

60MHz READOUT OSCILLOSCOPE

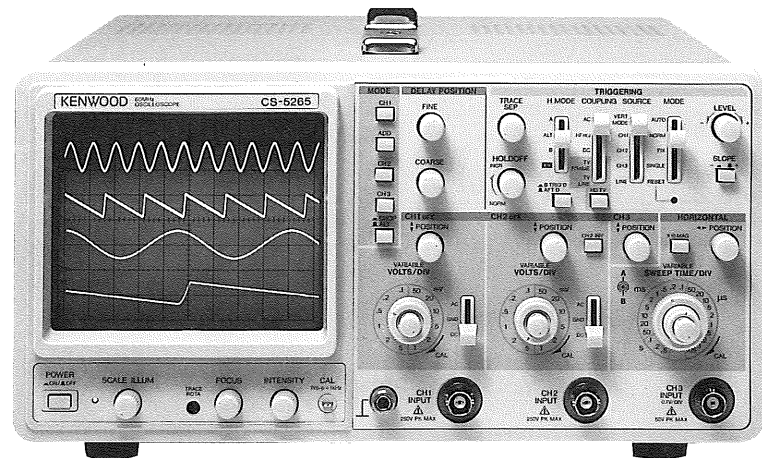
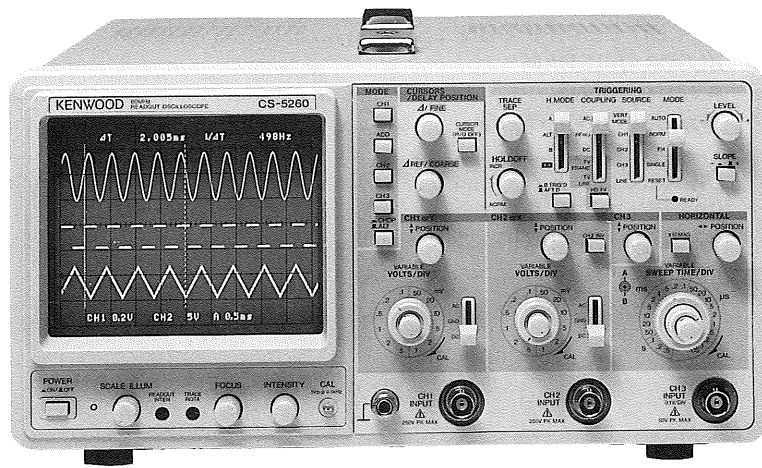
CS-5260

60MHz OSCILLOSCOPE

CS-5265

SERVICE MANUAL

KENWOOD CORPORATION



KENWOOD

WARNING

The following instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than contained in the operating instructions unless you are qualified to do so.

CONTENTS

SPECIFICATIONS	3
SAFETY	8
CIRCUIT DESCRIPTION	9
BLOCK DIAGRAM	15
ADJUSTMENT	17
TROUBLESHOOTING	26
PARTS LIST	28
DISASSEMBLY	29
PARTS LIST (ELECTRICAL)	30
SCHEMATIC DIAGRAM	49
P.C. BOARD	60
SEMICONDUCTORS	65

SPECIFICATIONS

CRT	
Type	150 mm rectangular tube with an integral graticule
Acceleration voltage	Approx. 12 kV
Effective area	8 × 10 divisions (1 division = 10 mm)
VERTICAL AXIS (COMMON TO CHANNELS 1 AND 2)	
Sensitivity (+10 to +35°C)	1 mV, 2 mV/div : ±5%, 5 mV to 5 V/div: ±3%
Attenuation	1-2-5 steps, 12 ranges, fine control between ranges
Input impedance	1 MΩ ± 2%, approx. 25 pF
Frequency response (-3 dB) (+10 to +35°C)	5mV to 5V/div DC: DC to 60 MHz AC: 5Hz to 60 MHz
	1mV to 2mV/div DC: DC to 20MHz, AC: 5Hz to 20MHz
Rise time (+10 to +35°C)	5mV to 5V/div Approx. 5.8 ns
	1mV to 2mV/div Approx. 17.5 ns
Signal delay time	The leading edge may be checked using a square wave of the rise time less than that of this model.
Crosstalk	-40 dB or less (at 1 kHz)
△Maximum input voltage	500 Vp-p or 250 V (DC+AC peak, 1 kHz or less)
VERTICAL AXIS (CH3)	
Sensitivity (+10 to +35°C)	0.1 V/div: ±3%
Input impedance	1MΩ ± 2%, approx. 25 pF
Frequency response (-3 dB) (+10 to +35°C)	DC to 60 MHz
Rise time (+10 to +35°C)	Approx. 5.8 ns
Signal delay time	The leading edge may be checked using a square wave of the rise time less than that of this model.
△Maximum input voltage	100 Vp-p or 50 V (DC+AC peak, 1 kHz or less)
Operation	Single trace: CH1, CH2, CH3 or ADD single trace operation Multi-trace : 2 to 4 traces of CH1, CH2, CH3 and ADD
	ALT/CHOP: Display by selecting ALT and CHOP ADD : Composite waveform of CH1 and CH2 signals are displayed.

SPECIFICATIONS

Chop frequency		Approx. 250 kHz (in multi-trace operation)
Channel polarity		Normal or inverted, CH2 only inverted
Horizontal axis (CH2, except for $\times 10$ MAG operation)		
Sensitivity (+10 to +35°C)		Same as vertical axis (CH2)
Input impedance		Same as vertical axis (CH2)
Frequency response (-3 dB) (+10 to +35°C)		DC: DC to 1 MHz, AC: 5 Hz to 1 MHz
X-Y phase difference		3° or less at 100 kHz
Operation mode		X-Y mode is selected with H. MODE CH1: Y-axis, CH2: X-axis
Δ Maximum input voltage		Same as vertical axis (CH2)
SWEEP		
Sweep types		A : A sweep ALT : Alternate A sweep and B sweep B : B sweep X-Y : X-Y oscilloscope operation
Sweep time (+10 to +35°C)	A sweep	0.5s to 50ns/div $\pm 3\%$ 1-2-5 steps, 22 ranges, fine adjustment between ranges
	B sweep	50ms to 50ns/div $\pm 3\%$ 1-2-5 steps, 19 ranges, fine adjustment between ranges
Sweep magnified operation (+10 to +35°C)		$\times 10 \pm 5\%$ ($\pm 8\%$ for over 0.5 ns/div)
Linearity (+10 to +35°C)		$\pm 3\%$ ($\pm 5\%$ in $\times 10$ MAG operation)
HOLDOFF		Continuously variable from A sweep NORM position
Trace separation		B sweep is continuously variable by ± 4 divisions or more with respect to A sweep.
Delayed sweep operation		Continuous delay operation (AFTER DELAY) Synchronous delay operation (B TRG'D) : Synchronous with the trigger signal
Delay time		Continuous control by 0.2 to 10 divisions for 0.5 div to maximum speed sweep
Delay time error (+10 to +35°C)		[CS-5275]: $\pm (3\% \text{ of set value} + 1\% \text{ of full scale}) + (0 \text{ to } 300 \text{ ns})$ [CS-5275]: Reading on CRT $\pm 4\%$ (0 to 300 ns)
Delay jitter		10000 : 1 of a value 10 times as high as A sweep setting

SPECIFICATIONS

TRIGGERING	
Trigger modes	AUTO : Automatic free running with no signal NORM : Triggered sweep FIX : Sweep at triggering point set to center of signal amplitude SINGLE: Single sweep mode RESET : Restarting single sweep operation
Trigger signal sources	VERT: Input signal selected for V. mode CH1 : Channel 1 input signal CH2 : Channel 2 input signal CH3 : Channel 3 input signal LINE: Commercial power line
Trigger coupling (For trigger sensitivity, see the table below.)	AC : AC coupling from 10 Hz HFrej : Low-pass filter coupling up to 30 kHz DC : DC coupling TV FRAME: Composite video signal, vertical synchronization separation TV LINE : Composite video signal, horizontal synchronization separation

Trigger sensitivity (+10 to +35°C)

MODE	COUPLING	Signal frequency	Sensitivity (Amplitude)	
			NORM	FIX *
NORM	AC	10Hz to 40MHz	1div	1.5div
		40M to 60MHz	1.5div	2div
	HFrej	10Hz to 30kHz	1div	1.5div
		over 30kHz	>min.	>min.
	DC	DC to 40MHz	1div	1.5div
		40M to 60MHz	1.5div	2div
	TV-F, -L	Composite video signal	1.5div	
	HDTV	HDTV video signal	1.5div	

AUTO : Same as above specifications for above 40Hz.

(The table shows the sensitivities in terms of the amplitude displayed on the CRT.)
 (>min. for the HFrej sensitivity shows that the amplitude necessary for synchronization increases.)

FIX * : Same as above specifications for above 50Hz.

