM 100K
(Change noted on parts list)

8) " R-54 TO 220K
(Change noted on parts list)

9) ADD 470K FROM (C-22/R28,22) TO PIN 2 of IC-8
THIS OFFSETS LOG CIRCUIT TO HELP LOWORIZE INTENSITY INPUT

10) Change R-44 FROM 10K TO 4.7K
Change noted on parts list

NOTE a) 'WHITE STREACH' IS 'OFF' WHEN POT IS C.W.

b) R-46 & R-47 CONTROL GAIN OF MULT. AMP. IF GAIN IS TO HIGH (TO MUCH CONTRAST) RAISE THEIR VALUE (IN PROPORTION) & YOU WILL Reduce GAIN & LOWER C-9 BY THE SAME PROPORTION

Layout NEED (over for alignment info)

Marked (*) resistors are 1% or better (preferably Metal film) (different size?)

1K : 2K
IS INDEPENDENT FROM 10K : 20K

Keep ±15V wires

ground plane

(save IC's 2,4,5,6,7,8 2 pin sockets)

(about 1 inch) from IC9 for thermal

short lead CRT cathode lead

You can move inputs (Vin H in D in)
together to a convenient spot

Video in cannot be moved

Video 75Ω load is now a BNC panel
connector

Q-3 & 4 SHOULD BE TIED TOGETHER
for heat transfer with silicone

PC 132 Parts List- High Resolution CRT Driver

with V, H, D^2 Correction (continued)

Revised Jan. 16, 1975 retyped by Jeffrey Schier 6/1/78

Resistors (continued)

Note-- all values in ohms
5% ¼ Watt unless otherwise noted

R65 - 75 ohm
R66 - 20K trim (GR10 #1)
R67 - 4.7K

Capacitors (continued)

C34 - 6.8 uf 35 VDC (Tantalum)
C35 - ? uf ceramic disc
over 300 volt
C36 - 0.01uf 1KV ceramic disc
C37 - 0.01 uf 1KV " "
C38 - 0.01 uf 1KV " "
C39 - 0.01 uf 1KV " "

Capacitors

C1 - 47 pf ceramic disc
C2 - 47 pf " "
C3 - 47 pf " "
C4 - 47 pf " "
C5 - 47 pf " "
C6 - 10 pf
C7 - 10 pf " "
* C8 - 100 pf " "
* C9 - 100 pf " "
C10 - 15 uF @ 20 Volts (Tantalum)
C11 - 15 uf @ 20 Volts " "
C12 - 22 uf @ 50 Volts " "
C13 - 0.1 uf ceramic disc
C14 - 0.1 uf " "
C15 - 0.1 uf " "
C16 - 0.1 uf " "
C17 - 0.1 uf " "
C18 - 0.1 uf " "
C19 - 0.1 uf " "
C20 - 0.1 uf " "
C21 - 15 uf / 20 Volt (Tantalum)
C22 - 0.1 uf ceramic disc
C23 - 0.1 uf " "
C24 - 0.1 uf " "
C25 - 220 pf " "
C26 - 220 pf " "
C27 - 0.1 uf
C28 - 0.1 uf
C29 - 0.1 uf ceramic disc
C30 - 0.01 uf " "
C31 - 0.01 uf " "
C32 - 6.8 uf / 35 VDC (Tantalum)
C33 - 6.8 uf / 35 VDC " "

* Compensation Capacitors should be adjusted for High Frequency Bandwidth

CRT DRIVER (PC-132) 1/16/75 retyped 2/10/78
by Jeff Schier

Alignment Procedure

Note : System should be warmed up, for 5 minutes
before alignment is attemped.

