



SERVICE MANUAL

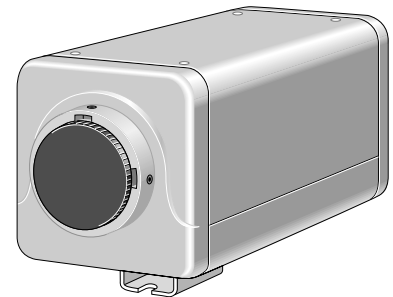
B/W CCD Camera

SPECIFICATIONS

Scanning system : CCIR standard (625 TV lines, 25 frames/sec.)
Interface : 2:1 interlace
Image device : 1/3 inch solid state image device CCD
Picture elements : 542 (Horizontal) x 584 (Vertical)
Effective picture elements : 512 (Horizontal) x 582 (Vertical)
Synchronizing system : Internal sync (INT), Line lock (LL) : manually switchable
Resolution : 400 TV lines horizontally, 400 TV lines vertically
Video output level : 1.0 Vp-p/75 Ω , composite
Video S/N ratio : More than 50 dB
Minimum required illumination : Approx. 0.05 lux with a F 1.2 lens,
 (incandescent lighting) approx. 0.07 lux with a F 1.4 lens
Backlight compensation : Manual ON/OFF switching, zone light measuring system
 (Active when using an auto-iris lens)
Iris function : Manual ON (EI)/OFF (AI) switching
High speed electronic shutter : 8 speeds, selectable by switch:
 (1/50, 1/120, 1/250, 1/500, 1/1000, 1/2000,
 1/4000, 1/10000 sec.)
Electronic iris range : 0.07 lux to 42,000 lux (F1.4, lens)
 0.05 lux to 30,000 lux (F1.2, lens)
Flange-back : 12.5 mm \pm 0.8 mm
AGC : Manual ON/OFF switching
Gamma correction : $\gamma = 0.45$
Lens mount : CS mount
Environmental conditions : Temperature: -10 $^{\circ}$ C ~ + 50 $^{\circ}$ C
 Humidity: less than 90 % (no condensation)
Power supply : 220 - 230 V AC \pm 10%, 50Hz
Power consumption : 4.0W (with auto iris lens)
 3.0W (without auto iris lens)
Weight : Approx. 800 g (without lens)

VCB-3440P

(Product Code : 117 074 24)
 (South East Asia)
 (Europe)



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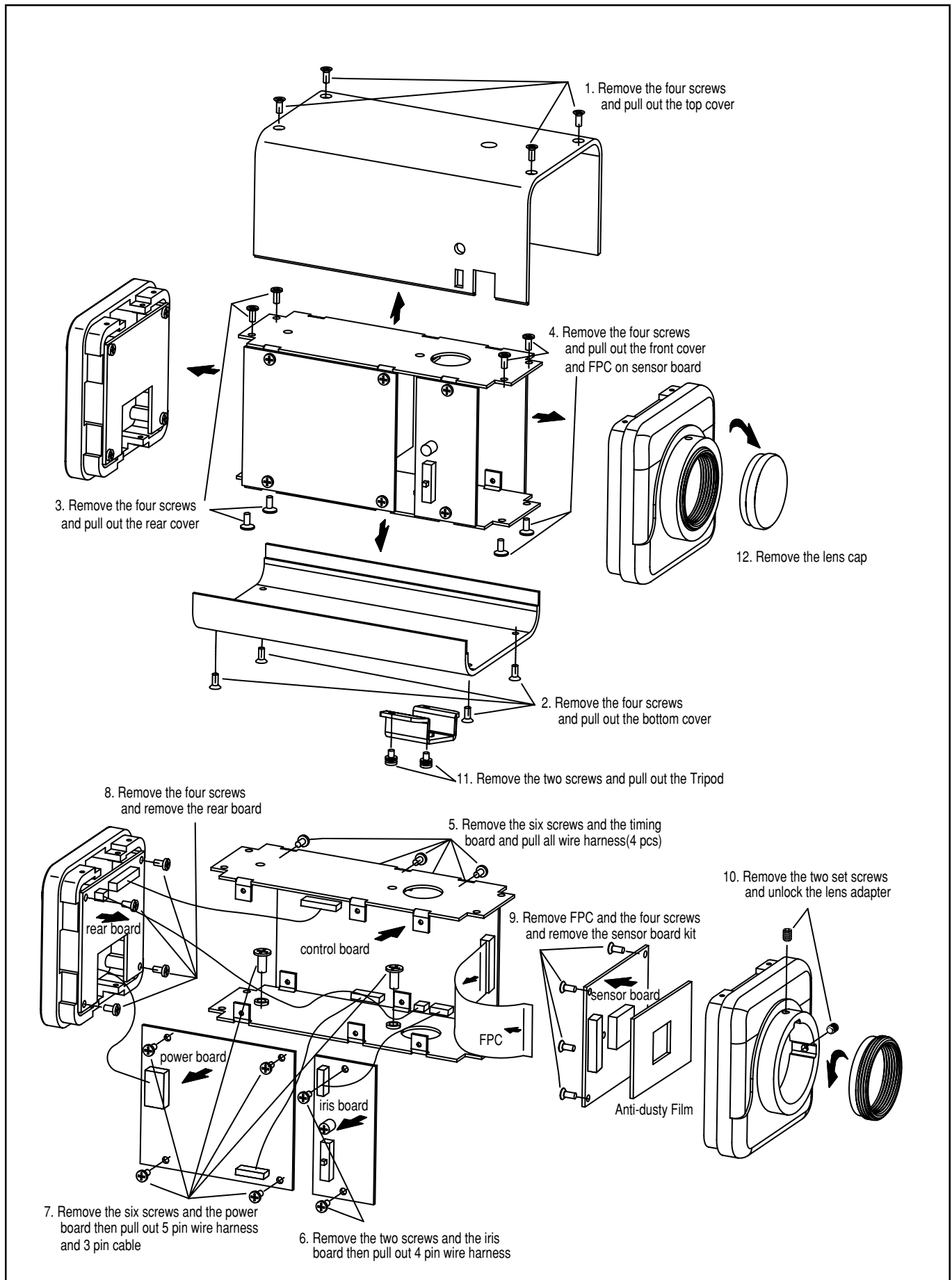
PRODUCT SAFETY NOTICE

The components designated by a symbol (\triangle) in this schematic diagram designates components whose value are of special significance to product safety. Should any component designated by a symbol need to be replaced, use only the part designated in the Parts List. Do not deviate from the resistance, wattage, and voltage ratings shown.

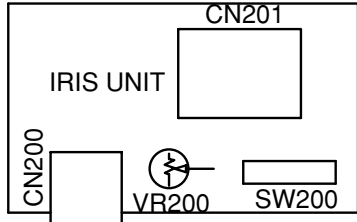
- NOTE : 1. Parts order must contain model number, part number, and description.
 2. Substitute parts may be supplied as the service parts.
 3. N. S. P. : Not available as service parts.

Design and specification are subject to change without notice.

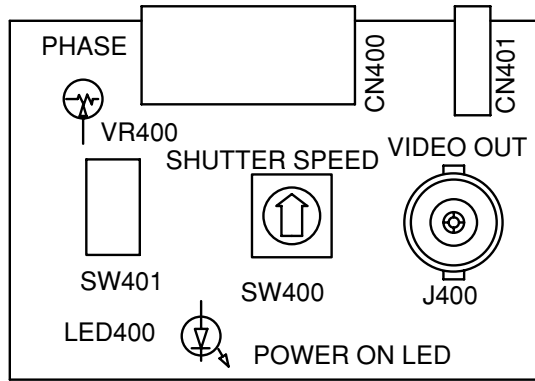
1. DISASSEMBLY



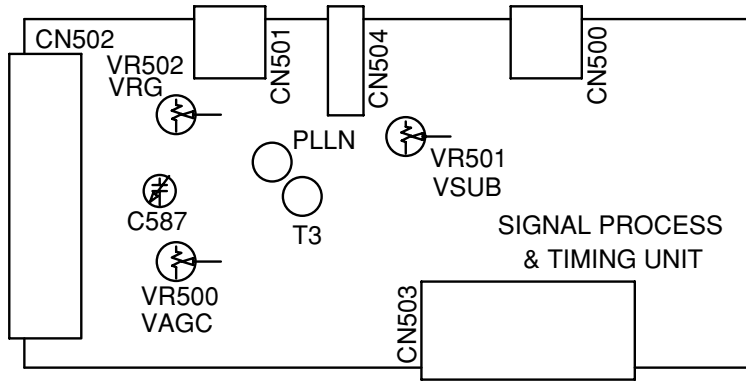
2. BOARD LOCATION



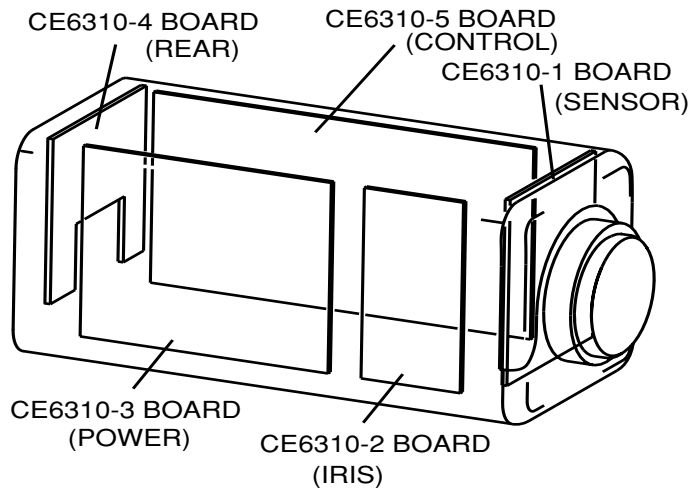
CE6310-2 BOARD



CE6310-4 BOARD



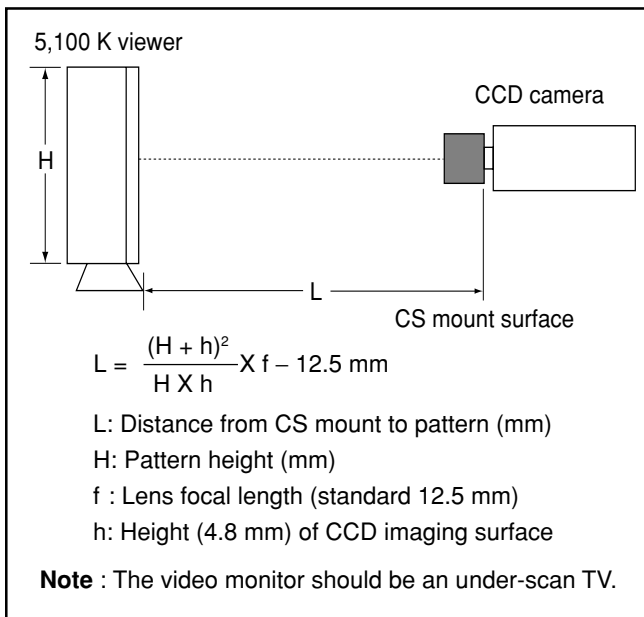
CE6310-5 BOARD



3. ADJUSTMENT

3-1. ADJUSTMENT PREPARATION

1. Use the 5,100K viewer for the subject.
2. Set the ITE gray scale chart II ($\gamma=0.45$) to the viewer.
3. Set the angle of adjustment control (VR) before starting adjustment at the center or temporary adjustment (nearly adjusted) unless specified.
4. Set the trigger signal of oscilloscope to VIDEO OUT, and apply H sync unless specified.
5. If no switch position is specified, the auto-iris lens switch position should be above (SW200). The other switches should be default (LL,AI, BLC OFF, AGC, SHUTTER → "0").
6. The VIDEO OUT connector (J400) connect to a video monitor terminated in 75 Ω input impedance.