SPECIFICATIONS

CALIBRATION SIGNAL : POSITIVE SQUARE WAVE, 1 V _{p-p} ±3%, APPROX. 1 kHz		
INTENSITY MODULATION		
Input voltage	Darkens at TTL level (+5 V).	
Input impedance	Approx. 10 kΩ	
Frequency response (+10 to +35°C)	DC to 5 MHz	
△Maximum input voltage	100 V _{p-p} or 50V (DC+AC peak)	
CH1 OUTPUT SIGNAL (WITH 50 Ω LOAD)		
Output voltage	Approx. 50 mV _{p-p} /div	
Output impedance	Approx. 50 Ω	
Frequency response (-3dB)	1, 2 mV	100 Hz to 20 MHz
	5 mV to	100 Hz to 60 MHz
TRACE ROTATION : TRACE ANGLE IS ADJUSTABLE WITH A SEMI-FIXED CONTROL ON PANEL.		
POWER SUPPLY		
Voltage	100/120/220/230 VAC ± 10 %	
Frequency	50 Hz or 60 Hz	
Power consumption	Approx. 48 W, 43 W Approx. 56VA, 51VA	
DIMENSIONS AND WEIGHT (VALUES ENCLOSED IN PARENTHESES INCLUDE PROJECTIONS.)		
Width	300 mm (300 mm)	
Height	150 mm (172 mm)	
Depth	400 mm (469 mm)	
Weight	Approx. 8.7 kg	
OPERATING TEMPERATURE AND HUMIDITY		
Operating temperature and humidity	0 to 40°C, 85% RH or less	
Storage temperature and humidity	-20 to 70°C, 85% RH or less	
ACCESSORIES		
Probe	PC-31 : 10 MW ±%, 12.5 pF±0%, 10 : 1 [CS-5260] PC-39 : 10 MW ±%, 12.5 pF±0%, 10 : 1 [CS-5265]	
	2 each	
Instruction manual	1 copy	
Adjusting screwdriver	1	
Power cord	1	
Replacement fuse	1 A×2 (for 100 V area) 630 mA×2 (for 200 V area)	

SPECIFICATIONS

[The specifications shown below do not apply to the CS-5265.]

READOUT	
Set values	CH1 and CH2 scale factors (with probe detection), CH3 scale factor (0.1 V/div fixed, with no probe detection), V-UNCAL, ADD, INV, A/B sweep scale factors (MAG-converted), sweep - UNCAL, DELAY TIME, TRIG'D, X-Y
Cursor modes (Between Δ REF and Δ cursors) In X-Y mode, only Δ V1 may be set.	Δ V1 : Displayed in voltage with conversion according to CH1 scale factor Δ V2 : Displayed in voltage with conversion according to CH2 scale factor Δ V3 : Displayed in voltage with conversion according to CH3 0.1 V/div Δ T : Displayed in time with conversion according to A sweep scale factor $1/\Delta$ T : Displayed in frequency with conversion according to A sweep scale factor
In V, H-VARI or UNCAL mode	RATIO: Voltage ratio and time ratio are displayed, with 5 divisions on the CRT as 100%. PHASE: Phase difference is displayed, with 5 divisions on the CRT as 360°.
Cursor measurement	Resolution : 10 bits Measuring error: $\pm 4\%$ Measuring range: ± 3.6 divisions or more vertically from CRT center. ± 4.6 divisions or more horizontally from CRT center.

■ The specifications shown above are subject to change without notice.

SAFETY

SAFETY

Before connecting the instrument to a power source, carefully read the following information, then verify that the proper power cord is used and the proper line fuse is installed for power source. The specified voltage is shown at the fuse holder of the AC inlet. If the power cord is not applied for specified voltage, there is always a certain amount of danger from electric shock.

Line voltage

This instrument operates using ac-power input voltages that 100/120/220/230 V at frequencies from 50 Hz to 60 Hz. z.

Power cord

The ground wire of the 3-wire ac power plug places the chassis and housing of the oscilloscope at earth ground. Do not attempt to defeat the ground wire connection or float the oscilloscope; to do so may pose a great safety hazard. The appropriate power cord is supplied by an option that is specified when the instrument is ordered.

The optional power cords are shown as follows in Fig. 1.

Line fuse

The fuse holder is located on the rear panel and contains the line fuse. Verify that the proper fuse is installed by replacing the line fuse.

Voltage conversion

This oscilloscope may be operated from either a 100 V to 230 V, 50/60 Hz power source. Use the following procedure to change from 100 to 230 volt operation or vice versa.

1. Remove the fuse holder.
2. Replace fuse F 1 with a fuse of appropriate value, 1 amp for 100 VAC to 120 VAC operation, 630 mA for 220 VAC to 230 VAC operation.
3. Reinsert it for appropriate voltage range.
4. When performing the reinsertion of fuse holder for the voltage conversion, the appropriate power cord should be used. (See Fig. 1.)


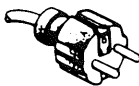




Plug configuration	Power cord and plug type	Factory installed instrument fuse	Line cord plug fuse	Parts No. for power cord
	North American 120 volt/60 Hz Rated 15 amp (12 amp max; NEC)	1 A, 250 V Fast blow 6×30 mm	None	E30-1951-05
	Universal Europe 220 volt/50 Hz Rated 16 amp	North Europe 630 mA, 250 V Slow blow 5×20 mm Other Europe 630 mA, 250 V Slow blow 6×30 mm	None	E30-1952-05
	U.K. 240 volt/50 Hz Rated 13 amp	630 mA, 250 V Slow blow 6×30 mm	None	E30-1947-05
	Australian 240 volt/50 Hz Rated 10 amp	630 mA, 250 V Slow blow 6×30 mm	None	E30-1821-15
	North American 240 volt/60 Hz Rated 15 amp (12 amp max; NEC)	630 mA, 250 V Slow blow 6×30 mm	None	—
	Switzerland 240 volt/50 Hz Rated 10 amp	630 mA, 250 V Slow blow 6×30 mm	None	—

Fig. 1 Power Input Voltage Configuration

CIRCUIT DESCRIPTION

VERTICAL PREAMPLIFIER UNIT

CH1, CH2

Each of the CH1 and CH2 inputs passes through an AC/DC/GND switch and enters the 1st attenuator (1/1, 1/10, 1/100).

The 1st attenuator is used in combination with the 2nd attenuator (1/1, 1/2, 1/4, 1/10) and the 5-fold function of the 2nd amplifier, to switch the 12 vertical ranges.

The head amp is composed of Q102 and U101 (Q202 and U201) and is a 1/1 buffer amp with an input impedance of 1 megohms and used for conversion of impedance. Q102 (Q202) is the source-follower. This head amp is installed between the 1st and 2nd attenuators.

Starting from the 2nd amp, this unit takes the differential amplifier configuration. The functions of U102 (U202) include the variation and inversion functions. The variation function allows to vary the gain continuously according to the voltage applied to pin 5. The inversion function allows to invert the phase according to the voltages applied to pins 6 and 7. As this function is provided only for CH2, CH1 is fixed. At the CH2 side, switch is done by Q215. Q103 (Q203) is the regulated current supply for U102 (U202).

Q106 and Q107 (Q206 and Q207) form an emitter-grounded amp.

Q108 to Q111 (Q208 to Q211) form the cascode amp of the differential amp. The vertical position can be moved by regulating the current applied to the emitter of Q111 (Q211) based on the panel operation.

CH3

With CH3, the attenuator is fixed. The signal impedance is converted by the buffer amp of source follower Q303 and regulated current supply Q304 and the signal is sent to emitter-follower Q305. Q305 is the signal side input stage of the differential amp.

Emitter-follower Q306 is the input stage of a constant-potential differential amp.

The outputs from Q305 and Q306 are input to the differential type cascode amp formed by Q307, Q308, Q310 and Q311. The current of the cascode amp is determined by regulated current supply Q309. The vertical position can be moved by regulating the current applied to the emitter of Q311 based on the panel operation.

Channel selector, delay line drive

As for the outputs from the position amps of the channels, only the signal of the channel with which the cathodes of CH1 - D104, D105, CH2 - D204, D205, CH3 - D301, D302, D304, D305 are turned "H" by the signals from V-MODE LOGIC is sent through CH1 - D103, D106, CH2 - D203, D206, CH3 - D303, D306 and transmitted to the delay line driver.

Q2 and Q3 form a feedback amp. Q1 lets the excessive bias current flow when CH1 or CH2 is in ADD mode.

Trigger amp, trigger selector

With CH1 (CH2), the differential outputs from U102 (U202) are

input to the emitter-followers Q112 and Q113 (Q212 and Q213), where Q113 (Q213) forms a cascode amp with Q114 (Q214). With CH3, the signal after the buffer amp is sent through the buffer of emitter-follower Q314, feedback amp Q312 an output as current from the collector of emitter-follower Q313.

Only the signal of the channel with which the cathode of CH1 - D108, CH2 - D208, CH3 - D308 is turned "H" by the signal from the trigger controller is sent through CH1 - D107, CH2 - D207, CH3 - D307 and output as current to the Horizontal unit. Q31 is the excessive bias current flow when CH1 or CH2 is in ADD mode.

CH1 OUT

The CH1 output is sent from the collector of Q112, through emitter-follower Q51 and output at CH1 OUT of the Final unit.

Trigger controller

The data on the trigger source set on the panel is input to pin 1 of U1 and "H" or "L" is output at pins 4 to 8 according to the set state.

U2 is used to switch between the data from U1 and the CRT display data of each channel from V-MODE LOGIC. If the current mode is not V mode, the former data is selected. If the current mode is V mode, the latter data is selected for use in controlling the trigger selector.

Among CH1 - U2 pin 7, CH2 - U2 pin 9, CH3 - U2 pin 12, the terminal set with the panel is turned "H".

