



SERVICE AND OPERATION MANUAL

MTG-1902EN OPEN FRAME S/VGA COLOR MONITOR

19" : 49 - 1337 - VP2

VISION PRO
HAPP CONTROLS

Information in this publication current as of Oct, 2003.
Information subject to change as display technology advance.
This publication produced by TOVIS Engineering Division.

This monitor has been designed and manufactured to deliver high performance video. For continued peak Performance use safe operation, only high quality TOVIS replacement parts or their exact specified Equivalent When servicing.

SAFETY PRECAUTIONS AND WARNINGS

Service Warning

This display contains HIGH VOLTAGE capable of delivering LETHAL quantities of energy. Service should only be attempted by trained personnel familiar with the potential dangers inherent with voltage equipment.

Safety Related Component Warning

Certain components used in TOVIS color monitors are critical for safe operation of the display. These parts Number are marked by (Δ) in the parts list and on the schematic diagram it is essential that these Safety critical components be replaced only with exactly specified components to prevent the Possibility of excessive X-radiation emission, electrical shock, fire, or premature component failure.

Modifying the original design without written approval from TOVIS is expressly forbidden, will void the original Parts and labor warranty, and may result in creating a hazardous situation.

X-Radiation Warning

COMPONENTS WHICH MAY AFFECT POTENTIAL EXCESS EMISSION OF X-RADIATION IN THE HORIZONTAL DEFLECTION AND HIGH VOLTAGE CIRCUITS (INCLUDING THE PICTURE TUBE) ARE TO BE USE ONLY TYPE AND RATING OF REPLACEMENT COMPONENT AS SHOWN IN THE PARTS LIST.

1. The only potential source of X-radiation emission is the picture tube. When the high voltage and horizontal deflection circuits are operating correctly there is no possibility of excess X-radiation emission. NEVER attempt to modify these circuits.
2. Periodically check the high voltage with a reliably calibrated meter for values not in excess of manufacture recommendations. See High Voltage Shut-down Circuit, page 4, for further details.

CRT Warning

All picture tubes used in TOVIS monitors are equipped with an integral implosion protection system. The picture Tube is, however, a highly evacuated component whose outside surfaces are subject to strong external forces. Care must be exercised so as not to bump or scratch the tube during installation or servicing as this may cause the tube to implode resulting in possible personal injury and property damage. Shatter-proof goggles must be worn by Individuals while handling the CRT or installing the display in the cabinet. Do not handle The CRT by the neck.

1. Always ensure the high voltage at the anode cap is fully discharged prior to handling or service.
2. Replace picture tube only with same type and number.

Product Safety and Service Guidelines

1. Service should be performed only after reading all the warnings and precautions in this manual and as Labeled on the CRT and chassis.
2. Where a short circuit has occurred, replace all components that indicate evidence of overheating or poor Connection on all plastic connectors.
3. Inspect wiring for frayed leads and damaged insulation when service is required, observe original lead Dress is followed as from the factory, especially in the high voltage circuitry area.
4. All protective devices must be reinstalled per original design.

PERFORMANCE AND OPERATING DATA

1. Power Supply

Power Input: 90VAC ~ 264VAC, 60/50Hz
 Fuse Rating: 250V, 50T 3.15A
 Power Consumption: 120W Max

2. Signal Input

Video Input: Analog, Positive Signal (0.7V p-p)
 Horizontal Sync: TTL Level, Positive
 or Negative Pulse
 Horizontal Scan: 30KHz ~ 38KHz
 Vertical Input: TTL Level, Positive or Negative Pulse
 Vertical Scan: 50Hz ~ 160Hz
 Resolution-Mode

Hf	Vf	Resolution	H Range	V range
31KHz	70Hz	720x400	+/-1KHz	50~160Hz
31KHz	60Hz	640x480		
38KHz	60Hz	800x600		

3. Picture Tube

Size: 19"
 Dot Pitch: 0.82mm
 Phosphor: P22

4. Leakage Current

To chassis ground, at 220VAC, 50Hz (Line/Neut in common)
 - 0.195mA Maximum

5. High Pot

Line/Neut in common to secondary/chassis,
 1500VAC 60Hz for 1 second
 - 2.0mA Maximum, No Breakdown

6. Non-Linearity

Using a vertical and horizontal symmetrical cross hatch pattern to equation for non-linearity will be
 Non-linearity (%) = ((largest grid minus the smallest grid)
 Divided by (largest grid plus the
 Smallest grid)) times 100.
 - 8% Maximum

7. Temperature

Operating: 10° ~ 50°C
 Storage: -10°C ~ 75°C

Humidity: 10% ~ 90%(Non-condensing)

8. Power Save Mode

Shall be initiated by holding the Vertical Sync input Low (0.5V) and shall reduce the power to less than 20 Watts.

9. Degaussing

Automatic at power-up and software via control Switch "SEL"

10. Regulation (Static)

The horizontal and vertical size will change less than 2mm for a 25% white level abrupt luminance change.

11. Display Stability for Temperature

The temperature is cycled from 25°C to 0°C, and from 25°C to 50°C the video size and centering drift will not exceed 5mm horizontally or 4mm vertically.
 (Measured after a 20 min. warm-up period at 25°C)

12. Monitor Test Specifications

Parameter	Nominal	Specification
H/V (0BÅ Beam Current)	24.5KV	+/-500V
G2	400V DC	+/-10V
Brightness	0.35Ft	+/-0.15Ft
Contrast (15% Window Box)	60.0Ft	+/-5Ft
White Balance (9300)	X: 0.281 Y: 0.311	+/-0.015 +/-0.015
White Balance (6500)	X: 0.313 Y: 0.329	+/-0.015 +/-0.015

Test Mode: VGA 640x 480(Fh: 31KHz, Fv: 60Hz)
 Signal: BSG-170 (BARO)

13. WARRANTY

Manufacturer warranty 2 years parts and labor.
 (Except on C.R.T)

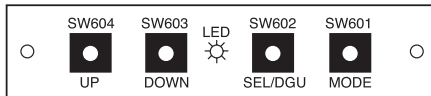
USER ADJUSTABLE CONTROLS

There are four switches on the control panel. Adjustable controls allow the best display status for individual preferences

Key Function

- ① **MODE**
MODE - Call the Main-Menu OSD.
- ② **SEL/DEGAUSS**
SEL - Select the function (sub-Menu OSD) on the Main- Menu OSD.
DEGAUSS - Do degaussing in state that the OSD isn't displayed.
- ③ **DOWN/UP**
When the Main - Menu is displayed, can search each function using these keys.
When the Sub - Menu is displayed (after select the function), can change each state of the screen using these keys.

