

LMV-185A/B
2 CHANNEL AC MILLIVOLTMETER
SERVICE MANUAL

NOTE

These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing other than that contained in the service manual unless you are qualified to do so.

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All informations for the "B" version
are indicated by <--> in this manual

1. SPECIFICATIONS

Voltmeter	
Measuring voltage range	100 μ V – 300V [150 μ V – 500V]
Measuring range	Measuring range 12 ranges 1, 3, 10, 30, 100, 300 mV 1, 3, 10, 30, 100, 300V [1.5, 5, 15, 50, 150, 500mV] [1.5, 5, 15, 50, 150, 500V]
	Decibel range 12 ranges –60, –50, –40, –30, –20, –10dB 0, +10, +20, +30, +40, +50dB (0 dB = 1V, 0 dB = 0.775V)
Measuring accuracy	\pm 2% of full scale (at 1 kHz or 400 Hz)
Frequency characteristics	5Hz ~ 1MHz \pm 10% 10Hz ~ 500kHz \pm 5% 20Hz ~ 100kHz \pm 3% (1 kHz as base)
Input resistance	10 M Ω
Input capacitance	Under 50 PF (1mV – 300mV [1.5mV – 500mV]) Under 35 PF (1V – 300V [1.5V – 500V])
Maximum input voltage	AC peak + DC = 600V
Noise	Within 2% of full scale by shorting input
Amplifier	
Output voltage	1 Vrms (no load) when 1.0V [5.0V] is indicated at full scale of each range
Frequency characteristics	10Hz – 300kHz, – 3 dB (1 kHz as base)
Output impedance	600 Ω \pm 20%
Distortion factor	Within 1% at full scale (1 kHz)
Operating temperature range	0 to 40 $^{\circ}$ C
Operating humidity range	Less than 85%
Power Supply	At specified voltage \pm 10%, 50/60 Hz: Input taps at 100, 120, 200, 240V; approx. 5 VA
Size and weight	132(W) x 150(H) x 250(D)mm, 2.5 Kg (exclusive of buttons, rubber legs and handle)
Accessories	Terminal adaptor for plug type 2 Furnished connection cord (banana-alligator) 2

2. TEST EQUIPMENT REQUIRED

The following test equipment is required for calibration and servicing of the Model LMV-185A/B. The suggested specifications are the minimum necessary for proper calibration of this instrument.

<u>Test Equipment</u>	<u>Minimum Spec</u>
- Multimeter	0 - 20V Accuracy <1% *LEADER Model LDM-853A
- AC Voltmeter Calibrator	1mV - 300V <1.5mV - 500V> 400Hz
- Audio Generator	10Hz - 1MHz *LEADER Model LAG-120A
- Oscilloscope	1mV sensitivity 1MHz bandwidth Low capacitance probe *LEADER Model LBO-514A
- AC Millivoltmeter	1V full scale 1MHz band width *LEADER Model LMV-181A

3. CALIBRATION PROCEDURE

3.1 General

Calibration should be performed after a 30 minute warm-up period. It should also be confirmed that the unit is connected to the rated power line voltage.

All adjustments should be completed in the given order, because some adjustments interact with others.

During the adjustment procedure, remove the case only when necessary and replace immediately after making an adjustment. This will maintain all circuits at constant operating temperature.

Keep all connecting wires as short as possible to avoid pick-up a noise from the stray AC field.

If the meter face plate has static charge, remove it by anti-static agent.

3.2 Adjustment of Meter Mechanical Zero.

Turn the instrument off and allow 30 second for all capacitors discharge.

Rotate zero adjustment screw clockwise or counterclockwise so that the pointer indicates exactly zero.

After pointer is exactly at zero, rotate the screw slightly opposite direction to release tension of meter suspension.

3.3 Initial Control Settings

The initial control settings to be used for each check and adjustment are listed below. Any variations from these settings are stated in the applicable procedure.

RANGE	
CH-1	300V<500V>
CH-2	300V<500V>

3.4 Power Supply

- Connect the DC voltmeter between test point and chassis.
- Check the voltages according to Table 3-1.

Test point	Voltage	Tolerance
IC201 PIN 2	+18V	+17.3V to +18.7V
IC202 PIN 2	+18V	+17.3V to +18.7V

Table 3-1

3.5 Sensitivity Adjustment

- Set: RANGE
CH-1 10mV<15mV>
- Connect the AC voltmeter calibrator to CH-1 INPUT connector and set the output voltage to 10mV<15mV>.
- Adjust VR201 for a meter reading of 10.0mV<15.0mV>.
- Set: RANGE
CH-1 10V<15V>
- Change the calibrator output voltage to 10V<15V>.
- Adjust VR101 for a meter reading of 10V<15V>.
- Apply the same procedure for CH-2 by adjusting VR203 and VR102.

3.6 Frequency Response Adjustment

- Set: RANGE
CH-1 1V<1.5V>
- Connect the audio generator to CH-1 INPUT connector and set the frequency to 400Hz, output level for full scale indication.
- Change the generator frequency to 50kHz.
- Adjust VC101 for full scale indication.
- Repeat above adjustment if necessary.
- Apply the same procedure for CH-2 by adjusting VC102.

