SE-M21C Publication A, Issue 3

SERVICE AND OPERATION MANUAL

SE - M21C XX SERIES, 13",19"
OPEN FRAME COLOR MONITORS

HAPP CONTROLS

Manufacturer of Electronic Controls

Information in this publication current as of Jan, 1998.
Information subject to change as display technology advances.

PERFORMANCE AND OPERATING DATA

1. Power Supply
RCC type self-oscillating switch mode power supply, dual AC input range, jumper selectable.

2. Input Signal
Video-R G B analog, positive, 1-5 Vp-p.
Impedance- 300 ohms, terminated.
Resolution- 480 pixels X 240 lines at 60 Hz vertical refresh rate.
Bandwidth- DC to 16 MHz (at-3db) typical
Rise Time- less then 25 nanoseconds
Sync- TTL, positive or negative. separate or composite. Monitor circuitry will automatically determine and adjust for all syncsignals regardless of type used.

Horizontal Scan
Frequency- 15.75 KHz nominal.
Capture Range- 13.25~18.25 KHz.
Active Video- full width display of video signals with active video from 40 to 50 usec.
Linearity - ±5%

Vertical Scan
Frequency- 60 Hz nominal
Capture Range- 47 ~ 70 Hz
Linearity- ±5%

3. Picture Size Regulation
2%

4. Geometric Distortion
± 2% (max)

5. Environmental Conditions
Temperature- 0° ~55° C
Humidity- 10 ~ 90%, no condensation

6. High Voltage
25 KV, with integral X-radiation shut-down protection.

7. Degaussing
Automatic, operating at beginning of each power-up cycle, provided the monitor has been turned off for at least 20 minutes.

OPERATING INSTRUCTIONS

1. Connect jumper cable, P503, to jumper pin corresponding to the line voltage in your locality - VJ1, 90-140 VAC;
VJ2, 180-260 VAC.

2. Apply line AC to the monitor via P501.

3. Apply signal source to the monitor via P101.

4. Set up user adjustable controls.
All controls are preset at the factory for optimum performance. If adjustment is necessary to suit program material, most adjustments can be made using only the controls on the remote VR PWB. Other controls in the monitor should be adjusted only if those controls have been tampered with or if major repairs were necessary on the monitor.

USER ADJUSTABLE CONTROLS

1. Main PWB
H-Hold, VR302
V-Hold, VR205

2. Remote VR PWB
Bright, VR305
Contrast, VR306
H-Cent, VR301
V-Cent, VR 204
H-Size, VR303
V-Height, VR201

3. Flyback Transformer
Focus

ADDITIONAL CONTROLS

1. Main PWB
Video Drive Controls*
Red, VR101
Green, VR102
Blue, VR103
East-West Correction, VR203
Side Pincushion VR304
Vertical Linearity, VR202

2. Neck PWB
Cut off Controls*
Red, VR104
Green, VR105
Blue, VR106

3. Flyback Transformer
Screen

Thease controls have been preset at the factory and should not require further attention.
* If adjustment of these controls becomes necessary, refer to White Balance procedure, page 12.

HIGH VOLTAGE SHUT-DOWN CIRCUIT

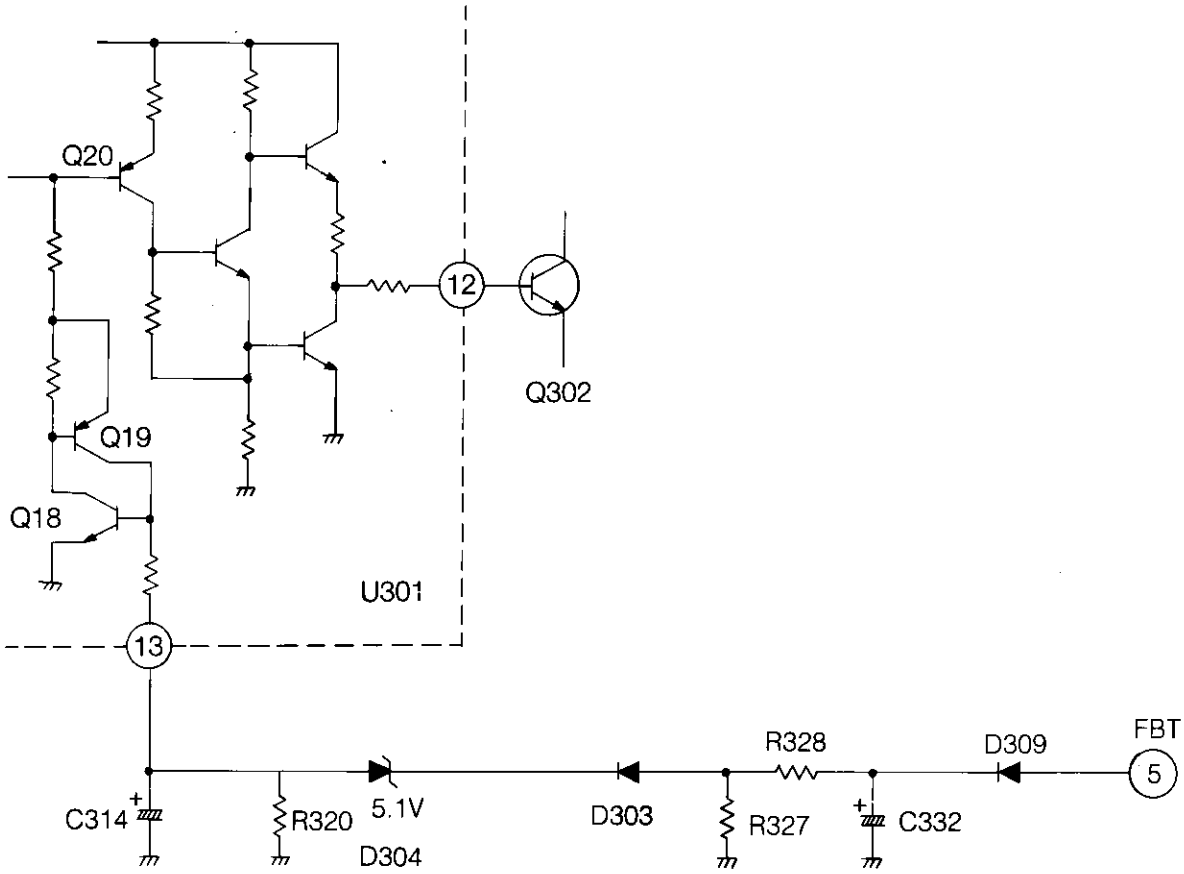
The chassis of this monitor has been designed to emit a minimum of soft X-radiation, in accordance with US DHHS rules 21 CFR, subchapter J, applicable at date of manufacture. A high voltage shut-down circuit, as shown below, guarantees horizontal oscillation shut-down should the high voltage exceed designed picture tube maximums. DO NOT ATTEMPT TO MODIFY THIS CIRCUIT.

