

TECHNICIANS



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VT-126
(VT-125)

**HIGH SENSITIVITY VOLTMETER
(NOISE METER)**

INSTRUCTION MANUAL



TRIO

GENERAL

The Noisemeter is an ultra-sensitive electronic voltmeter having a maximum sensitivity of $10\mu\text{V}$ fullscale ($30\mu\text{V}$ for the VT-125). Its wide frequency range covers from 10 Hz to 500 kHz ($1\text{ mV} \sim 300\text{V}$) and the five types of weighting are selectable. In addition, DIN or CCIR quasi-peak or average detection with RMS display is selectable, making possible S/N and noise measurements in accordance with JIS-A, DIN NOISE, DIN AUDIO, CCIR and CCIR/ARM standards. The units are also provided with an overload indicator and a 10 dB range relative reference adjustment. AC and DC outputs are provided and remote control of range switching is available to facilitate use on the production line.

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FEATURES

- ★ VT-126: $10\mu\text{V}$ fullscale maximum sensitivity with 0.2 μV graduated scale for measurements down to -120 dB .
VT-125: Maximum sensitivity of $30\mu\text{V}$ fullscale.
- ★ Button selection of JIS-A, DIN NOISE, DIN AUDIO, CCIR and CCIR/ARM weighting filters make possible noise measurements and S/N measurements in accordance with a variety of standards.
- ★ In addition to average detection and RMS display, DIN and CCIR semi-peak detection with RMS display is available for measurements in accordance with those standards.
- ★ AC OUT and DC OUT terminals are provided to facilitate waveform observation, recording of measured values or use of the unit as an amplifier.
- ★ A relative reference adjustment from $0 \sim -10\text{ dB}$ makes possible relative measurements of signals with respect to an arbitrarily set reference level, particularly useful in S/N measurement.
- ★ An overload indication prevents measurement errors caused by distortion not detected by the operator by viewing the meter level for use with the weighting filters.
- ★ Logic control is used for range selection making this function remote controllable (option).

SPECIFICATIONS

ITEM	VT-126	VT-125
VOLTMETER		
Voltage ranges:	$10\mu\text{V} \sim 300\text{V}$ $(10\mu\text{V}/30\mu\text{V}/100\mu\text{V}/300\mu\text{V}/1\text{mV}/3\text{mV}/10\text{mV}/$ $30\text{mV}/100\text{mV}/300\text{mV}/1\text{V}/3\text{V}/10\text{V}/30\text{V}/100\text{V}/$ $300\text{V fullscale})$ dB: $-100 \sim +50\text{ dB}$ ($0\text{ dB} = 1\text{V}$) dBm: $-98 \sim +52\text{ dBm}$ ($0\text{ dBm} = 1\text{ mW}/600$)	$30\mu\text{V} \sim 300\text{V}$ $(30\mu\text{V}/100\mu\text{V}/300\mu\text{V}/1\text{mV}/3\text{mV}/10\text{mV}/$ $30\text{mV}/100\text{mV}/300\text{mV}/1\text{V}/3\text{V}/10\text{V}/30\text{V}/100\text{V}/$ $300\text{V fullscale})$ dB: $-90 \sim +50\text{ dB}$ ($0\text{ dB} = 1\text{V}$) dBm: $-88 \sim +52\text{ dBm}$ ($0\text{ dBm} = 1\text{ mW}/600$)
Display accuracy:	With average detection, in FLAT mode: $10\mu\text{V}$ and $30\mu\text{V}$ range: within $\pm 5\%$ of fullscale $100\mu\text{V} \sim 300\text{V}$ range within $\pm 3\%$ of fullscale With quasi-peak detection and DIN NOISE, DIN AUDIO or CCIR weighting filter: $10\mu\text{V}$ range: within $+7\%$ of fullscale $30\mu\text{V} \sim 300\text{V}$ range within $\pm 5\%$ of fullscale	With average detection in FLAT mode: $30\mu\text{V}$ range: within $\pm 5\%$ of fullscale $100\mu\text{V} \sim 300\text{V}$ range within $\pm 3\%$ of fullscale With quasi-peak detection and DIN NOISE, DIN AUDIO or CCIR weighting filter: $30\mu\text{V} \sim 300\text{V}$ range within $\pm 5\%$ of fullscale
Frequency response:	With average detection and RMS display $10\mu\text{V}$ range: $20\text{ Hz} \sim 10\text{ kHz}$ $\pm 5\%$ $10\text{ Hz} \sim 30\text{ kHz}$ $\pm 10\%$ $30\mu\text{V} \sim 300\mu\text{V}$ range: $20\text{ Hz} \sim 20\text{ kHz}$ $\pm 5\%$ $10\text{ Hz} \sim 100\text{ kHz}$ $\pm 10\%$ $1\text{ mV} \sim 300\text{V}$ range: $20\text{ Hz} \sim 100\text{ kHz}$ $\pm 3\%$ $15\text{ Hz} \sim 300\text{ kHz}$ $\pm 5\%$ $10\text{ Hz} \sim 500\text{ kHz}$ $\pm 10\%$ With quasi-peak detection and RMS display $10\mu\text{V}$ range: $30\text{ Hz} \sim 15\text{ kHz}$ $\pm 5\%$ $20\text{ Hz} \sim 20\text{ kHz}$ $\pm 10\%$ $10\text{ Hz} \sim 30\text{ kHz}$ $\pm 20\%$	With average detection and RMS display $30\mu\text{V} \sim 300\mu\text{V}$ range: $20\text{ Hz} \sim 20\text{ kHz}$ $\pm 5\%$ $10\text{ Hz} \sim 100\text{ kHz}$ $\pm 10\%$ $1\text{ mV} \sim 300\text{V}$ range: $20\text{ Hz} \sim 100\text{ kHz}$ $\pm 3\%$ $15\text{ Hz} \sim 300\text{ kHz}$ $\pm 5\%$ $10\text{ Hz} \sim 500\text{ kHz}$ $\pm 10\%$ With quasi-peak detection and RMS display

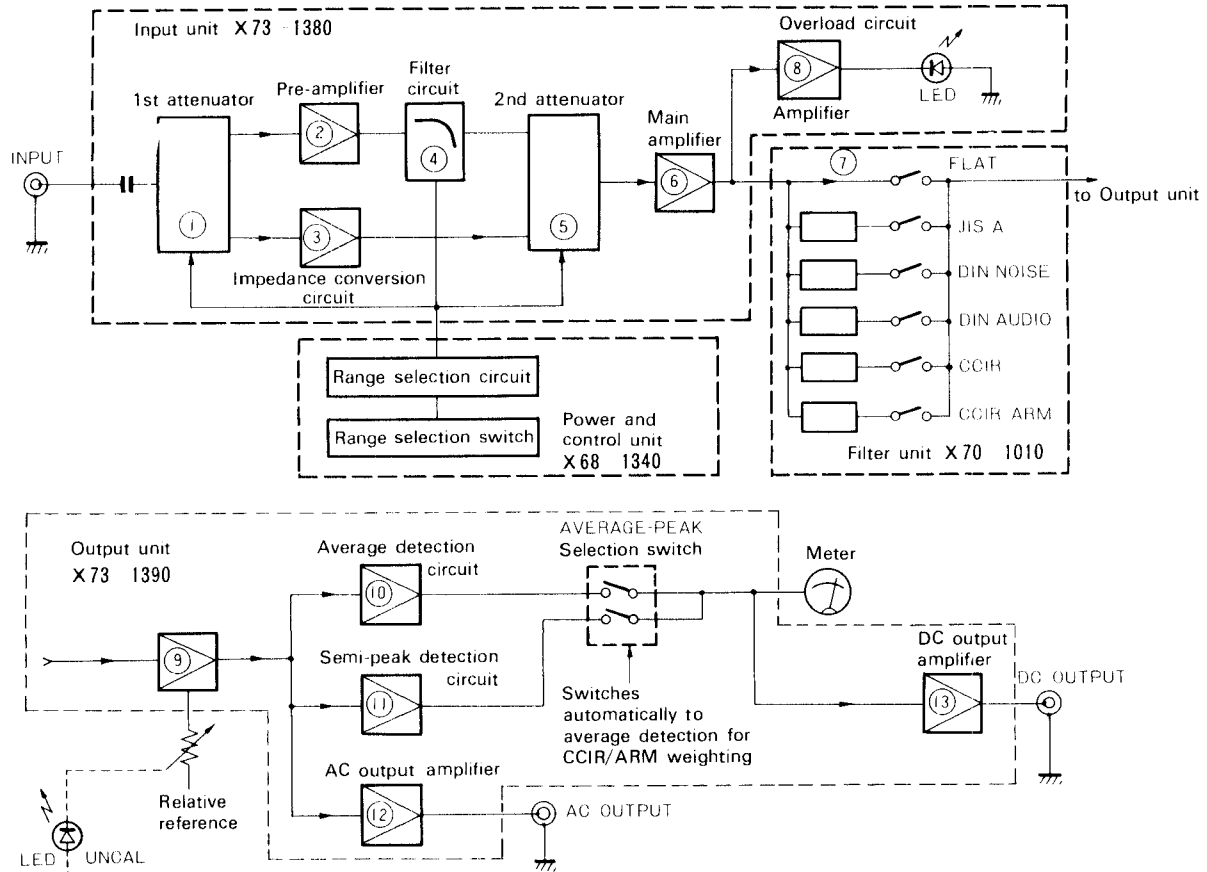
ITEM	VT-126	VT-125
	$30\ \mu\text{V} \sim 300\text{V}$ range: $30\ \text{Hz} \sim 20\ \text{kHz}$ $\pm 5\%$ $20\ \text{Hz} \sim 50\ \text{kHz}$ $\pm 10\%$ $10\ \text{Hz} \sim 100\ \text{kHz}$ $\pm 20\%$	$30\ \mu\text{V} \sim 300\text{V}$ range: $30\ \text{Hz} \sim 20\ \text{kHz}$ $\pm 5\%$ $20\ \text{Hz} \sim 50\ \text{kHz}$ $\pm 10\%$ $10\ \text{Hz} \sim 100\ \text{kHz}$ $\pm 20\%$
Input impedance:	$1\ \text{M}\Omega \pm 5\%$ Parallel capacitance: Less than 50pF	$1\ \text{M}\Omega \pm 5\%$ Parallel capacitance: Less than 50pF
Overload voltage level:	$10\ \mu\text{V} \sim 300\ \mu\text{V}$ range: AC $10\ \text{Vrms}$ DC 500V $1\ \text{mV} \sim 300\text{mV}$ range: AC $80\ \text{Vrms}$ DC + AC peak 500V $1\text{V} \sim 300\text{V}$ range: DC + AC peak 500V	$30\ \mu\text{V} \sim 300\ \mu\text{V}$ range: AC 10Vrms DC 500V $1\ \text{mV} \sim 300\ \text{mV}$ range: AC $80\ \text{Vrms}$ DC + AC peak 500V $1\text{V} \sim 300\text{V}$ range: DC + AC peak 500V
Relative reference adjustment:	$0 \sim \text{approx. } -12\ \text{dB}$	$0 \sim \text{approx. } -12\ \text{dB}$
Over level:	Lights up or flickers when a signal of more than $+15\ \text{dB}$ for maximum value is applied. This indicates that there is a possibility of erroneous indication due to over input when a level weighting filter is used.	Lights up or flickers when a signal of more than $+15\ \text{dB}$ for maximum value is applied. This indicates that there is a possibility of erroneous indication due to over input when a level weighting filter is used.
Residual noise:	Average detection: $10\ \mu\text{V}$ range input shorted Below $1.5\ \mu\text{Vrms}$ ($1.0\ \mu\text{Vrms}$ TYP.) $30\ \mu\text{V}$ range input shorted Below $5\ \mu\text{Vrms}$ ($3.0\ \mu\text{Vrms}$ TYP.)	Average detection: $30\ \mu\text{V}$ range input shorted Below $5\ \mu\text{Vrms}$ ($3.0\ \mu\text{Vrms}$ TYP.)

ITEM	VT-126	VT-125
	Peak detection: 10 μ V range input shorted Below 2.0 μ Vrms (1.0 μ Vrms TYP.) 30 μ V range input shorted Below 5 μ Vrms (3.0 μ Vrms TYP.)	Peak detection: 30 μ V range input shorted Below 5 μ Vrms (3.0 μ V TYP.)
Power supply regulation:		
Temperature coefficient:	0.08%/°C or less (Minimum 1 mV range)	0.08%/°C or less (Minimum 1mV range)
Operating temperature and humidity for guaranteed specification:	15 ~ 35°C, 80% maximum.	15 ~ 35°C, 80% maximum.
Full operating range:	0 ~ 50°C, 80% maximum.	0 ~ 50°C, 80% maximum.
AMPLIFIER		
AC AMPLIFIER:		
Gain:	Approx. 100 dB	Approx. 90 dB
Output voltage:	1 Vrms $\pm$ 10%	1 Vrms $\pm$ 10%
Output resistance:	600 Ω $\pm$ 10%	600 Ω $\pm$ 10%
Distortion:	Below 1% of fullscale at 1 kHz This distortion is determined by the S/N for the ranges 10 μ V ~ 300 μ V.	Below 1% of fullscale at 1 kHz This distortion is determined by the S/N for the ranges 30 μ V ~ 300 μ V.

ITEM	VT-126	VT-125
S/N:	With respect to fullscale: 1 mV ~ 300V range: 40 dB minimum 300 μ V range: 30 dB minimum 100 μ V range: 25 dB minimum 30 μ V range: 20 dB minimum 10 μ V range: 16.5 dB minimum	With respect to fullscale: 1 mV ~ 300V range: 40 dB minimum 300 μ V range: 30 dB minimum 100 μ V range: 25 dB minimum 30 μ V range: 20 dB minimum
Frequency response:	1 mV ~ 300V range: 10 Hz ~ 500 kHz within ± 3 dB 30 μ V ~ 300 μ V range: 10 Hz ~ 150 kHz within ± 3 dB 10 μ V range: 10 Hz ~ 30 kHz within ± 3 dB	1 mV ~ 300V range: 10 Hz ~ 500 kHz within ± 3 dB 30 μ V ~ 300 μ V range: 10 Hz ~ 150 kHz within ± 3 dB
DC OUTPUT AMPLIFIER:		
Output voltage:	1V $\pm 10\%$ for fullscale	1V $\pm 10\%$ for fullscale
Output resistance:	600 Ω $\pm 10\%$	600 Ω $\pm 10\%$
Frequency response:	Approx the same as the meter indication.	Approx the same as the meter indication.
POWER SUPPLY SECTION		
Supply voltage:	100/120/220/240VAC $\pm 10\%$ 50/60 Hz	100/120/220/240VAC $\pm 10\%$ 50/60 Hz
Power consumption:	Approx 15W	Approx 15W
Dimensions:	Width 128 mm Height 190 (214) mm Depth 285 (315) mm () dimensions include protrusions from the basic case.	Width 128 mm Height 190 (214) mm Depth 285 (315) mm () dimensions include protrusions from the basic case.

ITEM	VT-126	VT-125
Weight:	4.6 kg	4.6 kg
Accessories:	Power cord 1 Input cable (CA-41) 1 Instruction manual 1	Power cord 1 Input cable (CA-41) 1 Instruction manual 1

BLOCK DIAGRAM



CIRCUIT DESCRIPTION

①. FIRST ATTENUATOR

A resistive divider attenuator which is relay switched between 0 dB (10 μ V ~ 300 mV range) and - 60 dB (1V ~ 300V range). For the other ranges it is not in the circuit.

③. IMPEDANCE CONVERSION CIRCUIT (Q1 ~ Q3)

Used to convert the output of the first attenuator to a sufficiently low impedance to drive the second attenuator. An FET input voltage follower is used in this circuit. (1 mV ~ 300V range)

⑤. SECOND ATTENUATOR

A resistive divider attenuator in two sections, 0 dB or - 30 dB relay selected and 0/ - 10/ - 20/ - 30 dB four step FET switched selected section. This attenuator outputs a 1 mVrms signal for fullscale meter deflection.

② AND ④ PRE-AMPLIFIER AND FILTER (Q4 ~ Q8, Q201, Q202) For the 10 μ V, 30 μ V, 100 μ V and 300 μ V ranges the signal is amplified 100 times and passed to the filter. (Q201 and Q202 is not used in VT-125)

⑥. MAIN AMPLIFIER (Q11 ~ Q14)

A wideband non-inverting amplifier with a differential input of high impedance and low output impedance. The gain is 40 dB and the output is 40 mVrms for a fullscale deflection.