O.S.D Control Sub-P.C.B



O.S.D CONTROL METHOD

1) Control items.

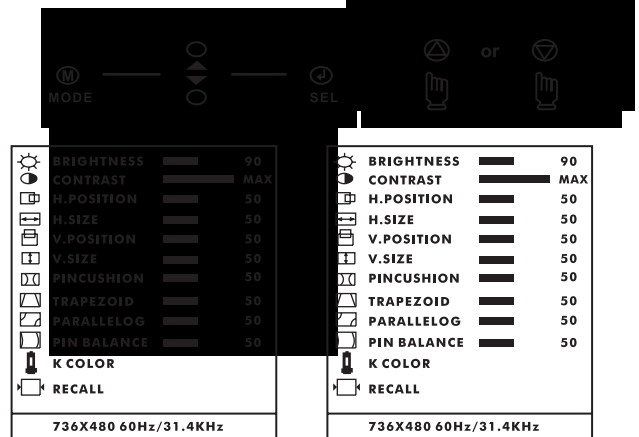
Location	Adjustment Method	Function
SUB PCB	OSD Control	Brightness
		Contrast
		HorizontalPosition
		Horizontal-Size
		Vertical Position
		Vertical-Size
		Pincushion
		Trapezoid
		Parallelog
		Pin balance
		Parallelogram
MAIN PCB	VR Control, VR502, VR501, FBT	Sub-Bright
		H.V Adjustment
		H-Sub Size
		Focus and Screen

O.S.D Controls

: User's control.

A. BRIGHTNESS ADJUSTMENT

- 1) Press the "MODE" key then Main-Menu OSD come out as below Figure.
- 2) Search "BRIGHTNESS" sub-menu using "UP/DOWN" key on the Main-Menu OSD.
- 3) Select the "BRIGHTNESS" by pressing "SEL" key. Then The "BRIGHTNESS" OSD color changes from yellow to red.
- 4) Search "BRIGHTNESS" sub-menu using "UP/DOWN" key on the Main-Menu OSD.
- 5) Select the "BRIGHTNESS" by pressing "SEL" key. Then The "BRIGHTNESS" OSD color changes fromBlue to red.
- 6) Adjust Brightness as much as you want using "UP/DOWN" key.
- 7) After finish the Brightness adjust, Press the "MODE" key then the "BRIGHTNESS" OSD color changes from red to blue and changed brightness value saved automatically.
- 8) If you want to adjust other function (sub-menu), Search your wanting sub-menu like "CONTRAST" using "UP/DOWN" key then adjusts as same way as above (4) and 5).
- 9) Press the "MODE" key then the OSD adjustment then the C

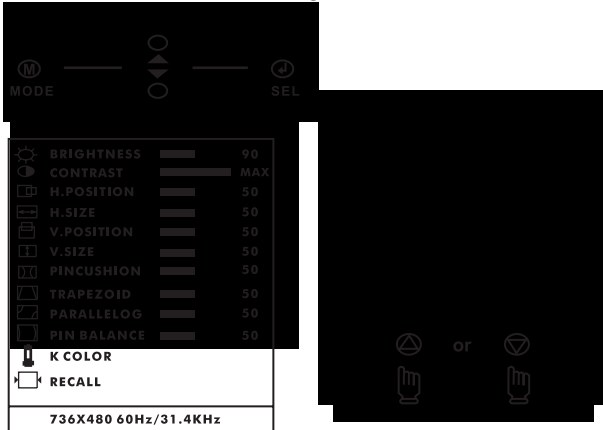


B. CONTRAST	ADJUST AS SAME WAY AS ABOVE
C. H.POSITION	ADJUST AS SAME WAY AS ABOVE
D. H-SIZE	ADJUST AS SAME WAY AS ABOVE
E. V.POSITION	ADJUST AS SAME WAY AS ABOVE
F. V-SIZE	ADJUST AS SAME WAY AS ABOVE
H. PINCUSHION	ADJUST AS SAME WAY AS ABOVE
I. TRAPEZOID	ADJUST AS SAME WAY AS ABOVE
J. PARALLELOG	ADJUST AS SAME WAY AS ABOVE
K. PINBALANCE	ADJUST AS SAME WAY AS ABOVE

USER ADJUSTABLE CONTROLS

K. COLOR ADJUSTMENT

Press the "MODE" key then Main-Menu OSD come out as left below figure.



- 1) Search "COLOR" sub-menu using "UP/DOWN" key on the Main-Menu OSD.
- 2) Select the "COLOR" by pressing "SEL" key. Then The color Sub-Menu OSD comes out as right below figure.
- 3) Search "USER" using "UP/DOWN" key

("COLOR1" and "COLOR2" is adjusted in factory by auto-alignment machine)