1) Intensity Offset - Tube not cut-off when
Hin = zero volts
Vin = zero volts
Din = zero volts
Intensity Pot all the way 'down'

Procedure - Set controls to the above values. Adjust
R45 for No visible picture, or no Video on Crt Cathode

2) Black Level - Self explanatory

3) Low Level Exponential Adjust -
Procedure - Adjust tube cutoff (set intensity to zero, and
just turn Crt spot out.
For 'low level intensity' turn R56 all the way CCW.
Black level, is -0.7 volts at IC10/Pin 12, with Video grounded.
Set sizes and intensity, for a picture (Very low level,
small size picture)
Adjust "exponent adjust" for a constant 'Visual' intensity,
as the picture is changed in size.

4) Break Point Adjust - Adjust size or intensity, until shading
error appears. Try adjusting R56 until shading vs. intensity
is at its best value.

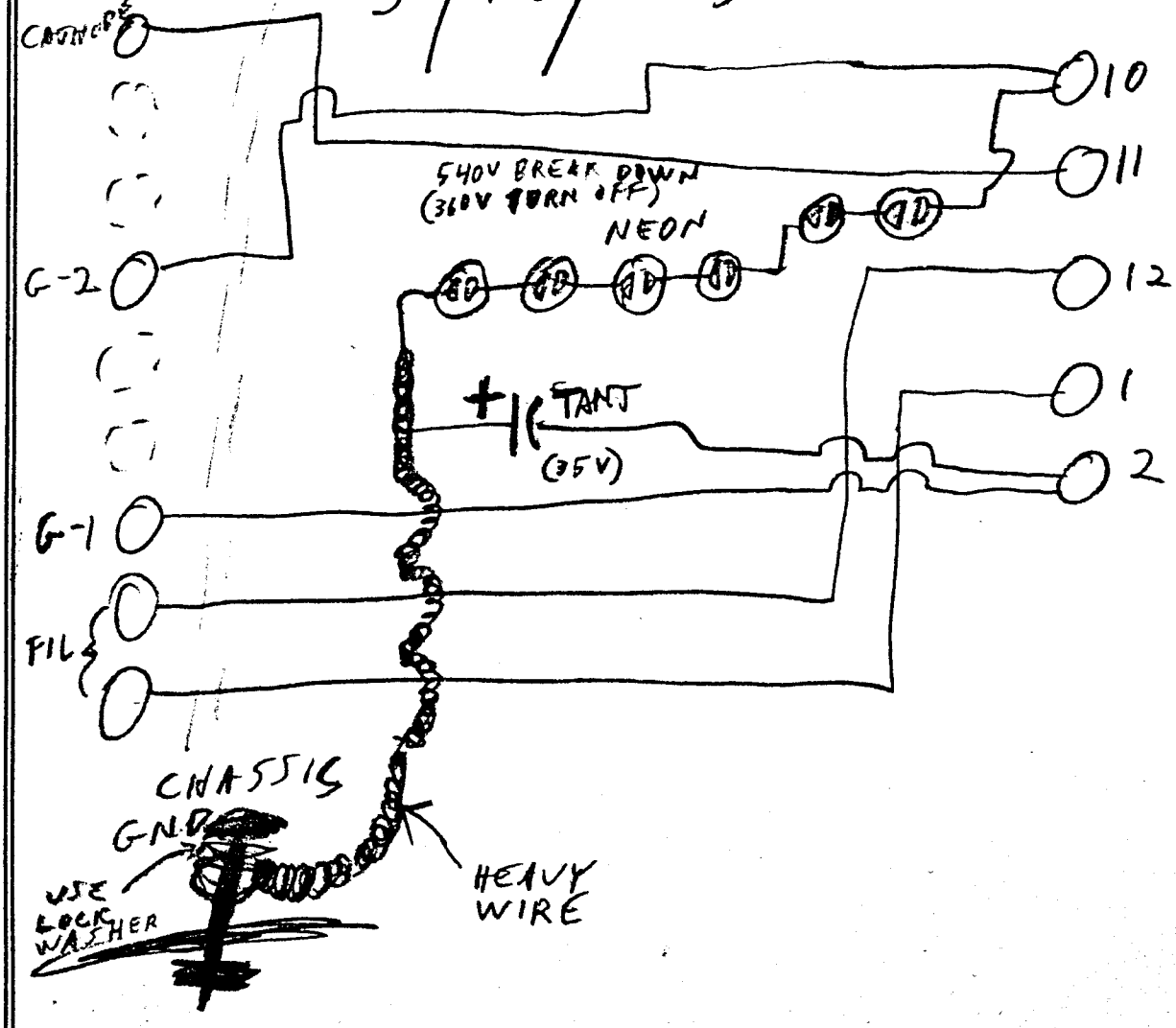
Layout Notes

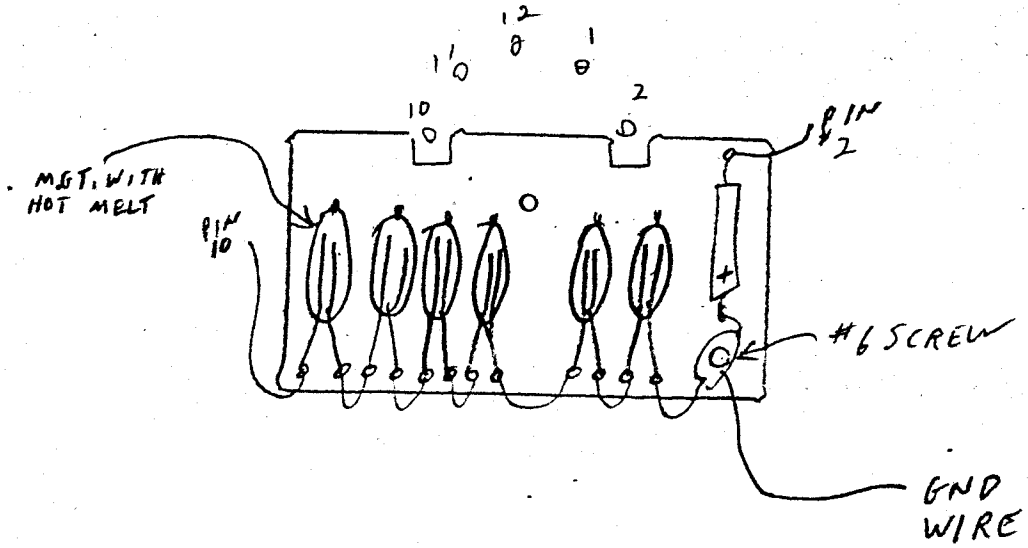
Marked (*)resistors are 1% or better (preferably metal film)
(different size?) 1K : 2K is independent from 10K to 20K

Heavy + and - 15 Volt traces.
A Ground Plane
Leave IC's 2,3,4,5,6,7,8 equidistant
(about 1 inch) from IC9, for thermal reasons.
A short length CRT cathode lead.
You can move inputs (Vin,Hin, Din) together to a convenient spot.
Video input cannot be moved.
Video 75 ohm load is now at the BNC panel connector.
Q3 and Q4 should strapped together, for heat transfer, with
silicone between the transistors.