V-MODE LOGIC

U3 and U4 generates a signal synchronized with the display channel select signal from the panel and the end of horizontal sweep, and a signal for controlling the channel selector based on the CHOP signal. (Figure 1)

Q34 cuts off the power supply to U4 only at the instant the channel switch is pressed, in order to prevent malfunction.

Vertical range converter

U401, U403, S102 and S202 output the vertical range, CAL and UNCAL data by turning them into analog values using an opamp for use as the R/O data. (Figures 3, 4)

Horizontal range converter

U402 and S401 output the horizontal range data using an opamp, as analog values for R/O data. (Figure 5)

U404 (for main sweep), U405 (for sub-sweep) and S401 are used to switch the reference voltage for letting the sweep current of the 1-2-5 steps of horizontal sweep flow. (Figure 2)

FINAL UNIT

Final amplifier

The signal sent from the vertical preamp through the delay line is input to the feedback amp of Q1 and Q2. During A ALT B sweep, the variation of the vertical position of sweep B is controlled by the current applied to the base of Q2 based on the panel operation.

Q3 to Q6 and U1 are used to amplify the vertical signal and U1,

CIRCUIT DESCRIPTION

Q5 and Q6 are used to amplify the R/O characters.
U1 is used to switch between the vertical signal and R/O signal.
Q9 to Q14 are cascode-connected for use in driving the CRT:

AC inlet, fuse

An external commercial supply voltage switch and fuse holder are provided.

Line filter

A filter for elimination of common mode noise and normal mode noise is provided.

CH1 OUT

The signal from the vertical preamp is output externally via Q201 and Q202 as a signal with 50-ohm impedance.

HORIZONTAL UNIT

Trigger

The trigger signal supplied from the Vertical unit (X73-2070) is AC/DC coupled and the trigger level is added to it.

The obtained signal is input to the trigger shaping circuit to become a pulse signal.

If FIX is selected, the trigger level is fixed so that it is always around the center of the waveform.

With TV-V, the composite video signal is separated by the V sync separator and input to the trigger shaping circuit.

With TV-H, the composite video signal is separated by the H sync separator and input to the trigger shaping circuit.

HFrej is used to apply a 50 kHz LPF to the trigger signal.

The polarity of the trigger pulse signal can be changed with SLOPE +/- . The output signal is input to the sweep logic circuit.

There is an additional circuit which applies the trigger signal to the sweep logic in case the trigger pulse signal has not been input for a certain period and auto free-run mode has been selected.

Sweep

When the trigger pulse is input to the sweep logic, the sweep gate is activated and the sweep wave is output.

When the sweep wave reaches a certain level, the sweep stop circuit is activated to close the sweep gate and end sweep.

When sweep stop is activated, the hold-off circuit is activated and, in a certain period after it, the sweep logic enters the trigger standby state.

The delayed sweep is performed either as the AFTER DELAY sweep or B TRIG'D sweep.

With the AFTER DELAY sweep, the voltage level of the main sweep wave and the voltage set with DTP are compared and delayed sweep is performed using the result signal as the trigger.

With the B TRIG'D sweep, sweep is triggered by the next trigger signal input after the voltage level of sweep wave have reached the voltage set with DTP.

In case ALT sweep is set, the main sweep and delayed sweep are performed alternately.

Horizontal amp

This circuitry switches between the sweep wave generated in the sweep block and the X signal and add H-POSITION.

After being magnified by 10 times if MAG has been selected, the signal is input to the R/O switch.

Here, the R/O signal is added to the vertical signal and the signal is amplified by the final amp to a high enough voltage level to drive the CRT.

Intensity circuit

The Z signal is generated with the sweep gate of the main sweep and that of the delayed sweep. During ALT sweep, a waveform for increasing the intensity of the delayed sweep section is generated with the main sweep. The voltage set with the INTEN potentiometer is added to the X signal and the voltage set with the R/O INTEN potentiometer is added to the R/O blanking signal and they are input to the high voltage circuit.

The high voltage circuits generates the CRT cathode voltage, G1 voltage and P1 voltage based on the intensity signal and the **FOCUS potentiometer**.

The cathode voltage is controlled always constant by the opamp. For use with the after-accelerating CRT, the anode voltage is also generated by the high voltage circuit.

Power supply

AC voltages of +14.8 V, -14.8 V, +6 V, -6 V, +67 V and +170 V are input from the transformer, and they are turned into stable DC voltages of respectively +12 V, -12 V, +5 V, +55 V and +140 V, which are supplied to their respective units.

CHOP

To observe signals of multiple channels simultaneously, the vertical amp is switched with the CHOP signal.

PANEL UNIT

This unit sends the potentiometer and switch data from the control panel to other units.

A limiting circuit is provided to prevent the CHIP operation while multi-channel operation is not selected even when the CHOP key is pressed.

The voltage setting of DTP is made by the opamp in the range from 0 to +4 V. The CAL signal is a 1 kHz, 1 Vp-p square wave. The intensity is controlled by the PWM based on the output from the original oscillator of CAL.

R/O UNIT

The R/O unit (X77-1870-00) accepts the attenuator and sweep data sent from or through the Panel unit and outputs character data to be displayed on the CRT.

It is composed of the controller block (U1, U2, U4 U6, X1), blanking circuit (U5, U14, U15, X2), A/D converter block (U3, U16, U17) and character data output block (U7, U8 U9, U10, U13).

The controller block is composed of the 1-chip CPU (with built-in ROM), RAM, decoder, ALE and oscillator x 1. The 1-chip CPU

CIRCUIT DESCRIPTION

(U1) incorporates a ROM as described above, and the entire unit is controlled by the software written in this ROM. The 1-chip CPU is operated based on X1 (10 MHz). Before the start of operation, the reset signal is input from U18 when the power is switched on. The 1-chip CPU incorporates 8-bit A/D converters in the output ports, input ports and also internally, and it outputs character data for CRT display based on the data input through the A/D converters.

As for the output port configuration, P40 to P47 and P30 to P33 in the circuit diagram output comparison data for an external 12-bit A/D converter and P34 to P37 output the control data for use in switching the analog data to the external 12-bit A/D converter. As for the input port configuration, P60 to P64 are used to recognize the "H" or "L" level of the push switches on the panel and input the CURSOR MODE, B TRIG'D, CH2 INV and X10 MAG signals. Among them, the CURSOR MODE switch is a non-locking switch so a Schmitt circuit is provided before the signal is input to the port. P50 to P57 are the analog voltage input ports. The input voltage is sent to the internal 8-bit A/D converter, converted into digital data and becomes the CRT display data. The 1-chip CPU has a bus configuration of 8 data bus bits and 16 address bus bits. A lower 8 bits of the address bus are also used as the data bus bits, IC (ALE circuit IC) U6 is provided for their separation.

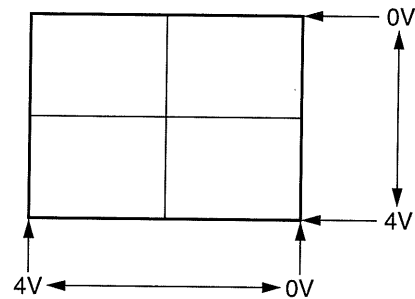
In addition to above, the controller block also includes a decoder (U4) and memory (U2). The decoder output is supplied to the memory as well as to the X latch CLK input, Y latch CLK input and blanking circuit block which will be described below. The memory functions as the system RAM of the 1-chip CPU and also stored CRT display data. The stored data is some of the data which has originally been prepared in the ROM inside the 1-chip CPU; only the data required for CRT display is stored in this memory.

Next, the blanking circuit block is composed of a 4 MHz oscillator composed of X2 and the inverter (U15), shift register (U14), inverter (U15) and OR (U5). It outputs the Blanking (R/O BLK), request (R/O REQ) and unblanking (R/O UBL) signals. The signals are output at the timing synchronized with the CLK signal from the decoder to X latch (U7) and Y latch (U8) and used to switch the display from waveform to character or from character to waveform and to clear the trace during switching. R/O BLK is used to clear the trace, R/O REQ is used to switch display between characters and traces and R/O UBL is used to illuminate a single dot in the character.

In synchronism with the signal outputs from the blanking circuit block, the character data output block outputs R/O-X (character dot position in Horizontal direction) and R/O-Y (character dot position in Vertical direction). The character data is sent from the memory (U2) described above to the X latch and Y latch, and the position data is sent through the address bus.

These data are latched simultaneously, and the latched data are input to the respective 8-bit D/A converters (U9, U10) to be converted into analog signals. After conversion, the obtained analog signals are input to analog switches U11 and U12, output from opamp U13 as signals with 0 to 4 V amplitudes, and sent respectively to the final amp.

The analog switches are supplied with the cursor voltages, which are used to determine the CRT screen position in case the cursor output is required. The relationship between these voltages and the CRT screen display is as shown in the following diagram.



In addition, there is an external 12-bit A/D converter for use as the means to input character data. This converts the cursor voltages, sweep time voltage, DTP voltage, etc., which require a certain resolution into digital data. The A/D converter is formed with an analog switch (U17), comparator (U3) and D/A converter (U16) for A/D conversion with the successive comparison method.