⑦. FILTER AND FILTER SELECTION CIRCUIT

FLAT, DIN NOISE, DIN AUDIO, CCIR and CCIR/ARM weighting filters and the associated selection circuitry.

⑧. OVERLEVEL CIRCUIT (IC2, IC3, Q15)

This circuit uses peak detection of a full-wave rectified signal to detect excessively high signal input levels. An LED display warns of excessively high input.

⑨. IMPEDANCE CONVERSION CIRCUIT

This circuit converts the filter output to a sufficiently low impedance.

⑩. AVERAGE DETECTION CIRCUIT (Q4 ~ Q9)

This circuit detects the average absolute signal value and provides a meter drive signal for an RMS display of signal level.

⑪. QUASI-PEAK DETECTION CIRCUIT (IC1 ~ IC4)

This circuit detects the peak-to-peak signal value and generates a meter drive signal representing the RMS value of the signal in accordance with CCIR standards.

⑫. AC OUTPUT AMPLIFIER (Q10 ~ Q12)

This circuit amplifies the signal from block ⑨ to provide an output signal of 1Vrms for fullscale deflection of the meter.

⑬. DC OUTPUT AMPLIFIER (IC5, IC6)

This circuit amplifies the signal from the meter terminals to provide a DC output of 1V for fullscale meter deflection.

CONTROLS AND INDICATORS

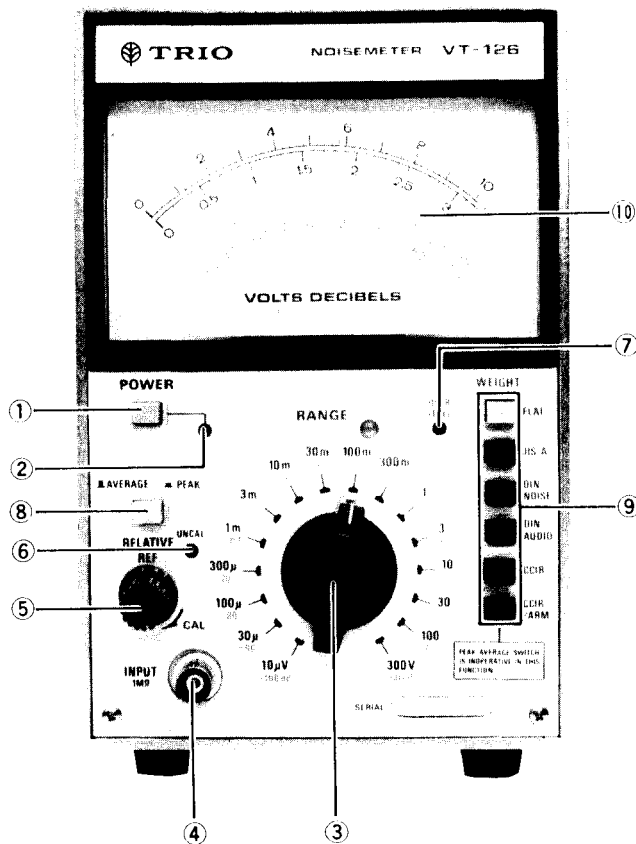


Fig. 1

FRONT PANEL

1. POWER

AC power switch.

2. POWER LAMP

Indicates the VT-125 (VT-125) is powered up. Lights when POWER is depressed.

3. RANGE

Attenuator selector switch. 16 positions (15 for the VT-125) in 10 dB steps. To prevent excessive inputs, this switch is started in the highest, 300V range and gradually worked down range to provide an easily readable meter deflection.

4. INPUT

BNC signal input connector.

5. RELATIVE REF AND 6. UNCAL LAMP

Sensitivity adjustment and uncalibrated annunciator. More than 10 dB of adjustment is possible. When the control is turned fully clockwise, the set range is calibrated. This control can be used to adjust the meter to an appropriate level for relative measurements. When not set at fully clockwise the UNCAL lamp lights to warn the operator.

7. OVERLEVEL

When using weighting filters the effect of the filter is to mask from the operator the presence of an excessively high input level. Thus distortion and the resulting errors can occur without the operator being aware of this condition. To

prevent this the OVERLEVEL warning lamp alerts the operator when the input level goes +15 dB above the full scale level (0 dB).

8. AVERAGE/PEAK

This switch is used to select the detection method. In the released position average detection and RMS display are in effect. Depressing the switch selects either DIN or CCIR quasi-peak detection and RMS display of the signal level. When CCIR/ARM is selected the detection method is automatically switched to average detection and RMS display regardless of the position of this switch.

9. WEIGHT

This six position selection switch group allows selection of one of FLAT or JIS-A, DIN NOISE, DIN AUDIO, CCIR or CCIR/ARM weighted response. Selection of the FLAT position turns the unit into a wideband AC voltmeter. If no button is depressed, the mode is automatically CCIR/ARM.

JIS-A: Used for noise level measurements in accordance with JIS C1502A, JIS C5551A, IEC-A, and IHF-A standards.

DIN NOISE: Used for noise level measurements in accordance with DIN standard 45405.

DIN AUDIO: Used for 10 Hz ~ 20 kHz audio level measurements in accordance with DIN standard 45405.

CCIR: Used for measurements of noise level in accordance with CCIR standards for measurements.

CCIR/ARM: Used for noise level measurements in accordance with CCIR/ARM standards for DOLBEY B type noise reduction systems. When the CCIR/ARM filter is

used, average detection is used regardless of the position of the AVERAGE/PEAK switch.

The appropriate AVERAGE/PEAK switch settings for the various filters are:

Filter:	AVERAGE	PEAK
JIS-A	○	—
DIN NOISE	—	○
DIN AUDIO	○	○
CCIR	—	○
CCIR/ARM	○	—

10. METER

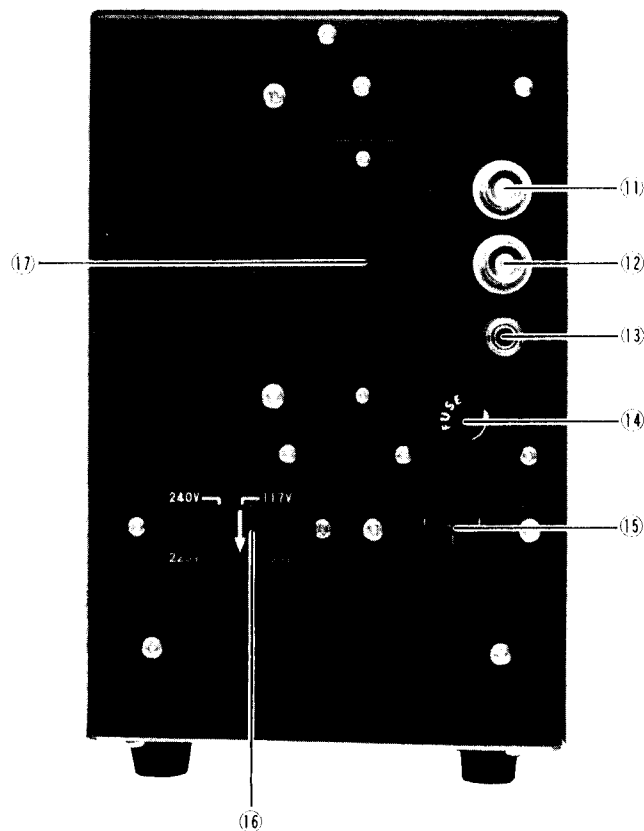


Fig. 2

REAR PANEL

11. AC OUTPUT

This output is used for waveform observation or for used of the VT-126 (VT-125) as an amplifier.

12. DC OUTPUT

This output is used for recording off-line measured values.

13. GND

Ground connection.

14. FUSE HOLDER

Use a screwdriver to open this holder for replacement of the fuse of specified rating.

For 100 or 120V: 0.5A

For 220 or 240V: 0.3A

15. AC POWER CONNECTOR

This is the AC power input connector. Use the power cord provided with the unit.

16. AC LINE VOLTAGE SELECTOR

Set the plug of this selector to the local line voltage (100/120/220/240V AC)

17. BLIND COVER

This cover protects the remote control mounting hole.

OPERATION

1. Check the mechanical zeroing of the meter.
2. Connect the signal cable to INPUT (4).
3. Set the RANGE switch (3) to the 300V range.
4. Connect the power cord and press the POWER (1) switch to turn the unit ON. The red LED (2) should light indicating the unit is ready for use.
5. Input the signal to be measured and if necessary gradually switch to lower (more sensitive) ranges until an easy to read meter deflection is obtained.

USING RELATIVE REF

To make measurements with respect to some arbitrary reference level, input the signal to be used as the reference level and use RELATIVE REF (5) to obtain a 0 dB meter deflection without changing the RELATIVE REF setting measurement of other signals can be made and read directly off the dB scale in dB with respect to the reference level. The adjustment range of the RELATIVE REF control is from 0 to -12 dB (negative only) so to set 0 dB for signal under 0 dB switching down range must be done.

READING THE METER SCALES (See Fig. 3)

1. VOLTAGE SCALES

These scales consist of a 0 ~ 10 and 0 ~ 3 scale which are used to read ranges which are multiples of 10 and 3 respectively. The range setting always refers to the meter fullscale deflection. The ranges are designed to overlap to allow values on the lower portion of one range to be more accurately read on the upper portion of the next more sensitive range.

2. dBm SCALES

A level of 1 mW into a 600 Ω resistance is take as 0 dBm (0.775V) and readings are made in 0 dBm with respect to this standard reference level.

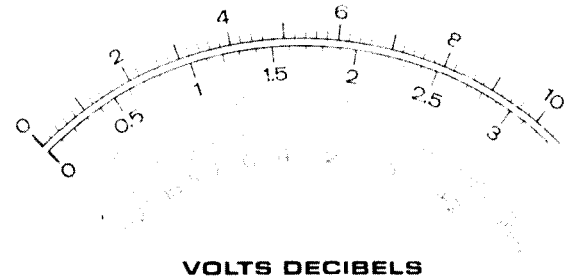


Fig. 3

PRECAUTIONS

1. To assure accurate measurements allow a five minute warming up period before actual measurements are begin. Note that switching between 1V and 300 mV and between 1 mV and 300 μ V and 10 μ V upon powering the unit up may result in the deflection of the meter.
2. To preserve the high sensitivity of this unit, be sure to use either the input signal cable provided or another low capacitance shielded cable. Use of single conductors or other unshielded cables or high impedance signal sources can result in noise being introduced into the measurement circuit.
3. Be sure to take care not to exceed the maximum allowable input levels:
10 μ V $\sim$ 300 μ V ranges: AC: 10Vrms
(30 μ V $\sim$ 300 μ V range DC: 500V
for VT-125)
1 mV $\sim$ 300 mV ranges: AC: 80Vrms
DC + AC peak: 500V
1V $\sim$ 300V ranges: DC + AC peak: 500V
For excessively high inputs in the 10 μ V to 300 μ V ranges the input impedance drops to approximately 100 Ω .
4. Please note that this unit OVERLEVEL LED lights when the input exceeds 15 dB above the fullscale reading for use with weighting filters to warn against distortion due to highly excessive signal levels. It also normally lights when switching between the 300V and 1V or between the 300 μ V and 1 mV ranges, but this is normal and not an indication of excessive signal level.
5. The dynamic range of the units is 40 $\sim$ 80 dB making it impossible to measure the internal weighing filter's frequency response while they are installed in the unit.
6. A signal or DC voltage should never be placed between the instrument case and ground.
7. When this instrument is used in a location where the AC line has pulse noise of a level higher than the internal filter can handle, performance may be affected. Consideration should be given to providing a clean power source in such a situation.
8. Temperature coefficient (10 μ V $\sim$ 300 μ V range for the VT-126 and 30 μ V $\sim$ 300 μ V range for VT-125) is 0.1%/°C TYP.

MAINTENANCE

Removing the CASE

Using a screwdriver, remove the two screws each on the left side, right side and top of the instrument. Open the bottom of the receptacle shaped case to remove the cover. Removal of the four screws retaining the bottom cover will expose the shield.

Selection of Power Line Voltage (See Fig. 4)

To set this instrument up for use with 100, 120V AC reinsert the power line voltage selector plug at the rear panel to appropriate position. Note that for use at 100 or 120V the fuse should be changed to a 0.5A unit.

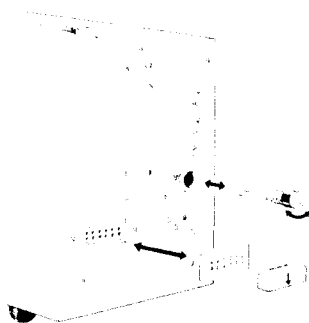


Fig. 4

ADJUSTMENT

Although this instrument is shipped in a calibrated and adjusted state, should recalibration be necessary, perform the procedures outlined below using calibrated instruments after verifying that the line voltage setting is correct.

Meter accuracy adjustment

1. Remove the case and bottom cover.
2. Without applying power mechanically zero the meter using the zero adjustment screw.
3. Using a meter calibrator apply either a 400Hz or 1 kHz signal to the INPUT (4) of this instrument.
4. Set the AVERAGE/PEAK switch (8) to AVERAGE and the WEIGHT switch (9) to FLAT.
5. Set the meter calibrator output to 10 mV and the meter RANGE switch (3) to 10 mV. Adjust VR2 of the Output Unit (X73-1390-00) for a fullscale deflection of 10 mV.
6. Set the meter calibrator output level to 30 mV and the meter range switch to 30 mV. Adjust VR4 on the Input Unit (X73-1380-00) (bottom side) for a fullscale deflection.

Next set the meter calibrator output level to 1V and the meter range switch to the 1V range. Adjust VR1 of the Input Unit for a fullscale deflection.

7. For adjustment of the 10 μ V to 300 μ V ranges (30 μ V to 300 μ V ranges for the VT-125), use a calibrated resistive attenuator to obtain an output of 100 μ V. Set the meter range to 100 μ V and adjust VR2 of the Input Unit for a fullscale deflection.

8. To adjust the 10 μV range of the VT-126, set the calibrator output to 10 μV and set the meter range switch to the 10 μV position. Adjust VR201 of the Input Unit for a fullscale deflection.
9. Depress the AVERAGE/PEAK switch and leave the WEIGHT switches in the FLAT condition. As was done in step 5, adjust VR7 of the Output Unit for a fullscale deflection.
10. Remove the calibrator and connect a wideband oscillator to the INPUT. Set the oscillator frequency to 1 kHz and the meter range switch to 1V. Adjust the oscillator output level for a fullscale deflection in this condition.
11. Shift the oscillator frequency to 100 kHz and use the TC1 on the Input Unit to adjust the meter for fullscale deflection.
12. Repeat the above procedure.

AC-DC OUT adjustment

Depress the AVERAGE/PEAK switch on the panel and leave the WEIGHT switches in the FLAT condition.

AC-OUT adjustment

Apply a signal so that the meter reads for fullscale. Adjust VR8 so that the AC OUT is 1 Vrms.

DC-OUT adjustment

Short circuit the input and adjust VR10 so that the DC OUT is 0V. Apply a signal so that the meter reads for fullscale. Adjust VR9 so that the DC OUT is 1V. Repeat above procedure until the specified value is obtained.

Adjustment of Weighting Filter Reference Level

The reference level of each filter is adjusted so that this level (the 0 dB level on the weighting curve) yields the same measured value as the FLAT condition. Use a frequency counter to accurately set the frequency of the oscillator for this adjustment.

Weighting	Filter Unit Control	Oscillator frequency	Adjust For:
JIS-A	VR1	1kHz	0 dB indication
DIN NOISE	VR2	1kHz	0 dB indication
DIN AUDIO	VR3	1kHz	0 dB indication
CCIR	VR4	6.3kHz	12.2 dB indication
CCIR/ARM	VR5	6.3kHz	6.6 dB indication

APPENDIX

With regard to CCIR recommendations and DIN 45405 standards for semi-peak detection of noise levels, the following characteristics are specified.

1. One tone burst is to be input and the measured value to be verified to be within the limits summarized below.
The tone burst is to be sine wave of 5 kHz frequency.
The duration times are listed in the table below.