Circuit Description

A flyback pulse is generated at pin 5 of the flyback transformer. This pulse is fed via resistive divider network to pin 13, IC U301. The resistive divider is such that the value of resistors R327 and R328 is set so that zener diode D304 will conduct when the flyback pulse becomes abnormally high.

A reference voltage is maintained by IC U301 internal circuitry. When D304 is conducting and the flyback pulse becomes equal to or greater than the reference voltage within IC U301, internal IC circuitry will act to shut off drive transistor Q302. Thus horizontal oscillation, and therefore high voltage, will be effectively shut down.

The protective circuit is released by turning off the monitor and reapplying power. If this circuit is working to shut down the monitor, then immediate service is required.

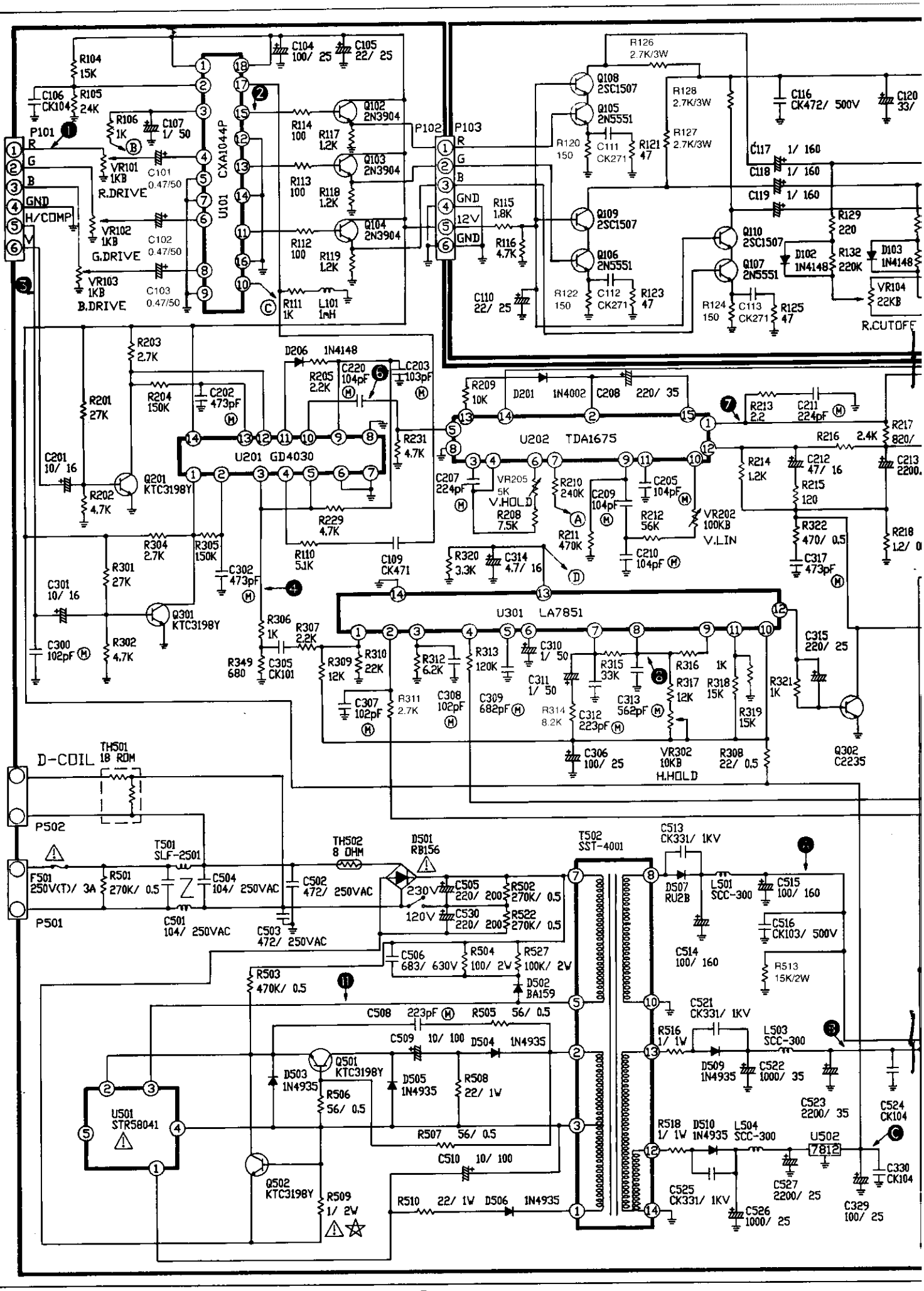


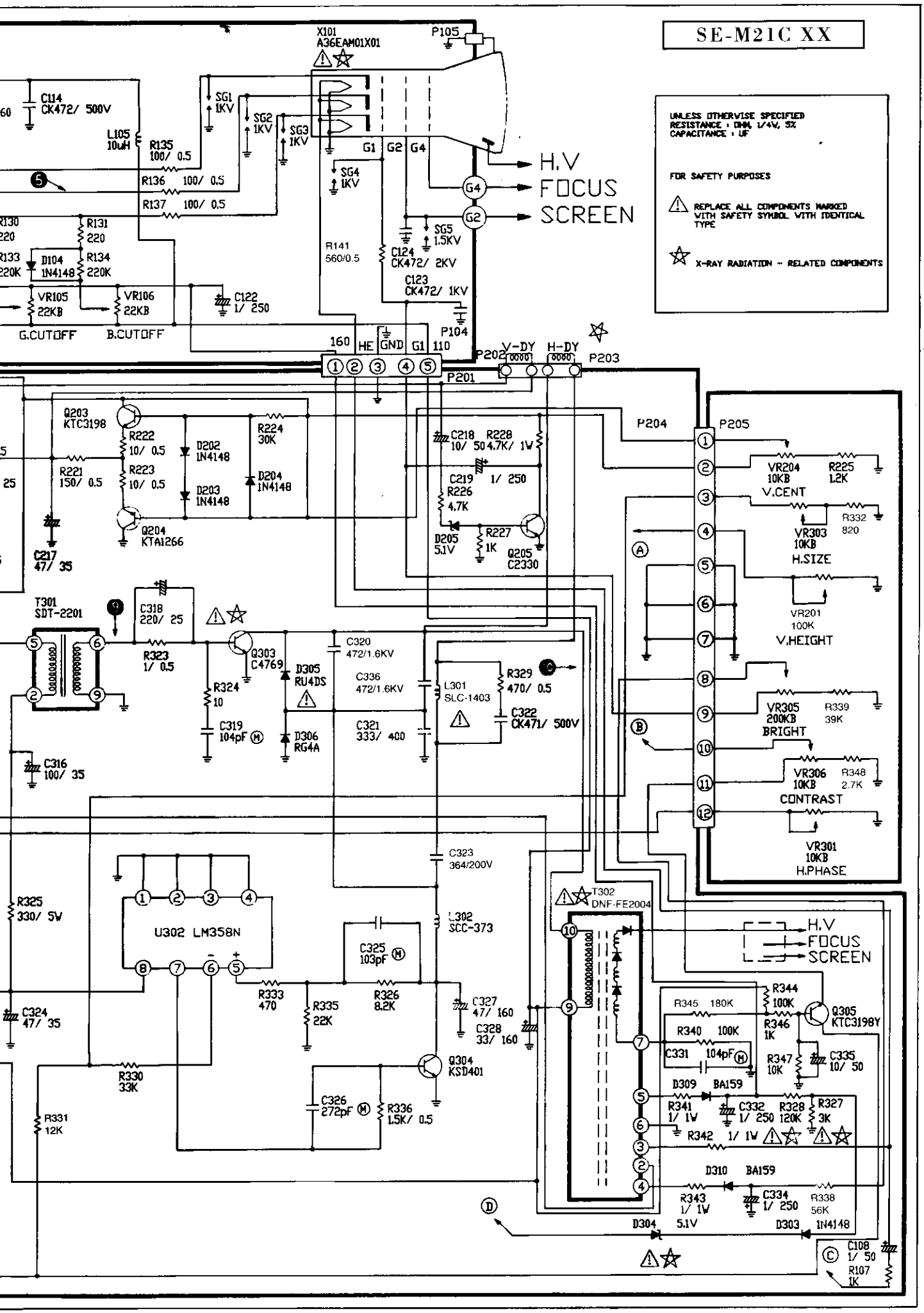
HIGH VOLTAGE CIRCUIT CHECK

Periodically check the high voltage with a reliably calibrated meter for values not in excess of manufactures recommendations-25KV. High voltage must not exceed 30KV at zero beam current at rated voltage.

The following steps describe how to measure the high voltage using a high impedence high voltage meter.

1. Connect meter lead (-) to chassis.
2. Connect meter lead (+) to the CRT anode button.
3. Turn the Bright Control, VR305, to maximum clockwise.
4. Measure the high voltage. The meter should in cate factory recommended values.
5. If the meter indication exceeds the maximum value, 30KV, immediate service is required to prevent the possibility of excess X-radiation emission.