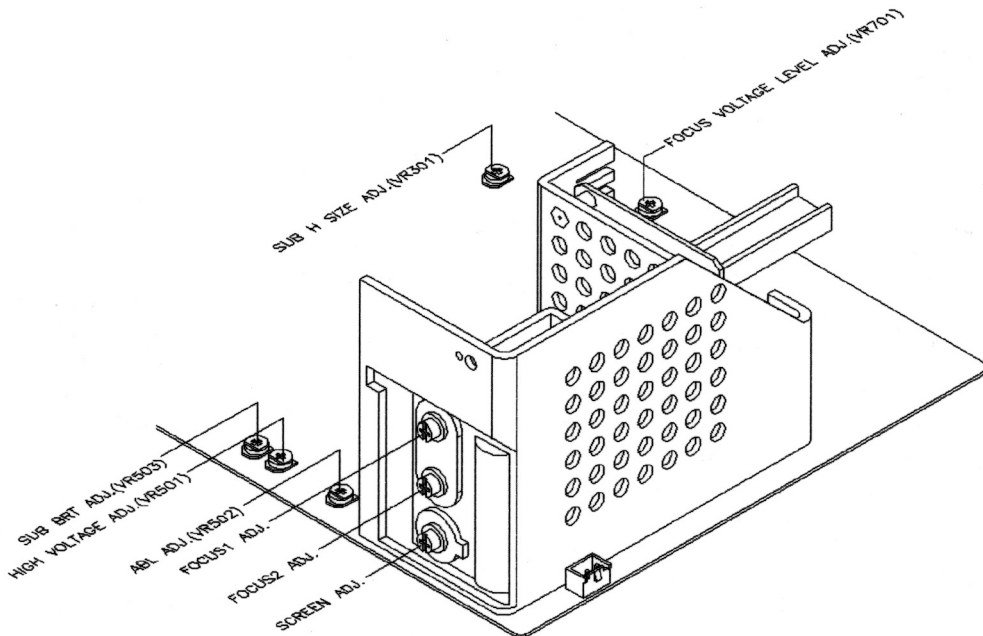
- 4) Press "SELECT" key to adjust "RED", "GREEN" and "BLUE" the each "RED", "GREEN" and "BLUE" is selected by pressing the "SELECT" key and selected item changes OSD color from white to it's own color as character
(ex: "RED" goes to red color)
- 5) Adjust "RED", "GREEN" or "BLUE" using "UP/DOWN" key.
- 6) Press "MODE" key to finish the color adjustment then the OSD goes back to Main-Menu.
- 7) Press the "MODE" key again to finish the adjustment then the OSD disappear.

L. RECALL

When press the "RECALL" key, all user's adjustment Value are erased and covered by factory adjustment Value.

At first stage without any user's adjustment, The Monitor set-upped by factory adjustment value

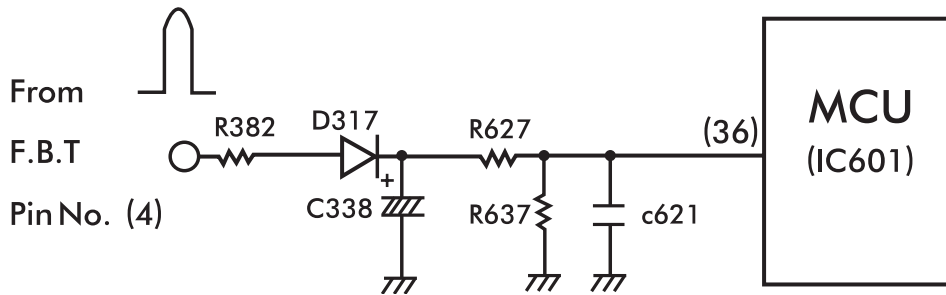
CONTROLS (VARIABLE RESISTORS)



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. 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. A fly back pulse is generated at pin (3) of the fly back transformer.

After the pulse converted to DC through rectifying circuit D317 & C338, In Normal Operation, 2.9 VDC impressed on MCU pin 36 with decreased voltage by R627 & R637. But when High Voltage increased more then 3.5 VDC, and it would be impressed on MCU pin 36, than pin 4(suspend) in MCU to be output from high to low, and IC pin 2 (+12VDC output) to be off and it has to be shut down.



PARTS LIST

LOC.	PARTS NAME	DESCRIPTION	LOC.	PARTS NAME	SPECIFICATIONS
SEMICONDUCTORS					
BD101	DIODE BRID	D3SBA60-4100	D413	DIODE CHIP	RLS4148
D101	DIODE RECT-FAST	EU1Z V1	D501	DIODE CHIP	RLS4148
D103	DIODE RECT-ULTRA	EG01Z V1	D601	LED	SAM3271
D104	DIODE RECT-FAST	RU1P	D605	DIODE CHIP	RLS4148
D105	DIODE RECT-FAST	S2L60- 4000	D606	DIODE CHIP	RLS4148
D108	DIODE RECT-FAST	EU1Z V1	D608	DIODE CHIP	RLS4148
D109	DIODE SW	1N4148	IC101	IC POWER	STR-F6656
D110	DIODE RECT-FAST	D5L60-4000	IC102	IC REGULATOR	KA278R05
D111	DIODE RECT-FAST	S3L20U-4000	IC103	IC REGULATOR	KA278R12
D112	DIODE RECT-FAST	EU2Z V1	IC104	IC REGULATOR	KA431AZ
D113	DIODE RECT-FAST	S2L60-4000	IC201	IC DEFLECTION	KA2142
D114	DIODE RECT-FAST	S3L20U-4000	IC301	IC DEFLECTION	TDA9109A
D201	DIODE RECT	1N4002	IC302	IC POWER	KA7500B
D301	DIODE RECT	FMQ-G5FS	IC401	IC VIDEO	KA2500B (SID2500A01-D0B0)
D302	DIODE RECT-FAST	D1NL20U-4060	IC402	IC VIDEO	LM2407T
D305	DIODE CHIP	RLS4148	IC403	IC OSD	S5D2508A
D306	DIODE RECT-FAST	1N4937	IC501	IC OP-AMP	KA358
D307	DIODE CHIP	RLS4148	IC601	IC u-COM	KS88C6348(S3C863A)
D308	DIODE RECT-FAST	S3L60-4000	IC602	IC EEPROM	KS24C08P (S524A60X81-DCB0)
D310	DIODE CHIP	RLS4148	PC101	IC PHOTO	PC-17K1 CC
D312	DIODE RECT-FAST	S3L60-4000	Q102	TR NPN	KSR1009
D313	DIODE RECT-FAST	1N4937	Q202	TR NPN	KSC2330-YTA
D314	DIODE CHIP	RLS4148	Q204	TR NPN	KSR1009
D315	DIODE CHIP	RLS4148	Q305	TR NPN	KSC3502-E
D316	DIODE CHIP	RLS4148	Q307	TR NPN	2N3904
D317	DIODE RECT-FAST	1N4937	Q308	TR NPN	FJL6825
D318	DIODE RECT-FAST	1N4937	Q309	TR NPN	KSC2328A
D319	DIODE CHIP	RLS4148	Q310	TR PNP	KSA928A-Y
D320	DIODE RECT-FAST	SDS06F150S	Q311	TR PNP	KSA928A-Y
D322	DIODE CHIP	RLS4148	Q312	TR NPN CHIP	KSC1623-Y(C1Y)
D398	DIODE CHIP	RLS4148	Q313	FET	IRF640A(B)
D399	DIODE CHIP	RLS4148	Q314	TR NPN CHIP	KSC1623-Y(C1Y)
D401	DIODE CHIP	RLS4148	Q317	FET	IRF650A(B)
D402	DIODE SW	1SS244	Q319	TR NPN	KSC5386
D403	DIODE SW	1SS244	Q350	TR NPN	KSC2328A
D404	DIODE SW	1SS244	Q351	TR PNP	KSA928A-Y
D405	DIODE SW	1SS244	Q352	FET	IRF640A(B)
D406	DIODE SW	1SS244	Q353	TR NPN	KSC2328A
D407	DIODE SW	1SS244	Q354	TR PNP	KSA928A-Y
D408	DIODE SW	1SS244	Q405	TR PNP	KSA992-F
D409	DIODE SW	1SS244	Q406	TR PNP	KSA992-F
D410	DIODE SW	1SS244			
D412	DIODE CHIP	RLS4148			