Tone burst duration (ms)		1	2	5	10	20	50	100	200	8
Measured value (%)		17.0	26.6	40	48	52	59	68	80	100
Allowable range (%)	Lower limit	13.5	22.4	34	41	44	50	58	68	
	Upper limit	21.4	31.6	46	55	60	68	78	92	

2. Input a tone burst signal as shown below and verify a response within the limits shown below. The tone burst frequency is 5 kHz.

Tone burst repetition frequency (Hz)		2	10	100
Measured value (%)		48	77	97
Allowable range (%)	Lower limit (%)	43	72	94
	Upper limit (%)	53	82	100

- 1) Noise Measurement Filter JIS C1502A, JIS C5551A IEC-A, IHF-A

Frequency (Hz)	Response (dB)	Response tolerance (dB)
25	44.6	± 2.0
31.5	39.2	± 2.0
40	34.5	± 2.0
50	30.2	± 2.0
63	26.1	± 2.0
80	22.3	± 2.0
100	19.1	± 1.0
125	16.1	± 1.0
160	13.2	± 1.0
200	10.8	± 1.0
250	8.6	± 1.0
315	6.5	± 1.0
400	4.8	± 1.0
500	3.2	± 1.0
630	1.9	± 1.0
800	0.8	± 1.0
1000	0	0
1250	+ 0.6	± 1.0
1600	+ 1.0	± 1.0

Frequency (Hz)	Response (dB)	Response tolerance (dB)
2000	+ 1.2	± 1.0
2500	+ 1.2	± 1.0
3150	+ 1.2	± 1.0
4000	+ 1.0	± 1.0
5000	+ 0.5	± 1.0
6300	0.1	± 1.0
8000	1.1	± 1.0
10000	2.4	± 1.0
12500	4.2	± 2.0
16000	6.5	± 2.0

2) Noise Measurement
Filter DIN 45405 (NOISE)

Frequency (Hz)	Response (dB)	Response tolerance (dB)
20	< -40	
31.5	< -38	
63	31.6	± 1.5
100	26.1	± 1.5
200	17.3	± 1.5
400	8.8	± 1.5
800	1.9	± 1.5
1000	0	± 0.5
2000	+ 5.3	± 1.5
4000	+ 8.2	± 1.5
5000	+ 8.4	± 0.5
6300	+ 8.0	± 1.5
7100	+ 7.1	± 1.5
8000	+ 5.1	± 2.0
9000	0.3	+ 3, - 2
10000	9.7	+ 3, - 2
16000	< - 21	
20000	< - 23	
31500	< - 30	

3) Noise Measurement
Filter DIN 45405 (AUDIO)

Frequency (Hz)	Response (dB)	Response tolerance (dB)
4	< -20	
10	< - 5	
31.5	0	± 0.5
1000	0	± 0.5
20000	0	± 0.5
25000	< - 3	
50000	< - 40	

4) Noise Measurement Filter (CCIR standard),
(Rec. 468-2)

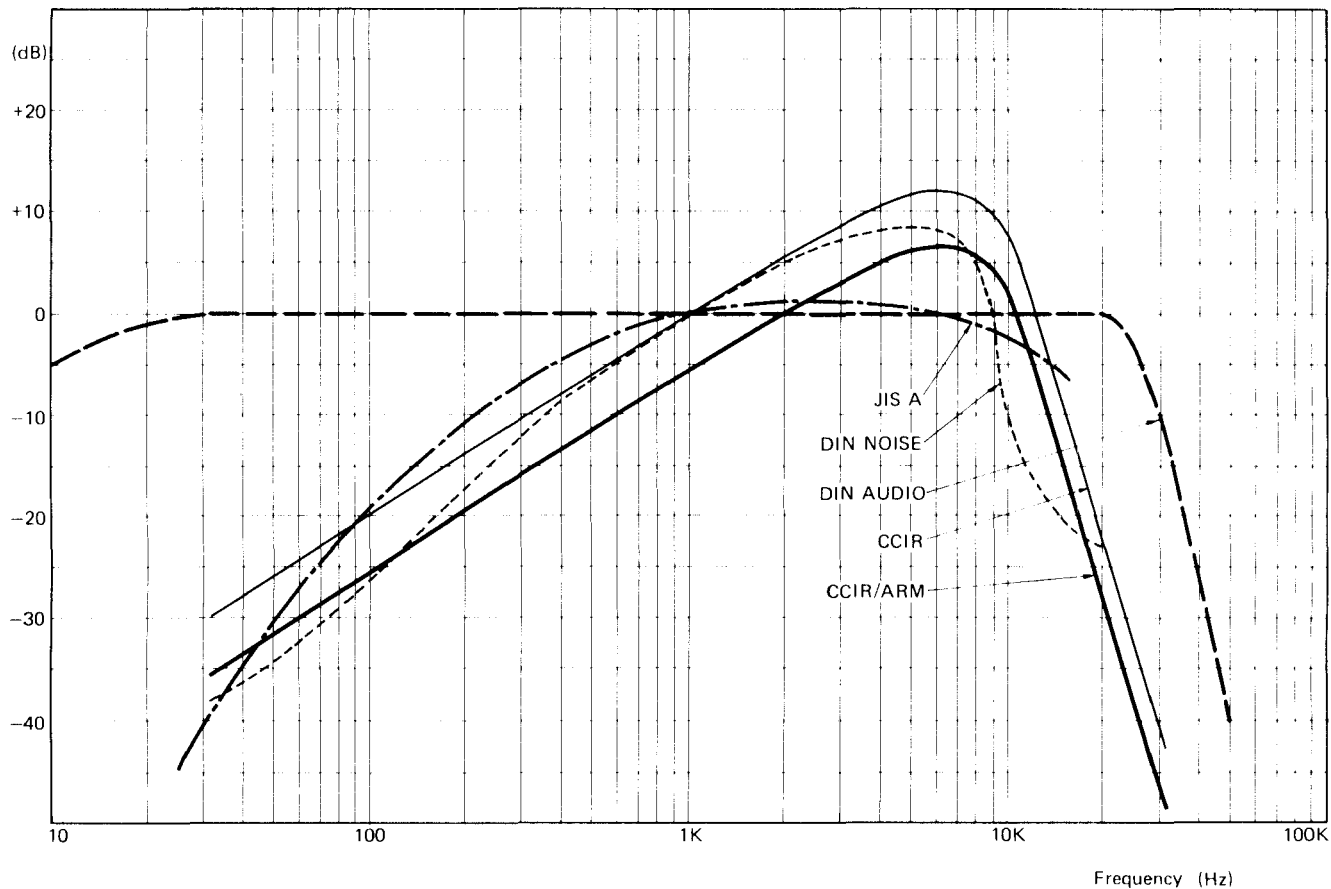
Frequency (Hz)	Response (dB)	Response tolerance (dB)
31.5	29.9	± 2.0
63	23.9	± 1.4 (1)
100	19.8	± 1.0
200	- 13.8	+ 0.85(1)
400	- 7.8	+ 0.7 (1)
800	1.9	+ 0.55(1)
1000	0	± 0.5
2000	+ 5.6	± 0.5 (1)
3150	+ 9.0	+ 0.5 (1)
4000	+ 10.5	± 0.5 (1)
5000	+ 11.7	± 0.5
6300	+ 12.2	0
7100	+ 12.0	+ 0.2 (1)
8000	+ 11.4	± 0.4 (1)
9000	+ 10.1	+ 0.6 (1)
10000	+ 8.1	+ 0.8 (1)
12500	0	± 1.2 (1)
14000	5.3	± 1.4 (1)
16000	11.7	+ 1.65(1)

Frequency (Hz)	Response (dB)	Response tolerance (dB)
20000	- 22.2	± 2.0
31500	42.7	+ 2.8 (1) ∞

5) Noise Measurement Filter
(CCIR/ARM standard)

Frequency (Hz)	Response (dB)	Response tolerance (dB)
31.5	35.5	± 2.0
63	29.5	± 1.4
100	25.4	± 1.0
200	19.4	± 0.85
400	13.4	± 0.7
800	7.5	± 0.55
1000	5.6	± 0.5
2000	0	± 0.5
3150	± 3.4	± 0.5
4000	± 4.9	± 0.5
5000	± 6.1	± 0.5
6300	± 6.6	0
7100	± 6.4	± 0.2
8000	± 5.8	± 0.4
9000	± 4.5	± 0.6
10000	± 2.5	± 0.8
12500	5.6	± 1.2
14000	10.9	± 1.4
16000	17.3	± 1.65
20000	27.8	± 2

Frequency (Hz)	Response (dB)	Response tolerance (dB)
31500	48.3	± 2.8 ∞



Noise Weighting Characteristics

PARTS LIST

Main Chassis

Ref No.	Parts No.	Description
J4 J13	A01-0874-02	Case
	A10-1430-02	Chassis
	A13-0735-03	Frame
	A20-2757-03	Die-casting panel
	A21-0888-04	Decorative panel
	[A21-0889-04]	[Decorative panel]
	A23-1628-03	Rear panel
	A40-0707-03	Bottom plate
	B07-0706-04	Push escutcheon × 8 (square, light grey)
	B30-0928-05	Lamp ass'y
	B30-0929-05	Lamp ass'y
	B30-0903-15	LED
	B31-0720-05	Meter
	B40-2765-04	Name plate (serial No)
	B41-0708-14	Voltage indicating plate
	B42-1837-04	Plate (for adjustment)
	B50-2936-00	Instruction manual
	B40-2780-04	Name plate (Model VT-126)
	[B40-2782-04]	[Name plate Model VT-125]
	E03-0201-05	Power connector
	E04-0251-05	BNC jack
	E04-0253-05	BNC jack (insulated)
	E08-1081-05	Voltage selector (jack)
	E09-0681-05	Voltage selector (plug)
	E21-0657-04	Metal terminal

Ref No	Parts No.	Description
J1 J2 J3 J5 J6 J7 J8 J9 J11 J12 J14 J17 J18 (J19)	E22-0381-05	Lug terminal
	E23-0513-05	Earth lug
	E30-1818-05	JIS power cord
	E31-0537-05	Lead wire with terminal
	E31-0763-05	Lead wire with connector
	E31-0764-05	Lead wire with connector
	E31-0765-05	Lead wire with connector
	E31-0766-05	Lead wire with connector
	E31-0767-05	Lead wire with connector
	E31-0768-05	Lead wire with connector
	E31-0769-05	Lead wire with connector
	E31-0770-05	Lead wire with connector
	E31-0772-05	Lead wire with connector
	E31-0773-05	Lead wire with connector
	E31-0774-05	Lead wire with connector
	E31-0776-05	Lead wire with connector
	E31-0777-05	Lead wire with connector
	(E31-0778-05)	(Lead wire with connector)
	E31-0779-05	Lead wire with connector
	E31-0780-05	Lead wire with connector
	F20-0078-05	Insulate sheet (for TR)
	F29-0014-05	Insulate sheet (for TR)
	F05-5013-05	Fuse 0.5A
	F05-3011-05	Fuse 0.3A
	F01-0824-04	Heat sink
	F10-1547-03	Shield cover
	F10-1548-04	Shield plate
	F15-0703-04	Blind plate
	F19-0703-04	Blind patch (for voltage selector)

[] The item bracketed is for VT-125

() Unless otherwise specified, all resistors are 1/5% and 1/4W

The part indicated with [] is installed in the foil side of P.C. board

Ref. No.	Parts No.	Description
	J03-0003-04	Rubber leg
	J10-0082-03	Bezel ass'y
	J10-0038-03	Bezel
	[J10-0084-03]	[Bezel ass'y]
	J13-0033-15	Fuse holder
	J19-1620-05	Cord keeper
	J21-2843-04	Bracket (for meter)
	J21-2931-04	Bracket (for transformer)
	J42-0515-05	Bushing
	J42-0507-04	Bushing (for BNC)
	J61-0049-05	Cable band
	K01-0058-25	Handle
	K21-0840-04	Knob (for RANGE)
	K21-0820-04	Knob (for REFERENCE)
	K27-0504-04	Push knob (square, grey)
	K27-0506-04	Push knob (square, orange)
	K27-0523-04	Push knob (square, grey)
T1	L01-9246-05	Power transformer
S402	S01-1512-05	Rotary switch
	[S101-1513-05]	[Rotary switch]
S401	S40-2509-05	Push switch (for power)
S301	S40-6501-05	Push switch (for AVERAGE/PEAK)
	H01-2925-14	Packing case
	[H01-2928-14]	[Packing case]
	H10-2802-02	Pad (foamed styrene)
	H20-1716-04	Pad (carton)
	H25-0029-04	Polyethylene bag (for fuse)
VR301	R01-1508-05	Variable resistor 1k Ω B

Ref. No.	Parts No.	Description
C1	CK45E3D103P	Ceramic capacitor 0.01 μ F + 100%, -0%
IC1		IC FS7915
IC2		IC FS7815
IC3		IC FS7905M
IC4		IC FS7805M
	X73-1380-00	Input unit
	[X73-1380-01]	[Input unit]
	X70-1010-00	Filter unit
	X73-1390-00	Output unit
	X68-1340-00	Power supply unit
	[X68-1340-01]	[Power supply unit]

X73-1380-00 Input unit

Ref. No.	Parts No.	Description
R1	RN14BK2H9993F	Metal film 999k Ω $\pm$ 1% 1/2W
R2	RN14BK2E9530F	Metal film 953 Ω $\pm$ 1% 1/4W
R3	RD14BY2H100J	Carbon 10 Ω $\pm$ 5% 1/2W
R4	RD14BB2E101J	Carbon 100 Ω
R5	RS14AB3A682J	Metal film 6.8k Ω $\pm$ 5% 1W
R6.7	RD14BB2E472J	Carbon 4.7k Ω
R8 ~ 10	RD14BB2E103J	Carbon 10k Ω
R11	RD14BB2E472J	Carbon 4.7k Ω
R12	RD14BB2E103J	Carbon 10k Ω
R13	RN14BK2E7502F	Metal film 75k Ω $\pm$ 1% 1/4W
R14	RD14BB2E103J	Carbon 10k Ω
R15	RD14BB2E331J	Carbon 330 Ω
R16.17	RD14BB2E102J	Carbon 1k Ω

Ref. No.	Parts No.	Description			
R18	RD14BB2E472J	Carbon	4.7k Ω		
R19	RS14AB3A101J	Metal film	100 Ω	$\pm 5\%$	1W
R20.21	RD14BB2E472J	Carbon	4.7k Ω		
R22.23	RD14BB2E103J	Carbon	10k Ω		
R24	RN14BK2E3302F	Metal film	33k Ω	$\pm 1\%$	1/4W
R25	RN14BK2E6202F	Metal film	62k Ω	$\pm 1\%$	1/4W
R26	R92.0798.05	Metal film	47M Ω		
R27	RN14BK2E3301F	Metal film	3.3k Ω	$\pm 1\%$	1/4W
R28	RN14BK2E18R0F	Metal film	18 Ω	$\pm 1\%$	1/4W
R30	RN14BK2E13R0F	Metal film	13 Ω	$\pm 1\%$	1/4W
R31	RN14BK2E3301F	Metal film	3.3k Ω	$\pm 1\%$	1/4W
R32	RN14BK2E8200F	Metal film	820 Ω	$\pm 1\%$	1/4W
R33	RN14BK2E1000F	Metal film	100 Ω	$\pm 1\%$	1/4W
R34	RN14BK2E4701F	Metal film	4.7k Ω	$\pm 1\%$	1/4W
R35	RN14BK2E1001F	Metal film	1k Ω	$\pm 1\%$	1/4W
R36	RD14BB2E682J	Carbon	6.8k Ω		
R37	RD14BB2E331J	Carbon	330 Ω		
R38	RD14BB2E682J	Carbon	6.8k Ω		
R39	RD14BB2E331J	Carbon	330 Ω		
R40.41	RN14BK2E2001F	Metal film	2k Ω	$\pm 1\%$	1/4W
R42	RN14BK2E2700F	Metal film	270 Ω	$\pm 1\%$	1/4W
R43	RN14BK2E4701F	Metal film	4.7k Ω	$\pm 1\%$	1/4W
R44.45	RD14BB2E472J	Carbon	4.7k Ω		
R46	RN14BK2E1501F	Metal film	1.5k Ω	$\pm 1\%$	1/4W
R47	R92.0786.05	Metal film	60 Ω	$\pm 0.5\%$	
R48	RN14BK2E4110D	Metal film	411 Ω	$\pm 0.5\%$	1/4W
R49	RN14BK2E2780D	Metal film	278 Ω	$\pm 0.5\%$	1/4W
R50	RN14BK2E4110D	Metal film	411 Ω	$\pm 0.5\%$	1/4W
R51	RN14BK2E2780D	Metal film	278 Ω	$\pm 0.5\%$	1/4W
R52	RN14BK2E4110D	Metal film	411 Ω	$\pm 0.5\%$	1/4W
R53	RN14BK2E1900D	Metal film	190 Ω	$\pm 0.5\%$	1/4W
R54	RN14BK2E1400F	Metal film	140 Ω	$\pm 1\%$	1/4W
R55	RN14BK2E14R0F	Metal film	14 Ω	$\pm 1\%$	1/4W