4. TROUBLESHOOTING PROCEDURE

4.1 Troubleshooting Aid-1

Confirm that the any equipment used with the LMV-185A/B is operating correctly.

Check all control settings, because an incorrect setting can make a good unit appear defective. If there is any question about the function, refer to the INSTRUCTION MANUAL for a correct operation.

Check all circuit for visual defects such as broken component, loose connection of a connector, open wire, poor soldering etc.

Some troubles can be solved with proper adjustment.

Check the voltage and waveform as shown in the Schematic Diagram to locate the defective circuit. Start with the power supply.

Typical voltage and waveform are obtained under the same conditions as "3.3 Initial Control Settings"

4.2 Troubleshooting Aid-2

The AC Millivoltmeter is an average responding RMS millivoltmeter. The AC Millivoltmeter has five basic sections; the input attenuator, impedance converter and amplifier, second attenuator, metering circuits, and output amplifier. Refer to "7 BLOCK DIAGRAM".

Depending on the input signal and the range setting switch, the circuit path will vary. When the range switch is set at 300mV<500mV> full scale or below, the input signal bypasses the input attenuator and then directly into the impedance converter and the second attenuator. When the range switch is set to 1V<1.5V> full scale or higher, the input attenuator is activated thereby reduction the input signal before it enters the impedance converter.

The impedance converter matches the high impedance of the input attenuator to the lower impedance of the second attenuator.

The metering amplifier and circuits amplify and detect the fixed gain output of the second attenuators for proper indication on the meter.

The output amplified increases and buffers the output signal to equal 1 Vrms AC output for a full scale reading on the meter.

4.3 Troubleshooting Aid-3

(1) Overall operation is not satisfactory, or no response to input signal.

a. Check that the power supply voltage is within tolerance according to Table 3-1.

Yes: Proceed to step b.

No: Check and troubleshoot on following points.

Line fuse.

Secondary voltage of the power transformer.

+15V: IC201 and associated circuit.

+15V: IC201 and associated circuit.

b. Amplifier check

Connect the AC voltmeter calibrator to CH-1 INPUT connector and set the frequency to 400Hz, output voltage to 100mV <150mV>.

Set the RANGE switch to 100mV<150mV>.

If the sensitivity is too low or no meter deflection, trace the signal from the input stage to meter circuit by using the oscilloscope, with low capacitance probe, to locate the defective circuit.

Check the sine wave amplitude at base of Q201 for approximately 7.5mVp-p.

Yes: Proceed to step c.

No: Check the sine wave amplitude at collector of Q104 for approximately 640mVp-p.

Yes- Check resistors and switch contact of 2nd attenuator.

No- Troubleshoot Input attenuator, Impedance converter/amplifier.

The sine wave amplitude at the base of Q201 is approximately 7.5mVp-p for the full scale indication regardless of the RANGE switch setting.

c. Check the sine wave amplitude at base of Q205 for approximately 110mVp-p.

Yes: Troubleshoot the Metering circuit.

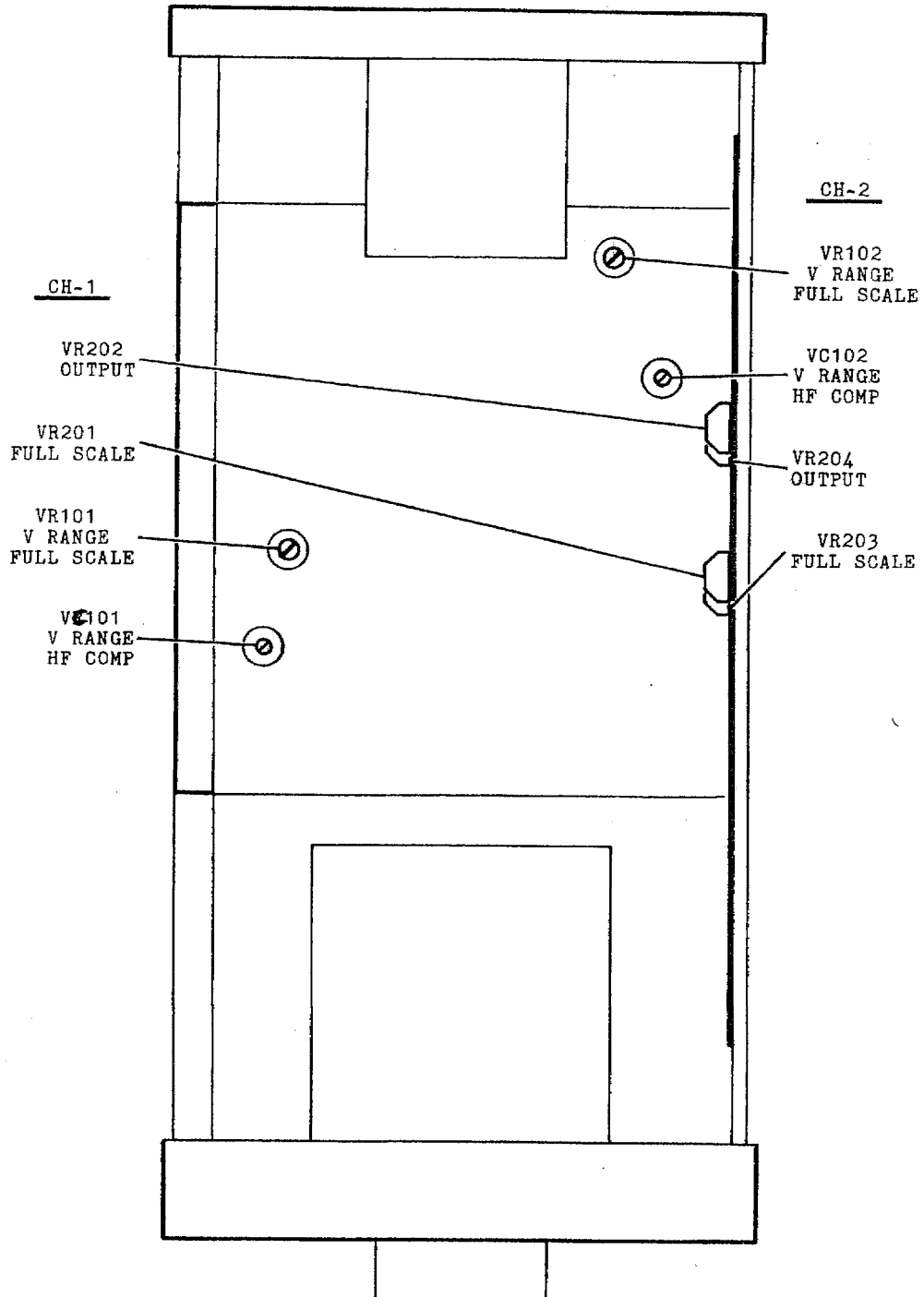
No: Troubleshoot Meter pre-amplifier.