3-2. VCO VOLTAGE ADJUSTMENT

Adjustment location: C587 (6310-5)

Measuring location: PLLN (6310-5)
J400 (VIDEO OUT, 6310-4)

Measuring equipment: Oscilloscope

Subject: No designation

Adjusting method:

1. Adjust the C587 so that the waveform width of PLLN is min.& stable (negative pulse) (pulse width < 250us).

3-3. VSUB & VRG VOLTAGE ADJUSTMENT

Adjustment location: VR501 (VSUB, 6310-5)

VR502 (VRG, 6310-5)

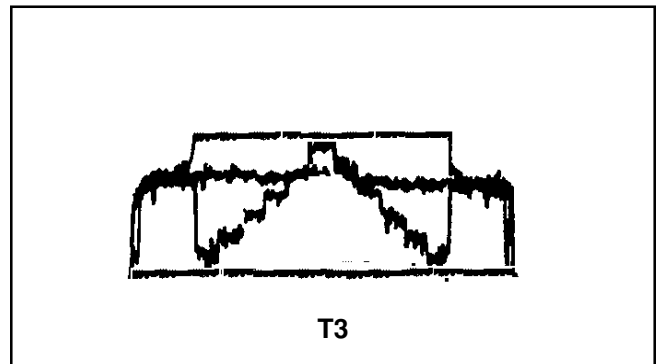
Measuring location: T3 (6310-5)
J400 (VIDEO OUT, 6310-4)

Measuring equipment: Oscilloscope

Subject: Gray scale chart ($\gamma=0.45$)

Adjusting method:

1. Display the gray scale chart on full screen.
2. Adjust the lens aperture so that the gray scale level is 4 levels.
3. Adjust the VR501(VSUB) so that the waveform of T3 is clear picture (uniformity).
4. Adjust the VR502(VRG) so that the waveform of T3 is max amplitude (uniformity).
5. Adjust the lens aperture to have full white clear picture.
6. Repeat item 2 ~ 5 until camera has clear picture (uniformity).



3-4. AGC LEVEL ADJUSTMENT (BLC OFF)

Adjustment location: VR500 (VAGC, 6310-5)

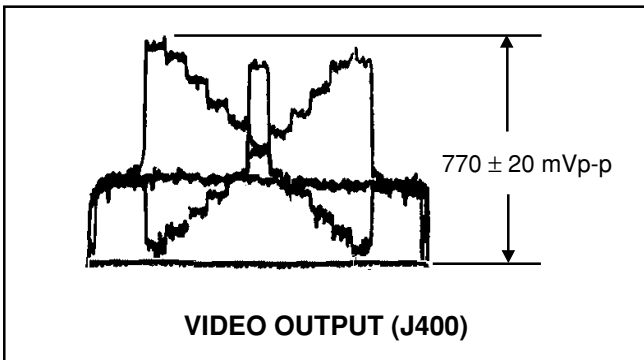
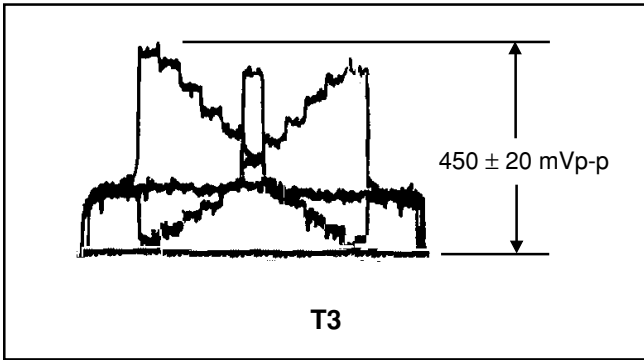
Measuring location: J400 (VIDEO OUT, 6310-4)
T3 (6310-5)

Measuring equipment: Oscilloscope

Subject: Gray scale chart ($\gamma=0.45$)

Adjusting method:

1. Display the gray scale chart on full screen.
2. Adjust the lens aperture so that the waveform level of T3 is 450 ± 20 mVp-p.
3. Adjust with VR500 so that the waveform level is 770 ± 20 mVp-p during video output (J400).



3-5. AUTO IRIS LEVEL ADJUSTMENT (BLC OFF)

Adjustment location: VR200 (6310-2)

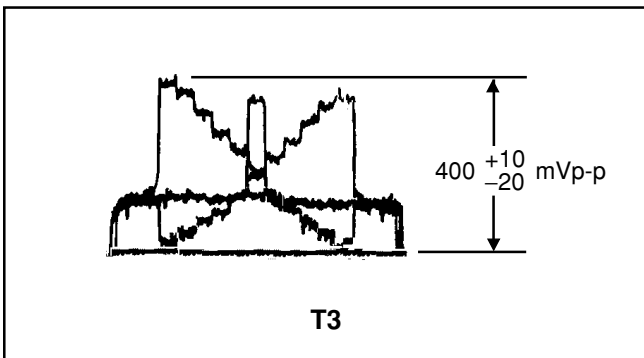
Measuring location: T3 (6310-5)

Measuring equipment: Oscilloscope

Subject: Gray scale chart ($\gamma=0.45$)

Adjusting method:

1. Attach the automatic iris lens, and then display the gray scale chart on full screen.
2. Adjust with VR200 so that the waveform level of T3 is 400^{+10}_{-20} mVp-p.
3. Set the BLC switch (SW401) to the "BLC" position.
4. Check video level saturation status (max. 2 steps saturation).
5. Return the BLC switch (SW401) to the "OFF" position.



3-6. LINE LOCK PHASE ADJUSTMENT

Adjustment location: VR400 (6310-4)

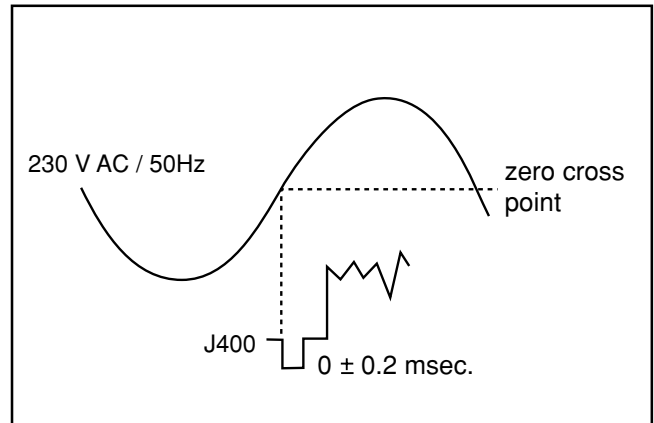
Measuring location: J400 (VIDEO OUT, 6310-4)
230V AC/GND terminals

Measuring equipment: Oscilloscope

Subject: No designation

Adjusting method:

1. Connect the camera to a 230V AC/50 Hz power source.
2. The HOT (signal) side and COLD (GND) side of the oscilloscope probe connect to the 230V AC terminals respectively.
3. Turn VR400 (LINE LOCK PHASE) to adjust the leading edge of the vertical sync signal and zero-cross shift of the 230V AC power supply to 0 ± 0.2 ms.



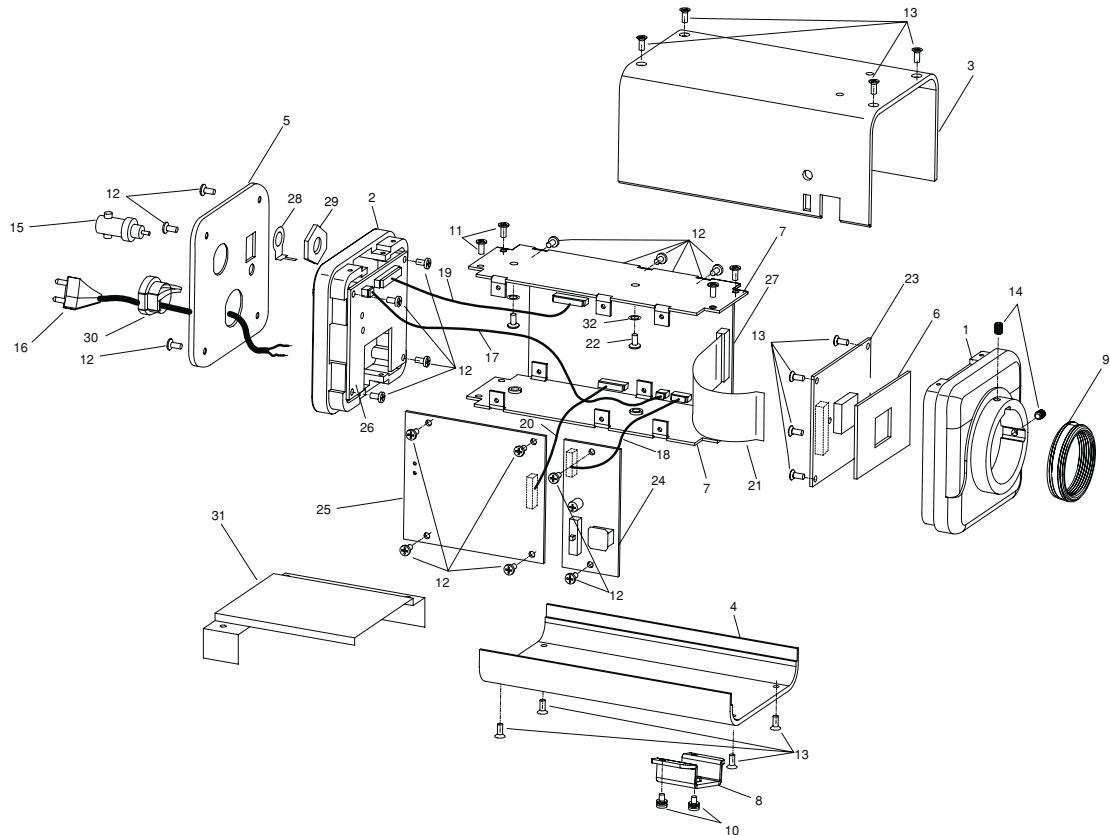
4. PARTS LIST

LOCATION	PARTS NO.	DESCRIPTION
ACCESSORIES & PACKING MATERIALS		
	645 051 5224	LENS CAP
	645 055 0492	3440P INSTRUCTION MANUAL
△	645 050 9728	IRIS PLUG,4P
	645 051 0496	AC TYPE PE CUSHION
	645 055 0508	3440P UNIT BOX
	645 051 0526	PE CAMERA BAG