Ref. No.	Parts No.	Description			
R56	RD14BB2E103J	Carbon	10k Ω		
R57	RD14BB2E101J	Carbon	100 Ω		
R58	RD14BB2E103J	Carbon	10k Ω		
R59	RD14BB2E681J	Carbon	680 Ω		
R60	RN14BK2E3300F	Metal film	330 Ω	$\pm 1\%$	1/4W
R61	RN14BK2E1502F	Metal film	15k Ω	$\pm 1\%$	1/4W
R62.63	RD14BB2E103J	Carbon	10k Ω		
R64.65	RD14BB2E102J	Carbon	1k Ω		
R66	RD14BB2E104J	Carbon	100k Ω		
R67	RD14BB2E102J	Carbon	1k Ω		
R68	RN14BK2E3302F	Metal film	33k Ω	$\pm 1\%$	1/4W
R69	RN14BK2E3301F	Metal film	3.3k Ω	$\pm 1\%$	1/4W
R70	RD14BB2E473J	Carbon	47k Ω		
R71 ~ 74	RN14BK2E1002F	Metal film	10k Ω	$\pm 1\%$	1/4W
R75	RN14BK2E1003F	Metal film	100k Ω	$\pm 1\%$	1/4W
R76	RD14BB2E333J	Carbon	33k Ω		
R77	RD14BB2E681J	Carbon	680 Ω		
R78.79	RD14BB2E102J	Carbon	1k Ω		
R80	RD14BB2E101J	Carbon	100 Ω		
R81	RD14BB2E561J	Carbon	560 Ω		
R82	RD14BB2E564J	Carbon	560k Ω		
R83	RD14BB2E154J	Carbon	150k Ω		
R84	RD14BB2E561J	Carbon	560 Ω		
R85	RD14BB2E472J	Carbon	4.7k Ω		
R86	RN14BK2E39R0F	Metal film	39 Ω	$\pm 1\%$	1/4W
R87	RD14BB2E124J	Carbon	120k Ω		
R88	RN14BK2E2000F	Metal film	200 Ω	$\pm 1\%$	1/4W
(R201					
(R202)	(RN14BK2E2001F)	(Metal film	2k Ω	$\pm 1\%$	1/4W)
(R203)	(RN14BK2E4701F)	(Metal film	4.7k Ω	$\pm 1\%$	1/4W)
(R204					
(R205)	(RD14BB2E472J)	(Carbon	4.7k Ω		)

Ref. No.	Parts No.	Description			Ref. No.	Parts No.	Description		
VR1.2	R12-0502-05	Variable resistor 100ΩB			C34 ~ 37	CQ93M1H222K	Mylar	2200pF	± 10% 50WV
VR6	R12-3502-05	Variable resistor 33kΩB			C38,39	CE04W1E101M	Electrolytic	100μF	25WV
VR7	R12-0058-05	Variable resistor 470ΩB			C40,41	CQ93M1H104K	Mylar	0.1μF	± 10% 50WV
					C42 ~ 45	CE04W1E470M	Electrolytic	47μF	25WV
					C46	CE04W1A471M	Electrolytic	470μF	10WV
					C47	CC45CH1H470J	Ceramic	47pF	± 5% 50WV
(VR201)	(R12-0058-05)	(Variable resistor 470ΩB)			C201	CQ93M1H222K	Mylar	2200pF	± 10% 50WV
C1	C91-0550-05	Metalized film	0.15μF	630WV	C202	CQ93BP2A202F	Polypropylen	2000pF	± 1% 100WV
C2	C91-0553-05	Dipped mica	7.5pF	300WV	C203	CQ93BP2A102F	Polypropylen	1000pF	± 1% 100WV
C3	CM93BD2A472J	Mica	4700pF	± 5% 100WV	C204	CE04W1A471M	Electrolytic	470μF	10WV
C4	CK45D2H471M	Ceramic	470pF	± 20% 500WV					
C5,6	CE04W1E101M	Electrolytic	100μF	25WV					
C7,8	CE04W1H2R2M	Electrolytic	2.2μF	50WV					
C9	CE04W1A471M	Electrolytic	470μF	10WV					
C10,11	CE04W1E101M	Electrolytic	100μF	25WV					
C12	C91-0519-05	Metalized film	1μF	100WV					
C13									
~ C15	CE04W1E101M	Electrolytic	100μF	25WV					
C16	CE04W0J472M	Electrolytic	4700μF	6.3WV	D1,2		Diode	1S1555	
C17	CE04W1A471M	Electrolytic	470μF	10WV	D5,6		Diode	1S1555	
C18	CC45CH1H100D	Ceramic	10pF	± 0.5pF 50WV	D9 ~ 12		Diode	1S1587	
C19,20	CE04W1E101M	Electrolytic	100μF	25WV	D13 ~ 16		Diode	1S1555	
C21,22	CE04W1C470M	Electrolytic	47μF	16WV	D18,19		Zener diode	WZ-081	
C23	CM93BD2A471F	Mica	470pF	± 1% 100WV	(D201)		(Diode	1S1555)	
C24	CM93BD2A241F	Mica	240pF	± 1% 100WV					
C25,26	CE04W1A471M	Electrolytic	470μF	10WV					
C27	CC45CH1H050D	Ceramic	5pF	± 0.5pF 50WV					
C28	CE04W1A471M	Electrolytic	470μF	10WV	Q1		FET	2SK68A(K)	
C29,30	CE04W1E101M	Electrolytic	100μF	25WV	Q2,3		Transistor	2SC1815(Y)	
C31	CE04W1C470M	Electrolytic	47μF	16WV	Q4		FET	2SK68A(K)	
C32	CC45CH1H100D	Ceramic	10pF	± 0.5pF 50WV	Q5		Transistor	2SA841(BL)	
C33	CE04BW1H010M	Electrolytic	1μF	50WV	Q6		Transistor	2SC495(Y)	

Ref. No.	Parts No.	Description
Q7		Transistor 2SC1815 (Y)
Q8		Transistor 2SA841 (BL)
Q9		Transistor 2SC1815(Y)
Q10		Transistor 2SA733(Q)
Q11,12		Transistor 2SA841(BL)
Q13,14		Transistor 2SC784(O)
Q15		Transistor 2SA733(Q)
Q16		Transistor 2SA841 (BL)
Q17		FET 2SK30A (GR)
(Q201)		(Transistor) (2SC1815 (Y))
(Q202)		(Transistor) (2SA841 (BL))
IC1		IC TC4066BP or MC14066BCP
IC2		IC CA3100E
IC3		IC NJM4558D
		Thermister SDT-100
RL1	S51-2408 05	Relay
RL2 ~ 4	S51-1404 05	Relay
(RL201)	(S51-1404-05)	(Relay)
P101,102	E40-0673 05	Pin connector 6P
P103,104	E40-0273 05	Pin connector 2P
P105	E40-0373 05	Pin connector 3P
	E23-0046-04	Terminal
	J25-2927-03	Printed circuit board
	J32-0821-04	Hex. post
	N10-2030-46	Hex. nut

X73-1390-00 Output unit

Ref. No	Parts No	Description
R1	RD14BB2E102J	Carbon 1k Ω
R2	RN14BK2E3301F	Metal film 3.3k Ω $\pm 1\%$ 1/4W
R3	RN14BK2E1000F	Metal film 100 Ω $\pm 1\%$ 1/4W
R4	RN14BK2E1002F	Metal film 10k Ω $\pm 1\%$ 1/4W
R5	RN14BK2E3300F	Metal film 330 Ω $\pm 1\%$ 1/4W
R6	RD14BB2E472J	Carbon 4.7k Ω
R7,8	RD14BB2E102J	Carbon 1k Ω
R9	RD14BB2E472J	Carbon 4.7k Ω
R10	RN14BK2E3000F	Metal film 300 Ω $\pm 1\%$ 1/4W
R11	RD14BB2E103J	Carbon 10k Ω
R12	RD14BB2E270J	Carbon 27 Ω
R13	RD14BB2E103J	Carbon 10k Ω
R14	RD14BB2E681J	Carbon 680 Ω
R15	RD14BB2E683J	Carbon 68k Ω
R16	RD14BB2E104J	Carbon 100k Ω
R17,18	RD14BB2E561J	Carbon 560 Ω
R19	RN14BK2E3300F	Metal film 330 Ω $\pm 1\%$ 1/4W
R20	RN14BK2E20R0F	Metal film 20 Ω $\pm 1\%$ 1/4W
R21	RN14BK2E1000F	Metal film 100 Ω $\pm 1\%$ 1/4W
R22,23	RD14BB2E151J	Carbon 150 Ω
R24	RN14BK2E4702F	Metal film 4.7k Ω $\pm 1\%$ 1/4W
R25	RN14BK2E1003F	Metal film 100k Ω $\pm 1\%$ 1/4W
R26	RN14BK2E3301F	Metal film 3.3k Ω $\pm 1\%$ 1/4W
R27	RN14BK2E4702F	Metal film 47k Ω $\pm 1\%$ 1/4W
R28,29	RN14BK2E3900F	Metal film 390 Ω $\pm 1\%$ 1/4W
R30,31	RD14BB2E472J	Carbon 4.7k Ω
R32	RN14BK2E1802F	Metal film 18k Ω $\pm 1\%$ 1/4W
R33	RN14BK2E1003F	Metal film 100k Ω $\pm 1\%$ 1/4W
R34	RD14BB2E102J	Carbon 1k Ω
R35,36	RD14BB2E103J	Carbon 10k Ω

Ref. No.	Parts No.	Description				Ref. No.	Parts No.	Description			
R37	RD14BB2E101J	Carbon	100Ω			C1	C91-0551-05	Metalized film	1μF		25WV
R38	RD14BB2E681J	Carbon	680Ω			C2	CE04W1A471M	Electrolytic	470μF		10WV
R39	RN14BK2E3900F	Metal film	390Ω	±1%	1/4W	C3,4	CE04W1E101M	Electrolytic	100μF		25WV
R40	RN14BK2E1502F	Metal film	15kΩ	±1%	1/4W	C5	CE04W1A471M	Electrolytic	470μF		10WV
R41	RD14BB2E152J	Carbon	1.5kΩ			C6	CE04W1A221M	Electrolytic	220μF		10WV
R42	RD14BB2E472J	Carbon	4.7kΩ			C7	CC45CH1H100D	Ceramic	10pF	±0.5pF	50WV
R43	RN14BK2E5230F	Metal film	523Ω	±1%	1/4W	C8,9	CE04W1E470M	Electrolytic	47μF		25WV
R44,45	RD14BB2E101J	Carbon	100Ω			C10	CE04W1C221M	Electrolytic	220μF		16WV
R46	RN14BK2E3002F	Metal film	30kΩ	±1%	1/4W	C11	CM93BD2A300G	Mica	30pF	±2%	100WV
R47	RN14BK2E5601F	Metal film	5.6kΩ	±1%	1/4W	C14	CE04W1C101M	Electrolytic	100μF		16WV
R48	RN14BK2E3002F	Metal film	30kΩ	±1%	1/4W	C15	CC45CH1H100D	Ceramic	10pF		50WV
R49						C16	CE04BW1A101N	Electrolytic	100μF		10WV
~51	RN14BK2E1002F	Metal film	10kΩ	±1%	1/4W	C17,18	CC45CH1H100D	Ceramic	10pF	±0.5pF	50WV
R52	RN14BK2E9761F	Metal film	9.76kΩ	±1%	1/4W	C19,20	C90-0903-05	Electrolytic	33μF		25WV
R53	RN14BK2E6040F	Metal film	604Ω	±1%	1/4W	C21	CE04W1E101M	Electrolytic	100μF		25WV
R54	RD14BB2E105J	Carbon	1MΩ			C22	CC45CH1H100D	Ceramic	10pF	±0.5pF	50WV
R55,56	RD14BB2E101J	Carbon	100Ω			C23	CC45CH1H150J	Ceramic	15pF	±5%	50WV
VR57	RD14BB2E101J	Carbon	100Ω			C24~26	CE04W1E101M	Electrolytic	100μF		25WV
VR58	RD14BB2E682J	Carbon	6.8kΩ			C28~29	CE04W1E101M	Electrolytic	100μF		25WV
VR59	RD14BB2E123J	Carbon	12kΩ			C30	CE04W1E470M	Electrolytic	47μF		25WV
R60,61	RN14BK2E1302F	Metal film	13kΩ	±1%	1/4W	C31	CE04W1A221M	Electrolytic	220μF		10WV
VR62	RD14BB2E560J	Carbon	56Ω								
VR2	R12-0502-05	Variable resistor 100ΩB				D1~5		Diode	1S1588		
VR3	R12-3041-05	Variable resistor 10KΩ				D6~8		Diode	1S1555		
VR4,5	R12-0502-05	Variable resistor 100Ω				D9,10		Zener Diode	WZ-100		
VR6	R12-2020-05	Variable resistor 6.8KΩ				Q1		FET	2SK30A(GR)		
VR7	R12-1037-05	Variable resistor 3.3KΩ				Q2		Transistor	2SA841(BL)		
VR8	R12-0511-05	Variable resistor 220Ω				Q3,4		Transistor	2SC1815(Y)		
VR9	R12-3040-05	Variable resistor 10kΩ				Q5,6		Transistor	2SA841(BL)		
VR10	R12-0058-05	Variable resistor 470Ω				Q7		Transistor	2SC784(O)		
						Q8		Transistor	2SC1815(Y)		
						Q9		FET	2SK30A(GR)		
						Q10,11		Transistor	2SA841(BL)		

Ref. No.	Parts No.	Description
Q12		Transistor 2SC784(O)
IC1 ~ 3		IC CA3100E
IC4 ~ 6		IC NJM4558D
		Thermister SDT-1000
	E23-0046-04	Terminal
P301	E40-0274-05	Pin connector 2P
P302	E40-0674-05	Pin connector 6P
P304.305	E40-0474-05	Pin connector 4P
P306		
~ P308	E40-0373-05	Pin connector 3P
	J25-2928-03	Printed circuit board
RL1	S51-2408-05	Relay

X70-1010-00 Filter unit

Ref. No.	Parts No.	Description
R1	RD14BB2E102J	Carbon 1k Ω
R2,3	RN14BK2E1872F	Metal film 18.7k Ω $\pm 1\%$ 1/4W
R4	RN14BK2E7502E	Metal film 75k Ω $\pm 1\%$ 1/4W
R5	RN14BK2E1003F	Metal film 100k Ω $\pm 1\%$ 1/4W
R6	RD14BB2E102J	Carbon 1k Ω
R7	RN14BK2E1001F	Metal film 1k Ω $\pm 1\%$ 1/4W
R9	RD14BB2E102J	Carbon 1k Ω
R10,11	RN14BK2E1001F	Metal film 1k Ω $\pm 1\%$ 1/4W
R12	RN14BK2E1002F	Metal film 10k Ω $\pm 1\%$ 1/4W
R13,14	RN14BK2E1102F	Metal film 11k Ω $\pm 1\%$ 1/4W
R15,16	RN14BK2E1302F	Metal film 13k Ω $\pm 1\%$ 1/4W
R17,18	RN14BK2E9101F	Metal film 9.1k Ω $\pm 1\%$ 1/4W
R19	RN14BK2E1102F	Metal film 11k Ω $\pm 1\%$ 1/4W