CIRCUIT DESCRIPTION

V-MODE LOGIC

When CH1 is selected with V-MODE

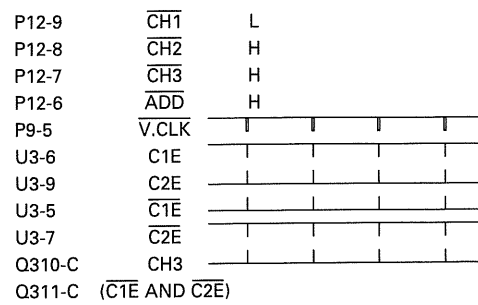


Fig. 1-a

When CH2 is selected with V-MODE

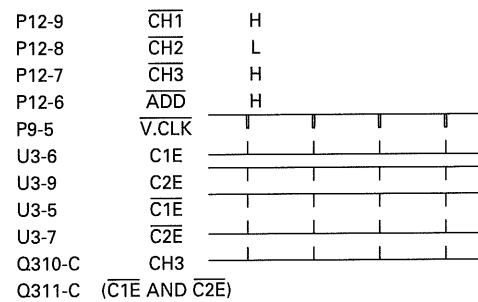


Fig. 1-b

When CH3 is selected with V-MODE

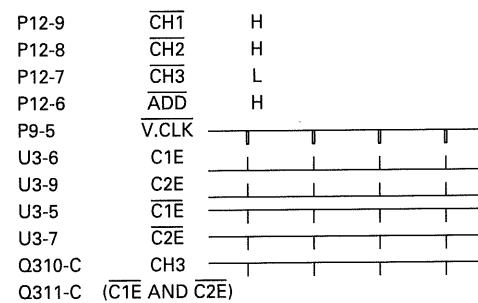


Fig. 1-c

CIRCUIT DESCRIPTION

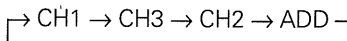
When ADD is selected with V-MODE

P12-9	$\overline{\text{CH1}}$	H								
P12-8	$\overline{\text{CH2}}$	H								
P12-7	$\overline{\text{CH3}}$	H								
P12-6	ADD	L								
P9-5	$\overline{\text{V.CLK}}$									
U3-6	C1E									
U3-9	C2E									
U3-5	$\overline{\text{C1E}}$									
U3-7	$\overline{\text{C2E}}$									
Q310-C	CH3									
Q311-C	$(\overline{\text{C1E}} \text{ AND } \overline{\text{C2E}})$									

Fig. 1-d

There are 16 combinations obtained from the 4 states, and it is abnormal if all of these are "H".

When more than one combination are used, the state is switched at the negative going of $\overline{\text{V.CLK}}$ in the order shown below:



SWEEP CODE	A SWEEP					B SWEEP					VOLTAGE RANGE (V)	VOLTAGE (V)	VOLTAGE (V)	
	S301	a	b	c	d	e	f	g	h	j				k
SWEEP TIME DIV	0.5s											< 0.168	Approx. -7.6	-12
	0.2s	○										0.168 ~ 0.301	Approx. -6.9	
	0.1s		○									0.302 ~ 0.504	Approx. -5.9	
	50ms			○					○			0.505 ~ 0.704	↓	0
	20ms	○		○			○		○			0.705 ~ 0.838		
	10ms		○	○				○	○			0.839 ~ 1.044		
	5ms				○					○		1.045 ~ 1.247	↓	
	2ms	○			○		○			○		1.248 ~ 1.381		
	1ms		○		○			○		○		1.382 ~ 1.584	↓	
	0.5ms			○	○				○	○		1.585 ~ 1.784		
	0.2ms	○		○	○		○		○	○		1.785 ~ 1.918	↓	
	0.1ms		○	○	○			○	○	○		1.919 ~ 2.124		
	50μs					○					○	2.125 ~ 2.327	↓	
	20μs	○				○	○				○	2.328 ~ 2.461		
	10μs		○			○		○			○	2.462 ~ 2.664	↓	
	5μs			○		○			○		○	2.665 ~ 2.864		
	2μs	○		○		○	○		○		○	2.865 ~ 2.998	↓	
	1μs		○	○		○		○	○		○	2.999 ~ 3.204		
	0.5μs				○	○				○	○	3.205 ~ 3.407	↓	
0.2μs	○			○	○	○			○	○	3.408 ~ 3.541			
0.1μs		○		○	○		○		○	○	3.542 ~ 3.743			
0.05μs			○	○	○			○	○	○	> 3.743	Approx. -7.6		
CHECK POINTS	X73-2070-00										P11-3, 2	P10-9, 4	P10-6, 1	
	X77-1870-00										P23-11, 13			

Fig. 2

CIRCUIT DESCRIPTION

● CH1 ATT & CH2 ATT voltage check table

V-Range (/div)	Voltage range (V)
5V	4.124 ~ 4.450
2V	3.790 ~ 4.123
1V	3.456 ~ 3.789
0.5V	3.130 ~ 3.455
0.2V	2.804 ~ 3.129
0.1V	2.470 ~ 2.803
50mV	2.136 ~ 2.469
20mV	1.810 ~ 2.135
10mV	1.484 ~ 1.809
5mV	1.150 ~ 1.483
2mV	0.816 ~ 1.149
1mV	0.490 ~ 0.815

Fig. 3

CH1 CHECK POINT P23-4
CH2 CHECK POINT P23-6

● UNCAL voltage check table

CH1 CAL	CH2 CAL	SWP CAL	Voltage range (V)
>	>	>	4.406 ~ 4.860
>	>	CAL	3.777 ~ 4.405
>	CAL	>	3.147 ~ 3.776
>	CAL	CAL	2.518 ~ 3.146
CAL	>	>	1.888 ~ 2.517
CAL	>	CAL	1.257 ~ 1.887
CAL	CAL	>	0.626 ~ 1.256
CAL	CAL	CAL	0.156 ~ 0.625

Fig. 4

CHECK POINT P23-15

● SWEEP CODE voltage check table

SWEEP TIME (/div)	Voltage range (V)
50ns	≥ 3.744
0.1μs	3.542 ~ 3.743
0.2μs	3.408 ~ 3.541
0.5μs	3.205 ~ 3.407
1μs	2.999 ~ 3.204
2μs	2.865 ~ 2.998
5μs	2.665 ~ 2.864
10μs	2.462 ~ 2.664
20μs	2.328 ~ 2.461
50μs	2.125 ~ 2.327
0.1ms	1.919 ~ 2.124
0.2ms	1.785 ~ 1.918
0.5ms	1.585 ~ 1.784
1ms	1.382 ~ 1.585
2ms	1.248 ~ 1.381
5ms	1.045 ~ 1.247
10ms	0.839 ~ 1.044
20ms	0.705 ~ 0.838
50ms	0.505 ~ 0.704
0.1s	0.302 ~ 0.504
0.2s	0.168 ~ 0.301
0.5s	≤ 0.167

Fig. 5

14 CHECK POINT
A SWEEP P23-11
B SWEEP P23-13

● V-MODE level check table

V-MODE								
CH1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
ADD	OFF	OFF	ON	ON	OFF	OFF	ON	ON
CH2	OFF	OFF	OFF	OFF	ON	ON	ON	ON
	↓	↓	↓	↓	↓	↓	↓	↓
CH1	L	L	H	L	H	L	H	L
ADD	H	H	L	L	H	H	L	L
CH2	H	H	H	H	L	L	L	L
	↓	↓	↓	↓	↓	↓	↓	↓
Display	CH1 (CH3)*		CH1 + CH2	CH1 + CH2	CH2	CH2	CH1 + CH2	CH1 + CH2

* CH3 display is used when only CH3 is ON.