LOCATION	PARTS NO.	DESCRIPTION
12	645 050 9292	PCB SCREW M2X4
13	645 050 9285	CABINET SCREW M2X4
14	645 050 9278	SET SCREW M3X4
15	645 051 0373	BNC SB-124B
16	△ 645 055 0416	POWER CORD (Included in the POWER PCB ASSY POWER BOARD)
17	645 051 0281	WIRE (N.S.P.)
18	645 051 0304	WIRE (N.S.P.)
19	645 051 0311	WIRE (N.S.P.)
20	645 051 0328	WIRE (N.S.P.)
21	645 051 0298	FLEXILE CABLE
22	645 050 9308	GND WIRE SCREW M3X4
23	645 052 0099	SENSOR PCB ASSY SENSOR BOARD
24	645 050 9117	IRIS PCB ASSY IRIS BOARD
25	645 055 0294	POWER PCB ASSY POWER BOARD
26	645 059 4670	REAR PCB ASSY REAR BOARD
27	645 052 0143	CONTROL PCB ASSY CONTROL BOARD
28	645 051 0380	BNC SB-124B GND
29	645 051 0397	BNC SB-124B NUT
30	645 055 0447	CORD BUSHING
31	645 055 0324	MYLAR
32	645 055 0355	M3 SPRING WASHER

CABINET & CHASSIS PARTS

1	645 050 9193	FRONT COVER
2	645 050 9209	REAR COVER
3	645 050 9216	TOP COVER
4	645 050 9186	BOTTOM COVER
5	645 055 0348	REAR PANEL
6	645 050 9162	ANTI DUSTY FILM
7	645 050 9223	SUPPORTER
8	645 050 9230	TRIPOD
9	645 050 9179	CS MOUNT RING
10	645 050 9254	TRIPOD SCREW M3X6
11	645 050 9322	SUPPORTER SCREW M2X4



ELECTRICAL PARTS

Note:

1. Materials of Capacitors and Resistors are abbreviated as follows ;

Resistors

MT-FILM Metallized Film Resistor
 MT-GLAZE Metallized Glaze Resistor
 OXIDE-MT Oxide Metallized Film Resistor

Capacitors

MT-POLYEST Metallized Polyester Capacitor
 MT-COMPO Metallized Composite Capacitor
 TA-SOLID Tantalum Solid Capacitor
 AL-SOLID Aluminum Solid Capacitor
 NP-ELECT Non-Polarized Electrolytic Capacitor
 OS-SOLID Aluminum Solid Capacitors with Organic Semiconductive Electrolytic Capacitor
 DL-ELECT Double Layered Electrolytic Capacitor

2. Tolerance of Capacitor (10pF over) and Resistor are noted with follow symboles.

F1% G2% J5% K10%
 M20% N30% Z+80% ~ -20%

3. Capacitors

U : μ F P : pF

4. Inductors

UH : μ H MH : mH

5. N.S.P. : Not available as service parts.

LOCATION	PARTS NO.	DESCRIPTION	LOCATION	PARTS NO.	DESCRIPTION
SENSOR PCB ASSY SENSOR BOARD			C216	645 051 0090	CERAMIC 0.1U Z 25V
	645 052 0099		C218	645 050 9476	CERAMIC 1U Z 25V (DIODES)
CN100	645 050 9735	(CONNECTOR) SMD CONNECTOR 16P,P1.0,180DEG. (N.S.P.)	D200	645 050 9544	DIODE 1SS355
C100	645 051 0090	(CAPACITORS) CERAMIC 0.1U Z 25V	D203	645 050 9544	DIODE 1SS355
C101	645 051 0182	CERAMIC 0.047U Z 25V	L200	645 050 9582	INDUCTOR 22UH J (SEMICONDUCTORS)
C102	645 051 0182	CERAMIC 0.047U Z 25V	Q201	645 050 9667	TR MMST2222A
C103	645 051 0090	CERAMIC 0.1U Z 25V	Q203	645 050 9667	TR MMST2222A (RESISTORS)
C116	645 051 0199	CERAMIC 4.7U Z 16V	R200	645 050 9766	CHIP RESISTOR 0 J
C117	645 051 0090	CERAMIC 0.1U Z 25V	R201	645 050 9766	CHIP RESISTOR 0 J
C118	645 051 0199	CERAMIC 4.7U Z 16V	R207	645 050 9988	CHIP RESISTOR 4.7K J
C119	645 051 0090	CERAMIC 0.1U Z 25V	R208	645 050 9926	CHIP RESISTOR 3.3K J
C122	645 051 0243	DIP ELECT 100U M 16V (INDUCTORS)	R209	645 050 9865	CHIP RESISTOR 2K J
L101	645 050 9575	INDUCTOR 47UH J	R211	645 050 9933	CHIP RESISTOR 33K J
L102	645 050 9575	INDUCTOR 47UH J (SEMICONDUCTOR)	R212	645 050 9544	DIODE 1SS355
Q100	645 050 9711	TR KTC3882 (RESISTORS)	R213	645 050 9759	CHIP RESISTOR 100 J
R100	645 050 9766	CHIP RESISTOR 0 J	R214	645 050 9834	CHIP RESISTOR 1M J
R101	645 050 9773	CHIP RESISTOR 1M J	R215	645 050 9742	CHIP RESISTOR 0 J
R102	645 050 9988	CHIP RESISTOR 4.7K J	R216	645 050 9759	CHIP RESISTOR 100 J
R103	645 050 9797	CHIP RESISTOR 100 J	R217	645 050 9742	CHIP RESISTOR 0 J
R104	645 050 9766	CHIP RESISTOR 0 J	R218	645 050 9742	CHIP RESISTOR 0 J
R105	645 050 9766	CHIP RESISTOR 0 J	R219	645 050 9742	CHIP RESISTOR 0 J
R106	645 050 9773	CHIP RESISTOR 1M J	R220	645 050 9742	CHIP RESISTOR 0 J
R119	645 050 9780	CHIP RESISTOR 10 J	R221	645 050 9742	CHIP RESISTOR 0 J
R121	645 050 9766	CHIP RESISTOR 0 J (MISCELLANEOUS)	R222	645 050 9803	CHIP RESISTOR 1K J
U100	645 059 4687	CCD MN39210AT	R235	645 050 9988	CHIP RESISTOR 4.7K J (SWITCH)
			SW200	645 051 0359	SLIDE SW 12P,00420693 (INTEGRATED CIRCUITS)
			U200	645 050 9353	IC NJM3414AM
			U201	645 050 9612	REGULATOR 78L05 (VARIABLE RESISTOR)
			VR200	645 050 9445	DIP VR 10K (JUMP)
			JUMP	645 051 0052	CHIP RESISTOR 0 J
IRIS PCB ASSY IRIS BOARD			POWER PCB ASSY POWER BOARD		
	645 050 9117			645 055 0294	
CN200	645 050 9490	(CONNECTOR) DIP CONNECTOR 4PINS (N.S.P.)	CN300	△ 645 055 0416	(CONNECTORS) POWER CORD AC230V (N.S.P.)
CN201	645 050 9728	SOCKET 4P,IRIS JACK (N.S.P.) (CAPACITORS)	CN301	645 050 9537	DIP CONNECTOR 4PINS (N.S.P.)
C200	645 051 0199	CERAMIC 4.7U Z 16V	C300	645 052 0303	(CAPACITORS) X2 CAP. 0.01U Z 275V
C202	645 051 0090	CERAMIC 0.1U Z 25V	C301	645 051 0236	DIP ELECT 1000U/25V
C203	645 050 9476	CERAMIC 1U Z 25V	C303	645 051 0274	DIP ELECT 470U/25V
C204	645 051 0229	TA-SOLID 1U M 35V	C304	645 051 0250	SMD ELECT 47U M 16V
C206	645 051 0199	CERAMIC 4.7U Z 16V	C305	645 051 0090	CERAMIC 0.1U Z 25V
C207	645 050 9476	CERAMIC 1U Z 25V	C309	645 051 0199	CERAMIC 4.7U Z 16V
C208	645 051 0212	TA-SOLID 10U M 10V	C310	645 051 0090	CERAMIC 0.1U Z 25V
C209	645 051 0090	CERAMIC 0.1U Z 25V	C311	645 051 0250	SMD ELECT 47U M 16V
C211	645 051 0090	CERAMIC 0.1U Z 25V			
C212	645 051 0175	CERAMIC 47P J 50V			
C213	645 051 0175	CERAMIC 47P J 50V			
C214	645 051 0175	CERAMIC 47P J 50V			
C215	645 050 9476	CERAMIC 1U Z 25V			

LOCATION	PARTS NO.	DESCRIPTION
C312	645 051 0090	CERAMIC 0.1U Z 25V
C313	645 051 0090	CERAMIC 0.1U Z 25V
C316	645 050 9476	CERAMIC 1U Z 25V
C317	645 051 0106	CERAMIC 0.01U Z 50V
C318	645 052 0297	TA-SOLID 0.22U K 35V
C319	645 052 0297	TA-SOLID 0.22U K 35V
(DIODES)		
D300	645 052 0181	DIODE BD104G
D304	645 050 9636	ZENER DIODE UDZ16B
(FUSE)		
F301	△ 645 055 0423	FUSE 250MA/250V
(INDUCTOR)		
L301	645 050 9605	INDUCTOR 22UH M
(SEMICONDUCTORS)		
Q300	645 050 9704	TR 2SD1733R
Q302	645 050 9667	TR MMST2222A
Q303	645 052 0235	TR MMST2907A
Q304	645 050 9667	TR MMST2222A
Q307	645 050 9667	TR MMST2222A
(RESISTORS)		
R301	645 050 9803	CHIP RESISTORS 1K J
R302	645 050 9810	CHIP RESISTORS 10K J
R303	645 050 9766	CHIP RESISTORS 0 J
R304	645 052 0259	CHIP RESISTORS 510 J
R307	645 050 9803	CHIP RESISTORS 1K J
R308	645 050 9810	CHIP RESISTORS 10K J
R309	645 050 9995	CHIP RESISTORS 47K J
R311	645 052 0266	CHIP RESISTORS 68K J
R312	645 050 9452	CHIP RESISTORS 3.3 J
R314	645 050 9766	CHIP RESISTORS 0 J
R315	645 052 0242	CHIP RESISTORS 12K J
R318	645 050 9827	CHIP RESISTORS 100K J
R320	645 051 0014	CHIP RESISTORS 6.8K J
R321	645 050 9797	CHIP RESISTORS 100 J
(TRANSFORMER)		
T300	645 055 0430	TRANSFORMER EI-41 AC230V
(REGULATOR)		
U300	645 050 9612	REGULATOR 78L05
(VARIABLE RESISTOR)		
VA300	645 052 0334	VARIATER DNR-07D471K

REAR PCB ASSY REAR BOARD

(CONNECTORS)		
CN400	645 050 9520	DIP CONNECTOR 12P,P1.25 (N.S.P.)
CN401	645 050 9506	DIP CONNECTOR 2P,P1.25 (N.S.P.)
(LED)		
LED400	645 050 9155	LED P3.0,RED
(RESISTORS)		
R400	645 051 0205	DIP RESISTOR 1.2K J 1/4W
R401	645 052 0259	CHIP RESISTOR 510 J
R402	645 050 9810	CHIP RESISTOR 10K J
(SWITCHES)		
SW400	645 051 0366	DIP ROTARY SW ERD210RS
SW401	645 052 0358	DIP SW 206004ES,4POLES