P101
R
G
B
GND
H/COMP
V
R.DRIVE
G.DRIVE
B.DRIVE
VR101 1KB
VR102 1KB
VR103 1KB
C101 0.47/50
C102 0.47/50
C103 0.47/50
R104 15K
C106 CK104
R105 24K
R106 1K
C107 1/ 50
U101 CXA1044P
C104 100/ 25
C105 22/ 25
Q102 2N3904
Q103 2N3904
Q104 2N3904
R114 100
R117 1.2K
R113 100
R118 1.2K
R112 100
R119 1.2K
R111 1K
L101 1mH
P102
P103
R115 1.8K
R116 4.7K
C110 22/ 25
R126 2.7K/3W
Q108 2SC1507
Q105 2N5551
R128 2.7K/3W
R127 2.7K/3W
R120 150
C111 CK271
R121 47
Q109 2SC1507
Q106 2N5551
R122 150
C112 CK271
R123 47
C116 CK472/ 500V
C120 33/
C117 1/ 160
C118 1/ 160
C119 1/ 160
Q110 2SC1507
Q107 2N5551
R129 220
D102 1N4148
R132 220K
D103 1N4148
VR104 22KB
R.CUTOFF
R124 150
C113 CK271
R125 47
R203 2.7K
D206 1N4148
C220 104pF
C203 103pF
R205 2.2K
R204 150K
C202 473pF
R201 27K
C201 10/ 16
Q201 KTC3198Y
R202 4.7K
U201 GD4030
R231 4.7K
R229 4.7K
R110 5.1K
C109 CK471
R209 10K
D201 1N4002
C208 220/ 35
U202 TDA1675
R213 2.2
C211 224pF
R217 820/
R216 2.4K
R214 1.2K
C212 47/ 16
C213 2200.
R215 120
C207 224pF
VR205 5K
V.HOLD
R208 7.5K
R210 240K
C209 104pF
C205 104pF
R212 56K
VR202 100KB
V.LIN
R211 470K
C210 104pF
R322 470/ 0.5
C317 473pF
R218 1.2/ 0
R320 3.3K
C314 4.7/ 16
R304 2.7K
R305 150K
C302 473pF
R301 27K
C301 10/ 16
Q301 KTC3198Y
R302 4.7K
C300 102pF
U301 LA7851
R306 1K
R307 2.2K
R309 12K
R310 22K
R312 6.2K
R313 120K
C310 1/ 50
C311 1/ 50
R315 33K
R316 1K
R317 12K
R318 15K
R319 15K
C307 102pF
R311 2.7K
C308 102pF
C309 682pF
R314 8.2K
C312 223pF
C313 562pF
R321 1K
C315 220/ 25
Q302 C2235
R349 680
C305 CK101
C306 100/ 25
VR302 10KB
H.HOLD
R308 22/ 0.5
D-COIL
TH501 1B RDM
P502
P501
T501 SLF-2501
TH502 8 OHM
D501 RB156
T502 SST-4001
F501 250V(T)/ 3A
R501 270K/ 0.5
C504 104/ 250VAC
C502 472/ 250VAC
C501 104/ 250VAC
C503 472/ 250VAC
230V
120V
C505 220/ 200
C530 220/ 200
R502 270K/ 0.5
R522 270K/ 0.5
C513 CK331/ 1KV
D507 RU2B
L501 SCC-300
C515 100/ 160
C516 CK103/ 500V
C514 100/ 160
R513 15K/2W
C506 683/ 630V
R504 100/ 2W
R527 100K/ 2W
R503 470K/ 0.5
D502 BA159
C508 223pF
R505 56/ 0.5
C509 10/ 100
D504 1N4935
C521 CK331/ 1KV
R516 1/ 1W
L503 SCC-300
D509 1N4935
C522 1000/ 35
C523 2200/ 35
C524 CK104
Q501 KTC3198Y
D503 1N4935
D505 1N4935
R508 22/ 1W
R506 56/ 0.5
U501 STR58041
R507 56/ 0.5
C510 10/ 100
R518 1/ 1W
D510 1N4935
L504 SCC-300
U502 7812
C330 CK104
C527 2200/ 25
C329 100/ 25
Q502 KTC3198Y
R509 1/ 2W
R510 22/ 1W
D506 1N4935
C525 CK331/ 1KV
C526 1000/ 25