d. Apply the same procedure for CH-2.

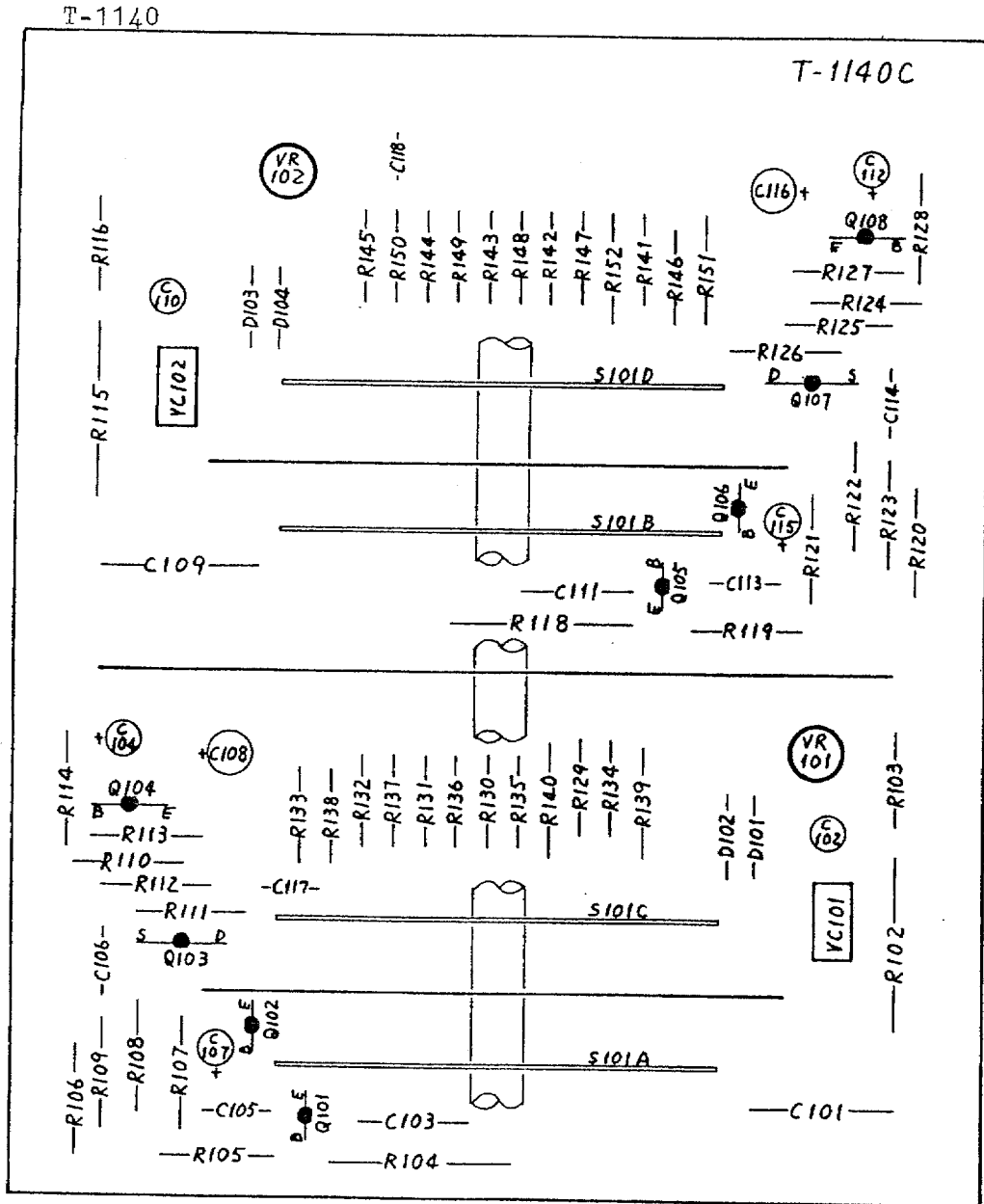
- (2) Poor accuracy
 - a. All RANGES
Adjust VR201 for CH-1, VR203 for CH-2.
Refer to paragraph 3.5.
 - b. 1V<1.5V> RANGE and above
Adjust VR101 for CH-1, VR102 for CH-2.
Refer to paragraph 3.5, 6.
 - c. At high frequency on 1V<1.5V> RANGE and above
Adjust VC101 for CH-1, VC102 for CH-2.
Refer to paragraph 3.6.