CRT SOCKET FOR PC-132

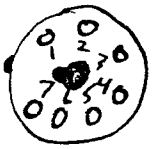
3/13/75





PC-132 TUBE SOCKET CONNECTIONS

PANASONIC TUBE

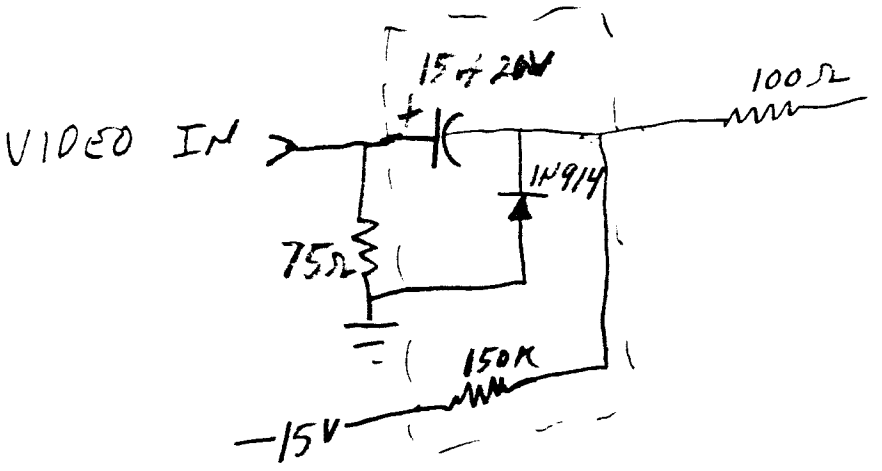


BACK VIEW

1) KATHODE (GREEN)
2) G-2 (YELLOW) +500V
3) FIL. (BROWN) } 12.6V
4) FIL. (BLACK) }
5) G-1 (RED)
6) DO NOT USE
7) G-3 (ORANGE) FOCUS WIPER 0 TO +500V