SE-M21C XX
UNLESS OTHERWISE SPECIFIED
RESISTANCE : OHM, 1/4W, 5%
CAPACITANCE : UF
FOR SAFETY PURPOSES
REPLACE ALL COMPONENTS MARKED WITH SAFETY SYMBOL WITH IDENTICAL TYPE
X-RAY RADIATION - RELATED COMPONENTS
X101
A36EAM01X01
P105
H.V
FOCUS
SCREEN
G1 G2 G4
SG1 1KV
SG2 1KV
SG3 1KV
SG4 1KV
SG5 1.5KV
C114 CK472/ 500V
L105 10uH
R135 100/ 0.5
R136 100/ 0.5
R137 100/ 0.5
R131 220
R134 220K
D104 1N4148
VR105 22KB
VR106 22KB
G.CUTOFF
B.CUTOFF
C122 1/ 250
R141 560/0.5
C124 CK472/ 2KV
C123 CK472/ 1KV
P104
160 HE GND G1 110
P202
V-DY H-DY
P203
P201
P204
P205
Q203 KTC3198
R222 10/ 0.5
R223 10/ 0.5
R221 150/ 0.5
R224 30K
D202 1N4148
D203 1N4148
D204 1N4148
Q204 KTA1266
C217 47/ 35
C218 10/ 50
R228 4.7K/ 1W
C219 1/ 250
R226 4.7K
D205 5.1V
R227 1K
Q205 C2330
VR204 10KB
V.CENT
R225 1.2K
VR303 10KB
H.SIZE
R332 820
VR201 100K
V.HEIGHT
VR305 200KB
BRIGHT
R339 39K
VR306 10KB
CONTRAST
R348 2.7K
VR301 10KB
H.PHASE
T301 SDT-2201
C318 220/ 25
R323 1/ 0.5
Q303 C4769
R324 10
C319 104pF
D305 RU4DS
D306 RG4A
C320 472/1.6KV
C336 472/1.6KV
C321 333/ 400
L301 SLC-1403
R329 470/ 0.5
C322 CK471/ 500V
C316 100/ 35
C323 364/200V
L302 SCC-373
T302 DNF-FE2004
U302 LM358N
R325 330/ 5W
C325 103pF
R333 470
R335 22K
R326 8.2K
C327 47/ 160
C328 33/ 160
C324 47/ 35
R330 33K
R331 12K
Q304 KSD401
C326 272pF
R336 1.5K/ 0.5
R345 180K
R344 100K
R346 1K
Q305 KTC3198Y
R340 100K
C331 104pF
R347 10K
C335 10/ 50
D309 BA159
R341 1/ 1W
C332 1/ 250
R328 120K
R327 3K
R342 1/ 1W
D310 BA159
R343 1/ 1W
C334 1/ 250
R338 56K
D304 5.1V
D303 1N4148
C108 1/ 50
R107 1K