- (3) No FLOAT switch works(The meter swing irregularly even connect the INPUT to ground on high sensitivity ranges.
Check R301 and 302 for open.

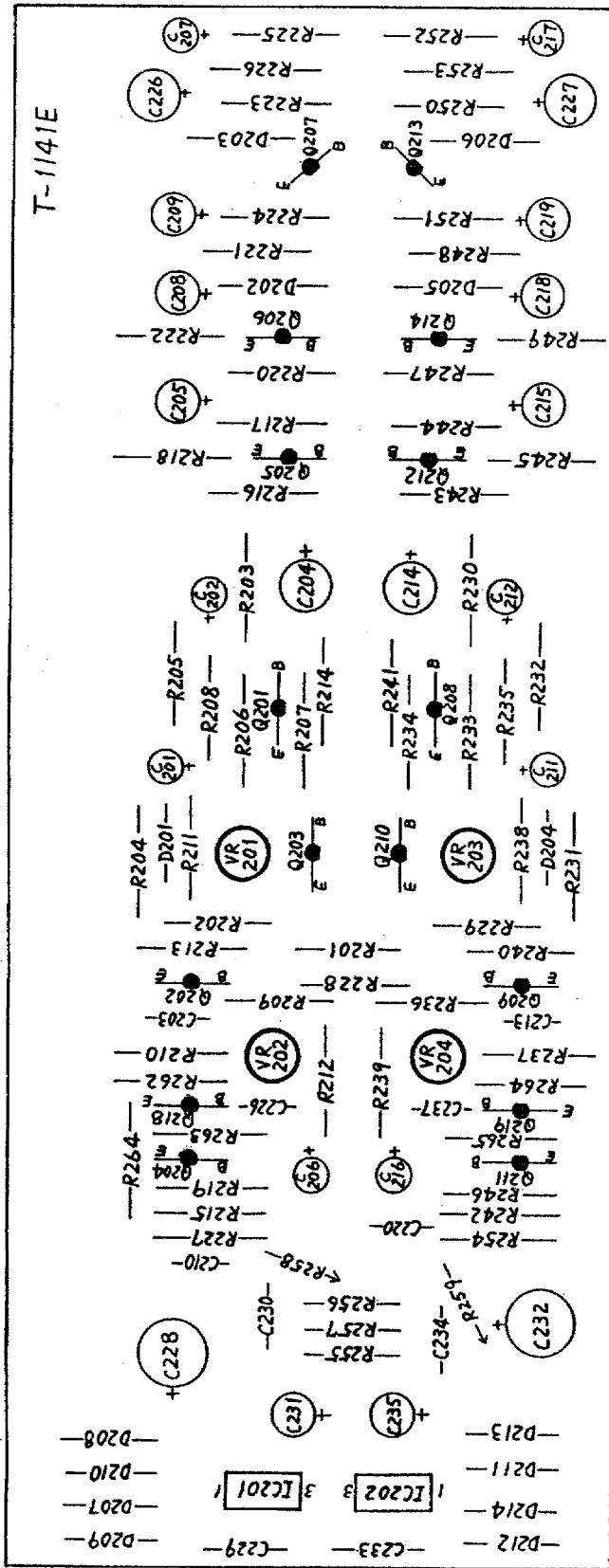
5. ADJUSTMENT LOCATIONS



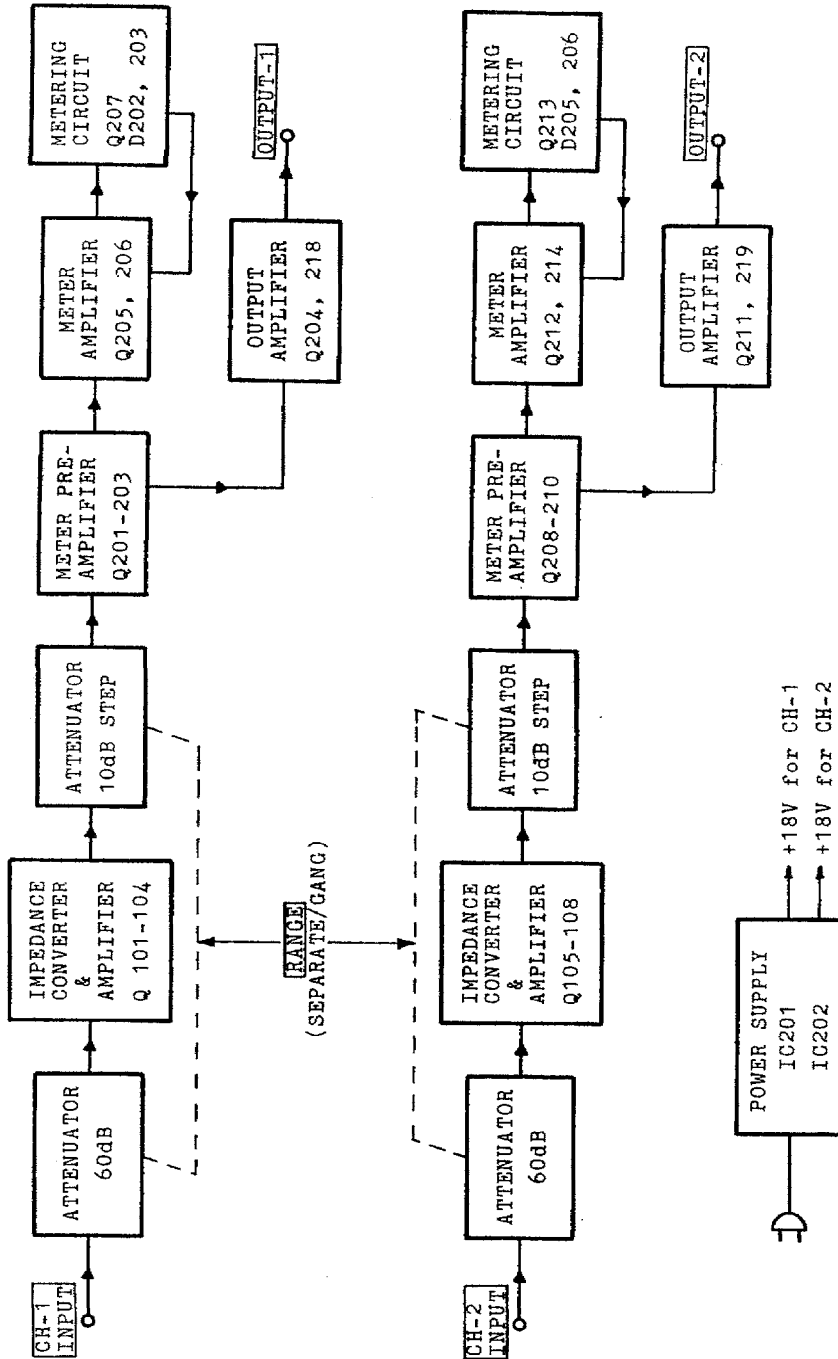
6. PRINTED CIRCUIT BOARD



T-1141



7. BLOCK DIAGRAM



9. PARTS LIST

No.	LDR PT No.	DESCRIPTION	No.	LDR PT No.	DESCRIPTION	No.	LDR PT No.	DESCRIPTION	No.	LDR PT No.	DESCRIPTION
*** LMV-185A/B ***											
-RESTORERS-											
R102	1130105013	METAL FILM	R212	1010392009	CARBON FILM	R212	1010392009	CARBON FILM	3.9K OHM	5%	1/4W
R103	1319001006	METAL FILM	R213	1010220000	CARBON FILM	R213	1010220000	CARBON FILM	22 OHM	5%	1/4W
R104	1210103002	METAL OXIDE	R214	1311001008	METAL FILM	R214	1311001008	METAL FILM	1K OHM	1%	1/4W
R105	1010221002	CARBON FILM	R215	1010222004	CARBON FILM	R215	1010222004	CARBON FILM	2.2K OHM	5%	1/4W
R106	1010195005	CARBON FILM	R216	1010392009	CARBON FILM	R216	1010392009	CARBON FILM	3.9K OHM	5%	1/4W
R109	1010475003	CARBON FILM	R217	1010273001	CARBON FILM	R217	1010273001	CARBON FILM	27K OHM	5%	1/4W
R109	1010475003	CARBON FILM	R218	1311809006	METAL FILM	R218	1311809006	METAL FILM	18 OHM	1%	1/4W
R110	1010120000	CARBON FILM	R219	1010561006	CARBON FILM	R219	1010561006	CARBON FILM	560 OHM	5%	1/4W
R113	1010100000	CARBON FILM	R220	1010472007	CARBON FILM	R220	1010472007	CARBON FILM	4.7K OHM	5%	1/4W
R114	1010151007	CARBON FILM	R221	1010331009	CARBON FILM	R221	1010331009	CARBON FILM	330 OHM	5%	1/4W
R115	1130105013	METAL FILM	R222	1010681006	CARBON FILM	R222	1010681006	CARBON FILM	680 OHM	5%	1/4W
R116	1319001006	METAL FILM	R223	1010471005	CARBON FILM	R223	1010471005	CARBON FILM	470 OHM	5%	1/4W
R118	1210103002	METAL OXIDE	R224	1010470003	CARBON FILM	R224	1010470003	CARBON FILM	47 OHM	5%	1/4W
R119	1010221002	CARBON FILM	R225	1010103006	CARBON FILM	R225	1010103006	CARBON FILM	10K OHM	5%	1/4W
R120	1010155005	CARBON FILM	R226	1010153001	CARBON FILM	R226	1010153001	CARBON FILM	15K OHM	5%	1/4W