PARTS LIST

LOC.	PARTS NAME	DESCRIPTION	LOC.	PARTS NAME	SPECIFICATIONS
SEMICONDUCTORS					
Q407	DTR PNP	KSA992-F	LF101	FILTER-LINE	LF-2828A
Q408	TR NPN	KSC1845-F	LF102	FILTER-LINE	LF-1620
Q409	TR NPN	KSC1845-F	T101	TRANS-SMPS	TM-1902X
Q410	TR NPN	KSC1845-F	T102	TRANS-SYNC	ST-1902X
Q501	TR PNP CHIP	KSA812-Y(D1Y)	T301	COIL-LINEARITY	MS-3709D
Q507	TR PNP	2N6520	T302	TRANS-DRIVE	THD-1902X1
Q601	TR PNP CHIP	KSA812-Y(D1Y)	T303	TRANS-DUMMY	DT-1902X
Q603	TR PNP CHIP	KSA812-Y(D1Y)	T501	FBT	MCH-19A26
ZD301	ZENER DIODE CHIP	UZ-15B	RESISTORS		
ZD302	ZENER DIODE CHIP	UZ-5.1B	R101	R CARBON FILM	1/2W 1M J
ZD303	ZENER DIODE CHIP	UZ-30B	R103	R METAL OXIDE	2W 100K
ZD304	ZENER DIODE CHIP	UZ-30B	R104	R CHIP	4.7K J 2012
ZD305	ZENER DIODE CHIP	UZ-30B	R106	R CHIP	150 J 3216
ZD306	ZENER DIODE CHIP	UZ-30B	R107	R CEMENT	2W 0.22 J (MPR TYPE)
ZD501	DIODE ZENER	UZ-5.1B	R107B	R CEMENT	2W 0.15 J (MPR TYPE)
ZD601	ZENER DIODE CHIP	UZ-5.6B	R108	R CHIP	510 J 3216
ZD602	ZENER DIODE CHIP	UZ-5.6B	R109	R CEMENT	2W 68K J (R TYPE)
ZD604	ZENER DIODE CHIP	UZ-5.6B	R110	R CHIP	1K J 3216
ZD605	ZENER DIODE CHIP	UZ-5.6B	R111	R CHIP	1K J 3216
ZD606	ZENER DIODE CHIP	UZ-5.6B	R112	R CHIP	100K J 3216
ZD609	ZENER DIODE CHIP	UZ-5.6B	R113	R METAL FILM	1/4W 1.3K F
ZD610	ZENER DIODE CHIP	UZ-5.6B	R114	R CHIP	2K J 3216
TRANSFORMERS, COIL					
BC101	COIL-BEAD	HC-3550	R114B	R CHIP	20K J 3216
BC301	COIL-BEAD	HC-3550	R115	R CHIP	4.7K J 3216
BC307	COIL-BEAD	HC-3550	R122	R METAL OXIDE	3W 10K J
BC402	COIL-BEAD	HC-3550	R123	R METAL OXIDE	2W 2 J (R TYPE)
BC403	COIL-BEAD	HC-3550	R124	R CHIP	4.7K J 2012
BC404	COIL-BEAD	HC-3550	R125	R METAL OXIDE	2W 22 J (SMALL)
BC405	COIL-BEAD	HC-3550	R138	R CHIP 1K J 3216	1K J 3216
BC406	COIL-BEAD	HC-3550	R139	R CHIP 220 J 3216	220 J 3216
BC407	COIL-BEAD	HC-3550	R197	R METAL OXIDE	3W 10K J (R TYPE)
F401	FILTER-LC	22P	R198	R METAL OXIDE	3W 15 J
F402	FILTER-LC	22P	R204	R CHIP	5.6K J 2012
F403	FILTER-LC	22P	R205	R METAL OXIDE	1W 1 J
L302	COIL-BEAD	HC-3550	R206	R CHIP	12K J 2012
L303	COIL-BEAD	HC-3550	R207	R CHIP	5.1K J 2012
L304	COIL-CHOKE	A85R	R208	R CARBON FILM	1/2W 240 J
L305	COIL-BEAD	HC-3550	R209	R METAL OXIDE	1W 0.82 J
L307	COIL-CHOKE	C110R	R210	R CARBON FILM	1/4W 1 J
L601	COIL-PEAKING AXIAL	100uH (AL02)	R211	R CHIP	30K J 2012
L602	COIL-PEAKING AXIAL	100uH (AL02)	R213	R CHIP	4.7K J 3216
			R214	R CHIP	10K J 2012