PARTS LIST

LOCATION NO.	PARTS NAME	SPECIFICATIONS
TRANSFORMERS, COILS		
T301	TRANS, DRIVE	SDT-2201
T302	FBT	2004
T501	LINE FILTER	SLF-2501
T502	TRANS, SWITCHING	SST-4001
L101	COIL, PEAKING	1mH
L105	COIL, PEAKING	10µH
L301	COIL, LINEARITY	SLC-1403
L302	COIL, H-SIZE	SCC-373
L501	COIL, CHOKE	SCC-300
L503	COIL, CHOKE	SCC-300
L504	COIL, CHOKE	SCC-300
INTEGRATED CIRCUITS		
U101	IC, LINEAR	CXA1044P
U201	IC, CMOS	GD4030B
U202	IC, LINEAR	TDA1675
U301	IC, LINEAR	LA7851
U302	IC, LINEAR(OP-AMP)	LM358N
U501	IC, HYBRID	STR58041
U502	IC, LINEAR	KIA7812
SEMI-CONDUCTORS		
Q102	TRANSISTOR	2N3904
Q103	TRANSISTOR	2N3904
Q104	TRANSISTOR	2N3904
Q105	TRANSISTOR	2N5551
Q106	TRANSISTOR	2N5551
Q107	TRANSISTOR	2N5551
Q108	TRANSISTOR	2SC1507
Q109	TRANSISTOR	2SC1507
Q110	TRANSISTOR	2SC1507
Q201	TRANSISTOR	KTC3198Y
Q203	TRANSISTOR	KTC3198Y
Q204	TRANSISTOR	KTA1266
Q205	TRANSISTOR	KSC2330
Q301	TRANSISTOR	KTC3198Y
Q302	TRANSISTOR	2SC2235
Q303	TRANSISTOR	2SC4769
Q304	TRANSISTOR	KSD401
Q305	TRANSISTOR	KTC3198Y
Q501	TRANSISTOR	KTC3198Y
Q502	TRANSISTOR	KTC3198Y
D102	DIODE, SWITCHING	IN4148
D103	DIODE, SWITCHING	IN4148
D104	DIODE, SWITCHING	IN4148
D201	DIODE, RECTIFIER	IN4002
D202	DIODE, SWITCHING	IN4148
D203	DIODE, SWITCHING	IN4148
D204	DIODE, SWITCHING	IN4148
D205	DIODE, ZENER	1/2W 5.1V
D206	DIODE, SWITCHING	IN4148
D303	DIODE, SWITCHING	IN4148
D304	DIODE, ZENER	1/2W 5.1V
D305	DIODE, FAST RECOV.	RU4DS
D306	DIODE, FAST RECOV.	RG4A
D309	DIODE, FAST RECOV.	BA159
D310	DIODE, FAST RECOV.	BA159
D501	DIODE, BRIDGE	RB-156
D502	DIODE, FAST RECOV.	BA159
D503	DIODE, FAST RECOV.	IN4935
D504	DIODE, FAST RECOV.	IN4935
D505	DIODE, FAST RECOV.	IN4935
D506	DIODE, FAST RECOV.	IN4935
D507	DIODE, FAST RECOV.	RU2B
D509	DIODE, FAST RECOV.	IN4935
D510	DIODE, FAST RECOV.	IN4935
RESISTORS		
TH501	POSISTOR	120V 8 ROM
TH502	THERMISTOR	8 OHM
VR101	VARIABLE RESISTOR	CET065C 1KB
VR102	VARIABLE RESISTOR	CET065C 1KB
VR103	VARIABLE RESISTOR	CET065C 1KB
VR104	VARIABLE RESISTOR	CET117 10KB
VR105	VARIABLE RESISTOR	CET117 10KB
VR106	VARIABLE RESISTOR	CET117 10KB
VR201	VARIABLE RESISTOR	CET92E 100KB
VR202	VARIABLE RESISTOR	CET065C 100KB
VR204	VARIABLE RESISTOR	CET92E 10KB
VR205	VARIABLE RESISTOR	CET065C 5KB
VR301	VARIABLE RESISTOR	CET92E 10KB
VR302	VARIABLE RESISTOR	CET065C 10KB
VR303	VARIABLE RESISTOR	CET92E 10KB
VR305	VARIABLE RESISTOR	CET92E 200KB
VR306	VARIABLE RESISTOR	CET92E 10KB
R104	RESISTOR, CARBON	1/4W 15K J
R105	RESISTOR, CARBON	1/4W 24K J
R106	RESISTOR, CARBON	1/4W 1K J
R107	RESISTOR, CARBON	1/4W 1K J
R110	RESISTOR, CARBON	1/4W 5.1K J
R111	RESISTOR, CARBON	1/4W 1K J
R112	RESISTOR, CARBON	1/4W 100 OHM J
R113	RESISTOR, CARBON	1/4W 100 OHM J
R114	RESISTOR, CARBON	1/4W 100 OHM J
R115	RESISTOR, CARBON	1/4W 1.8K J
R116	RESISTOR, CARBON	1/4W 4.7K J
R117	RESISTOR, CARBON	1/4W 1.2K J
R118	RESISTOR, CARBON	1/4W 1.2K J
R119	RESISTOR, CARBON	1/4W 1.2K J
R120	RESISTOR, CARBON	1/4W 150 OHM J
R121	RESISTOR, CARBON	1/4W 47 OHM J
R122	RESISTOR, CARBON	1/4W 150 OHM J
R123	RESISTOR, CARBON	1/4W 47 OHM J
R124	RESISTOR, CARBON	1/4W 150 OHM J
R125	RESISTOR, CARBON	1/4W 47 OHM J
R126	RESISTOR, MOF	3W 2.7K J
R127	RESISTOR, MOF	3W 2.7K J
R128	RESISTOR, MOF	3W 2.7K J
R129	RESISTOR, CARBON	1/4W 220 OHM J
R130	RESISTOR, CARBON	1/4W 220 OHM J
R131	RESISTOR, CARBON	1/4W 220 OHM J
R132	RESISTOR, CARBON	1/4W 220K J
R133	RESISTOR, CARBON	1/4W 220K J
R134	RESISTOR, CARBON	1/4W 220K J
R135	RESISTOR, CARBON	1/2W 100 OHM J
R136	RESISTOR, CARBON	1/2W 100 OHM J
R137	RESISTOR, CARBON	1/2W 100 OHM J
R141	RESISTOR, CARBON	1/2W 560 OHM J
R201	RESISTOR, CARBON	1/4W 27K J
R202	RESISTOR, CARBON	1/4W 4.7K J
R203	RESISTOR, CARBON	1/4W 2.7K J
R204	RESISTOR, CARBON	1/4W 150K J
R205	RESISTOR, CARBON	1/4W 2.2K J
R208	RESISTOR, CARBON	1/4W 7.5K J
R209	RESISTOR, CARBON	1/4W 10K J