Fig. 6

CHECK POINT P23-4
P23-10
P24-6

● MAG level check

ON	OFF
L	H

CHECK POINT P23-17

Fig. 7

● CH2 INV level check table

ON	OFF
L	H

CHECK POINT P23-12

Fig. 8

● B TRIG'D level check table

ON	OFF
L	H

CHECK POINT P23-19

Fig. 9

● H DISPLAY voltage check table

	Output voltage range (V)
A	≥ 2.085
ALT	1.381 ~ 2.084
B	0.704 ~ 1.380
X-Y	≤ 0.703

CHECK POINT P23-20

Fig. 10

● Probe voltage check table

	Output voltage range (V)
1/1	≥ 4.197
1/10	3.176 ~ 4.196
1/100	≤ 3.175

CHECK POINT
CH1PB : P23-3
CH2PB : P23-5

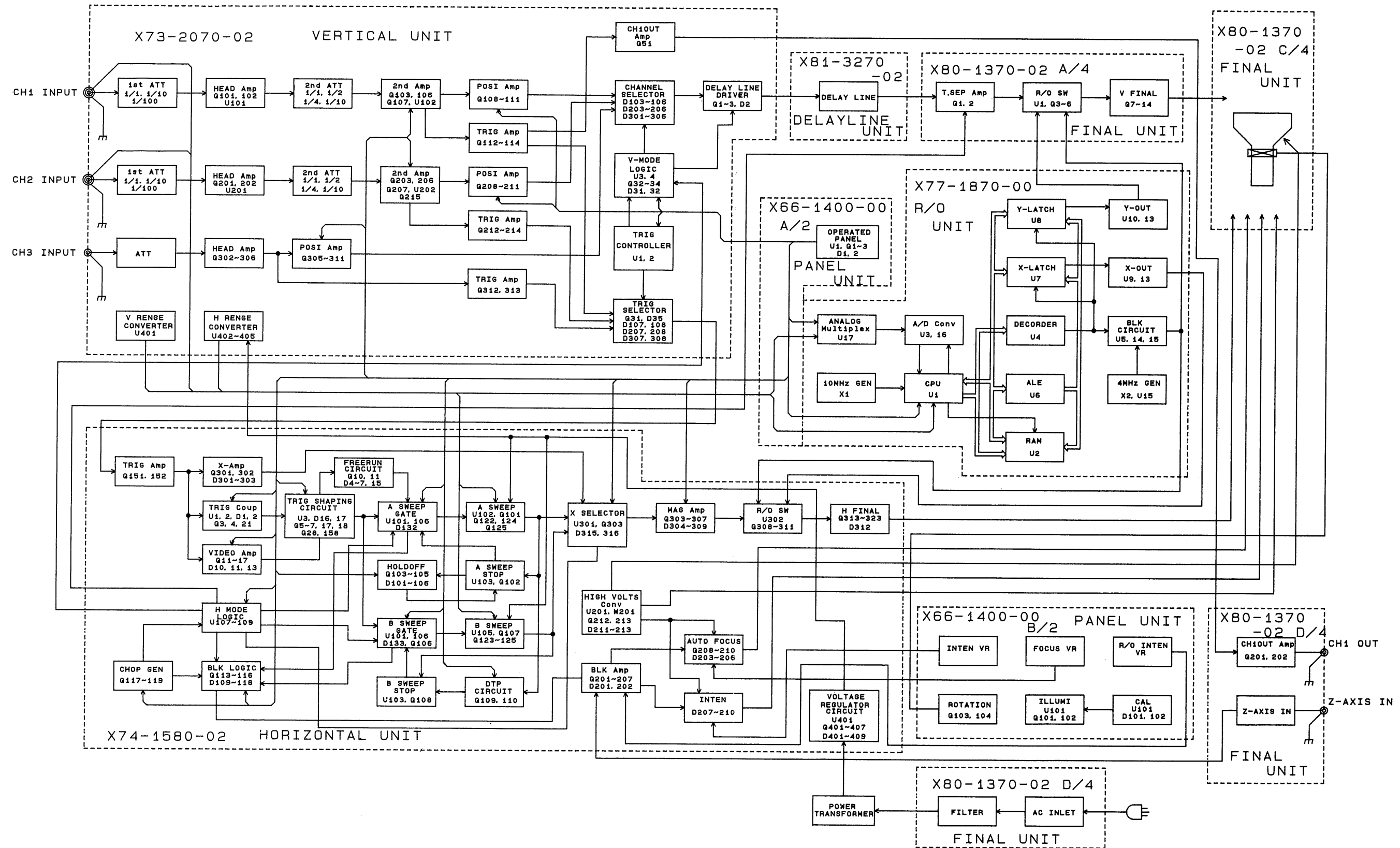
Fig. 11

● CURSOR voltage check table

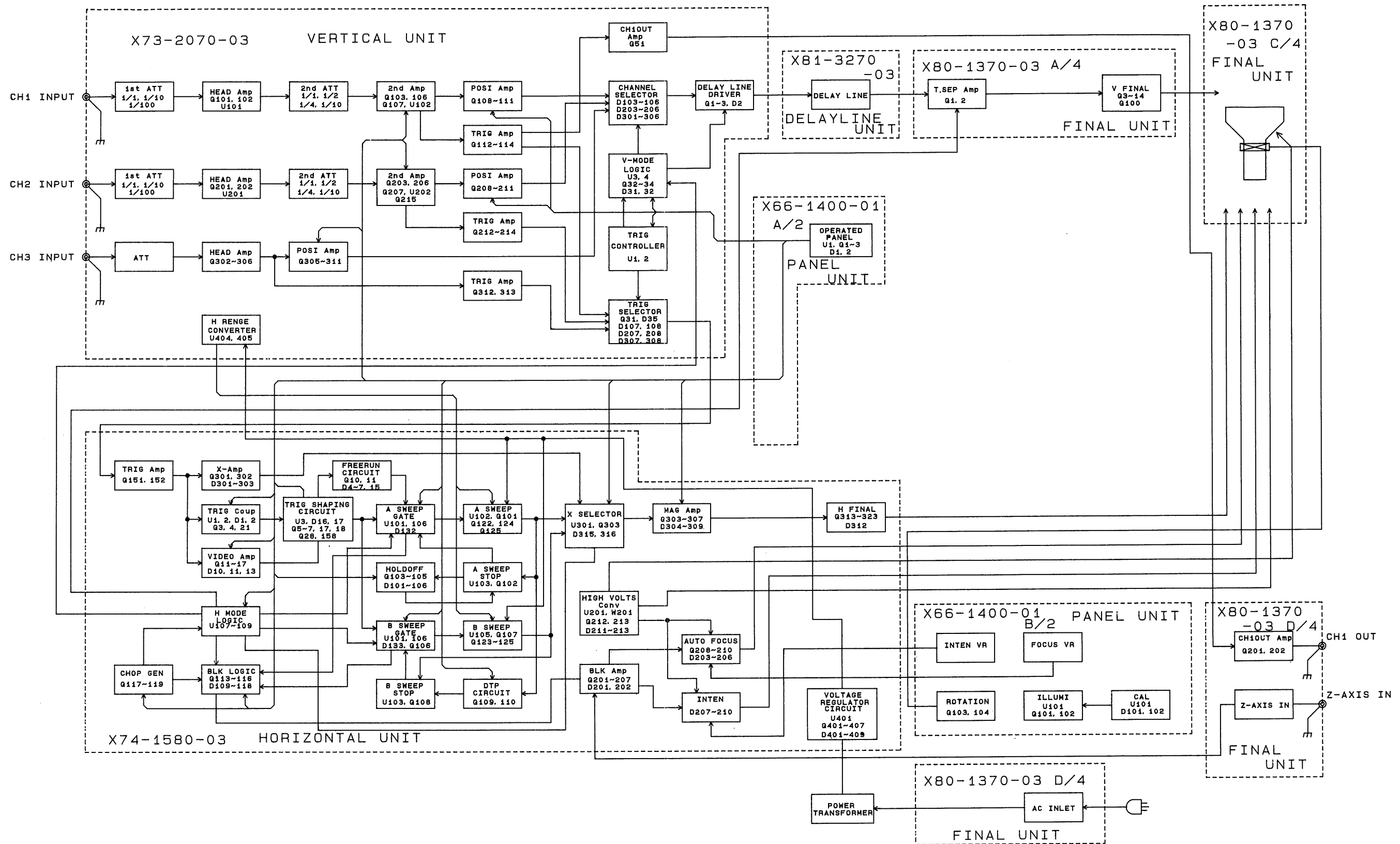
ON	OFF
L	H

Fig. 12

CS-5260 BLOCK DIAGRAM



CS-5265 BLOCK DIAGRAM



ADJUSTMENT

To obtain the best performance, periodically calibrate the unit. Sometimes, only one mode need be calibrated, while at other times, all modes should be calibrated. When one mode is calibrated, it must be noted that the other modes may be affected. When calibrating all modes, perform the calibration in the specified sequence.

The following calibration required an accurate measuring instrument and an insulated adjusting flat blade screwdriver. If they are not available, contact your dealer. For optimum adjustment, turn the power on and warm up the scope sufficiently (more than 30 minutes) before starting.

Before calibrating the scope, check the power supply voltage.

TEST EQUIPMENT REQUIRED

The following instrument or their equivalent should be used for making adjustment.

Test Equipment	Model	Minimum Specification
Digital Multi-Meter	DL-712 (KENWOOD)	Impedance: More than 10 M Ω , Measuring range: 0.2 V to 1000 V
Sine-Wave Generator	651 B (YHP)	Frequency: 10 Hz to 10 MHz, constant voltage over tuning range
Sine-Wave Generator	SG-503 (Tektronix)	Frequency: 50 kHz to 100 MHz, Output impedance: 50 Ω , constant voltage over tuning range
Square-Wave Generator	PG-506 (Tektronix)	Output signal: 1 kHz, Amplitude: 10 mVp-p to 10 Vp-p, Accuracy: within $\pm 1\%$, Rise time: 35ns or less 100 kHz, Rise time: 1 ns or less
Q Meter	4343B (YHP)	—
Color Pattern Generator	CG-921 (KENWOOD)	—
Oscilloscope	CS-6040 (KENWOOD)	Sensitivity: more than 1 mV Frequency response: More than 150 MHz
Time-Marker Generator	TG-501 (Tektronix)	Time mark: 0.5 s to 0.1 μ s repetitive waveform
High-Voltage Probe	—	Input Impedance: 1000 M Ω
Termination	—	Impedance: 50 Ω Accuracy: within 3%
Termination	—	3 watts type impedance: 50 Ω
Attenuator	—	- 20 dB attenuation (50 Ω)

Table 1

PREPARATION FOR ADJUSTMENT

Control Settings

The control settings listed below must be used for each adjustment procedure.

Exceptions to these settings will be noted as they occur. After completing a adjustment, return the controls to the following settings.