CONTROL PCB ASSY CONTROL BOARD

645 052 0143		
(CONNECTORS)		
CN500	645 050 9537	DIP CONNECTOR 4P,P2.0 (N.S.P.)
CN501	645 050 9490	DIP CONNECTOR 4P,P1.25 (N.S.P.)
CN502	645 050 9735	SMD CONNECTOR 16P,P1.0,180DEG. (N.S.P.)
CN503	645 050 9520	DIP CONNECTOR 12P,P1.25 (N.S.P.)
CN504	645 050 9506	DIP CONNECTOR 2P,P1.25 (N.S.P.)
(CAPACITORS)		
C500	645 051 0199	CERAMIC 4.7U Z 16V
C501	645 051 0090	CERAMIC 0.1U Z 25V
C503	645 051 0199	CERAMIC 4.7U Z 16V
C504	645 051 0199	CERAMIC 4.7U Z 16V
C506	645 051 0199	CERAMIC 4.7U Z 16V
C507	645 051 0199	CERAMIC 4.7U Z 16V
C508	645 051 0151	CERAMIC 330P J 50V
C509	645 051 0243	DIP ELECT 100U M 16V

LOCATION	PARTS NO.	DESCRIPTION
C510	645 051 0090	CERAMIC 0.1U Z 25V
C511	645 051 0199	CERAMIC 4.7U Z 16V
C512	645 051 0199	CERAMIC 4.7U Z 16V
C513	645 051 0090	CERAMIC 0.1U Z 25V
C515	645 050 9483	CERAMIC 2.2U Z 16V
C516	645 051 0199	CERAMIC 4.7U Z 16V
C517	645 051 0199	CERAMIC 4.7U Z 16V
C518	645 051 0090	CERAMIC 0.22U Z 16V
C520	645 051 0090	CERAMIC 0.1U Z 25V
C521	645 051 0090	CERAMIC 0.1U Z 25V
C522	645 051 0090	CERAMIC 0.1U Z 25V
C523	645 051 0137	CERAMIC 0.22U Z 16V
C524	645 051 0212	TA-SOLID 10U M 10V
C525	645 051 0090	CERAMIC 0.1U Z 25V
C526	645 051 0090	CERAMIC 0.1U Z 25V
C527	645 051 0090	CERAMIC 0.1U Z 25V
C529	645 050 9483	CERAMIC 2.2U Z 16V
C530	645 051 0090	CERAMIC 0.1U Z 25V
C531	645 051 0090	CERAMIC 0.1U Z 25V
C532	645 051 0120	CERAMIC 22P J 50V
C533	645 051 0212	TA-SOLID 10U M 10V
C534	645 052 0310	DIP ELECT 220U M 10V
C535	645 051 0168	CERAMIC 33P J 50V
C536	645 051 0168	CERAMIC 33P J 50V
C537	645 050 9476	CERAMIC 1U Z 25V
C538	645 051 0090	CERAMIC 0.1U Z 25V
C539	645 051 0090	CERAMIC 0.1U Z 25V
C540	645 051 0090	CERAMIC 0.1U Z 25V
C541	645 051 0212	TA-SOLID 10U M 10V
C542	645 051 0090	CERAMIC 0.1U Z 25V
C543	645 050 9483	CERAMIC 2.2U Z 16V
C547	645 051 0151	CERAMIC 330P J 50V
C548	645 051 0151	CERAMIC 330P J 50V
C549	645 050 9483	CERAMIC 2.2U Z 16V
C550	645 050 9476	CERAMIC 1U Z 25V
C551	645 050 9483	CERAMIC 2.2U Z 16V
C555	645 050 9483	CERAMIC 2.2U Z 16V
C557	645 051 0090	CERAMIC 0.1U Z 25V
C559	645 051 0090	CERAMIC 0.1U Z 25V
C561	645 051 0113	CERAMIC 100P J 50V
C562	645 051 0090	CERAMIC 0.1U Z 25V
C563	645 051 0144	CERAMIC 27P J 50V
C564	645 051 0168	CERAMIC 33P J 50V
C565	645 051 0090	CERAMIC 0.1U Z 25V
C567	645 050 9476	CERAMIC 1U Z 25V
C568	645 050 9469	CHIP RESISTOR 0 J
C569	645 051 0199	CERAMIC 4.7U Z 16V
C570	645 051 0199	CERAMIC 4.7U Z 16V
C571	645 051 0090	CERAMIC 0.1U Z 25V
C572	645 050 9476	CERAMIC 1U Z 25V
C573	645 051 0090	CERAMIC 0.1U Z 25V
C574	645 051 0090	CERAMIC 0.1U Z 25V
C575	645 051 0090	CERAMIC 0.1U Z 25V
C576	645 051 0090	CERAMIC 0.1U Z 25V
C577	645 051 0090	CERAMIC 0.1U Z 25V
C578	645 051 0090	CERAMIC 0.1U Z 25V
C579	645 051 0090	CERAMIC 0.1U Z 25V
C580	645 051 0090	CERAMIC 0.1U Z 25V
C581	645 051 0090	CERAMIC 0.1U Z 25V
C582	645 051 0090	CERAMIC 0.1U Z 25V
C583	645 051 0090	CERAMIC 0.1U Z 25V
C586	645 050 9469	CHIP RESISTOR 0 J
C587	645 052 0280	CERAMIC TRIM CAP. TZC3P200A110
C589	645 050 9476	CERAMIC 1U Z 25V
C590	645 051 0090	CERAMIC 0.1U Z 25V
C591	645 051 0199	CERAMIC 4.7U Z 16V
C593	645 052 0310	DIP ELECT 220U M 10V
C594	645 051 0090	CERAMIC 0.1U Z 25V
C598	645 050 9483	CERAMIC 2.2U Z 16V
C599	645 050 9483	CERAMIC 2.2U Z 16V
C600	645 051 0106	CERAMIC 0.01U Z 50V
C602	645 051 0199	CERAMIC 4.7U Z 16V
C603	645 051 0199	CERAMIC 4.7U Z 16V
C605	645 051 0199	CERAMIC 4.7U Z 16V
C606	645 051 0199	CERAMIC 4.7U Z 16V
C607	645 051 0199	CERAMIC 4.7U Z 16V
C611	645 050 9476	CERAMIC 1U Z 25V
C613	645 051 0151	CERAMIC 330P J 50V


LOCATION	PARTS NO.	DESCRIPTION	LOCATION	PARTS NO.	DESCRIPTION
C614	645 051 0199	CERAMIC 4.7U Z 16V	R544	645 050 9803	CHIP RESISTOR 1K J
C615	645 050 9483	CERAMIC 2.2U Z 16V	R545	645 050 9773	CHIP RESISTOR 1M J
C616	645 051 0199	CERAMIC 4.7U Z 16V	R550	645 050 9995	CHIP RESISTOR 47K J
C618	645 051 0090	CERAMIC 0.1U Z 25V	R551	645 050 9810	CHIP RESISTOR 10K J
C620	645 051 0090	CERAMIC 0.1U Z 25V	R554	645 050 9766	CHIP RESISTOR 0 J
D503	645 050 9544	DIODE 1SS355	R555	645 050 9810	CHIP RESISTOR 10K J
D504	645 050 9636	ZENER DIODE UDZ16B	R557	645 050 9803	CHIP RESISTOR 1K J
D505	645 050 9643	ZENER DIODE UDZ5.6B	R558	645 050 9810	CHIP RESISTOR 4.7 J
D506	645 052 0198	VER IABLE CAP. DIODE 1SV215	R559	645 050 9773	CHIP RESISTOR 1M J
D507	645 052 0198	VER IABLE CAP. DIODE 1SV215	R560	645 050 9797	CHIP RESISTOR 100 J
D508	645 052 0204	LED SML-310VT	R561	645 050 9766	CHIP RESISTOR 0 J
D509	645 050 9544	DIODE 1SS355	R562	645 050 9964	CHIP RESISTOR 4.7 J
D510	645 050 9568	DIODE RB706F-40	R564	645 050 9995	CHIP RESISTOR 47K J
D511	645 050 9544	DIODE 1SS355	R565	645 050 9773	CHIP RESISTOR 1M J
D512	645 050 9544	DIODE 1SS355	R566	645 051 0038	CHIP RESISTOR 820 J
D513	645 050 9650	ZENER DIODE UDZ8.2B	R569	645 050 9827	CHIP RESISTOR 100K J
D515	645 050 9568	DIODE RB706F-40	R570	645 050 9827	CHIP RESISTOR 100K J
L501	645 050 9575	INDUCTOR 47UH J	R571	645 050 9827	CHIP RESISTOR 100K J
L502	645 050 9575	INDUCTOR 47UH J	R572	645 050 9827	CHIP RESISTOR 100K J
L503	645 050 9575	INDUCTOR 47UH J	R573	645 050 9827	CHIP RESISTOR 100K J
L504	645 050 9599	INDUCTOR 10UH J	R574	645 050 9827	CHIP RESISTOR 100K J
L505	645 052 0228	INDUCTOR 8.2UH J	R575	645 050 9827	CHIP RESISTOR 100K J
L506	645 050 9575	INDUCTOR 47UH J	R577	645 050 9810	CHIP RESISTOR 10K J
L507	645 050 9599	INDUCTOR 10UH J	R587	645 050 9803	CHIP RESISTOR 1K J
L508	645 050 9575	INDUCTOR 47UH J	R588	645 050 9766	CHIP RESISTOR 0 J
L509	645 050 9575	INDUCTOR 47UH J	R589	645 050 9810	CHIP RESISTOR 10K J
L510	645 050 9575	INDUCTOR 47UH J	R591	645 051 0007	CHIP RESISTOR 5.6K J
L511	645 050 9582	INDUCTOR 22UH J	R592	645 050 9827	CHIP RESISTOR 100K J
L512	645 050 9599	INDUCTOR 10UH J	R594	645 050 9766	CHIP RESISTOR 0 J
Q500	645 050 9681	TR 2SD1664R	R596	645 050 9766	CHIP RESISTOR 0 J
Q502	645 050 9766	CHIP RESISTOR 0 J	R597	645 050 9964	CHIP RESISTOR 4.7 J
Q504	645 050 9698	TR 2SC4617R	R598	645 050 9766	CHIP RESISTOR 0 J
Q506	645 050 9667	TR MMST2222A	R607	645 050 9988	CHIP RESISTOR 4.7K J
Q507	645 050 9674	TR IMZ1A	R610	645 051 0021	CHIP RESISTOR 75 J
Q508	645 050 9667	TR MMST2222A	R611	645 050 9766	CHIP RESISTOR 0 J
Q509	645 050 9667	TR MMST2222A	R612	645 050 9766	CHIP RESISTOR 0 J
R501	645 051 0069	CHIP RESISTOR 10 J	R613	645 050 9964	CHIP RESISTOR 4.7 J
R502	645 051 0076	CHIP RESISTOR 12 J	R614	645 050 9964	CHIP RESISTOR 4.7 J
R503	645 050 9971	CHIP RESISTOR 470 J	R615	645 050 9766	CHIP RESISTOR 0 J
R506	645 050 9810	CHIP RESISTOR 10K J	R620	645 051 0021	CHIP RESISTOR 75 J
R507	645 050 9810	CHIP RESISTOR 10K J	R621	645 050 9919	CHIP RESISTOR 330 J
R508	645 050 9889	CHIP RESISTOR 2.2K J	R625	645 050 9919	CHIP RESISTOR 330 J
R509	645 050 9902	CHIP RESISTOR 300 J	R626	645 050 9872	CHIP RESISTOR 220 J
R510	645 050 9766	CHIP RESISTOR 0 J	R628	645 050 9810	CHIP RESISTOR 10K J
R512	645 051 0083	CHIP RESISTOR 3.16K F	R629	645 050 9827	CHIP RESISTOR 100K J
R513	645 059 4694	CHIP RESISTOR 1.8K J	R631	645 050 9766	CHIP RESISTOR 0 J
R514	645 051 0083	CHIP RESISTOR 3.16K F	U501	645 050 9414	IC SN104280PT
R515	645 054 8611	CHIP RESISTOR 56K J	U502	645 050 9407	IC UPD65630GA-Y38
R516	645 050 9766	CHIP RESISTOR 0 J	U503	645 050 9339	IC MN3112SA
R517	645 050 9810	CHIP RESISTOR 10K J	U505	645 050 9612	REGULATOR 78L05
R518	645 050 9841	CHIP RESISTOR 1.2K J	U507	645 052 0327	COMPARATOR TA75S393F
R520	645 050 9766	CHIP RESISTOR 0 J	U509	645 050 9360	IC 7S04F
R521	645 050 9810	CHIP RESISTOR 10K J	U510	645 050 9360	IC 7S04F
R522	645 050 9957	CHIP RESISTOR 39K J	U511	645 050 9391	IC BU4S81
R523	645 050 9940	CHIP RESISTOR 36K J	U512	645 050 9391	IC BU4S81
R524	645 050 9858	CHIP RESISTOR 15K J	U513	645 050 9391	IC BU4S81
R525	645 051 0045	CHIP RESISTOR 9.1K J	U514	645 050 9391	IC BU4S81
R526	645 050 9889	CHIP RESISTOR 2.2K J	U515	645 050 9346	IC 74HC4053D
R527	645 050 9797	CHIP RESISTOR 100 J	U516	645 050 9346	IC 74HC4053D
R528	645 051 0083	CHIP RESISTOR 3.16K F	U517	645 050 9346	IC 74HC4053D
R529	645 050 9766	CHIP RESISTOR 0 J	U518	645 050 9384	IC BU4S66
R530	645 050 9803	CHIP RESISTOR 1K J	VR500	645 050 9421	VR 20K
R531	645 051 0083	CHIP RESISTOR 3.16K F	VR501	645 050 9421	VR 20K
R532	645 050 9896	CHIP RESISTOR 24K J	X500	645 050 9629	CRYSTAL 18.9375MHZ
R533	645 050 9933	CHIP RESISTOR 33K J			
R534	645 051 0014	CHIP RESISTOR 6.8K J			
R535	645 051 0007	CHIP RESISTOR 5.6K J			
R537	645 050 9964	CHIP RESISTOR 4.7 J			
R538	645 050 9919	CHIP RESISTOR 330 J			
R539	645 050 9773	CHIP RESISTOR 1M J			
R540	645 050 9797	CHIP RESISTOR 100 J			
R541	645 050 9810	CHIP RESISTOR 10K J			
R542	645 050 9810	CHIP RESISTOR 10K J			
R543	645 050 9810	CHIP RESISTOR 10K J			