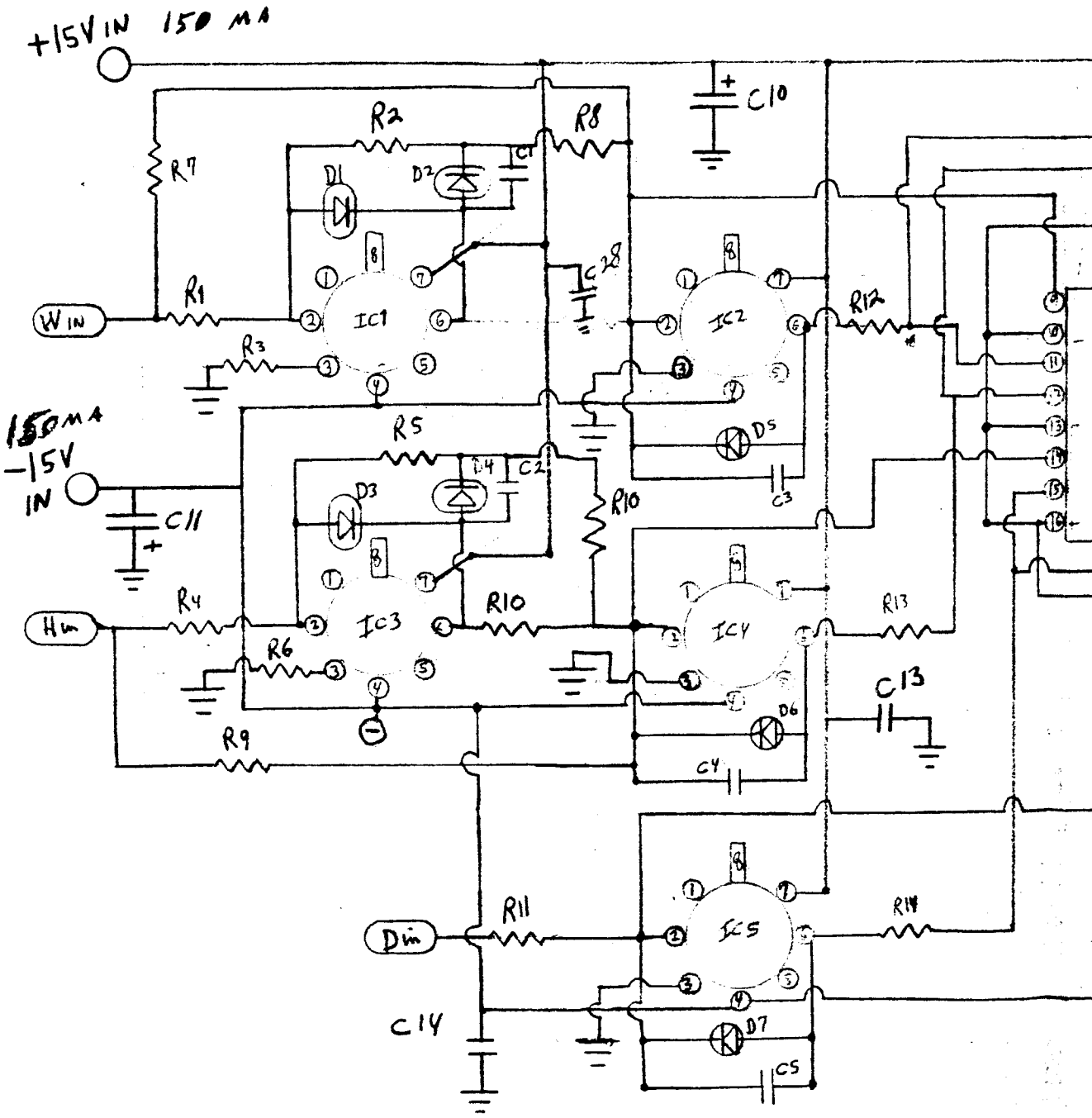
PC-132 CHICAGO

VIDEO CLAMP

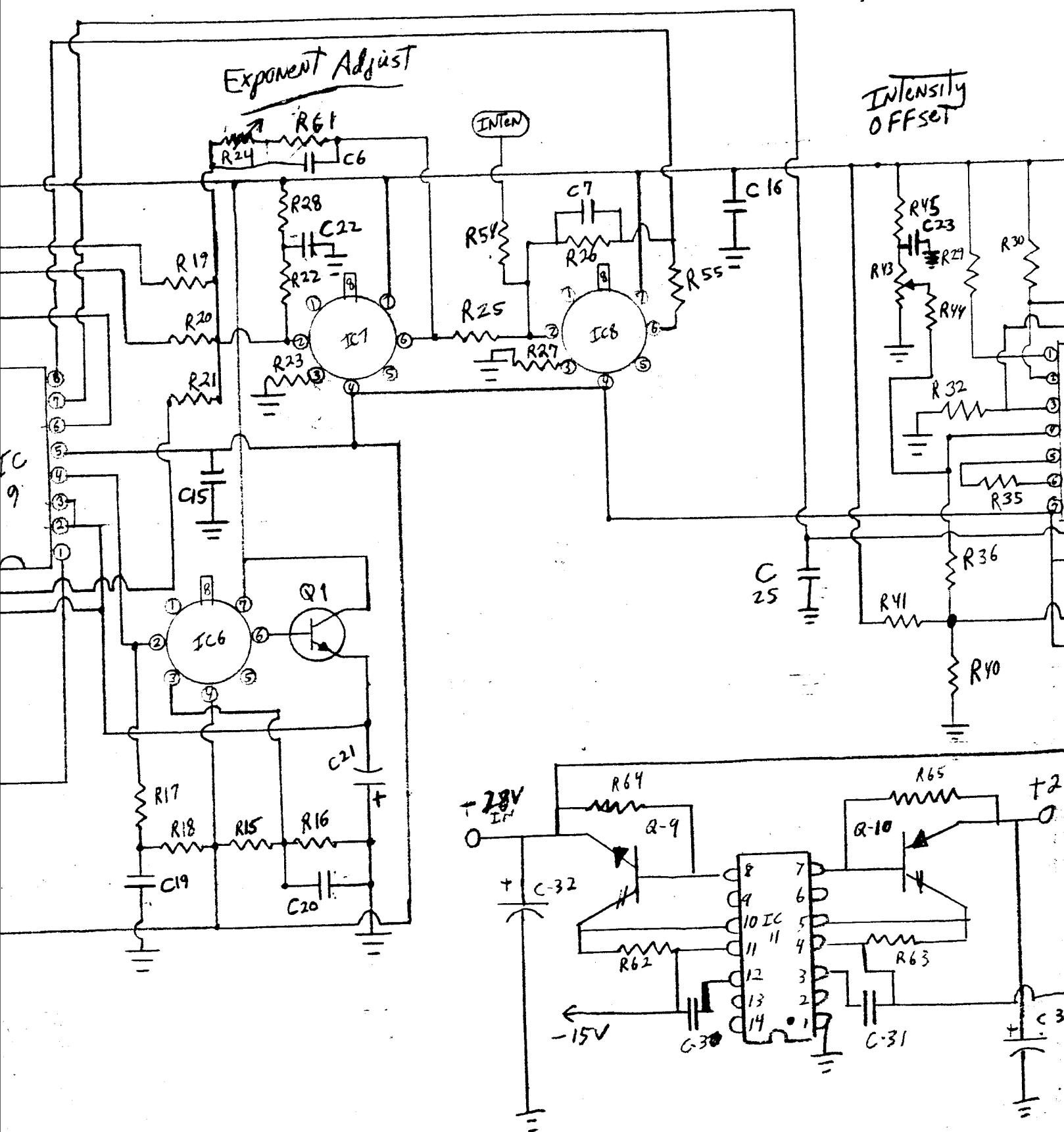


Rull High Resolution CRT

1/2/75 Robert Diam



DRIVER WITH H.V.D.C. COMPENSATION



Matsushita Electronics Corporation

Telephone No.
TAKATSUKI (82) 5521

Takatsuki, Osaka, Japan
Telex: MECTRON J63461

Cable Address
"MECTRON" TAKATSUKI

140AKB4

CATHODE RAY TUBE

The 140AKB4 is a 5"-55°, directly viewed, rectangular, glass picture tube of the low voltage electro-static focus and magnetic deflection type. The 140AKB4 employes a very small diameter neck of 0.788". The 140AKB4 has a 12.6 volts 64 milliampere heater and its maximum overall length is 7.953 max. inches thus very suitable for micro portable T.V. set.

GENERAL DATA

ELECTRICAL DATA

Heater Current at 12.6 volts	64 mA
Direct Interelectrode Capacitance:	
Grid No.1 to all other electrodes	7 pF
Cathode to all other electrodes	4 pF
External conductive coating to anode	400 max pF 200 min pF
Focusing Method	Electrostatic
Deflection Method	Magnetic
Deflection Angles (Approx.)	
Diagonal	55 degrees