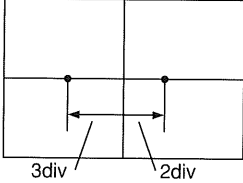
NAME OF KNOBS	POSITION
INTEN	12 o'clock
FOCUS	Optimum position
CH1, CH2, CH3 \blacklozenge POSITION	Mechanical center
\blacktriangleleft \blacktriangleright POSITION	Mechanical center
$\times 10$ MAG	OFF
VARIABLE, H.VARIABLE (VOLTS/DIV, SWEEP TIME/DIV)	CAL
AC-GND-DC (CH1 and CH2)	DC (GND at no signal)
VERTICAL MODE	CH1
HORIZONTAL MODE	A
TRIGGERING COUPLING	AC
TRIGGERING SOURCE	VERT MODE
TRIGGERING MODE	AUTO
TRIGGERING LEVEL	Mechanical center
VOLTS/DIV (CH1 and CH2)	5 V/DIV
A/B SWEEP TIME/DIV	0.5 s/50 ms
TRACE SEP	Fully CCW
HOLD OFF	Fully CCW
SLOPE	\blacksquare +

Table 2

ADJUSTMENT

Item	Adjustment	P.C.B.	Procedure
Operating voltage	VR4 VR303	X80-1370 X74-1580	V.MODE: CH1, CH2. AC-DC: GND (both CH), VOLTS: 10 mV (both CH), H.DISP: X-Y, R/O: OFF 1) Move the spot to the CRT center by operating the POSI controls. 2) Attach the multimeter probes across P5-1 and GND of X80-1370 and adjust VR4 to the voltage 82.5 V. 3) Attach the multimeter probes across P7-1 and GND of X74-1580 and adjust VR303 so that the voltage is 70 V. 4) Attach the probe to P7-4 and ensure that the voltage reading is approx. 70 V.
Focus Center and ASTIG	VR201	X74-1580	V.MODE: CH1, CH2, AC-DC: GND (both CH), VOLTS: 10 mV (both CH), H.DISP: X-Y 1) Move the spot to the CRT center by operating the POSI controls. 2) Adjust the spot to the best point with FOCUS on the panel and ASTIG (VR305). 3) Set FOCUS on the panel to the 12:00 position and adjust VR201 to move the spot to the best point.
Intensity	VR202	X74-1580	V.MODE: CH1, CH2. AC-DC: GND (both CH), VOLTS: 10 mV (both CH), H.DISP: X-Y 1) Set INTEN to the 10:00 position. 2) At the 10:00 position, adjust so that the spot disappears.
Cursor Y-Gain and POSI * In case the R/O unit is not used, ignore this item.	VR3 (Gain) VR2 (POSI)	X80-1370	V.MODE: CH1, CH2. AC-DC: GND (both CH), VOLTS: 10 mV (both CH), H.DISP: A, R/O: ON, A.SWEEP: 1 ms 1) Set the R/O display to 6.00 by operating the cursor POSI controls. 2) Adjust VR3 and VR2 so that the interval between cursors is 6 div. 3) Maximize the cursor interval by operating the cursor POSI controls. 4) Adjust VR2 to make it uniform.
Cursor X-Gain and POSI * In case the R/O unit is not used, adjust only VR304. The VR can be used to adjust the length of the SWEEP TIME 1 ms trace.	VR304 (Gain) VR306 (POSI)	X74-1580	V.MODE: CH1, CH2. AC-DC: GND (both CH), VOLTS: 10 mV (both CH), H.DISP: A, R/O: ON (1/ΔT), A.SWEEP: 1 ms 1) Set the R/O display to 8.00 by operating the cursor POSI controls. 2) Adjust VR304 and V306 so that the cursor interval is 8 div.. 3) Maximize the cursor interval by operating the cursor POSI controls. 4) Adjust VR306 to make it uniform. In case the R/O unit is not used, VR304 is to be adjusted in the SWEEP TIME 1 ms adjustment.
CH1 Gain	VR1 (10 mV) VR102 (1 mV)	X80-1370 X73-2070	V.MODE: CH1, AC-DC: DC, H.DISP: A, VOLTS: 10 mV, VARI: CAL. 1) Input a 50 mV square wave signal. 2) Adjust so that the amplitude is 5 div. (10 mV range) 3) Switch VOLTS to 1 mV and input a 5 mV square wave signal. 4) Adjust so that the amplitude is 5 div. (1 mV range)
CH2 Gain	VR207 (10 mV) VR202 (1 mV)	X73-2070	V.MODE: CH2, AC-DC: DC, H DISP: A, VOLTS: 10 mV, VARI: CAL. 1) Input a 50 mV square wave signal. 2) Adjust so that the amplitude is 5 div. (10 mV range) 3) Switch VOLTS to 1 mV and input a 5 mV square wave signal. 4) Adjust so that the amplitude is 5 div. (1 mV range)

ADJUSTMENT

Item	Adjustment	P.C.B.	Procedure
X-Gain * In case the R/O unit is not used, do not adjust this item now but adjust after H.POSI.	VR308	X74-1580	<p>H.DISP: X-Y, AC-DC: DC VOLTS: 10 mV, VARI: CAL.</p> <p>1) Input a 50 mV square wave signal to CH2. 2) Adjust so that the amplitude is 5 div. (10 mV range) * Make the adjustment to 5 div., at the CRT center.</p> 
CH3 Gain	VR301	X73-2070	<p>V.MODE: CH3, H.DISP: A</p> <p>1) Input a 0.5 V square wave signal. 2) Adjust so that the amplitude is 5 div. (0.1 V range)</p>
CH1 Step ATT Balance	VR103	X73-2070	<p>V.MODE: CH1, AC-DC: GND (both CH) VOLTS: 5 mV (both CH) H.DISP: A</p> <p>1) Adjust so that the trace does not move when VOLTS is switched from 5 mV to 2 mV. * Adjust after switching to 2 mV with reference to the 5 mV position.</p>
CH1 VARIABLE Balance	VR104	X73-2070	<p>V.MODE: CH1, AC-DC: GND (both CH) VOLTS: 5 mV (both CH) H.DISP: A</p> <p>Adjust by setting VARIABLE to the MIN (fully counterclockwise) position with reference to the MAX (CAL) position. * Ensure that the trace does not move when VARIABLE is switched between MIN ↔ MAX.</p>
CH2 Step ATT Balance	VR203	X73-2070	<p>V.MODE: CH2, AC-DC: GND, VOLTS: 5 mV, H.DISP: A.</p> <p>1) Adjust so that the trace does not move when VOLTS is switched from 5 mV to 2 mV. * Adjust after switching to 2 mV with reference to the 5 mV position.</p>
CH2 VARIABLE Balance	VR204	X73-2070	<p>V.MODE: CH2, AC-DC: GND, VOLTS: 5 mV, H.DISP: A.</p> <p>1) Adjust by setting VARIABLE to the MIN (fully counterclockwise) position with reference to the MAX (CAL) position. * Ensure that the trace does not move when VARIABLE is switched between MIN ↔ MAX.</p>
CH2 INV Balance	VR208	X73-2070	<p>V.MODE: CH2, AC-DC: GND, VOLTS: 5 mV, H.DISP: A.</p> <p>1) Adjust so that the trace does not move when CH2 INV is switched ON-OFF. 2) Check CH2 STEP ATT BAL and VARI BAL and, if any is deviated, re-adjust following the adjustment procedure.</p>
ADD POSI	VR1	X73-2070	<p>V.MODE: CH1, ADD, AC-DC: GND, VOLTS: 5 mV H.DISP: A</p> <p>1) Superimpose the two displayed traces by operating CH2 POSI. 2) Switch V.MODE CH2 ON. (After this, CH1, CH2 and ADD of V.MODE are ON.) 3) Superimpose the two displayed traces by operating CH1 POSI. 4) Adjust the trace to the center of scale. (The CRT seems to display a single trace but it actually consists of a superimposition of 3 traces.)</p>

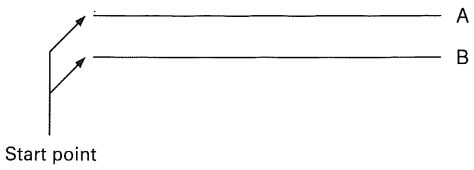
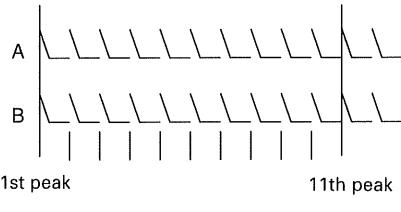
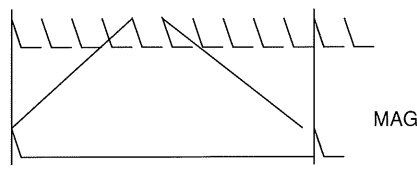
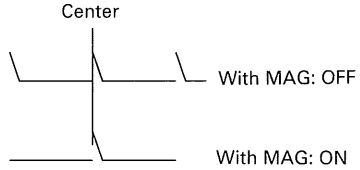
ADJUSTMENT