R122	1010475003	CARBON FILM	R227	1010103006	CARBON FILM	R227	1010103006	CARBON FILM	10K OHM	5%	1/4W
R123	1010105000	CARBON FILM	R228	1010151007	CARBON FILM	R228	1010151007	CARBON FILM	150 OHM	5%	1/4W
R124	1010120000	CARBON FILM	R229	1010473009	CARBON FILM	R229	1010473009	CARBON FILM	47K OHM	5%	1/4W
R127	1010100000	CARBON FILM	R230	1311001008	METAL FILM	R230	1311001008	METAL FILM	1K OHM	1%	1/4W
R128	1010151007	CARBON FILM	R231	1010274003	CARBON FILM	R231	1010274003	CARBON FILM	270K OHM	5%	1/4W
R129	1362780009	METAL FILM	R232	1010274003	CARBON FILM	R232	1010274003	CARBON FILM	270K OHM	5%	1/4W
R130	1362780009	METAL FILM	R233	1010683000	CARBON FILM	R233	1010683000	CARBON FILM	68K OHM	5%	1/4W
R131	1362780009	METAL FILM	R234	1010562008	CARBON FILM	R234	1010562008	CARBON FILM	5.6K OHM	5%	1/4W
R132	1362780009	METAL FILM	R235	1311509006	METAL FILM	R235	1311509006	METAL FILM	15 OHM	1%	1/4W
R133	1361900007	METAL FILM	R236	1010103006	CARBON FILM	R236	1010103006	CARBON FILM	10K OHM	5%	1/4W
R134	1364110006	METAL FILM	R237	1010222004	CARBON FILM	R237	1010222004	CARBON FILM	2.2K OHM	5%	1/4W
R135	1364110006	METAL FILM	R238	1312500002	METAL FILM	R238	1312500002	METAL FILM	250 OHM	5%	1/4W
R136	1364110006	METAL FILM	R239	1010392009	CARBON FILM	R239	1010392009	CARBON FILM	3.9K OHM	5%	1/4W
R137	1364110006	METAL FILM	R240	1010220000	CARBON FILM	R240	1010220000	CARBON FILM	22 OHM	5%	1/4W
R138	1364110006	METAL FILM	R241	1311001008	METAL FILM	R241	1311001008	METAL FILM	1K OHM	1%	1/4W
R139	1010151007	CARBON FILM	R242	1010222004	CARBON FILM	R242	1010222004	CARBON FILM	2.2K OHM	5%	1/4W
R140	1010150005	CARBON FILM	R243	1010392009	CARBON FILM	R243	1010392009	CARBON FILM	3.9K OHM	5%	1/4W
R141	1362780009	METAL FILM	R244	1010273001	CARBON FILM	R244	1010273001	CARBON FILM	27K OHM	5%	1/4W
R142	1362780009	METAL FILM	R245	1311809006	METAL FILM	R245	1311809006	METAL FILM	18 OHM	1%	1/4W
R143	1362780009	METAL FILM	R246	1010561006	CARBON FILM	R246	1010561006	CARBON FILM	560 OHM	5%	1/4W