Ref. No.	Parts No.	Description
R20	RN14BK2E5602F	Metal film 56k Ω $\pm 1\%$ 1/4W
R21	RN14BK2E1002F	Metal film 10k Ω $\pm 1\%$ 1/4W
R22	RD14BB2E472J	Carbon 4.7k Ω
R23	RD14BB2E102J	Carbon 1k Ω
R24	RN14BK2E1001F	Metal film 1k Ω $\pm 1\%$ 1/4W
R25	RN14BK2E7872F	Metal film 78.7k Ω $\pm 1\%$ 1/4W
R27	RN14BK2E1583F	Metal film 158k Ω $\pm 1\%$ 1/4W
R28 ~ 34	RN14BK2E8201F	Metal film 8.2k Ω $\pm 1\%$ 1/4W
R35	RD14BB2E472J	Carbon 4.7k Ω
R36	RD14BB2E102J	Carbon 1k Ω
R37	RN14BK2E1001F	Metal film 1k Ω $\pm 1\%$ 1/4W
R38	RN14BK2E2001F	Metal film 2k Ω $\pm 1\%$ 1/4W
R39,40	RN14BK2E6040F	Metal film 604 Ω $\pm 1\%$ 1/4W
R41	RN14BK2E2001F	Metal film 2k Ω $\pm 1\%$ 1/4W
R42	RN14BK2E3001F	Metal film 3k Ω $\pm 1\%$ 1/4W
VR1	R12-1033-05	Variable resistor 2.2K Ω B
VR2	R12-1037-05	Variable resistor 3.3K Ω B
VR3	R12-0060-05	Variable resistor 330 Ω B
VR4,5	R12-1501-05	Variable resistor 1.5K Ω B
C1,2	CQ93BP2A333F	Polypropylen 0.033 μ F $\pm 1\%$ 100WV
C3	CM93BD2A221F	Mica 220pF $\pm 1\%$ 100WV
C4	CQ93BP2A243F	Polypropylen 0.024 μ F $\pm 1\%$ 100WV
C5	CQ93BP2A272F	Polypropylen 2700pF $\pm 1\%$ 100WV
C6	CM93BD2A131F	Mica 130pF $\pm 1\%$ 100WV
C7	CQ93BP2A302F	Polypropylen 3000pF $\pm 1\%$ 100WV
C8	CM93BD2A271F	Mica 270pF $\pm 1\%$ 100WV
C9	CQ93BP2A102F	Polypropylen 1000pF $\pm 1\%$ 100WV
C10	CM93BD2A390G	Mica 39pF $\pm 2\%$ 100WV
C11	CQ93BP2A332F	Polypropylen 3300pF $\pm 1\%$ 100WV

Ref. No.	Parts No.	Description			
C12	CM93BD2A820F	Mica	82pF	± 1%	100WV
C13	CQ93BP2A102F	Polypropylen	1000pF	± 1%	100WV
C15	CQ93BP2A682F	Polypropylen	6800pF	± 1%	100WV
C16	CQ93BP2A272F	Polypropylen	2700pF	± 1%	100WV
C17	CM93BD2A471F	Mica	470pF	± 1%	100WV
C18	CQ93BP2A103F	Polypropylen	0.01μF	± 1%	100WV
C19	CQ93BP2A333F	Polypropylen	0.033μF	± 1%	100WV
C20	CQ93BP2A102F	Polypropylen	1000pF	± 1%	100WV
C21,22	CQ93BP2A114F	Polypropylen	0.11μF	± 1%	100WV
C23	CQ93BP2A112F	Polypropylen	1100pF	± 1%	100WV
C24	CQ93BP2A122F	Polypropylen	1200pF	± 1%	100WV
C25	CQ93BP2A132F	Polypropylen	1300pF	± 1%	100WV
C26	CM93BD2A391F	Mica	390pF	± 1%	100WV
C27	CQ93BP2A362F	Polypropylen	3600pF	± 1%	100WV
C28	CM93BD2A181F	Mica	180pF	± 1%	100WV
C29	CQ93BP2A182F	Polypropylen	1800pF	± 1%	100WV
C30	CQ93BP2A123F	Polypropylen	0.012μF	± 1%	100WV
C31	CQ93BP2A682F	Polypropylen	6800pF	± 1%	100WV
C32	CQ93BP2A203F	Polypropylen	0.02μF	± 1%	100WV
C33	CQ93BP2A303F	Polypropylen	0.03μF	± 1%	100WV
C34	CQ93BP2A102F	Polypropylen	1000pF	± 1%	100WV
C35	CQ93BP2A822F	Polypropylen	8200pF	± 1%	100WV
C36	CQ93BP2A152F	Polypropylen	1500pF	± 1%	100WV
C37	CQ93BP2A303F	Polypropylen	0.03μF	± 1%	100WV
C38 ~ 41	CE04.V1E101M	Electrolytic	100μF		25WV
C42	CM93BD2A391F	Mica	390pF	± 1%	100WV
L1	L33-0802-05	Relay	12.9mH	G	
L2	L33-0803-05	Relay	26.5mH	G	
Q1,2		Transistor	2SC1815(Y)		

Ref. No.	Parts No.	Description	
IC1		IC	TL082
IC2,3		IC	NJM4558D
IC4		IC	TL082
IC5,6		IC	NJM4558D
S201	S42-6503-05	Push switch	
	E23-0046-04	Terminal	
P201	E40-0274-05	Pin connector 2P	
P202	E40-0974-05	Pin connector 9P	
P203	E40-0373-05	Pin connector 3P	
P204	E40-0974-05	Pin connector 9P	
P205	E40-0374-05	Pin connector 3P	
	J25-2926-03	Printed circuit board	

X68-1340-00 Power supply unit

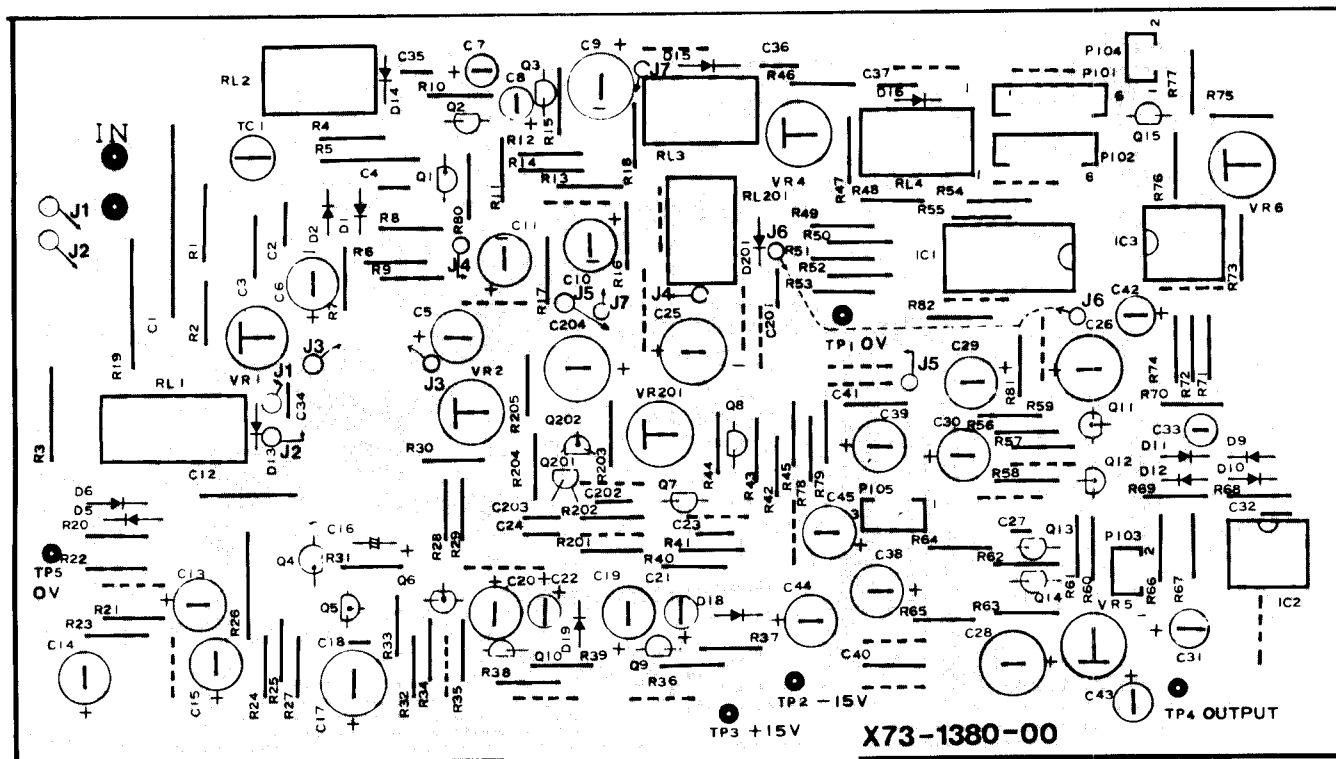
Ref. No.	Parts No.	Description	
R1	RD14BB2E103J	Carbon	10kΩ
R2	RD14BB2E472J	Carbon	4.7kΩ
R3	RD14BB2E103J	Carbon	10kΩ
R4	RD14BB2E472J	Carbon	4.7kΩ
R5	RD14BB2E103J	Carbon	10kΩ
R6	RD14BB2E472J	Carbon	4.7kΩ

Ref. No.	Parts No.	Description			
R7	RD14BB2E103J	Carbon	10k Ω		
R8	RD14BB2E472J	Carbon	4.7k Ω		
R9 ~ 14	RD14BB2E124J	Carbon	120k Ω		
R15 ~ 19	RD14BB2E101J	Carbon	100 Ω		
R20,21	RD14BB2E102J	Carbon	1k Ω		
R22	RD14BB2E104J	Carbon	100k Ω		
R23	RD14BB2E101J	Carbon	100 Ω		
R24 ~ 26	RD14BB2E124J	Carbon	120k Ω		
R27	RD14BB2E123J	Carbon	12k Ω		
R28	RD14BB2E272J	Carbon	2.7k Ω		
(R201)	(RD14BB2E103J)	(Carbon	10k Ω)		
(R202)	(RD14BB2E472J)	(Carbon	4.7k Ω)		
(R203)	(RD14BB2E101J)	(Carbon	100 Ω)		
C1,2	CE04W1V222M	Electrolytic	2200 μ F	35WV	
C3 ~ 6	CQ93M1H104K	Mylar	0.1 μ F	$\pm 10\%$ 50WV	
C7,8	CE04W1E101M	Electrolytic	100 μ F	25WV	
C9,10	CE04W1C470M	Electrolytic	47 μ F	16WV	
C11	CE04W1E221M	Electrolytic	220 μ F	25WV	
D1		Diode	S1RBA40		
D2 ~ 50		Diode	1S1555		
(D201)	1S1555	(Diode)	(1S1555)		
Q1 ~ 7		Transistor	2SA841(BL)		
Q8 ~ 10		Transistor	2SC1815(Y)		

Ref. No.	Parts No.	Description	
(Q201)		(Transistor)	(2SA841 (BL))
RL1	S51-1404-05 T25-2929-03	Relay Printed circuit board	
	E23-0046-04	Terminal	
P401	E40-1273-05	Pin connector 12P	
P402,403	E40-0473-05	Pin connector 4P	
P404	E40-1274-05	Pin connector 12P	
P405	E40-0473-05	Pin connector 4P	
P406	E40-0332-05	Pin connector 3P	
P407	E40-1273-05	Pin connector 12P	
P408	E40-0573-05	Pin connector 5P	
P409	E40-1273-05	Pin connector 12P	
P410	E40-0573-05	Pin connector 5P	
P411	E40-1273-05	Pin connector 12P	
P412	E40-1173-05	Pin connector 11P	

P.C. BOARD

X73-1380-00

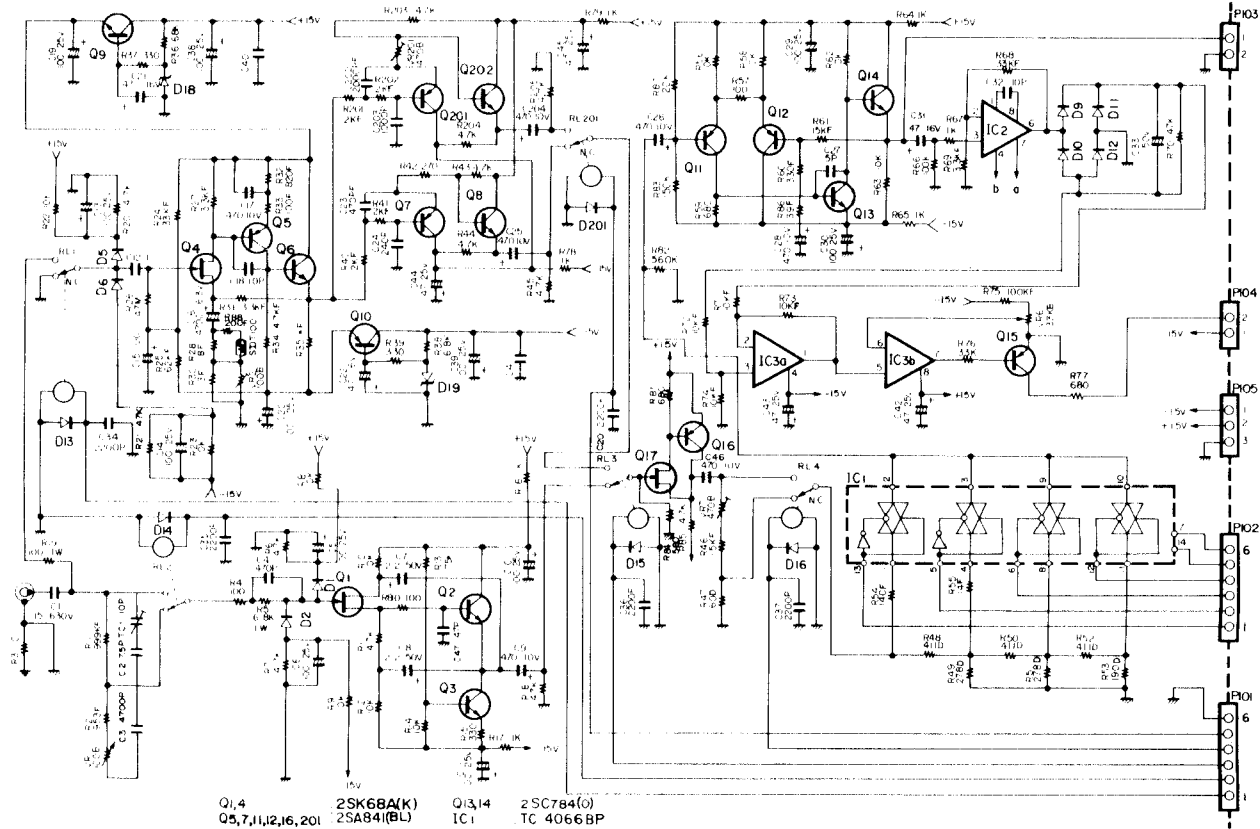


X73-1380-00

CIRCUIT DIAGRAM

X73-1380-00

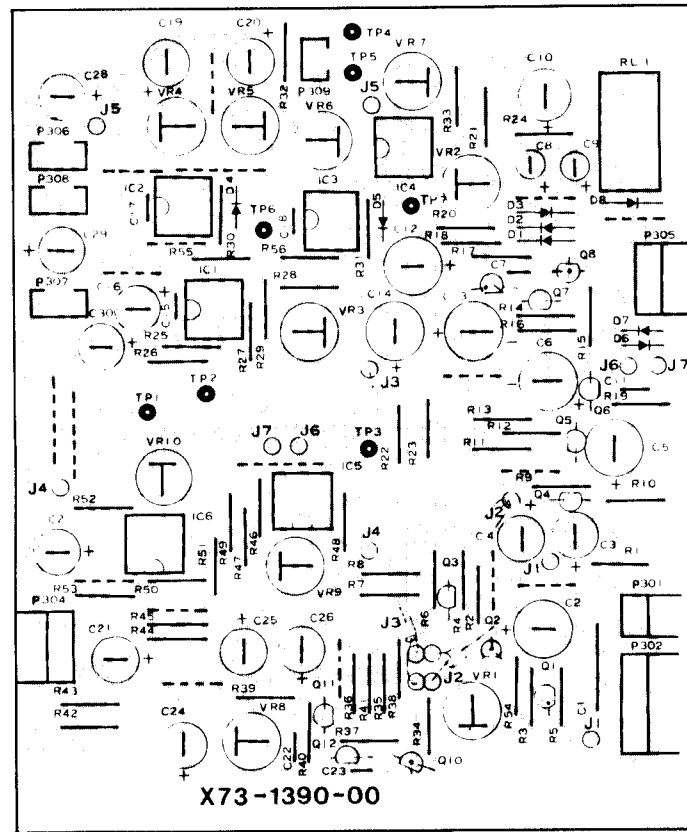
The parts whose part Nos. are 200 or more are not used in VT-125.