PARTS LIST

LOCATION NO.	PARTS NAME	SPECIFICATIONS
R210	RESISTOR, CARBON	1/4W 200K J
R211	RESISTOR, CARBON	1/4W 470K J
R212	RESISTOR, CARBON	1/4W 56K J
R213	RESISTOR, CARBON	1/4W 2.2 OHM J
R214	RESISTOR, CARBON	1/4W 1.2K J
R215	RESISTOR, CARBON	1/4W 120 OHM J
R216	RESISTOR, CARBON	1/4W 2.4K J
R217	RESISTOR, CARBON	1/2W 820 OHM J
R218	RESISTOR, CARBON	1/2W 1.2 OHM J
R221	RESISTOR, CARBON	1/2W 150 OHM J
R222	RESISTOR, CARBON	1/2W 10 OHM J
R223	RESISTOR, CARBON	1/2W 10 OHM J
R224	RESISTOR, CARBON	1/4W 30K J
R225	RESISTOR, CARBON	1/4W 1.2K J
R226	RESISTOR, CARBON	1/4W 4.7K J
R227	RESISTOR, CARBON	1/4W 1K J
R228	RESISTOR, MOF	1/4W 4.7K J
R229	RESISTOR, CARBON	1/4W 4.7K J
R231	RESISTOR, CARBON	1/4W 4.7K J
R301	RESISTOR, CARBON	1/4W 27K J
R302	RESISTOR, CARBON	1/4W 4.7K J
R303	RESISTOR, CARBON	1/4W 4.7K J
R304	RESISTOR, CARBON	1/4W 2.7K J
R305	RESISTOR, CARBON	1/4W 150K J
R306	RESISTOR, CARBON	1/4W 1K J
R307	RESISTOR, CARBON	1/4W 2.2K J
R308	RESISTOR, CARBON	1/2W 22 OHM J
R309	RESISTOR, CARBON	1/4W 12K J
R310	RESISTOR, CARBON	1/4W 22K J
R311	RESISTOR, CARBON	1/4W 2.7K J
R312	RESISTOR, CARBON	1/4W 6.2K J
R313	RESISTOR, CARBON	1/4W 120K J
R314	RESISTOR, CARBON	1/4W 8.2K J
R315	RESISTOR, CARBON	1/4W 33K J
R316	RESISTOR, CARBON	1/4W 1K J
R317	RESISTOR, CARBON	1/4W 12K J
R318	RESISTOR, CARBON	1/4W 15K J
R319	RESISTOR, CARBON	1/4W 15K J
R320	RESISTOR, CARBON	1/4W 3.3K J
R321	RESISTOR, CARBON	1/4W 1K J
R322	RESISTOR, CARBON	1/2W 470 OHM J
R323	RESISTOR, CARBON	1/2W 1 OHM J
R324	RESISTOR, CARBON	1/4W 10 OHM J
R325	CEMENT	5W 330 OHM J
R326	RESISTOR, CARBON	1/4W 8.2K J
R327	RESISTOR, CARBON	1/4W 3K J
R328	RESISTOR, CARBON	1/4W 120K J
R329	RESISTOR, CARBON	1/2W 470 OHM J
R330	RESISTOR, CARBON	1/4W 33K J
R331	RESISTOR, CARBON	1/4W 12K J
R332	RESISTOR, CARBON	1/4W 820 OHM J
R333	RESISTOR, CARBON	1/4W 470 OHM J
R335	RESISTOR, CARBON	1/4W 22K J
R336	RESISTOR, CARBON	1/2W 1.5K J
R338	RESISTOR, CARBON	1/4W 56K J
R339	RESISTOR, CARBON	1/4W 39K J
R340	RESISTOR, CARBON	1/4W 100K J
R341	RESISTOR, MOF	1W 1 OHM J
R342	RESISTOR, MOF	1W 1 OHM J
R343	RESISTOR, MOF	1W 1 OHM J
R344	RESISTOR, CARBON	1/4W 100K J
R345	RESISTOR, CARBON	1/4W 180K J
R346	RESISTOR, CARBON	1/4W 1K J
R347	RESISTOR, CARBON	1/4W 10K J
R348	RESISTOR, CARBON	1/4W 2.7 K J
R349(D301)	RESISTOR, CARBON	1/4W 680 OHM J
R501	RESISTOR, CARBON	1/2W 270K J
R502	RESISTOR, CARBON	1/2W 270K J
R503	RESISTOR, CARBON	1/2W 470K J
R504	RESISTOR, MOF	2W 100K J
R505	RESISTOR, CARBON	1/2W 56 OHM J
R506	RESISTOR, CARBON	1/2W 56 OHM J
R507	RESISTOR, CARBON	1/2W 56 OHM J
R508	RESISTOR, MOF	1W 22 OHM J
R509	RESISTOR, CEMENT	2W 1 OHM J
R510	RESISTOR, MOF	1W 22 OHM J
R513	RESISTOR, MOF	2W 15K J
R516	RESISTOR, MOF	1W 1 OHM J
R518	RESISTOR, MOF	1W 1 OHM J
R519	RESISTOR, MOF	1/4W 27K J
R522	RESISTOR, CARBON	1/2W 270K J
R527	RESISTOR, MOF	2W 100K J

CAPACITORS

C101	CAPACITOR, ELT	0.47MF
C102	CAPACITOR, ELT	0.47MF
C103	CAPACITOR, ELT	0.47MF
C104	CAPACITOR, ELT	25V 100μF
C105	CAPACITOR, ELT	25V 22μF
C106	CAPACITOR, CERAMIC	50V 104pF
C107	CAPACITOR, ELT	50V 1μF
C108	CAPACITOR, ELT	50V 1μF
C109	CAPACITOR, CERAMIC	50V 471pF
C110	CAPACITOR, ELT	25V 22μF
C111	CAPACITOR, CERAMIC	50V 271pF
C112	CAPACITOR, CERAMIC	50V 271pF
C113	CAPACITOR, CERAMIC	50V 271pF
C114	CAPACITOR, CERAMIC	500V 472pF
C116	CAPACITOR, CERAMIC	500V 472pF
C117	CAPACITOR, ELT	160V 1μF
C118	CAPACITOR, ELT	160V 1μF
C119	CAPACITOR, ELT	160V 1μF
C120	CAPACITOR, ELT	160V 33μF
C122	CAPACITOR, ELT	250V 1μF
C123	CAPACITOR, CERAMIC	1KV 472pF
C124	CAPACITOR, CERAMIC	2KV 472pF
C201	CAPACITOR, ELT	16V 10μF
C202	CAPACITOR, MYLAR	50V 473pF J
C203	CAPACITOR, MYLAR	50V 103pF J
C205	CAPACITOR, MYLAR	50V 104pF J
C207	CAPACITOR, MYLAR	50V 224pF J
C208	CAPACITOR, ELT	35V 220μF
C209	CAPACITOR, MYLAR	50V 104pF J
C210	CAPACITOR, MYLAR	50V 104pF J
C211	CAPACITOR, MYLAR	50V 224pF J
C212	CAPACITOR, ELT	16V 47μF
C213	CAPACITOR, ELT	25V 2200μF
C217	CAPACITOR, ELT	35V 47μF
C218	CAPACITOR, ELT	50V 10μF
C219	CAPACITOR, ELT	250V 1μF
C220	CAPACITOR, MYLAR	50V 104pF J
C300	CAPACITOR, MYLAR	50V 102pF J
C301	CAPACITOR, ELT	16V 10μF
C302	CAPACITOR, MYLAR	50V 473pF J
C305	CAPACITOR, CERAMIC	50V 101pF
C306	CAPACITOR, ELT	25V 100μF
C307	CAPACITOR, MYLAR	50V 102pF J
C308	CAPACITOR, CERAMIC	50V 102pF J