R144	1362780009	METAL FILM	R247	1010472007	CARBON FILM	R247	1010472007	CARBON FILM	4.7K OHM	5%	1/4W
R145	1361900007	METAL FILM	R248	1010331009	CARBON FILM	R248	1010331009	CARBON FILM	330 OHM	5%	1/4W
R146	1364110006	METAL FILM	R249	1010681006	CARBON FILM	R249	1010681006	CARBON FILM	680 OHM	5%	1/4W
R147	1364110006	METAL FILM	R250	1010471005	CARBON FILM	R250	1010471005	CARBON FILM	470 OHM	5%	1/4W
R148	1364110006	METAL FILM	R251	1010470003	CARBON FILM	R251	1010470003	CARBON FILM	47 OHM	5%	1/4W
R149	1364110006	METAL FILM	R252	1010103006	CARBON FILM	R252	1010103006	CARBON FILM	10K OHM	5%	1/4W
R150	1364110006	METAL FILM	R253	1010153001	CARBON FILM	R253	1010153001	CARBON FILM	15K OHM	5%	1/4W
R151	1010151007	CARBON FILM	R254	1010103006	CARBON FILM	R254	1010103006	CARBON FILM	10K OHM	5%	1/4W
R152	1010150005	CARBON FILM	R255	1020102001	CARBON FILM	R255	1020102001	CARBON FILM	10K OHM	5%	1/4W
R201	1010151007	CARBON FILM	R256	1010470003	CARBON FILM	R256	1010470003	CARBON FILM	47 OHM	5%	1/2W
R202	1010473009	CARBON FILM	R257	1010151007	CARBON FILM	R257	1010151007	CARBON FILM	150 OHM	5%	1/4W
R203	1311001008	METAL FILM	R258	1210101008	METAL OXIDE	R258	1210101008	METAL OXIDE	100 OHM	5%	1W
R204	1010274003	CARBON FILM	R259	1210101008	METAL OXIDE	R259	1210101008	METAL OXIDE	100 OHM	5%	1W
R205	1010274003	CARBON FILM	R262	1010392009	CARBON FILM	R262	1010392009	CARBON FILM	3.9K OHM	5%	1/4W
R206	1010683000	CARBON FILM	R263	1010182008	CARBON FILM	R263	1010182008	CARBON FILM	1.8K OHM	5%	1/4W
R207	1010562008	CARBON FILM	R264	1010472007	CARBON FILM	R264	1010472007	CARBON FILM	4.7K OHM	5%	1/4W
R208	1311509006	METAL FILM	R265	1010392009	CARBON FILM	R265	1010392009	CARBON FILM	3.9K OHM	5%	1/4W
R209	1010103006	CARBON FILM	R266	1010472007	CARBON FILM	R266	1010472007	CARBON FILM	4.7K OHM	5%	1/4W
R210	1010222004	CARBON FILM	R301	1210470009	METAL OXIDE	R301	1210470009	METAL OXIDE	47 OHM	5%	1W
R211	1312500002	METAL FILM	R302	1210470009	METAL OXIDE	R302	1210470009	METAL OXIDE	47 OHM	5%	1W