Q1,4	2SK68A(K)	Q13,14	2SC784(O)
Q5,7,11,16,201	2SA84(BL)	IC1	TC 4066BP
Q2,3,6,8-9,202	2SC1815(Y)	IC2	CA3100E
Q17	2SK30A(GR)	IC3	NJM4558D
D1,2,5,6,13-16,201	1S1555	D18,19	WZ-081
D9-12	1S1587		

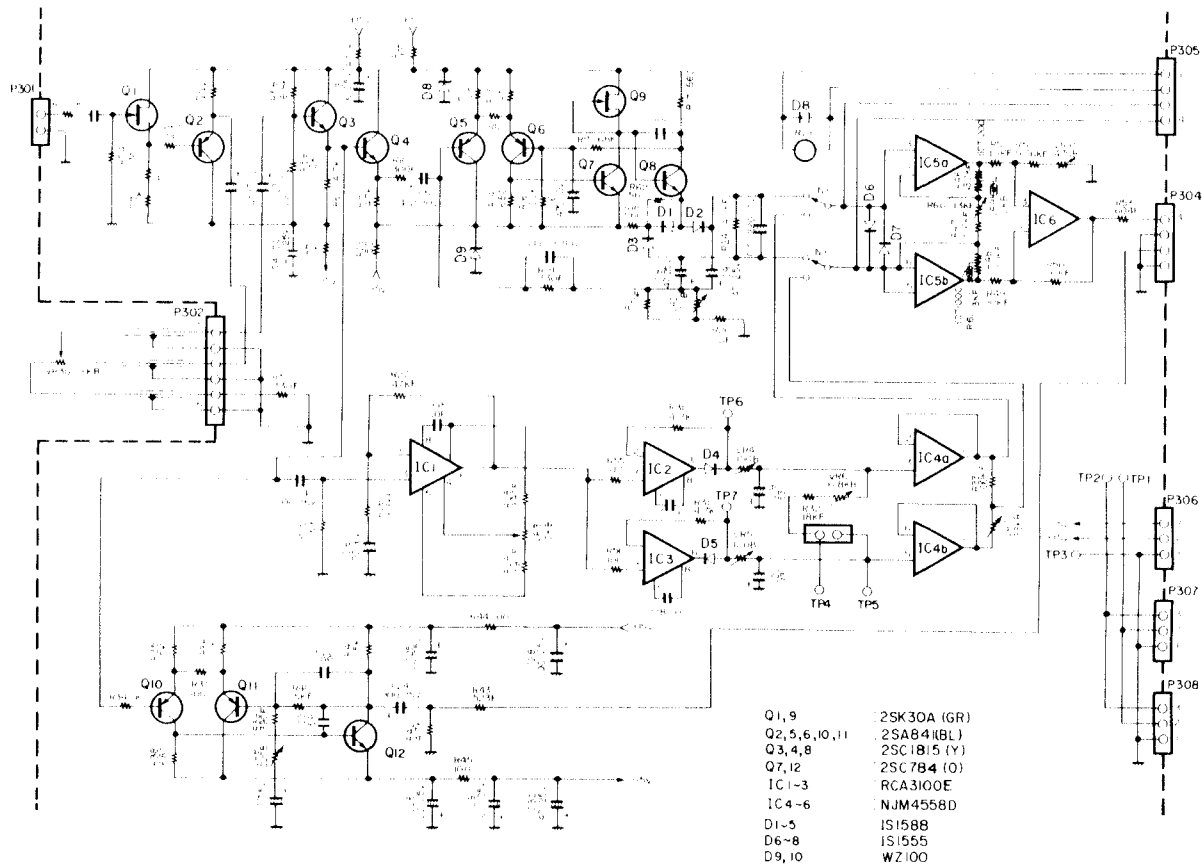
P.C. BOARD

X73-1390-00



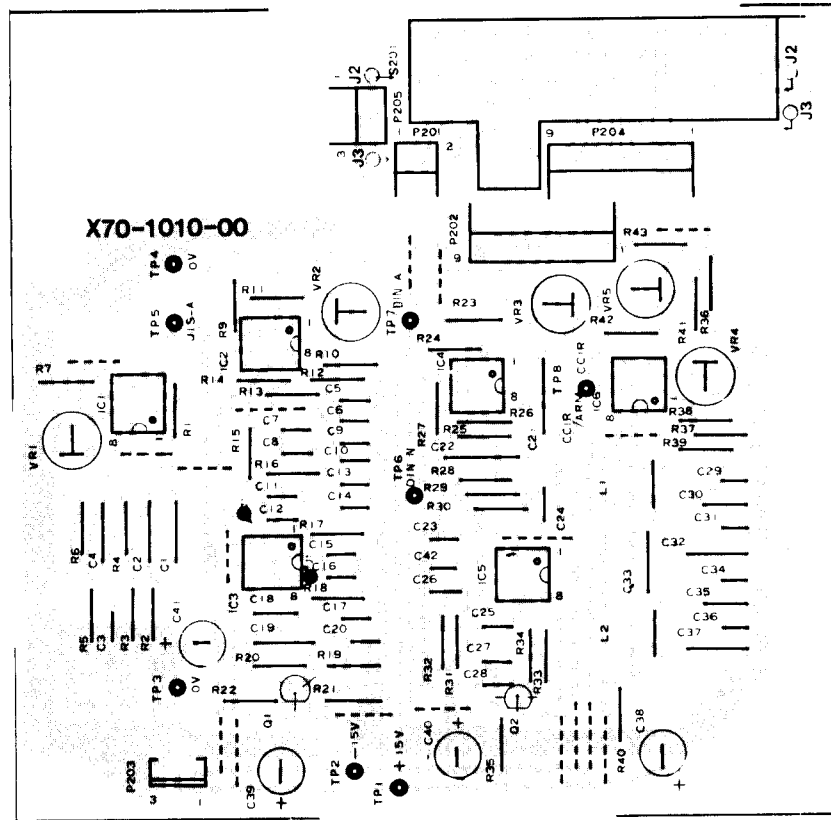
CIRCUIT DIAGRAM

X73-1390-00



P.C. BOARD

X70-1010-00

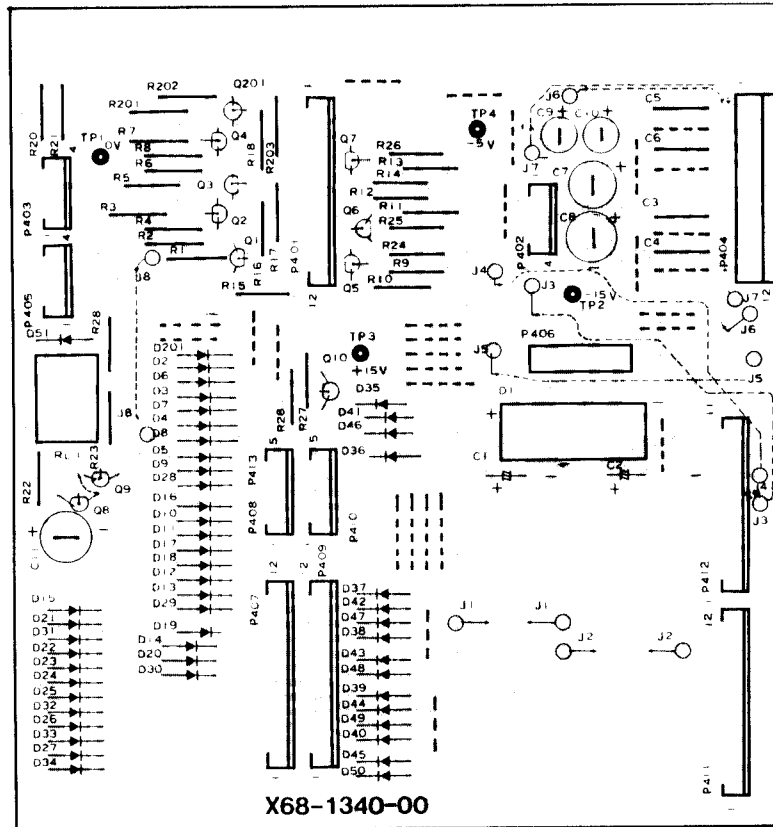


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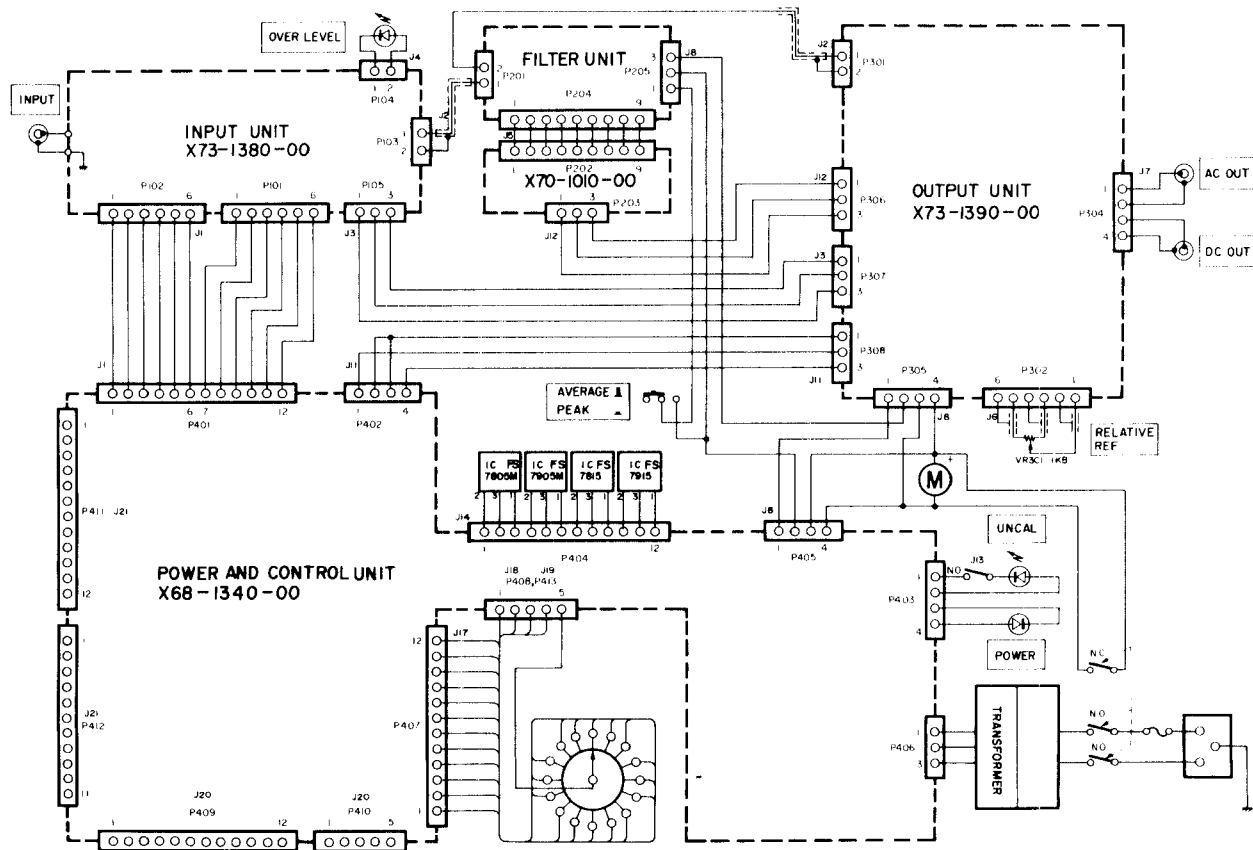
P.C. BOARD

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X-68-1340-00

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CONTROLS AND INDICATORS

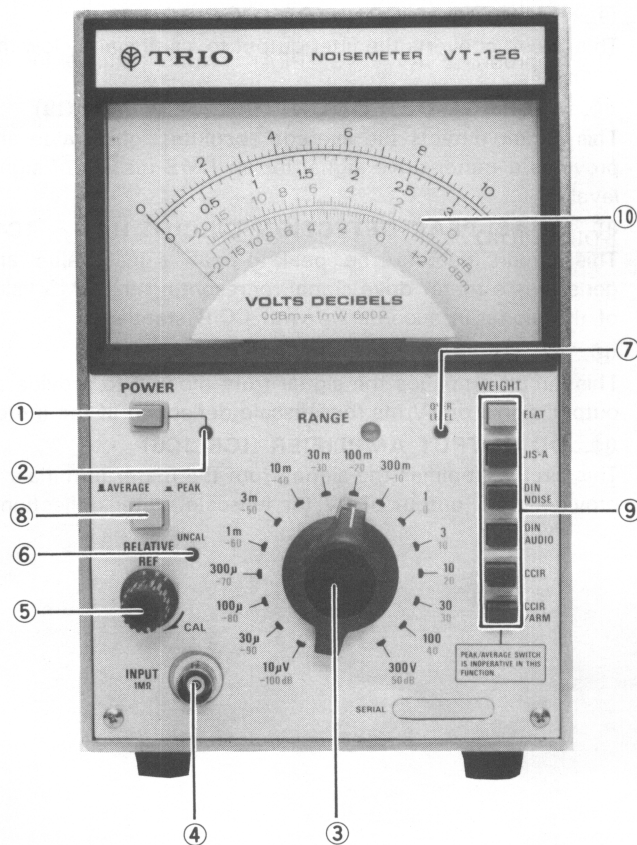


Fig. 1

FRONT PANEL

1. POWER

AC power switch.

2. POWER LAMP

Indicates the VT-126 (VT-125) is powered up. Lights when POWER is depressed.

3. RANGE

Attenuator selector switch. 16 positions (15 for the VT-125) in 10 dB steps. To prevent excessive inputs, this switch is started in the highest, 300V range and gradually worked down range to provide an easily readable meter deflection.

4. INPUT

BNC signal input connector.

5. RELATIVE REF AND 6. UNCAL LAMP

Sensitivity adjustment and uncalibrated annunciator. More than 10 dB of adjustment is possible. When the control is turned fully clockwise, the set range is calibrated. This control can be used to adjust the meter to an appropriate level for relative measurements. When not set at fully clockwise the UNCAL lamp lights to warn the operator.