PARTS LIST

LOC.	PARTS NAME	DESCRIPTION	LOC.	PARTS NAME	SPECIFICATIONS
RESISTORS					
R215	R CHIP	510 J 2012	R357	R CHIP	30K J 2012
R216	R CHIP	56K J 2012	R358	R CHIP	30K J 2012
R217	R CHIP	8.2K J 2012	R360	R METAL OXIDE	2W 1K J
R218	R CHIP	33K F 2012	R361	R CHIP	47K J 2012
R220	R CHIP	510 J 2012	R362	R CHIP	10K J 2012
R221	R CHIP	1K J 2012	R363	R CHIP	1.5 J 3216
R222	R CHIP	2K J 2012	R364	R CHIP	360 J 2012
R223	R CHIP	270 J 2012	R365	R CHIP	1K J 2012
R304	R CHIP	5.6K J 2012	R366	R CHIP	3.3K J 2012
R307	R CHIP	1/4W 10 J	R367	R CHIP	1K J 2012
R308	R CHIP	1K J 3216	R368	R CHIP	5.1K J 2012
R309	R CHIP	10K J 2012	R369	R CHIP	100K J 2012
R310	R CHIP	1K J 2012	R370	R CEMENT	2W 0.33 J (MPR TYPE)
R311	R CHIP	1K J 2012	R371	R CHIP	4.7K J 2012
R312	R CHIP	100 J 3216	R372	R CHIP	8.2K J 2012
R313	R CHIP	20K J 2012	R373	R CHIP	22K J 2012
R314	R METAL CHIP	6.8K F 2012	R374	R CHIP	7.5K J 2012
R315	R CHIP	1.8K J 2012	R375	R CHIP	4.7K J 2012
R316	R CHIP	3K J 2012	R377	R CHIP	2K J 2012
R317	R CHIP	10K J 2012	R378	R CHIP	10K J 2012
R318	R CHIP	470K J 2012	R379	R CHIP	3.3K J 2012
R321	R METAL OXIDE	1W 330 J	R380	R CARBON FILM	1/2W 10 J
R322	R CHIP	15K J 2012	R381	R CHIP	8.2K J 2012
R324	R CHIP	470 J 3216	R382	R METAL OXIDE	1W 1 J
R325	R CEMENT	7W 470 J (R TYPE)	R384	R CARBON FILM	1/2W 1 J
R326	R CHIP	100 J 3216	R385	R CARBON FILM	1/4W 3.3K J
R327	R CHIP	47K J 3216	R399	R CHIP	1K J 2012
R328	R METAL OXIDE	2W 3 J (SMALL)	R401	R CHIP	75 J 2012
R329	CARBON FILM	1/4W 20 J	R402	R CHIP	75 J 2012
R330	R METAL OXIDE	2W 24 J (R TYPE)	R403	R CHIP	75 J 2012
R331	R CHIP	1K J 2012	R408	R CHIP	2W 2 J
R333	R METAL OXIDE	2W 10 J (SMALL)	R409	R CHIP	100 J 3216
R336	R CHIP	10K J 2012	R410	R CHIP	100 J 3216
R337	R CHIP	4.7K J 2012	R411	R CHIP	100 J 3216
R340	R CHIP	15K J 3216	R412	R CHIP	33 J 2012
R341	R CHIP	1K J 3216	R413	R CHIP	100 J 2012
R346	R METAL OXIDE	2W 2.7 J (SMALL)	R414	R CHIP	100 J 2012
R347	R CARBON FILM	1/2W 1 J	R415	R CHIP	33 J 2012
R348	R CARBON FILM	1/4W 47 J	R416	R CHIP	33 J 2012
R353	R METAL OXIDE	2W 330 J (SMALL)	R417	R CHIP	4.7K J 3216
R354	R CEMENT	2W 0.33 J (MPR TYPE)	R418	R CHIP	220K J 3216
R355	R CHIP	1M J 2012	R419	R CHIP	10 J 2012
R356	R CHIP	20K J 2012	R420	R CHIP	10 J 2012