No.	LDR PT No.	DESCRIPTION	No.	LDR PT No.	DESCRIPTION
(185A/B CONT'D)					
-VARIABLE RESISTORS-					
VR101	1712007008	METAL GLAZE 2.2K OHM 25% 1/2W		2240101008	ELECTROLYTIC 100uF 20% 25V
VR102	1712007008	METAL GLAZE 2.2K OHM 25% 1/2W		2120150009	MICA 15PF 10% 500V
VR201	1712002008	METAL GLAZE 100 OHM 25% 1/2W		2120150009	MICA 15PF 10% 500V
VR202	1712007008	METAL GLAZE 2.2K OHM 25% 1/2W			
VR203	1712002008	METAL GLAZE 100 OHM 25% 1/2W			
VR204	1712007008	METAL GLAZE 2.2K OHM 25% 1/2W			
-CAPACITORS-					
C101	2180104004	PLASTIC FILM 0.1uF 500V			
C102	2130562009	PLASTIC FILM 5600PF 10% 50V			
C103	2020472003	CERAMIC 4700PF 10% 500V			
C104	2240470009	ELECTROLYTIC 47uF 20% 25V			
C105	2140104015	PLASTIC FILM 0.1uF 10% 50V			
C106	2140104015	PLASTIC FILM 0.1uF 10% 50V			
C107	2230100009	ELECTROLYTIC 100uF 20% 16V			
C108	2220471007	ELECTROLYTIC 470uF 20% 10V			
C109	2180104004	PLASTIC FILM 0.1uF 10% 600V			
C110	2130562009	PLASTIC FILM 5600PF 10% 50V			
C111	2020472003	CERAMIC 4700PF 10% 500V			
C112	2240470009	ELECTROLYTIC 47uF 20% 25V			
C113	2140104015	PLASTIC FILM 0.1uF 10% 50V			
C114	2140104015	PLASTIC FILM 0.1uF 10% 50V			
C115	2230100009	ELECTROLYTIC 10uF 20% 16V			
C116	2220471007	ELECTROLYTIC 470uF 20% 10V			
C117	2120101006	MICA 100PF 10% 500V			
C118	2120101006	MICA 100PF 10% 500V			
C201	2220330009	ELECTROLYTIC 330uF 20% 10V			
C202	2220331001	ELECTROLYTIC 330uF 20% 10V			
C202	2250229001	ELECTROLYTIC 2.2uF 20% 50V			
C203	2010473008	CERAMIC 0.047uF 20% 50V			
C206	2240220006	ELECTROLYTIC 220uF 20% 25V			
C207	2010473008	CERAMIC 0.047uF 20% 50V			
C207	2250109001	ELECTROLYTIC 1uF 20% 50V			
C208	2230470002	ELECTROLYTIC 47uF 20% 16V			
C209	2230470002	ELECTROLYTIC 47uF 20% 16V			
C210	2120101006	MICA 100PF 10% 500V			
C211	2220330009	ELECTROLYTIC 330uF 20% 10V			
C212	2250229001	ELECTROLYTIC 2.2uF 20% 50V			
C214	2220331001	ELECTROLYTIC 330uF 20% 10V			
C215	2220221004	ELECTROLYTIC 220uF 20% 25V			
C216	2240220006	ELECTROLYTIC 220uF 20% 25V			
C217	2250109001	ELECTROLYTIC 1uF 20% 50V			
C218	2230470002	ELECTROLYTIC 47uF 20% 16V			
C219	2230470002	ELECTROLYTIC 47uF 20% 16V			
C220	2120101006	MICA 100PF 10% 500V			
C226	2210331004	ELECTROLYTIC 330uF 20% 6.3V			
C227	2210331004	ELECTROLYTIC 330uF 20% 6.3V			
C228	2250221005	ELECTROLYTIC 2.2uF 20% 50V			
C229	2140334003	PLASTIC FILM 0.33uF 10% 50V			
C230	2140104015	PLASTIC FILM 0.1uF 10% 50V			
C231	2250221005	ELECTROLYTIC 2.2uF 20% 50V			
C232	2250221005	ELECTROLYTIC 2.2uF 20% 50V			
C233	2140334003	PLASTIC FILM 0.33uF 10% 50V			
C234	2140104015	PLASTIC FILM 0.1uF 10% 50V			
(185A/B CONT'D)					
C235	2240101008	ELECTROLYTIC 100uF 20% 25V			
C236	2120150009	MICA 15PF 10% 500V			
C237	2120150009	MICA 15PF 10% 500V			
-VARIABLE CAPACITORS-					
VC101	2910030006	CERAMIC 2-10PF 250V			
VC102	2910030006	CERAMIC 2-10PF 250V			
-TRANSISTORS-					
Q101	3031815027	NPN 2SC1815-CR			
Q102	3031815027	NPN 2SC1815-CR			
Q103	3050030001	FET 2SK30A-CR			
Q104	3010970001	PNP 2SA970 BL			
Q105	3031815027	NPN 2SC1815-CR			
Q106	3031815027	NPN 2SC1815-CR			
Q107	3050030001	FET 2SK30A-CR			
Q108	3010970001	PNP 2SA970 BL			
Q201	3032240000	NPN 2SC2240-BL			
Q202	3031815027	NPN 2SC1815-CR			
Q203	3010970001	PNP 2SA970 BL			
Q204	3031815027	NPN 2SC1815-CR			
Q205	3031815027	NPN 2SC1815-CR			
Q206	3031815027	NPN 2SC1815-CR			
Q207	3031815027	NPN 2SC1815-CR			
Q208	3032240000	NPN 2SC2240-BL			
Q209	3031815027	NPN 2SC1815-CR			
Q210	3010970001	PNP 2SA970 BL			
Q211	3031815027	NPN 2SC1815-CR			
Q212	3031815027	NPN 2SC1815-CR			
Q213	3031815027	NPN 2SC1815-CR			
Q214	3031815027	NPN 2SC1815-CR			
Q219	3011015003	PNP 2SA1015-D or Y			
Q219	3011015003	PNP 2SA1015-D or Y			
-DIODES-					
D101	3110004000	DETECTOR 1S1555			
D102	3110004000	DETECTOR 1S1555			
D103	3110004000	DETECTOR 1S1555			
D104	3110004000	DETECTOR 1S1555			
D201	3120055004	ZENER RD11EB 11V			
D202	3110004000	DETECTOR 1S1555			
D203	3110004000	DETECTOR 1S1555			
D204	3120055004	ZENER RD11EB 11V			
D205	3110004000	DETECTOR 1S1555			
D206	3110004000	DETECTOR 1S1555			
D207	3110019003	RECTIFIER 1D261			
D208	3110019003	RECTIFIER 1D261			
D209	3110019003	RECTIFIER 1D261			
D210	3110019003	RECTIFIER 1D261			
D211	3110019003	RECTIFIER 1D261			
D212	3110019003	RECTIFIER 1D261			
D213	3110019003	RECTIFIER 1D261			
D214	3110019003	RECTIFIER 1D261			
D301	3130005006	LED SLP-751			