7. OVERLEVEL

When using weighting filters the effect of the filter is to mask from the operator the presence of an excessively high input level. Thus distortion and the resulting errors can occur without the operator being aware of this condition. To

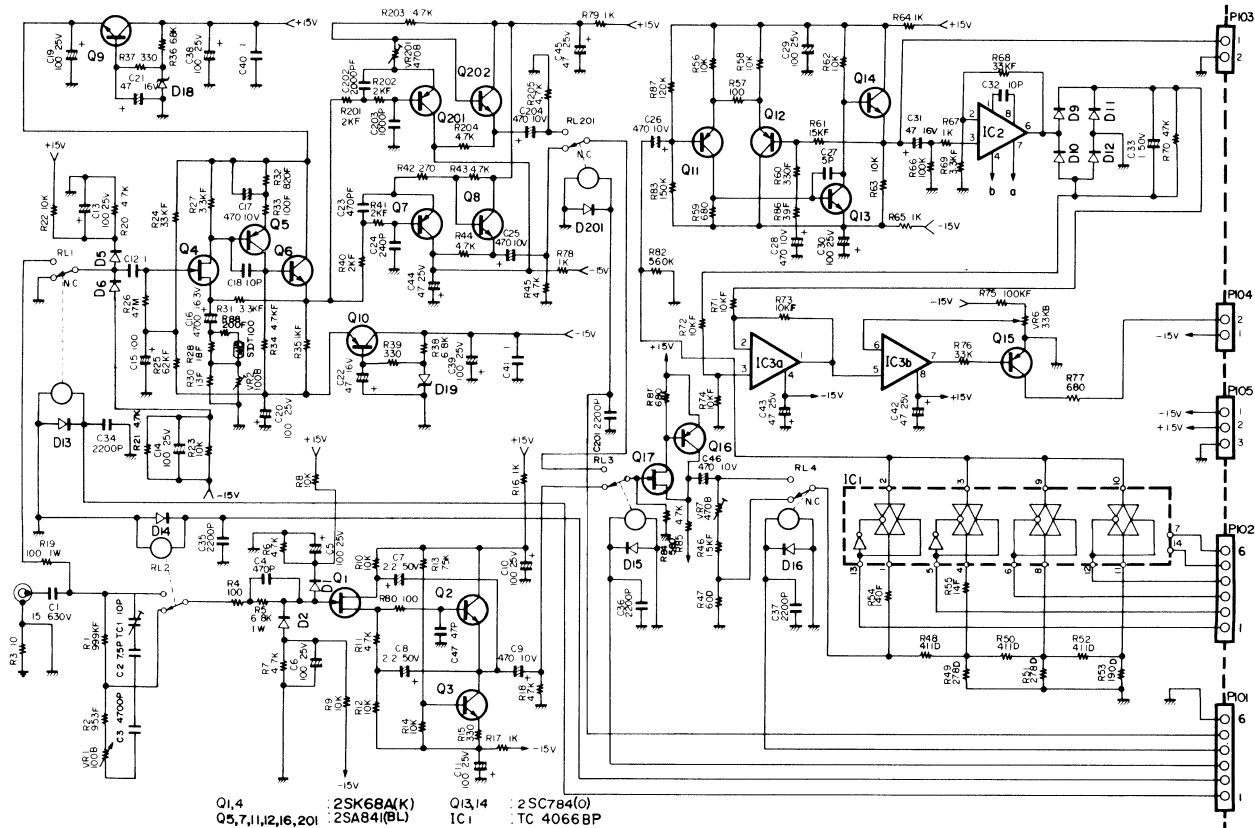
Ref. No.	Parts No.	Description			
R7	RD14BB2E103J	Carbon	10k Ω		
R8	RD14BB2E472J	Carbon	4.7k Ω		
R9~14	RD14BB2E124J	Carbon	120k Ω		
R15~19	RD14BB2E101J	Carbon	100 Ω		
R20,21	RD14BB2E102J	Carbon	1k Ω		
R22	RD14BB2E104J	Carbon	100k Ω		
R23	RD14BB2E101J	Carbon	100 Ω		
R24~26	RD14BB2E124J	Carbon	120k Ω		
R27	RD14BB2E123J	Carbon	12k Ω		
R28	RD14BB2E272J	Carbon	2.7k Ω		
(R201)	(RD14BB2E103J)	(Carbon	10k Ω)		
(R202)	(RD14BB2E472J)	(Carbon	4.7k Ω)		
(R203)	(RD14BB2E101J)	(Carbon	100 Ω)		
C1,2	CE04W1V222M	Electrolytic	2200 μ F	35WV	
C3~6	CQ93M1H104K	Mylar	0.1 μ F	$\pm 10\%$ 50WV	
C7,8	CE04W1E101M	Electrolytic	100 μ F	25WV	
C9,10	CE04W1C470M	Electrolytic	47 μ F	16WV	
C11	CE04W1E221M	Electrolytic	220 μ F	25WV	
D1		Diode	S1RBA40		
D2~50		Diode	1S1555		
(D201)	1S1555	(Diode)	(1S1555)		
Q1~7		Transistor	2SA841(BL)		
Q8~10		Transistor	2SC1815(Y)		

Ref. No.	Parts No.	Description			
(Q201)		(Transistor)	(2SA841 (BL))		
RL1	S51-1404-05 T25-2929-03	Relay			
		Printed circuit board			
	E23-0046-04	Terminal			
P401	E40-1273-05	Pin connector 12P			
P402,403	E40-0473-05	Pin connector 4P			
P404	E40-1274-05	Pin connector 12P			
P405	E40-0473-05	Pin connector 4P			
P406	E40-0332-05	Pin connector 3P			
P407	E40-1273-05	Pin connector 12P			
P408	E40-0573-05	Pin connector 5P			
P409	E40-1273-05	Pin connector 12P			
P410	E40-0573-05	Pin connector 5P			
P411	E40-1273-05	Pin connector 12P			
P412	E40-1173-05	Pin connector 11P			

CIRCUIT DIAGRAM

X73-1380-00

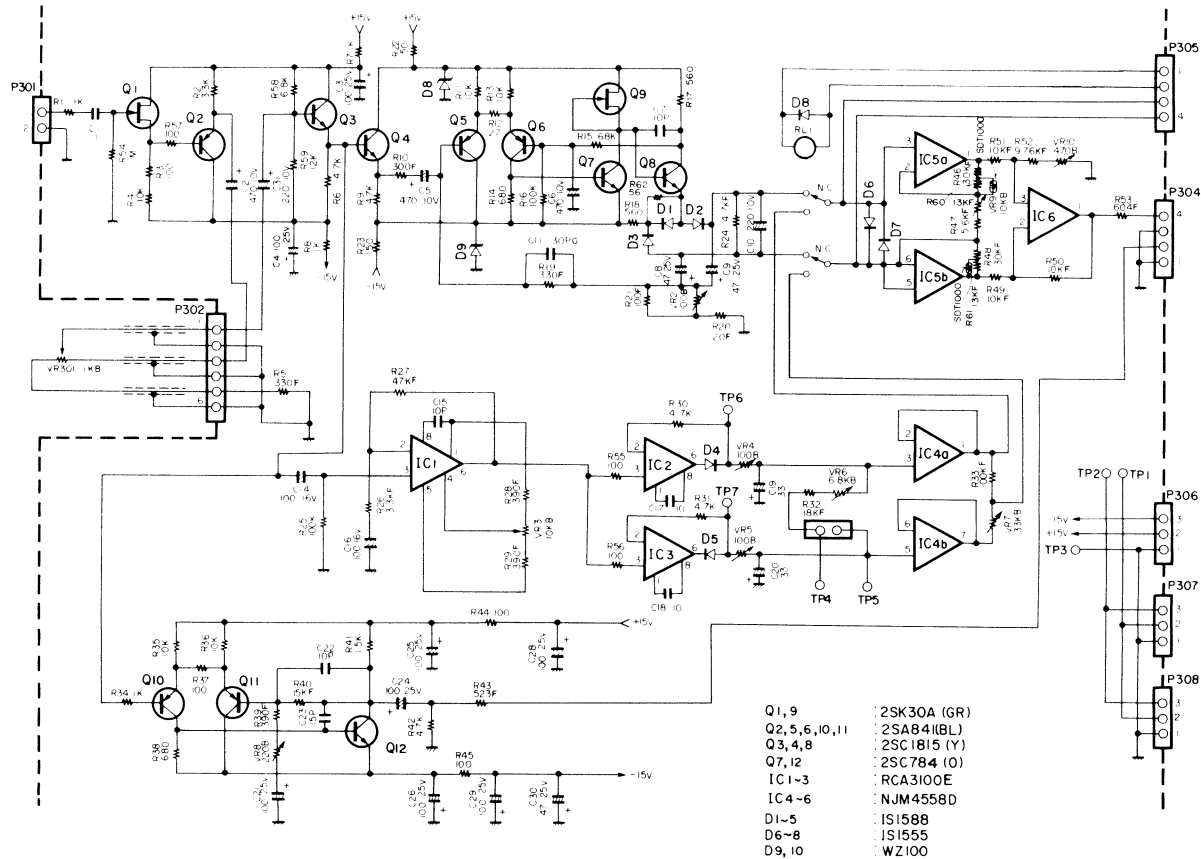
The parts whose part Nos. are 200 or more are not used in VT-125.



- | | | | |
|--------------------|--------------|--------|--------------|
| Q1,4 | : 2SK68A(K) | Q13,14 | : 2SC784(O) |
| Q5,7,11,12,16,201 | : 2SA841(BL) | IC1 | : TC 4066(B) |
| Q2,3,6,8-9,202 | : 2SC1815(Y) | IC2 | : CA3100E |
| Q17 | : 2SK30A(GR) | IC3 | : NJM4558D |
| D1,2,5,6,13-16,201 | : 1S1555 | D18,19 | : WZ-081 |
| D9-12 | : 1S1587 | | |