CIRCUIT DIAGRAMS & PRINTED WIRING BOARDS

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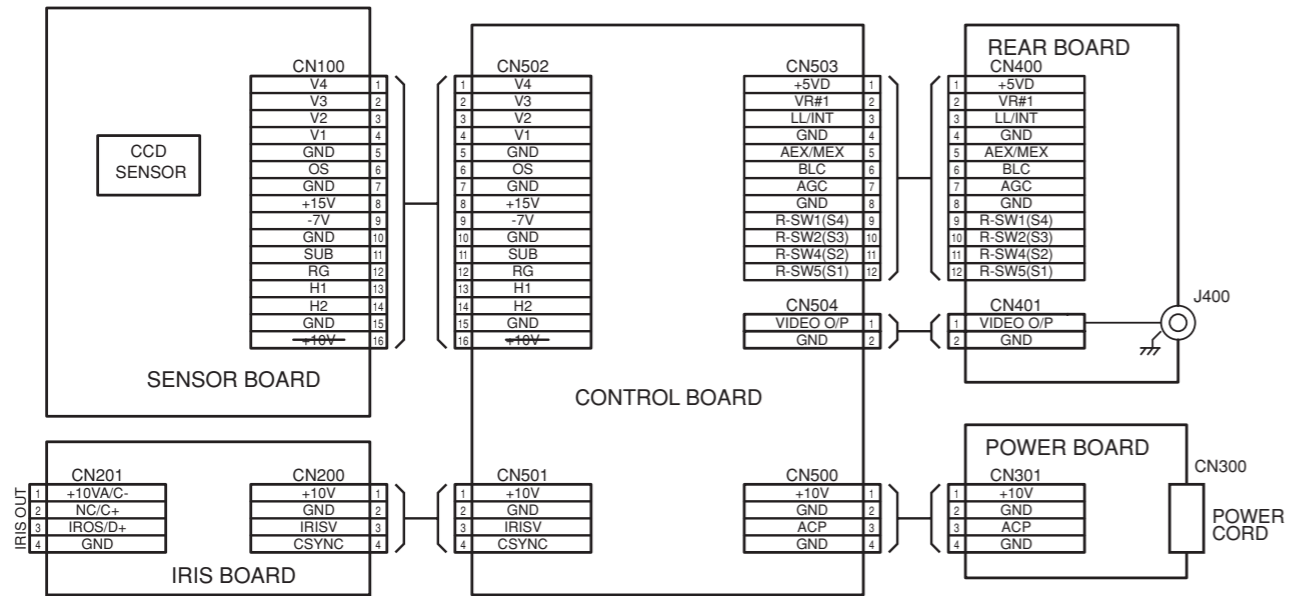
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PRODUCT SAFETY NOTICE

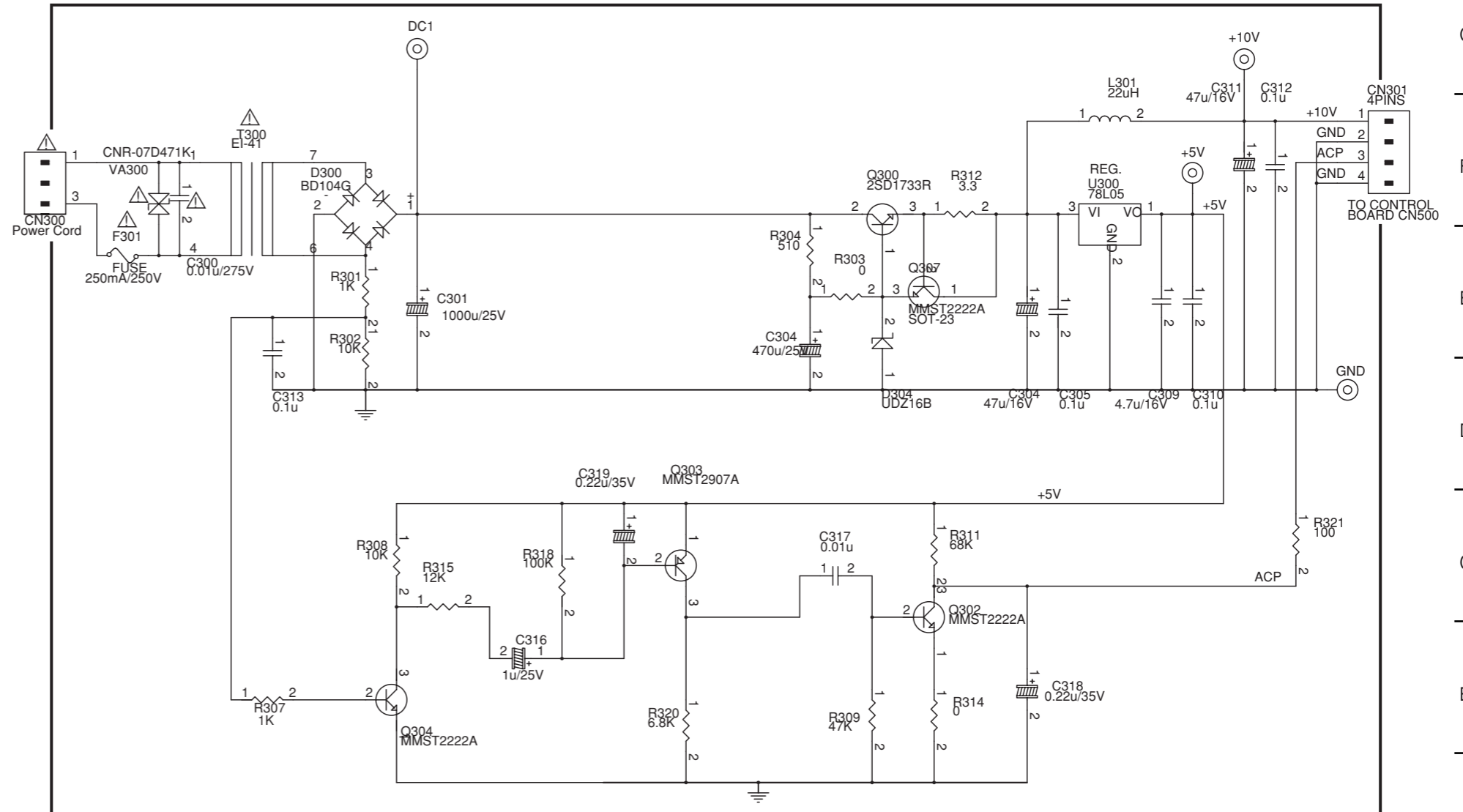
THE COMPONENTS DESIGNATED BY A SYMBOL () IN THIS SCHEMATIC DIAGRAM DESIGNATES COMPONENTS WHOSE VALUE ARE OF SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. SHOULD ANY COMPONENT DESIGNATED BY A SYMBOL NEED TO BE REPLACED, USE ONLY THE PART DESIGNATED IN THE PARTS LIST. DO NOT DEVIATE FROM THE RESISTANCE, WATTAGE AND VOLTAGE RATINGS SHOWN.