No.	LDR PT No.	DESCRIPTION		
-----<185A/B CONT'D>-----				
-INTEGRATED CIRCUITS-				
IC201	3217818012	REGULATOR	MC7818CP	+18V
IC202	3217818012	REGULATOR	MC7818CP	+18V
-TRANSFORMER-				
T1	3800382001	TRANSFORMER	J-382A	
-SWITCHES-				
S101	4000323000	ROTARY	Q-323B	"RANGE"
S201	4030015004	TOGGLE	3T-106D	"POWER"
S301	4030002001	SLIDE	S-22007L,T	"FLOAT"
-FUSE-				
F101	4363515003	TIME LAG	BET	100mA "90V-264V"
-PC BOARDS-				
	5901140009		T-1140C	
	5901141001		T-1141E	
-MISCELLANEOUS-				
	437102009	FUSE HOLDER	FH-003	
*** LMV-185A ***				
-RESISTORS-				
R107	1010683000	CARBON FILM	68K OHM	5% 1/4W
R111	1010221002	CARBON FILM	220 OHM	5% 1/4W
R112	1010391007	CARBON FILM	390 OHM	5% 1/4W
R121	1010683000	CARBON FILM	68K OHM	5% 1/4W
R125	1010391007	CARBON FILM	390 OHM	5% 1/4W
R126	1010221002	CARBON FILM	220 OHM	5% 1/4W
-METER-				
M	4220001017		1mA	(H-987A)
*** LMV-185B ***				
-RESISTORS-				
R107	1010154003	CARBON FILM	150K OHM	5% 1/4W
R111	1010391007	CARBON FILM	390 OHM	5% 1/4W
R112	1010331009	CARBON FILM	330 OHM	5% 1/4W
R121	1010154003	CARBON FILM	150K OHM	5% 1/4W
R125	1010331009	CARBON FILM	330 OHM	5% 1/4W
R126	1010391007	CARBON FILM	390 OHM	5% 1/4W
-METER-				
M	4220001026		1mA	(H-988)

10 CABINET REMOVAL

- Take three screws off to remove the Top cover.
- Take one screw off to remove the Bottom cover.