PARTS LIST

LOCATION NO.	PARTS NAME	SPECIFICATIONS
C309	CAPACITOR, MYLAR	50V 682pF J
C310	CAPACITOR, ELT	50V 1μF
C311	CAPACITOR, ELT	50V 1μF
C312	CAPACITOR, MYLAR	50V 103pF J
C313	CAPACITOR, P. P.	100V 562pF J
C314	CAPACITOR, ELT	16V 4.7μF
C315	CAPACITOR, ELT	25V 220μF
C316	CAPACITOR, ELT	35V 100μF
C317	CAPACITOR, MYLAR	50V 473pF J
C318	CAPACITOR,ELT	25V 220μF
C319	CAPACITOR, MYLAR	50V 104pF J
C320	CAPACITOR, P. P.	1.6KV 472pF J
C321	CAPACITOR, P. P.	630V 333pF J
C322	CAPACITOR,CERAMIC	500V 471pF
C323	CAPACITOR, P. P.	200V 364pF J
C324	CAPACITOR,ELT	35V 47μF
C325	CAPACITOR, MYLAR	50V 103pF J
C326	CAPACITOR, MYLAR	50V 272pF J
C327	CAPACITOR, ELT	160V 47μF
C328	CAPACITOR, ELT	160V 33μF
C329	CAPACITOR, ELT	25V 100μF
C330	CAPACITOR, CERAMIC	50V 104pF
C331	CAPACITOR, MYLAR	50V 104pF J
C332	CAPACITOR, ELT	250V 1μF
C334	CAPACITOR, ELT	250V 1μF
C335	CAPACITOR, ELT	25V 10μF
C336	CAPACITOR, P. P.	1.6KV 472pF J
C501	CAPACITOR, X-CAP	250VAC 104pF K
C502	CAPACITOR, Y-CAP	250VAC 472pF
C503	CAPACITOR, Y-CAP	250VAC 472pF
C504	CAPACITOR, X-CAP	250VAC 104pF K
C505	CAPACITOR, ELT	200V 220μF
C506	CAPACITOR, P. P.	630V 683pF J
C508	CAPACITOR, MYLAR	50V 223pF J
C509	CAPACITOR, ELT	100V 10μF
C510	CAPACITOR, ELT	100V 10μF
C513	CAPACITOR,CERAMIC	1KV 331pF
C514	CAPACITOR, ELT	160V 100μF
C515	CAPACITOR, ELT	160V 100μF
C516	CAPACITOR,CERAMIC	500V 103pF
C521	CAPACITOR,CERAMIC	1KV 331pF
C522	CAPACITOR, ELT	35V 1000μF
C523	CAPACITOR, ELT	35V 2200μF
C524	CAPACITOR,CERAMIC	50KV 104pF
C525	CAPACITOR,CERAMIC	1KV 331pF
C526	CAPACITOR, ELT	25V 1000μF
C527	CAPACITOR, ELT	25V 2200μF
C530	CAPACITOR, ELT	200V 220μF

MISCELLANEOUS

SG1	SPARK GAP	1KV
SG2	SPARK GAP	1KV
SG3	SPARK GAP	1KV
SG4	SPARK GAP	1KV
SG5	SPARK GAP	1.5KV
F501	FUSE	250VAC 3A TIME-LAG
F501	FUSE HOLDER	FC51A
X101	CRT SOCKET	ISM(29ø)
P101	CONN. HEADER	LW1143-06P
P102	CONN. HEADER	LW0640-06P
P103	WIRE ASS'Y	6P(BH0640-CHW0640)
P104	WIRE ASS'Y	5P(BH0640-CHW0640)
P105	PIN BASE(1PIN)	2.36ø

LOCATION NO.	PARTS NAME	SPECIFICATIONS
P201	CONN. HEADER	LW0640-05P
P202	CONN. HEADER	DAPB-4P-W
P203	CONN. HEADER	DAPB-4P-W
P204	CONN. HEADER	LW0640-12P
P205	WAFER	3024-12CHPB
P501	CONN. HEADER	LWP1143-02P
P502	PIN BASE(1PIN)	2.36ø x 2
P503	CONN. ASS'Y	BL101
SIGNAL CABLE		SWA-2004A(CH1143-06P)
VR CABLE		SWA-1011A 12P(CHW0640-CHW0640)
POWER CORD		SWA-1012A(CHP1143-2P)
D.Y CONNECTOR		SWA-1013A(BL104)
DEGAUSSING COIL		SDC-1505A
EARTH WIRE		SWA-1505A
P.C.B		MAIN B/D
		SOCKET B/D
		CONTROL B/D

HAPP CONTROLS
Manufacturer of Electronic Controls
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