PARTS LIST

LOC.	PARTS NAME	DESCRIPTION	LOC.	PARTS NAME	SPECIFICATIONS
RESISTORS					
R421	R CHIP	10 J 2012	R510	R CHIP	39K J 3216
R422	R CHIP	390 J 2012	R511	R CHIP	39K J 3216
R423	R CHIP	390 J 2012	R522	R CHIP	100K J 3216
R424	R CHIP	390 J 2012	R532	R CHIP	2K J 2012
R425	R CARBON FILM	1/4W 2.2 J	R533	R CHIP	3.3K J 2012
R426	R CHIP	100 J 2012	R536	R CHIP	68K J 2012
R427	R CHIP	100 J 2012	R537	R CHIP	120K J 3216
R432	R CHIP	100 J 2012	R601	R CHIP	2K J 2012
R433	R CHIP	100 J 2012	R602	R CHIP	100 J 2012
R434	R CHIP	100 J 3216	R603	R CHIP	100 J 2012
R435	R CHIP	100 J 3216	R604	R CHIP	1.5K J 2012
R436	R CHIP	100 J 3216	R605	R CHIP	100 J 2012
R437	R CHIP	4.7K J 3216	R606	R CHIP	1.8K J 2012
R438	R CHIP	220K J 3216	R607	R CHIP	100 J 2012
R439	R CHIP	62K J 2012	R608	R CHIP	100 J 2012
R440	R CHIP	62K J 2012	R610	R CHIP	4.7K J 2012
R441	R CHIP	62K J 2012	R611	R CHIP	2K J 2012
R442	R CHIP	910 J 2012	R612	R CHIP	100 J 2012
R445	R CHIP	820K J 2012	R613	R CHIP	100 J 2012
R446	R CHIP	820K J 2012	R618	R CHIP	15K J 2012
R447	R CHIP	820K J 2012	R620	R CHIP	4.7K J 2012
R448	R CHIP	6.2K J 2012	R621	R CHIP	4.7K J 2012
R450	R CARBON FILM	1/4W 10 J	R622	R CHIP	1.2K J 2012
R451	R CHIP	36K J 2012	R623	R CHIP	330 J 3216
R452	R CHIP	100 J 2012	R624	R CHIP	1.2K J 2012
R453	R CHIP	100 J 2012	R625	R CHIP	100 J 2012
R454	R CHIP	100 J 2012	R626	R CHIP	100 J 2012
R455	R CHIP	200 J 2012	R627	R CHIP	200K J 2012
R456	R CHIP	200 J 2012	R628	R CHIP	10K J 2012
R457	R CHIP	200 J 2012	R629	R CHIP	3.3K J 2012
R458	R CHIP	200 J 2012	R630	R CHIP	3.3K J 2012
R460	R CHIP	47 J 3216	R631	R CHIP	100 J 2012
R461	R CHIP	47 J 3216	R633	R CHIP	100 J 2012
R462	R CHIP	47 J 3216	R634	R CHIP	100 J 2012
R501	R CHIP	100 J 3216	R635	R CHIP	4.7K J 2012
R502	R CHIP	5.6K J 2012	R636	R CHIP	56K J 2012
R503	R CHIP	100K J 2012	R637	R CHIP	27K J 2012
R504	R CHIP	240K J 2012	R638	R CHIP	8.2K J 2012
R505	R CHIP	24K J 2012	R639	R METAL CHIP	13.7K F 2012
R506	R CHIP	2.4K J 2012	R640	R CHIP	22K J 2012
R507	R CHIP	33K J 2012	R641	R METAL CHIP	2.55K F 2012
R508	R CHIP	5.1K J 2012	R642	R CHIP	100 J 2012
R509	R CHIP	91K J 3216	R643	R CHIP	100 J 2012

PARTS LIST

LOC.	PARTS NAME	DESCRIPTION	LOC.	PARTS NAME	SPECIFICATIONS
R645	R CHIP	1K J 2012	C305	C MYLAR	100V 0.1uF J
R654	R CHIP	10K J 2012	C307	C CHIP	B 470pF K 2012
RL101	RELAY	DY313-D12S	C308	C MYLAR	100V 0.1uF J
RS601	RESONATOR CRYSTAL	8.00MHz(HC-50/U)	C309	C MYLAR	100V 0.1uF J
VR301	VR-SEMI	NVZ 6TTL 2K	C310	C ELECTRO	16V 220uF RF
VR501	VR-SEMI	NVZ 6THT 50K	C311	C MYLAR	NPPS 1.6KV 5300pF J
VR502	VR-SEMI	NVZ 6THT 50K	C312	C ELECTRO	16V 100uF RF
VR503	VR-SEMI	NVZ 6THT 100K	C313	C MYLAR	NPPS 1.6KV 1000pF J
CAPACITORS			C315	C ELECTRO	100V 100uF RUS
C101	C LINE ACROSS	AC 275V 0.22uF	C316	C MYLAR	PFU 400V 0.20uF J
C104	C ELECTRO	450V 330uF FUX	C318	C MYLAR	MPP 250V 0.27uF J
C105	C ELECTRO	50V 47uF RF	C323	C ELECTRO	16V 100uF RF
C106	C MYLAR	100V 4700pF J	C324	C CHIP	F 0.1uF Z 2012
C107	C MYLAR	NPP 630V 0.033uF J	C325	C ELECTRO	16V 47uF RF
C108	C CHIP	F 0.1uF Z 2012	C326	C MYLAR	100V 0.22uF J
C109	C ELECTRO	50V 1uF RF	C328	C MYLAR	MPP 250V 0.47uF J
C111	C ELECTRO	16V 220uF RF	C329	C MYLAR	MPP 250V 0.56uF J
C112	C LINE ACROSS	AC 275V 0.22uF	C330	C MYLAR	100V 6800pF J
C118	C MYLAR	100V 0.1uF J	C331	C CHIP	B 1000pF K 2012
C119	C ELECTRO	100V 220uF RUS	C332	C MYLAR	100V 0.01uF J
C121	C ELECTRO	35V 470uF RF	C333	C ELECTRO	50V 10uF RF
C122	C ELECTRO	100V 100uF RUS	C334	C MYLAR	100V 0.047uF J
C124	C ELECTRO	160V 47uF RUS	C336	C CHIP	F 0.1uF Z 2012
C125	C CHIP	B 100pF K 2012	C337	C ELECTRO	16V 100uF RF
C126	C ELECTRO	16V 1000uF RF	C338	C ELECTRO	50V 10uF RF
C127	C ELECTRO	16V 47uF RF	C339	C ELECTRO	50V 2.2uF RF
C132	C ELECTRO	16V 2200uF RF	C340	C CHIP	F 0.1uF Z 2012
C202	C ELECTRO	16V 2200uF RF	C341	C ELECTRO	16V 1000uF RF
C203	C ELECTRO	35V 220uF RF	C342	C MYLAR	MPE 63V 0.22uF J
C204	C MYLAR	100V 1500pF J	C343	C CHIP	F 0.1uF Z 2012
C205	C MYLAR	100V 5600pF J	C344	C ELECTRO	16V 100uF RF
C206	C ELECTRO	16V 2200uF RF	C345	C MYLAR	MPE 63V 0.47uF J
C207	C ELECTRO	50V 10uF RF	C346	C CHIP	B 100pF K 2012
C208	C MYLAR	MPE 63V 1uF J	C347	C MYLAR	100V 1000pF J
C209	C MYLAR	100V 0.01uF J	C348	C MYLAR	100V 0.022uF J
C210	C MYLAR	MPE 200V 0.3uF J	C349	C MYLAR	100V 0.01uF J
C212	C MYLAR	MPE 63V 0.1uF J	C350	C ELECTRO	50V 4.7uF RF
C213	C MYLAR	100V 0.047uF J	C351	C MYLAR	100V 0.22uF J
C214	C MYLAR	100V 1500pF J	C352	C CHIP	B 100pF K 2012
C215	C CHIP	B 1000pF K 2012	C353	C ELECTRO	50V 1uF RF
C216	C ELECTRO	16V 220uF RF	C354	C ELECTRO	50V 3.3uF RF
C303	C ELECTRO	50V 1uF RF	C355	C MYLAR	100V 1000pF J
			C356	C ELECTRO	50V 47uF RF