CIRCUIT DIAGRAMS

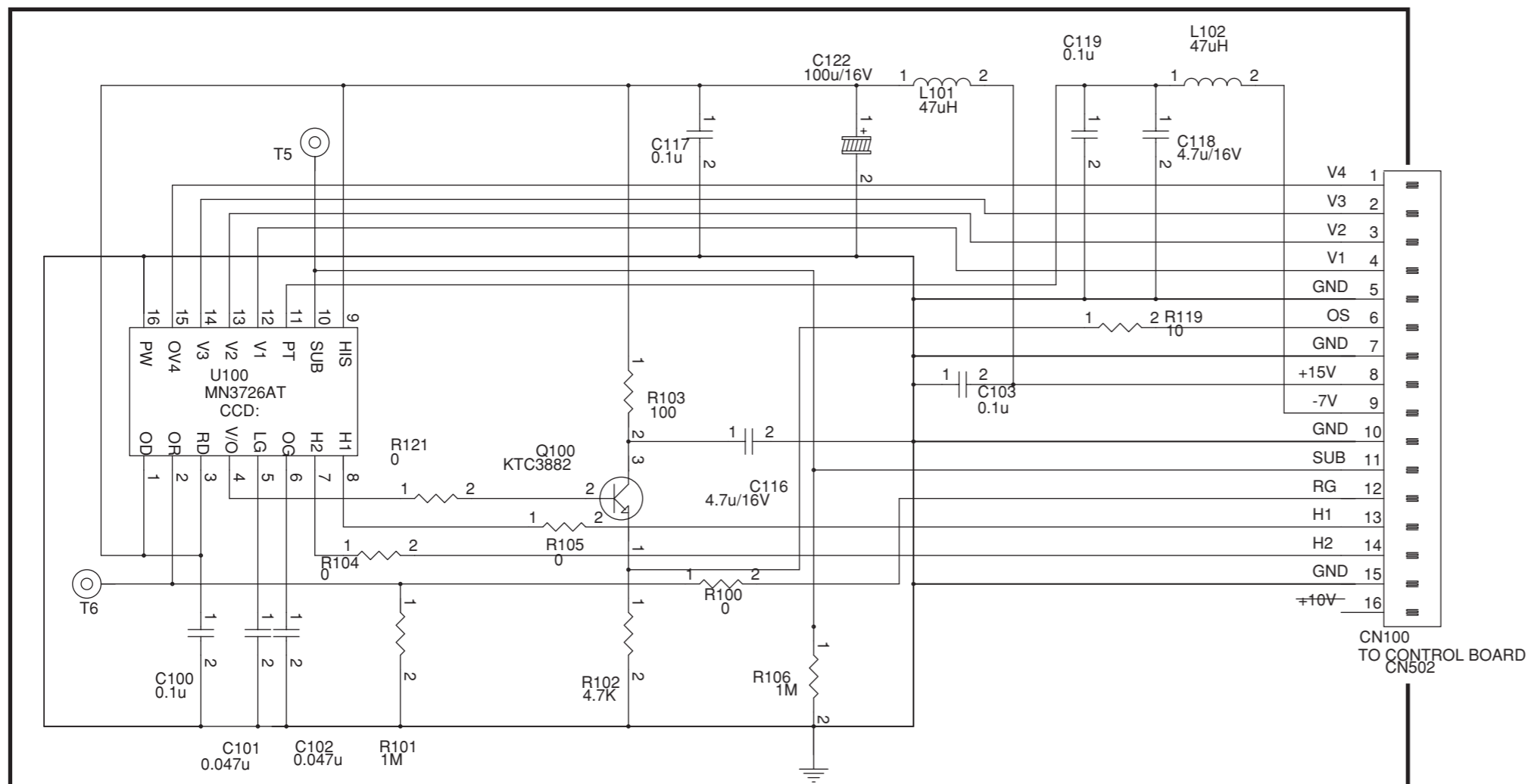
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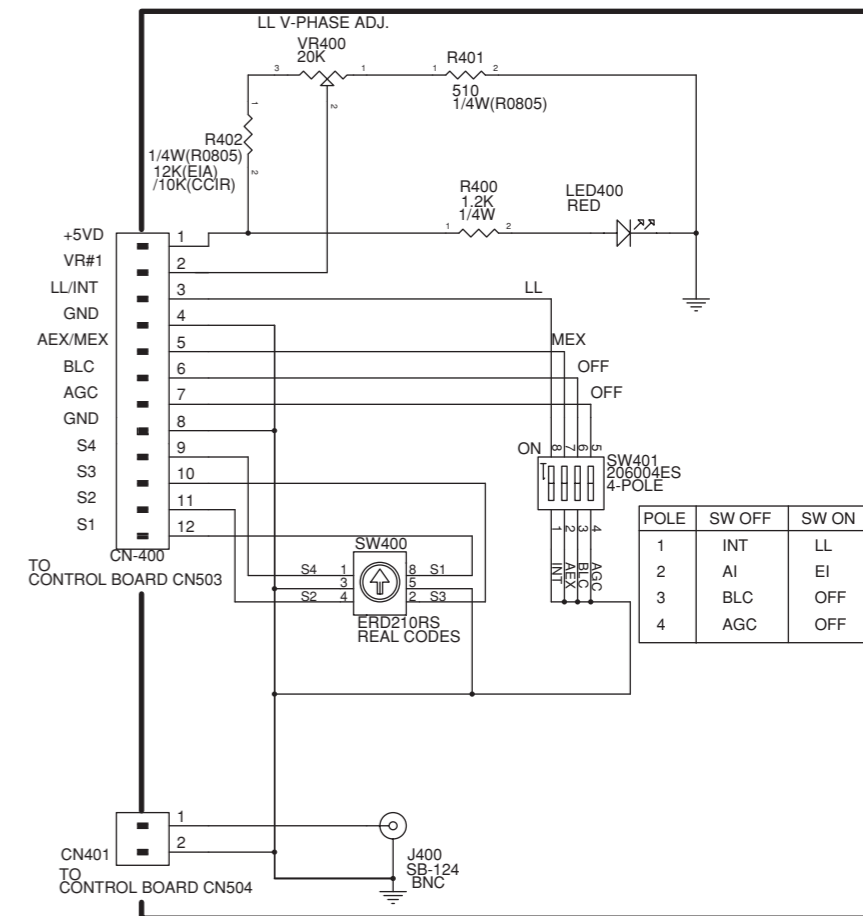
POWER BOARD