Item	Adjustment	P.C.B.	Procedure
V.POSI Center	VR106 (CH1) VR206 (CH2) VR302 (CH3)	X73-2070	V.MODE: CH1, CH2, CH3, VOLTS: 5 mV, H.DISP: A, AC-DC: GND. 1) Set POSI of each CH to the 12:00 position. 2) Adjust the trace of each CH to the scale center.
CH1 Waveform Shaping	TC102 (0.1 V) TC104 (1 V)	X73-2070	V.MODE: CH1, AC-DC: DC, VARI: CAL, VOLTS: 10 mV (ideal waveform), H.DISP: A. 1) Input a 1 kHz square wave to the CH1 input. 2) Adjust so that the waveforms at 0.1 V and 1 V are flat.
CH2 Waveform Shaping	TC202 (0.1 V) TC204 (1 V)	X73-2070	V.MODE: CH2, AC-DC: DC, VARI: CAL, VOLTS: 10 mV (ideal waveform), H.DISP: A. 1) Input a 1 kHz square wave to the CH2 input. 2) Adjust so that the waveforms at 0.1 V and 1 V are flat.
CH3 Waveform Shaping	TC301	X73-2070	V.MODE: CH3, H.DISP: A. 1) Input a 1 kHz square wave to the CH1 input and adjust so that the waveform is flat.
Input Capacity	TC101 (0.1 V) TC103 (1 V)	X73-2070	V.MODE: CH1, AC-DC: DC, VARI: CAL, VOLTS: 10 mV (reference), H.DISP: A. 1) Connect a capacity meter to the CH1 input. 2) Measure the capacity of the 10 mV range. (No more than 25 p) 3) At 0.1 V and 1 V, adjust to obtain the same values as 10 mV.
Input Capacity	TC201 (0.1 V) TC203 (1 V)	X73-2070	V.MODE: CH2 AC-DC: DC, VARI: CAL, VOLTS: 10 mV (reference), H.DISP: A. 1) Connect a capacity meter to the CH2 input. 2) Measure the capacity of the 10 mV range. (No more than 25 p) 3) At 0.1 V and 1 V, adjust to obtain the same values as 10 mV.
FIX Level	VR2	X74-1580	V.MODE: CH1, AC-DC: DC, VOLTS: 0.1 V, TRIG MODE: FIX, SWEEP T: 0.2 ms. 1) Input 1 kHz sine wave to CH1 and set it so that it extends by 3 div., above and below the scale center line. 2) Adjust so that the waveform starts from the scale center line when SLOPE is switched between +/-. 3) Set the amplitude to 1 div., switch SLOPE to + and -, and ensure that triggering is applied. (If it is not applied, re-adjust now.) <div style="text-align: center;"> <p>Align the start with the center. → 3div 3div</p> </div>
TRIG Level	VR1	X74-1580	V.MODE: CH1, AC-DC: DC, VOLTS: 0.1 V, TRIG MODE: AUTO, SWEEP T: 0.2 ms. 1) Input 1 kHz sine wave to CH1 and set it so that it extends by 3 div., above and below the scale center line. 2) Set TRIG LEVEL to the 12:00 position and adjust so that the waveform starts from the scale center line. <div style="text-align: center;"> <p>Align the start with the center. → 3div 3div</p> </div>

ADJUSTMENT

Item	Adjustment	P.C.B.	Procedure
CH1 TRIG DC Coupling	VR105	X73-2070	<p>V.MODE: CH1, AC-DC: DC, VOLTS: 0.1 V, TRIG MODE: AUTO, SWEEP T: 0.2 ms, COUPLING: AC.</p> <ol style="list-style-type: none"> 1) Input 1 kHz sine wave to CH1 and set it so that it extends by 3 div., above and below the scale center line. 2) Adjust TRIG LEVEL so that the waveform starts from the scale center line. 3) Switch COUPLING to DC and adjust so that the waveform starts from the scale center line. <div style="text-align: right; margin-top: 10px;"> </div>
CH2 TRIG DC Coupling	VR205	X73-2070	<p>V.MODE: CH2, AC-DC: DC, VOLTS: 0.1 V, TRIG MODE: AUTO, SWEEP T: 0.2 ms, COUPLING: AC.</p> <ol style="list-style-type: none"> 1) Input 1 kHz sine wave to CH2 and set it so that it extends by 3 div., above and below the scale center line. 2) Adjust TRIG LEVEL so that the waveform starts from the scale center line. 3) Switch COUPLING to DC and adjust so that the waveform starts from the scale center line. <div style="text-align: right; margin-top: 10px;"> </div>
CH3 TRIG DC Coupling	VR303	X73-2070	<p>V.MODE: CH3, TRIG MODE: AUTO, SWEEP T: 0.2 ms.</p> <ol style="list-style-type: none"> 1) Set the trace to the scale center by operating V.POSI. 2) Input a 1 kHz sine wave to CH1 and set it so that it extends by 3 div., above and below the scale center line. (As CH3 is fixed to DC, it may not be triggered at this time. But it can be triggered by adjustment.) 3) Adjust so that the waveform starts from the scale center line. <div style="text-align: right; margin-top: 10px;"> </div>
TRIG ADD	VR31	X73-2070	<p>V.MODE: CH1, CH2, AC-DC: DC, VOLTS: 0.1 V, TRIG MODE: AUTO, SWEEP T: 0.2 ms, COUPLING: AC</p> <ol style="list-style-type: none"> 1) Set the traces of each CH to the scale center position by operating V.POSI. 2) Switch CH1 and CH2 to OFF and ADD to ON. 3) Input a 1 kHz sine wave to CH1 and set it so that it extends by 3 div., above and below the scale center line. 4) Adjust TRIG LEVEL so that the waveform starts from the scale center line. 5) Switch COUPLING to DC and adjust so that the waveform starts from the scale center line.

ADJUSTMENT

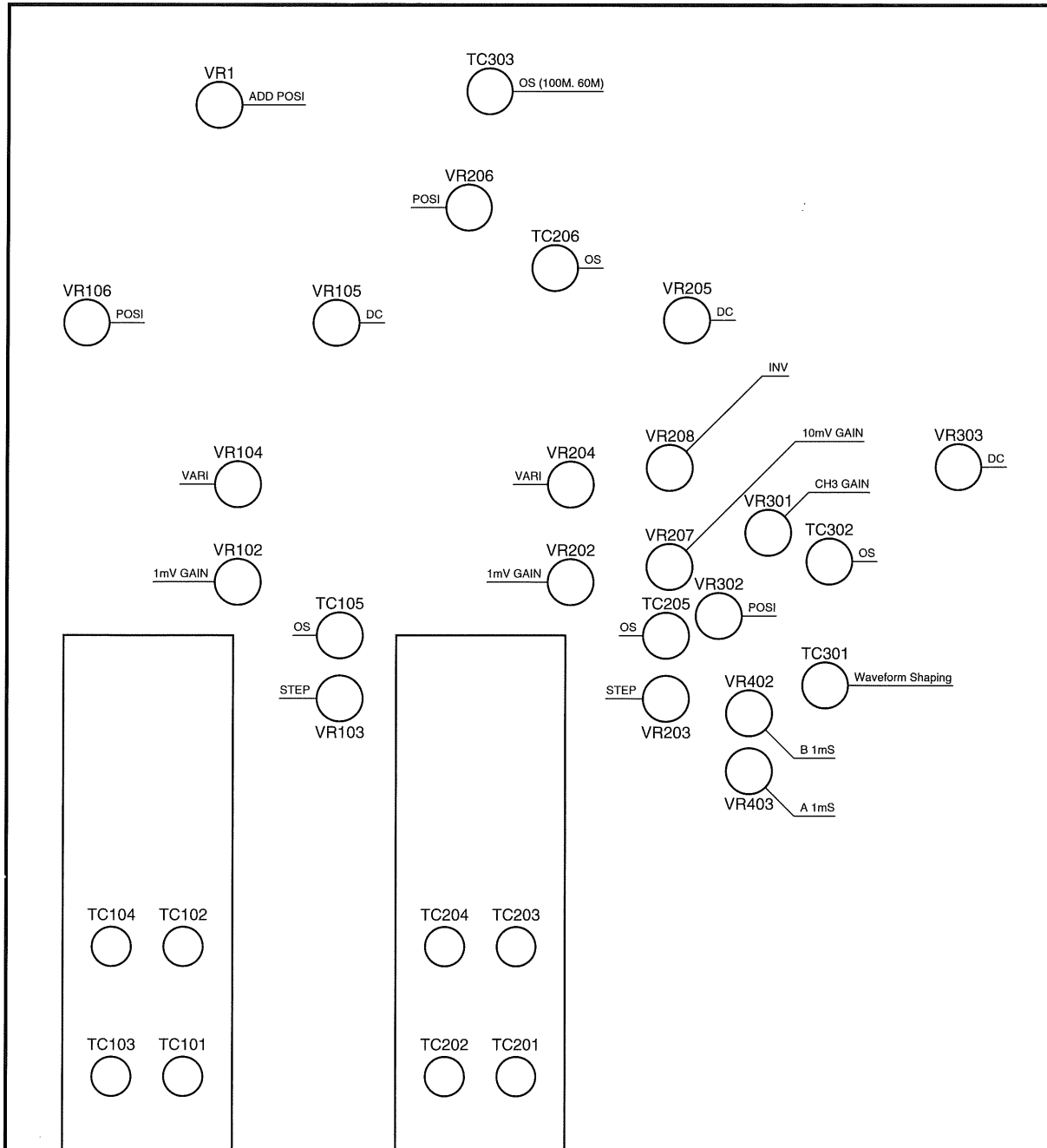
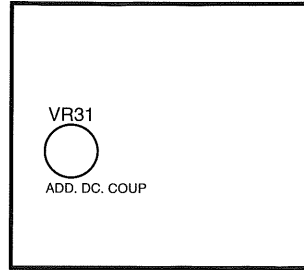
Item	Adjustment	P.C.B.	Procedure
A/B sweep start points	VR102	X74-1580	<p>V.MODE: CH1, AC-DC: DC, SWEEP TIME: A → 1 ms, B → 0.1 ms, H.DISP: ALT DTM: MIN. (Fully counterclockwise) 1) Adjust so that the start points of A.SWEEP and B.SWEEP are aligned.</p> 
A, B SWEEP TIME 1 ms * In case the R/O unit is not used, adjust VR304 alternately so that the total number of marker peaks is 12.	VR403 (A, SWEEP) VR402 (B, SWEEP)	X73-2070	<p>SWEEP TIME: A, B → 1 ms, H.DISP: ALT, DTM: MIN (fully counterclockwise). 1) Input a 1 ms marker signal. 2) Adjust so that the marker peak and scale coincides at every div.</p> 
MAG GAIN	VR302	X74-1580	<p>SWEEP TIME: A → 1 ms, H.DISP: A, AC-DC: DC. 1) Input a 1 ms marker signal. 2) Adjust H.POSI so that the marker peak and scale coincides at every div. 3) Switch X10 MAG ON and adjust so that the interval between two peaks is 10 div.</p> 
MAG Center	VR309	X74-1580	<p>SWEEP TIME: A → 1 ms, H.DISP: A, AC-DC: DC. 1) Input a 5 ms marker signal. 2) Adjust H.POSI so that the center peak is aligned with the scale center. 3) Switch X10 MAG ON and adjust so that the center marker peak is aligned with the scale center. (Adjust by repeating a few times.) 4) After the adjustment, switch MAG between ON-OFF and ensure that the center marker peak does not move.</p> 