Horizontal	degrees
Vertical	degrees
Electron Gun:	
Ion trap	Not Required
Focus lens	Tripotential

OFFICIAL DATA

Faceplate	Filterglass
Light transmission at center (Approx.)	70%
Phosphor	P4-Sulfide Type Aluminized
Fluorescence	White
Persistence	Medium short

MECHANICAL DATA

Tube Dimentions:	
Overall length:	7.953" max. (202 mm)
Greatest dimensions of tube:	
Diagonal	5.406"±0.078" (137.3±2) mm
Width	4.732"±0.078" (120.2±2) mm
Height	3.760"±0.078" (95.5±2) mm

PC 132

R-3 C-20 IC-1 R-8 R-7 R-2 D-1 C-16 D-2 R-1 R-4 R-9 R-10 C-21 IC-3 R-5 D-3 C-22 D-4 R-11 IC-2 D-5 C-3 R-12 R-4 D-6 C-4 R-13 IC-5 D-7 C-5 C-19 R-14 IC-9 R-24 R-22 C-2 R-23 R-21 R-20 R-19 C-17 C-18 R-18 R-17 C-6 D-8 R-61 R-25 R-26 IC-7 IC-8 R-54 C-15 C-7 R-55 Q-1 IC-6 R-15 C-14 R-16 C-1 R-42 R-40 R-36 R-41 R-44 R-43 R-45 C-23 R-39 R-35 R-34 C-24 R-31 R-32 C-22 R-30 C-25 R-33 IC-10 R-51 C-8 R34 R-56 R-53 R-52 D9 R-51 C-18 Q-2 Q-4 R46 R-48 R-47 C-9 C-36 C-37 C-38 C-39 C-8 D10 C 24 R 49 R-50 R-67 C-34 C 29 R-59 R-59 R-64 C-35 R-65 C-32 Q-9 R 62 C 30 IC 11 C-31 R 63 Q-10 C-12 Q6 Q-8 R-60 R66

PC 13