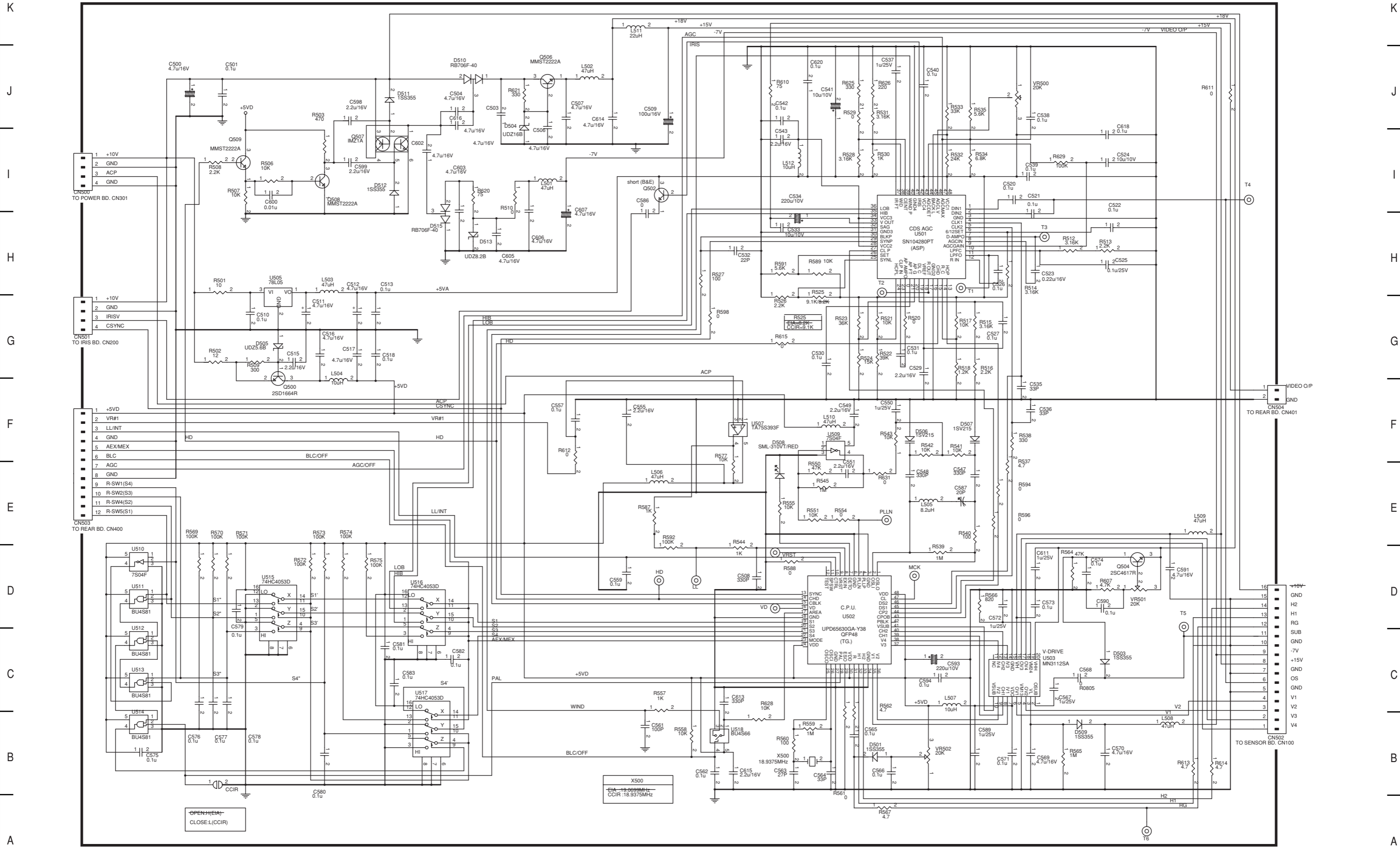
SENSOR BOARD



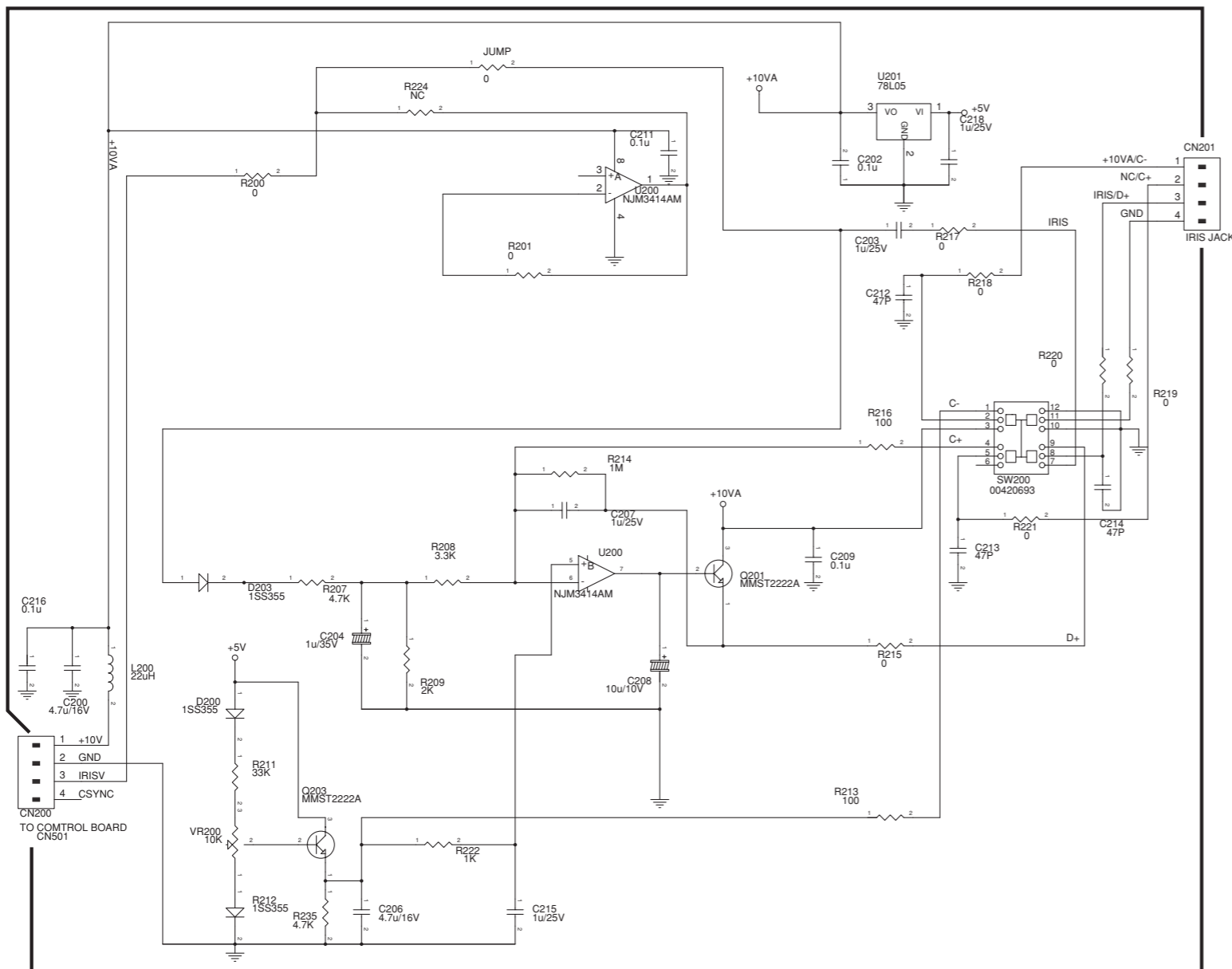
REAR BOARD



CONTROL BOARD



IRIS BOARD



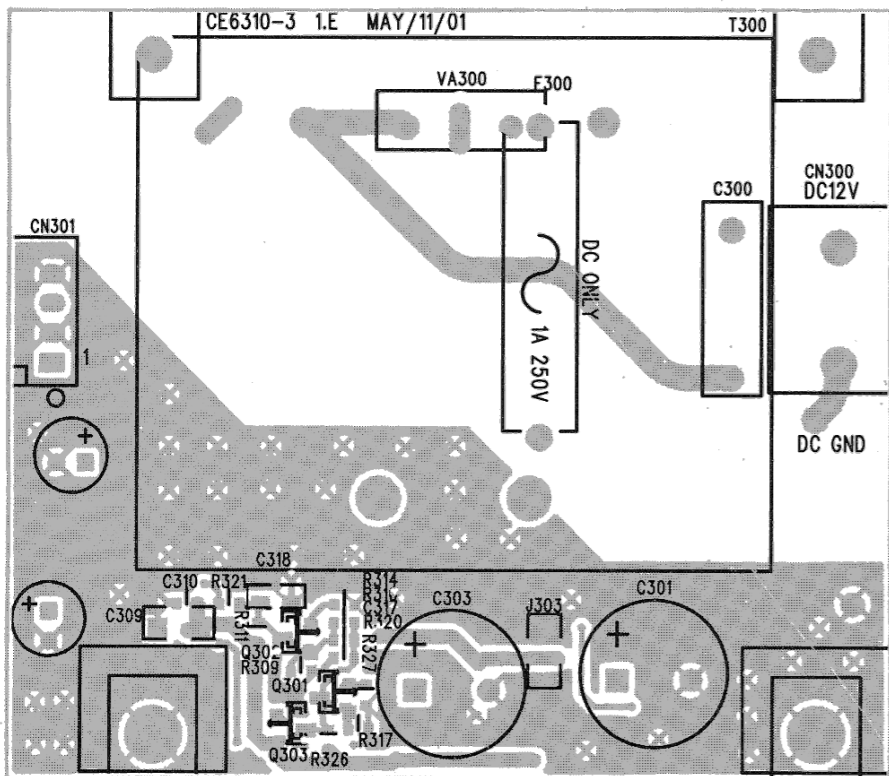
CIRCUIT WAVEFORMS

TEST POINT LOCATION	WAVEFORM	TEST POINT LOCATION	WAVEFORM
Test point T5 Shutter =1/50sec 1V/div 5ms/div		Test point T5 Shutter =1/1000sec 1V/div 5ms/div	
Test point T5 Shutter =1/120sec 1V/div 5ms/div		Test point T5 Shutter =1/2000sec 1V/div 5ms/div	
Test point T5 Shutter =1/250sec 1V/div 5ms/div		Test point T5 Shutter =1/4000sec 1V/div 5ms/div	
Test point T5 Shutter =1/500sec 1V/div 5ms/div		Test point T5 Shutter =1/10000sec 1V/div 5ms/div	

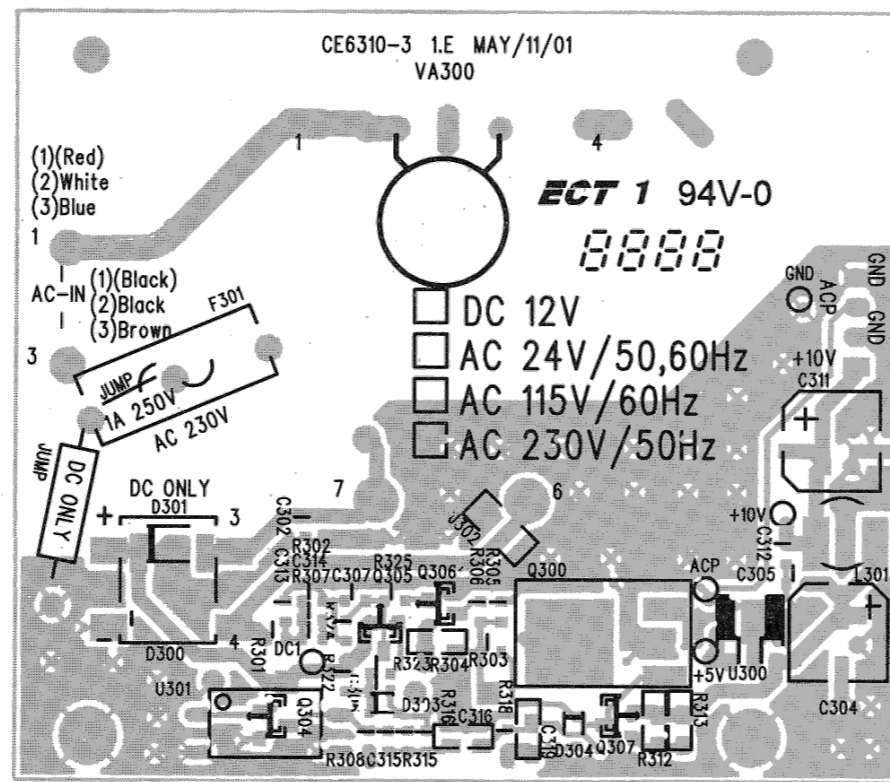
WF-VCB3440P

PRINTED WIRING BOARDS (P.W.B.)

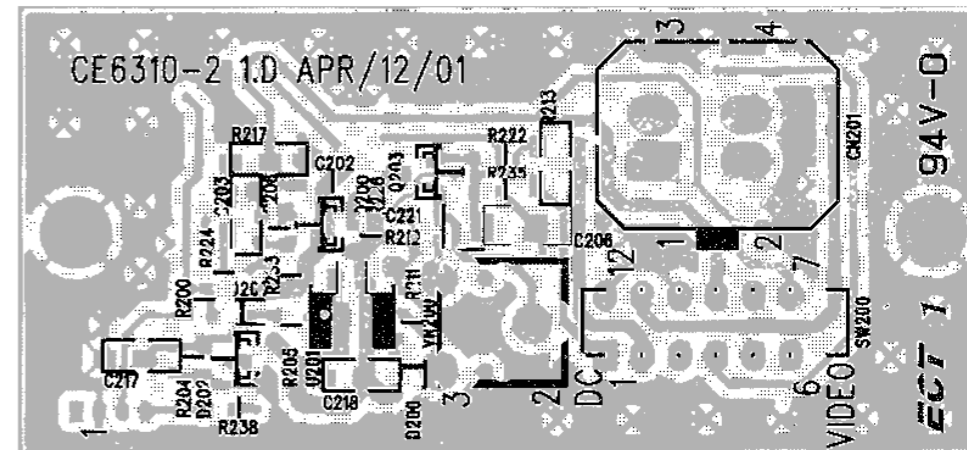
POWER P.W.B. (SIDE A)



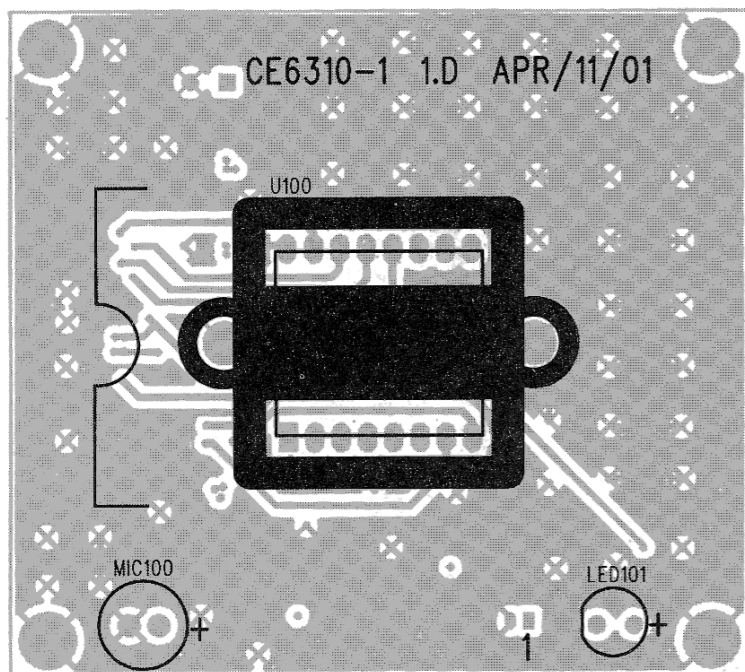
POWER P.W.B. (SIDE B)