PARTS LIST

LOC.	PARTS NAME	DESCRIPTION	LOC.	PARTS NAME	SPECIFICATIONS
C357	C MYLAR	100V 3900pF J	C447	C ELECTRO	16V 100uF RF
C358	C MYLAR	100V 1000pF J	C449	C MYLAR	100V 0.1uF J
C359	C ELECTRO	50V 100uF RF	C450	C MYLAR	100V 0.1uF J
C360	C CHIP	F 0.1uF Z 2012	C451	C MYLAR	100V 0.1uF J
C362	C MYLAR	100V 0.012uF J	C452	C MYLAR	100V 0.01uF J
C364	C ELECTRO	200V 10uF RUH	C453	C MYLAR	100V 0.01uF J
C365	C MYLAR	100V 0.1uF J	C454	C MYLAR	100V 0.01uF J
C366	C ELECTRO	50V 3.3uF RF	C460	C CHIP	B 47pF K 2012
C370	C CHIP	F 0.015uF K 2012	C461	C CHIP	B 47pF K 2012
C371	C MYLAR	PFU 400V 0.27uF J	C462	C CHIP	B 47pF K 2012
C398	C ELECTRO	100V 220uF RUS	C463	C CHIP	B 47pF K 2012
C401	C CHIP	F 0.1uF Z 2012	C501	C ELECTRO	50V 10uF RND
C402	C CHIP	F 0.1uF Z 2012	C505	C MYLAR	200V 0.1uF K
C404	C ELECTRO	16V 100uF RF	C601	C ELECTRO	50V 10uF RF
C405	C CHIP	F 0.1uF Z 2012	C603	C CHIP	B 100pF K 2012
C407	C CHIP	F 0.1uF Z 2012	C605	C ELECTRO	50V 10uF RF
C408	C CHIP	F 0.1uF Z 2012	C608	C ELECTRO	50V 10uF RF
C410	C ELECTRO	16V 100uF RF	C609	C ELECTRO	16V 100uF RF
C413	C ELECTRO	50V 1uF RF	C610	C CHIP	F 0.01uF K 2012
C414	C ELECTRO	50V 10uF RF	C611	C CHIP	F 0.1uF Z 2012
C416	C CHIP	F 0.1uF Z 2012	C612	C CHIP	B 47pF K 2012
C418	C CHIP	F 0.1uF Z 2012	C613	C CHIP	B 47pF K 2012
C419	C CHIP	F 0.1uF Z 2012	C614	C CHIP	B 22pF K 2012
C420	C CHIP	F 0.1uF Z 2012	C615	C CHIP	B 22pF K 2012
C421	C CHIP	F 0.1uF Z 2012	C616	C ELECTRO	16V 220uF RF
C422	C ELECTRO	100V 22uF RUS	C617	C CHIP	F 0.1uF Z 2012
C423	C MYLAR	100V 0.1uF J	C618	C CHIP	B 1000pF K 2012
C424	C ELECTRO	50V 1uF RUB	C619	C CHIP	B 1000pF K 2012
C425	C ELECTRO	50V 1uF RUB	C621	C CHIP	F 0.1uF Z 2012
C426	C ELECTRO	50V 1uF RUB	C624	C CHIP	F 0.1uF Z 2012
C427	C ELECTRO	100V 4.7uF RUS	C699	C CHIP	B 1000pF K 2012
C428	C MYLAR	100V 0.1uF J	MISCELLANEOUS		
C429	C MYLAR	100V 0.1uF J	A001	PCB MAIN	FR-4 282x197x1.6T
C430	C MYLAR	100V 0.1uF J	A002	PCB POWER	FR-4 230x166x1.6T
C431	C MYLAR	100V 0.01uF J	A005	PCB NECK	FR-4 228x252x1.6T
C434	C ELECTRO	16V 100uF RF	CRTGND	WAFER	YFW800-01
C435	C CHIP	F 0.1uF Z 2012	F101	FUSE	50T 250V 3.15A
C436	C CHIP	F 0.1uF Z 2012	F101A	FUSE CLIP	FC-21D
C437	C ELECTRO	16V 100uF RF	G2	WAFER	YFW800-01
C438	C ELECTRO	16V 100uF RF	M001	CRT	A48KRD82X
C441	C CHIP	F 0.1uF Z 2012	M002	COIL- DEGAUSSING	CD-0190A-10N
C443	C ELECTRO	16V 1000uF RF	M003	SIGNAL CABLE	PC SIGNAL CABLE 1.65M
C444	C MYLAR	100V 0.1uF J			
C445	C ELECTRO	16V 100uF RF			