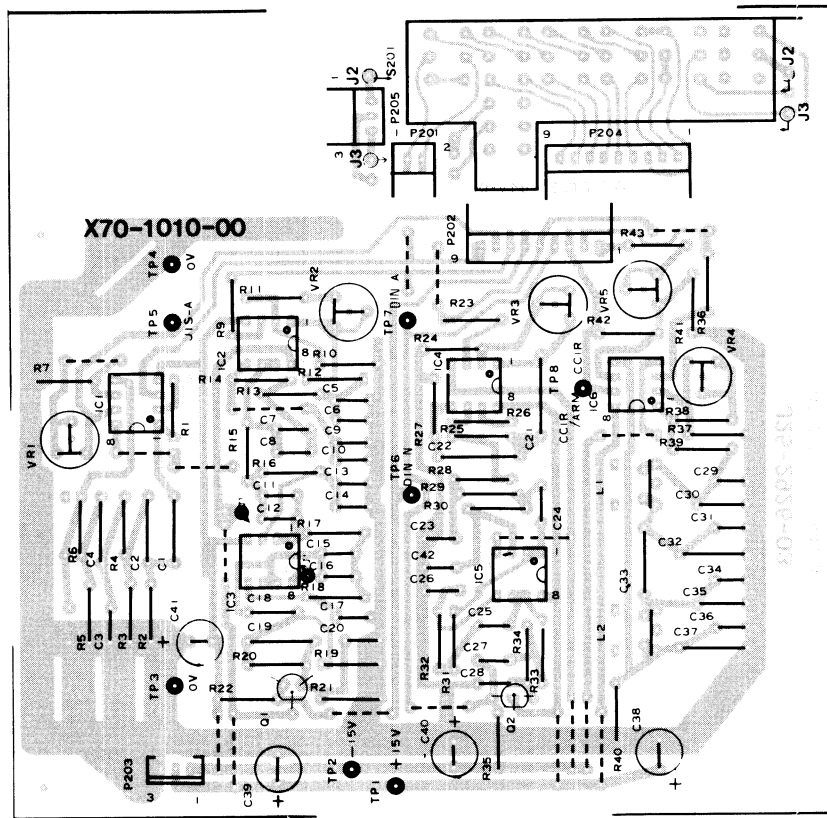
CIRCUIT DIAGRAM

X73-1390-00



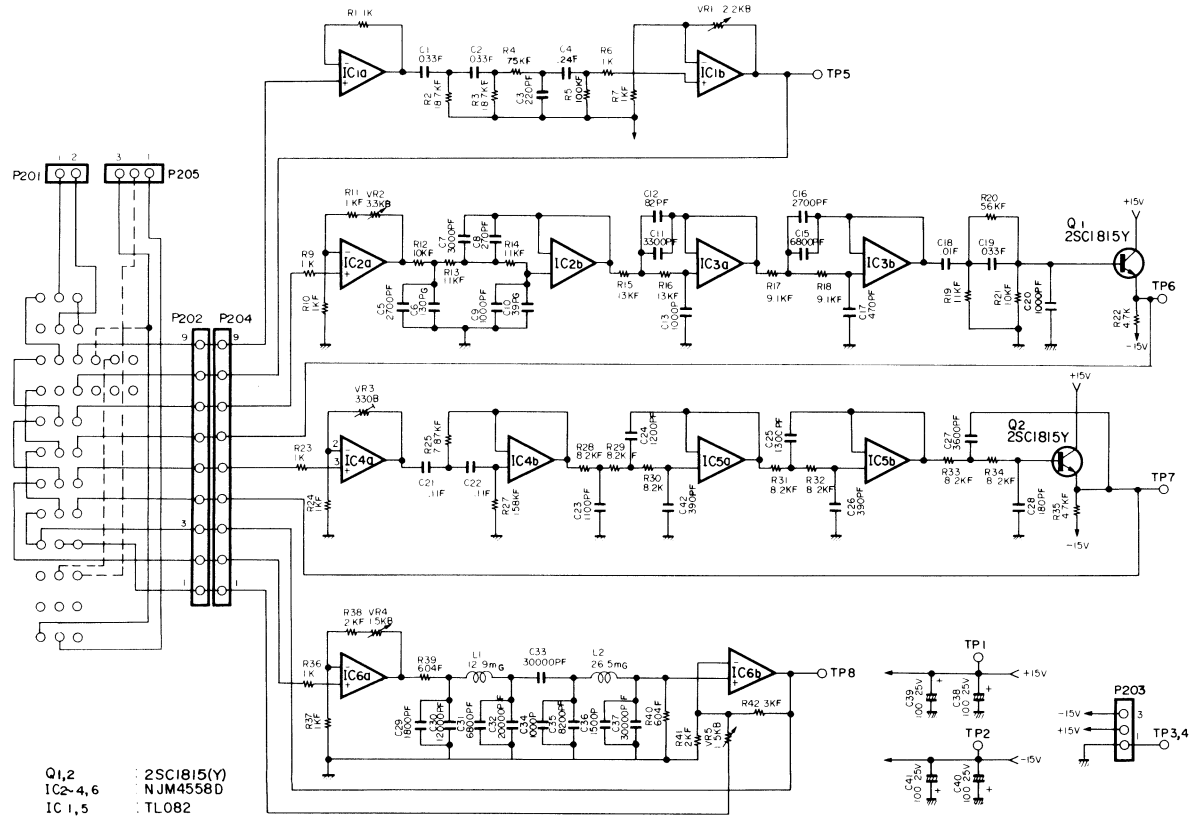
P.C. BOARD

X70-1010-00



CIRCUIT DIAGRAM

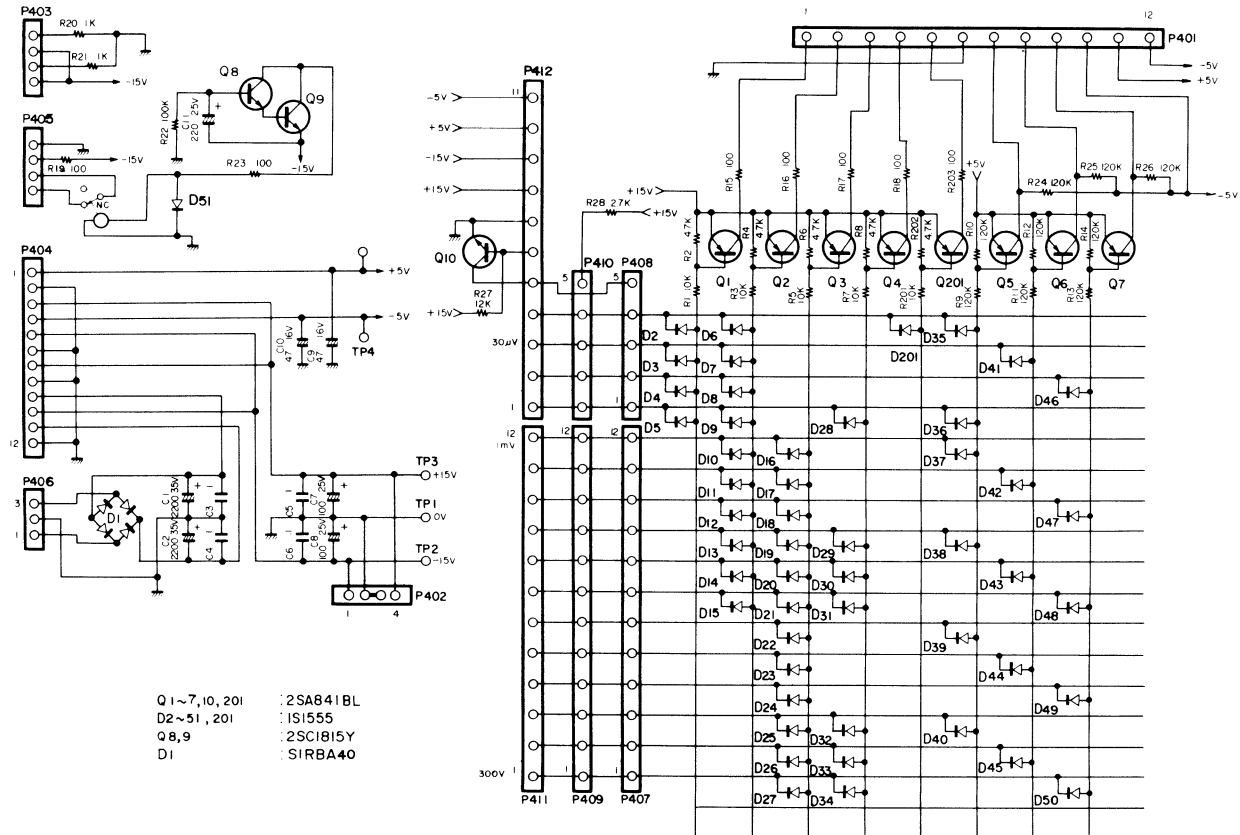
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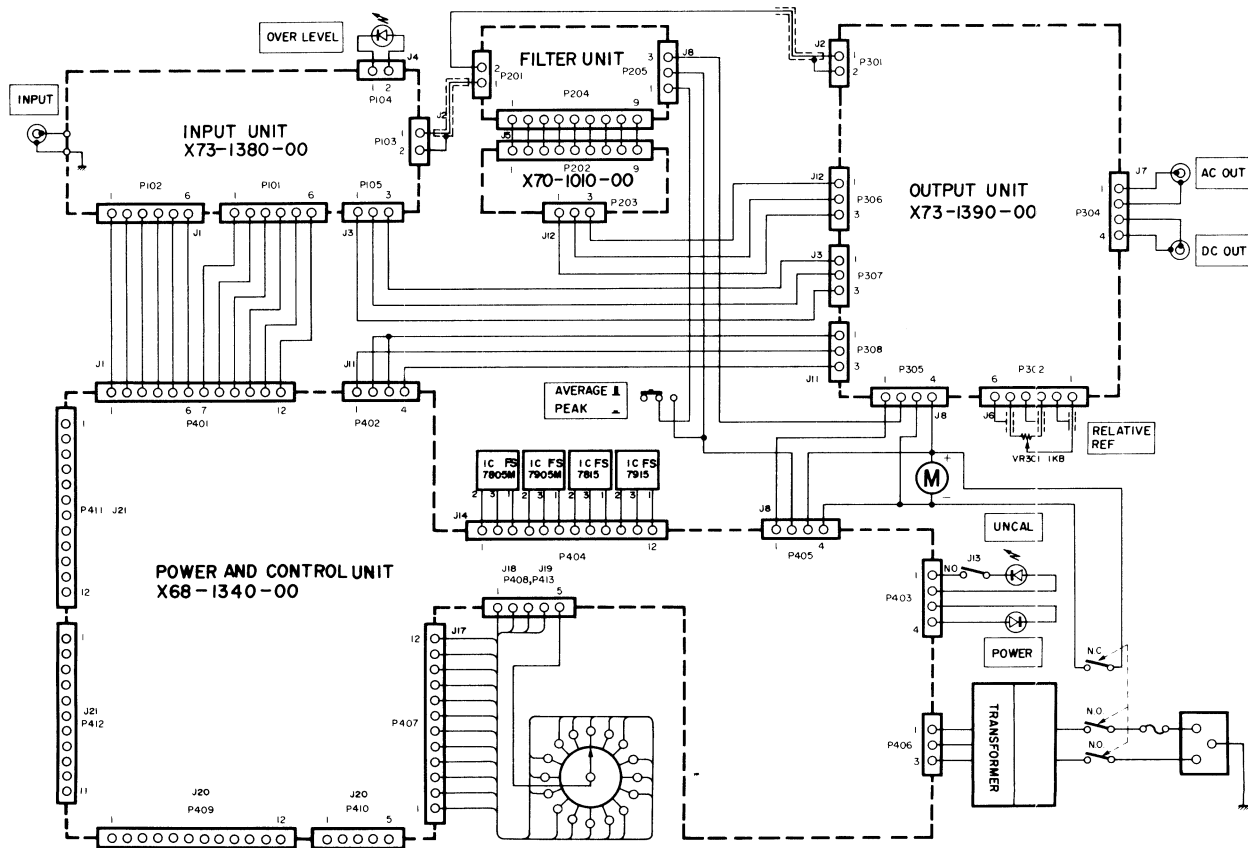


CIRCUIT DIAGRAM

X-68-1340-00

The parts whose part Nos. are 200 or more are not used in VT-125.



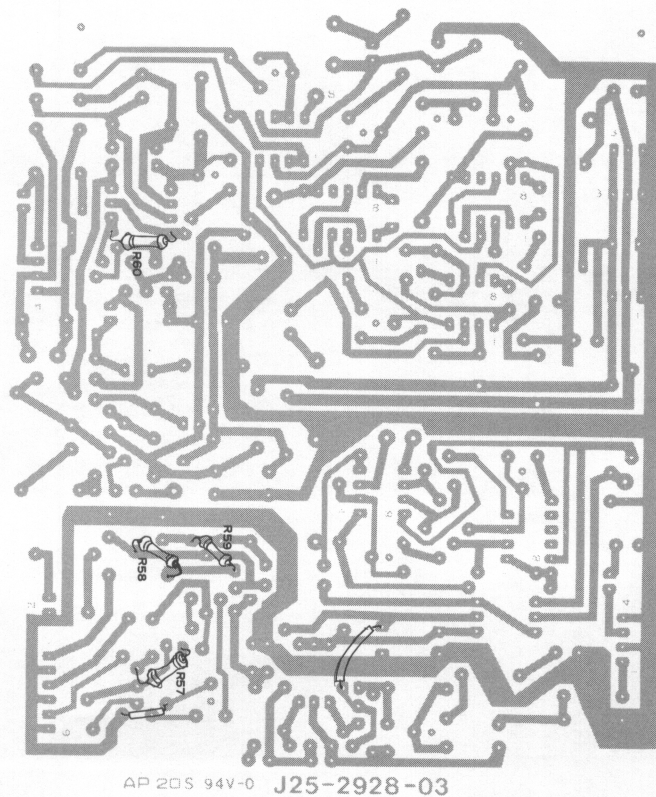
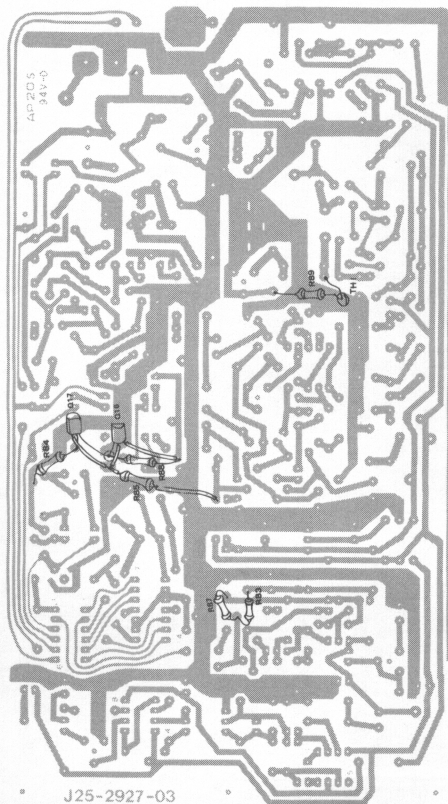


P.C. BOARD

★ On the foil side view

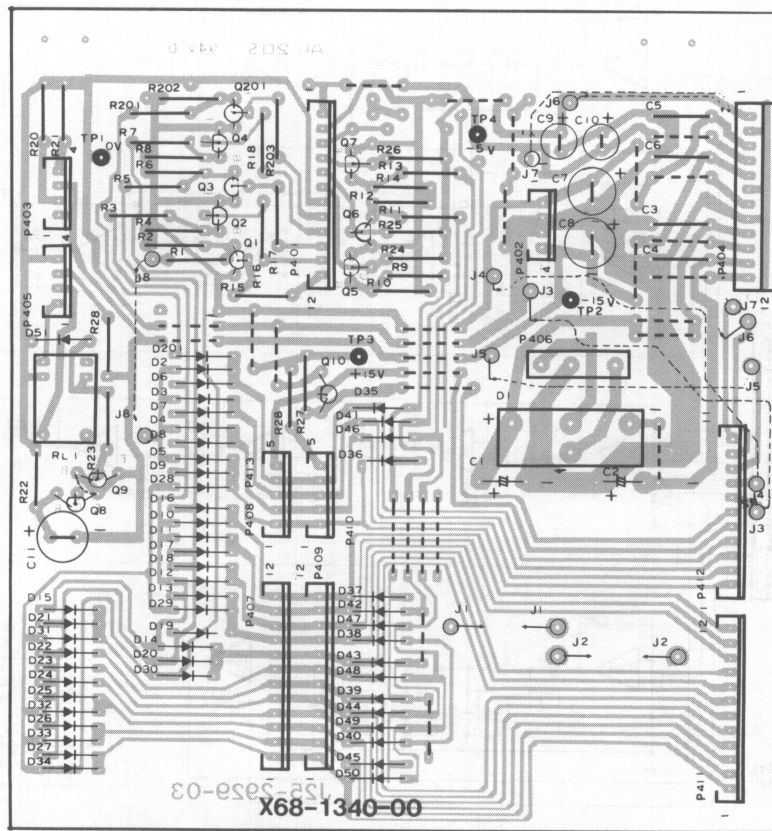
X73-1380-00

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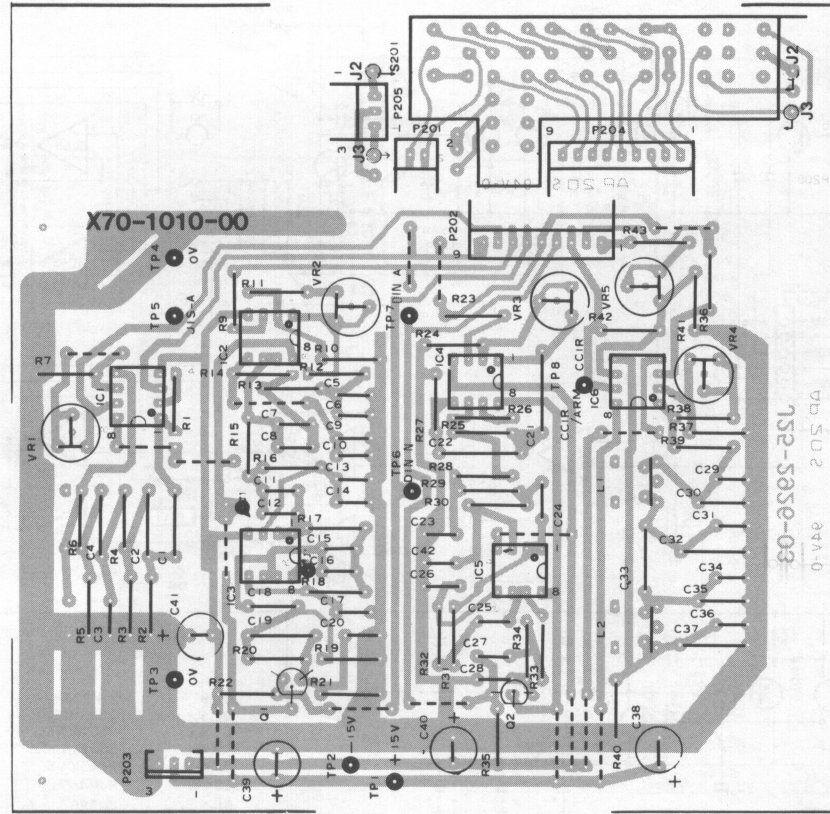
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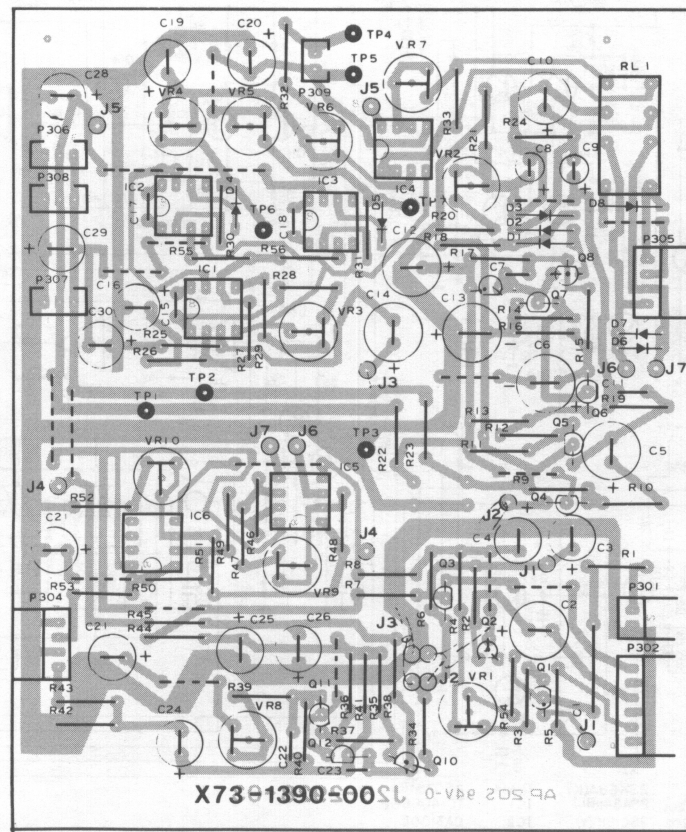
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X70-1010-00



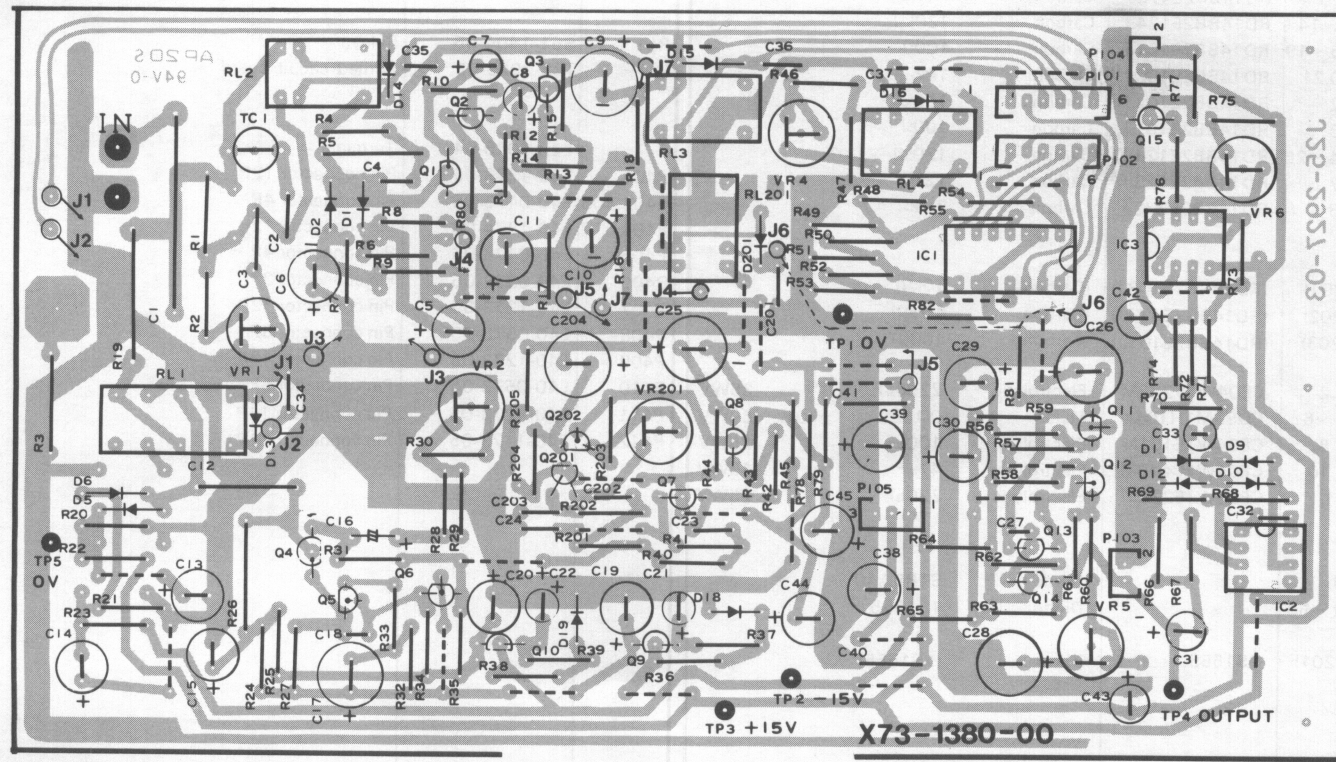
P.C. BOARD

X73-1390-00



P.C. BOARD

X73-1380-00



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TRIO-KENWOOD CORPORATION

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