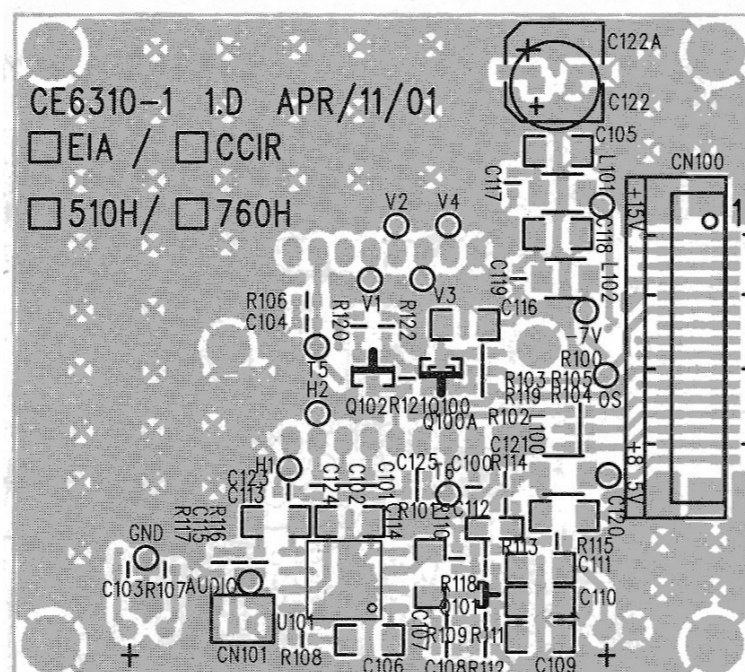
IRIS P.W.B. (SIDE A)



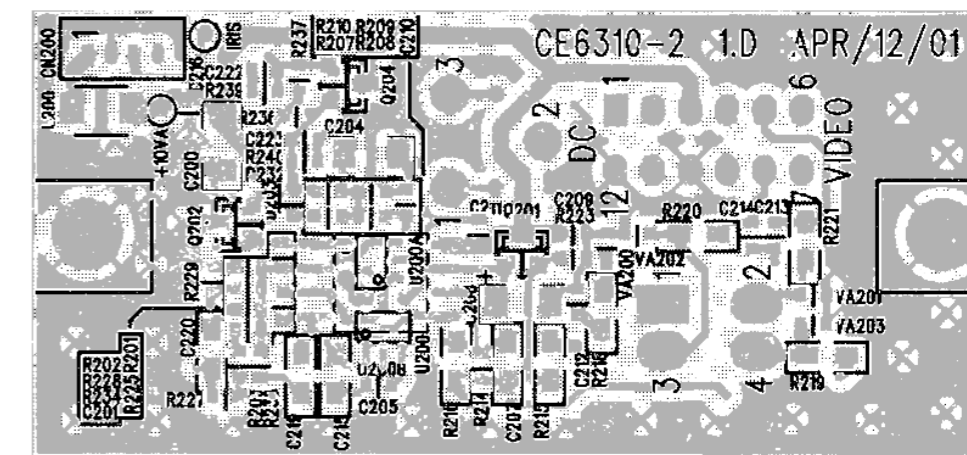
SENSOR P.W.B. (SIDE A)



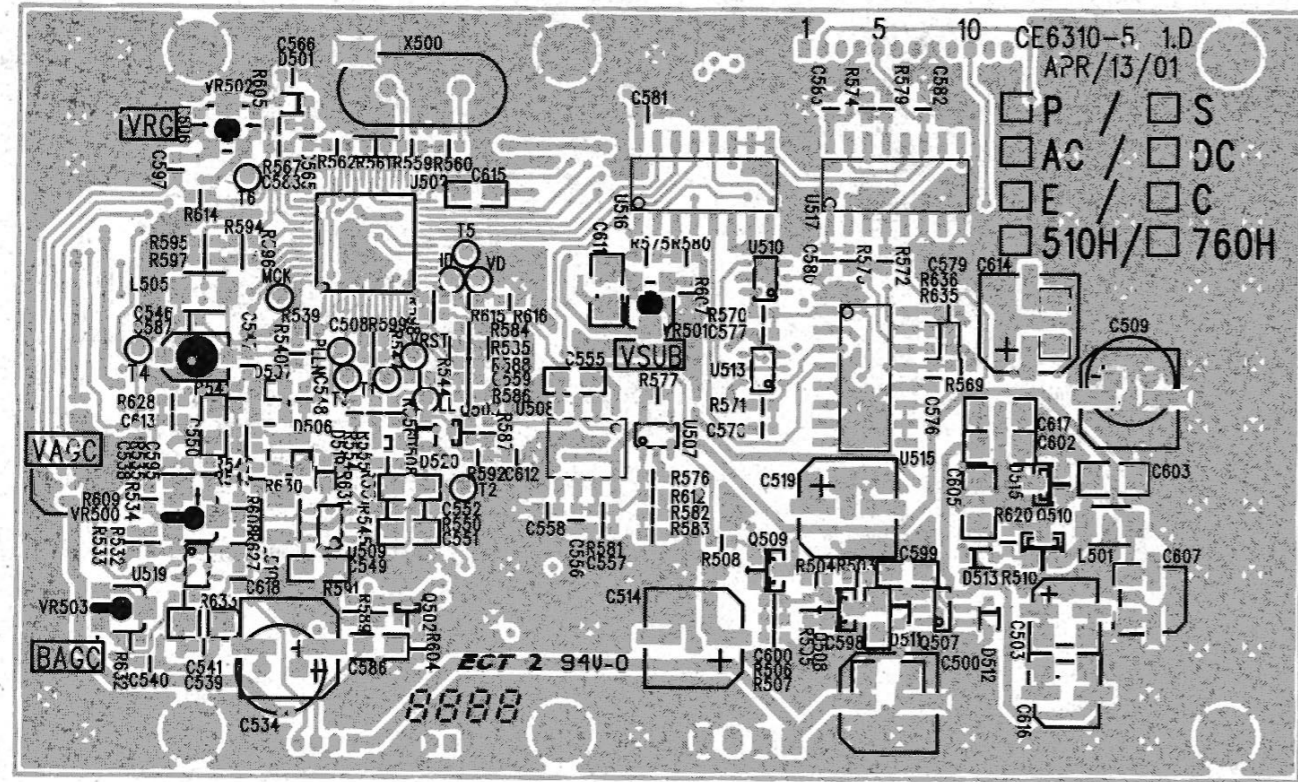
SENSOR P.W.B. (SIDE B)



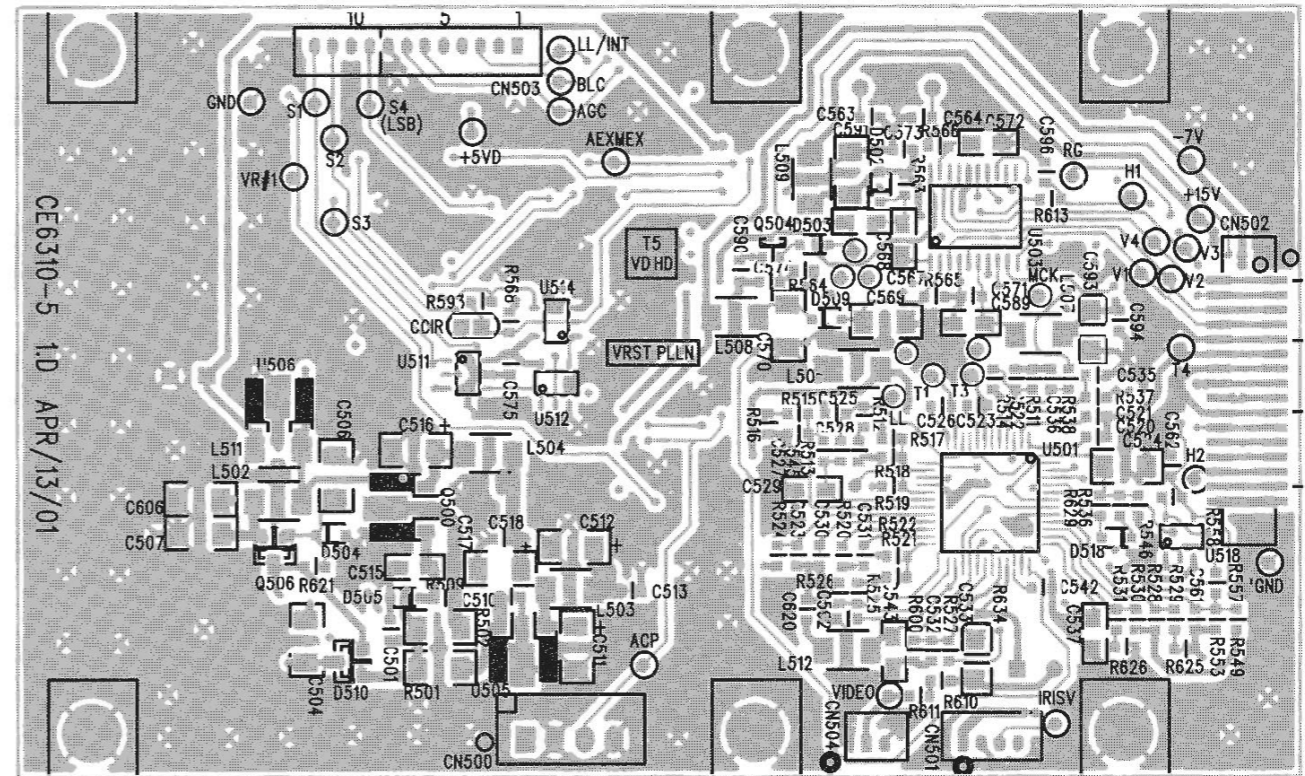
IRIS P.W.B. (SIDE B)



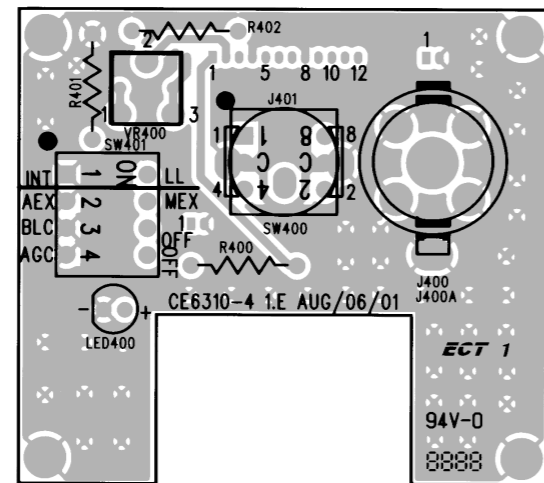
CONTROL P.W.B. (SIDE A)



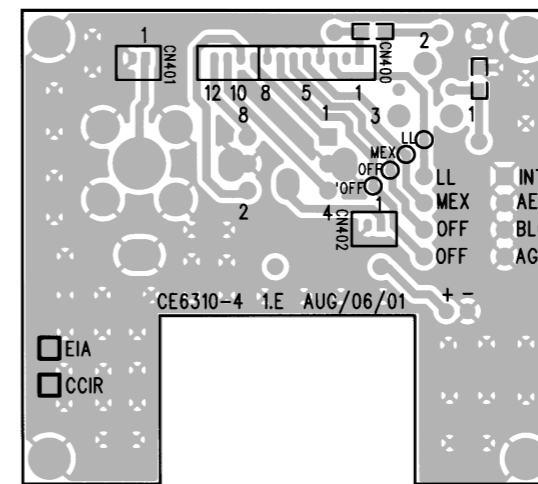
CONTROL P.W.B. (SIDE B)



REAR P.W.B. (SIDE A)



REAR P.W.B. (SIDE B)





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Osaka, Japan