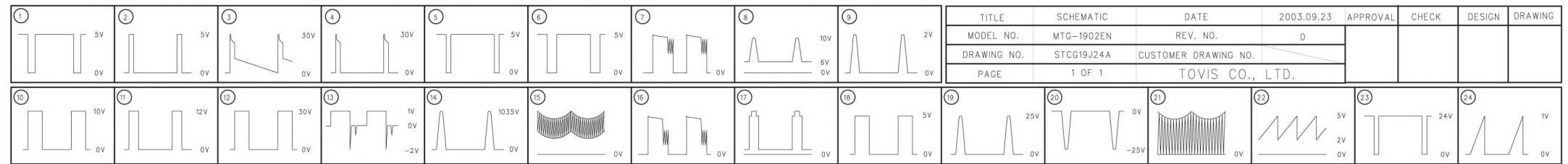
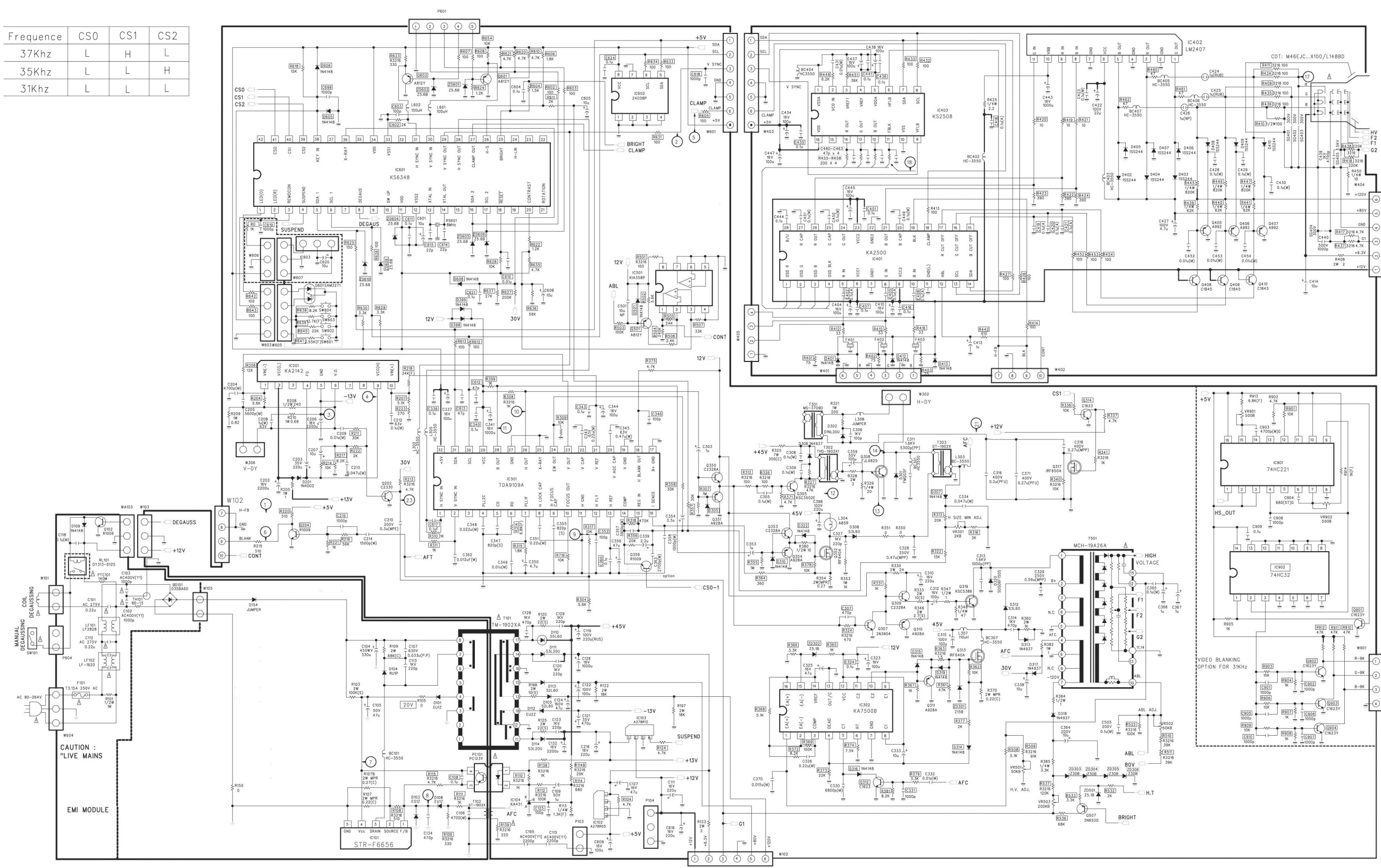
PARTS LIST

LOC.	PARTS NAME	DESCRIPTION
<u>MISCELLANEOUS</u>		
M004	CORD-POWER	3P 110V 1.8M KKP-30/CLAMP
M009	CONN ASSY	CRT GND 920(H)
P601	WAFER	YMW250-05
PTC101	POSISTOR	ECPAC7ROM140
SG401	SPARK GAP	MTA-301M
SG402	SPARK GAP	MTA-301M
SG403	SPARK GAP	MTA-301M
SG404	SPARK GAP	MTA-301M
SG405	SPARK GAP	1.5KV+-500V
SIGNAL CABLE	WAFER	YFW800-01
SK401	SOCKET CRT	ISHS04S
TH101	THERMISTOR	8D-13F
W101	WAFER	YFW800-02
W102	CONN ASSY	10P 300 5264-06,04/YBNH250-10
W105	WAFER	LW1143-02
W105	WAFER	LWP1143-02
W105A	CONN ASSY	2P 200, LH03-03/LH03-02
W306	WAFER	YFW800-04
W401	WAFER	YMW250-06
W402	WAFER	YMW250-04
W403	WAFER	YMW250-07
W404	WAFER	YMW250-06
W601	CONN ASSY	7P 2464 5264-07/YBNH250-07
W603	WAFER	YMW250-04
W604	WAFER	350760-4
W605	WAFER	YMAW250-04
W605A	CONN ASSY	4P 500 5264-04/5264-04
W903	CONN ASSY	3P 180 5264-03/YBNH250-03
WA103	WAFER	YMW250-03
YT01	TERMINAL TAP	GP88119-2
YT02	TERMINAL TAP	GP88119-2
YT03	TERMINAL TAP	GP88119-2
YT04	TERMINAL TAP	GP88119-2

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37Khz	L	H	L
35Khz	L	L	H
31Khz	L	L	L



TOTAL VISUAL APPLIANCE			
TITLE	SCHEMATIC	DATE	2003.09.23
MODEL NO.	MTG-1902EN	REV. NO.	0
DRAWING NO.	STCG19J24A	CUSTOMER DRAWING NO.	
PAGE	1 OF 1		
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