ADJUSTMENT

Item	Adjustment	P.C.B.	Procedure
H. POSITION X-POSITION * In case the R/O unit is not used. Adjust X-GAIN after H.POSI. (Adjustment sequence) 1) H.POSI 2) X-GAIN 3) X-POSI	VR301 (H.POSI) VR307 (X-POSI)	X74-1580	SWEEP TIME: A → 1 ms, H.DISP: A 1) Set the AC-DC switch to GND. (The marker signal can be left input.) 2) Set H.POSI to the 12:00 position. 3) Adjust VR301 so that the trace start point is aligned with the left end of scale. 4) Set H.DISP to X-Y. 5) Adjust VR307 so that the spot comes on the scale center.
A, B SWEEP TIME 1 μs	TC101 (A, SWEEP) TC102 (B, SWEEP)	X74-1580	SWEEP TIME: A, B → 1 μs, H.DISP: ALT, DTM: MIN (fully counterclockwise). 1) Input a 1 μs marker signal. 2) Adjust so that the marker peak and scale coincides at every div.
A, SWEEP TIME 0.05 μs	TC301 (A, SWEEP)	X74-1580	SWEEP TIME: A, B → 0.05 μs, H.DISP: ALT, DTM: MIN (fully counterclockwise). 1) Input a 50 ns marker signal. 2) Adjust so that the marker peak and scale coincides at every div.
D.T. POSI * In case the R/O unit is not used: 1. Turn the MAIN and FINE potentiometers fully counterclockwise. 2. Align the of B sweep with 0.2 div. 3. Turn the MAIN and FINE potentiometers fully clockwise. 4. Align the start of B sweep with 10 div. The potentiometers used in the start and stop adjustments are the same.	VR103 (Start) VR104 (Stop)	X74-1580	H.DISP: ALT, AC-DC: GND, A.SWEEP: 1 ms, B.SWEEP: 10 μs 1) Turn the MAIN and FINE potentiometers of D.T.M. control fully counterclockwise. 2) Adjust the R/O display to 0.40 ms with FINE. 3) Adjust VR103 so that the start of B sweep is aligned with 0.4 div., of the scale. 4) Turn the MAIN and FINE potentiometers of D.T.M. control fully clockwise. 5) Adjust the R/O display to 10.00 ms with FINE. 6) Adjust VR104 so that the start of B sweep is aligned with 10.00 div., of the scale. <div style="text-align: center;"> </div>
CH1 1 MHz square wave	TC1 TC62 TC105	X80-1370 X73-2070	V.MODE: CH1, VOLTS: 10 mV, AC-DC: DC H.DISP: A. 1) Input a 1 MHz square wave to CH1 and set its amplitude to 6 div. 2) Adjust the waveform to the best point. * With the 100 MHz band, provide an overshoot of 0.3 to 0.4 div. * With the 60 MHz band, provide an overshoot of 0.1 to 0.2 div. * With the 40 MHz band, provide an overshoot of 0.1 to 0.2 div. Specification: (Above) 0.5, (Below) 0.5, (Above + Below) = Less than 0.7 div.
CH2 1 MHz square wave	TC205 TC206	X73-2070	V.MODE: CH2, VOLTS: 10 mV, AC-DC: DC H.DISP: A. 1) Input a 1 MHz square wave to CH2 and set its amplitude to 6 div. 2) Adjust the waveform to the best point. 3) Check that the overshoot in each range from 5 mV to 0.1 V is within the specification. (Check both CHs.) * Provide overshoot in the same way as CH1. Specification: Same as CH1.
CH3 1 MHz square wave	TC302 TC303	X73-2070	V.MODE: CH3, H.DISP: A. 1) Input a 1 MHz square wave to CH3 and set its amplitude to 6 div. 2) Adjust the waveform to the best point. * Adjust TC303 for only the 100M and 60M bands. Specification: Same as CH1.

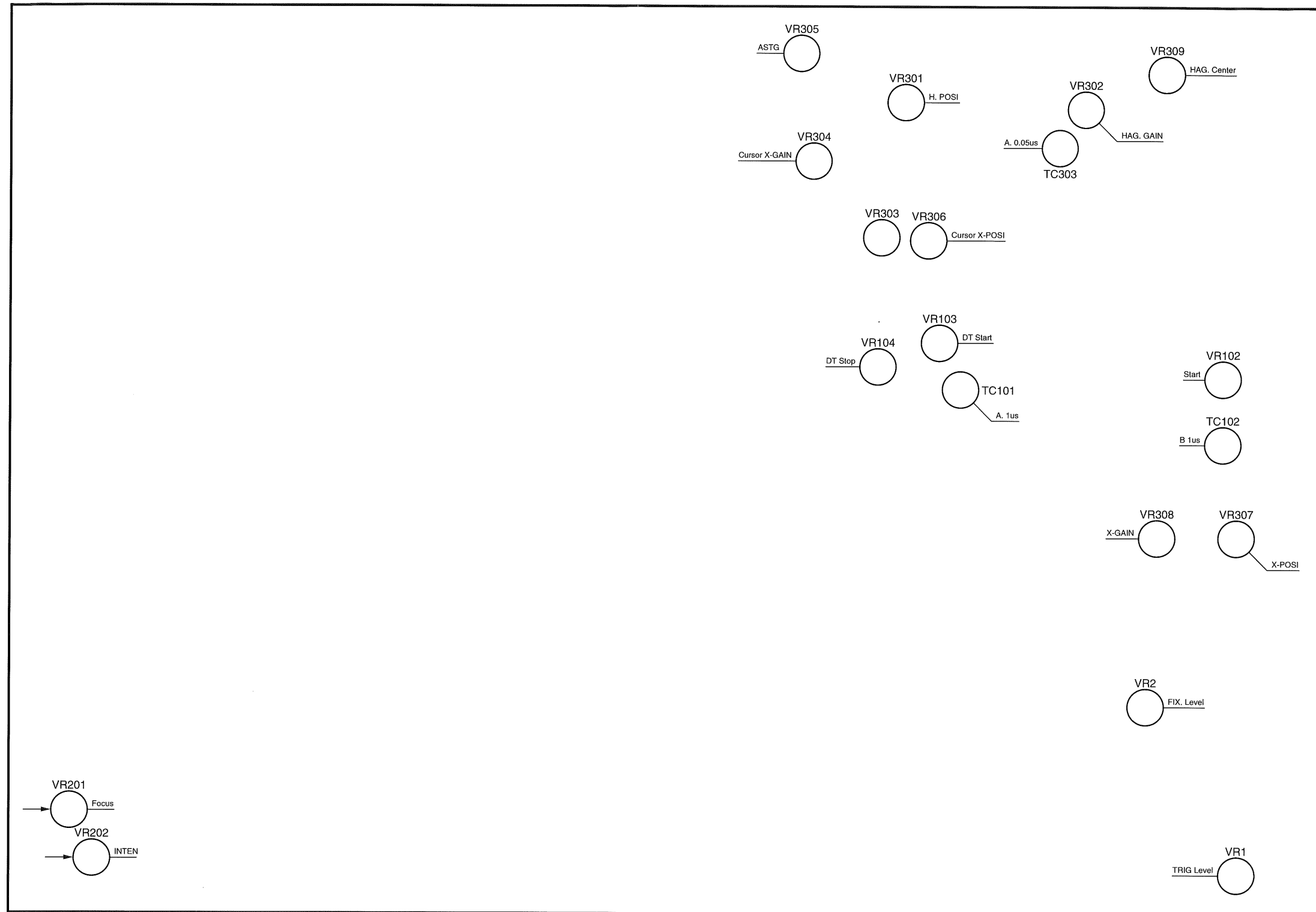
ADJUSTMENT

VERTICAL UNIT (X73-2070-0X)



ADJUSTMENT

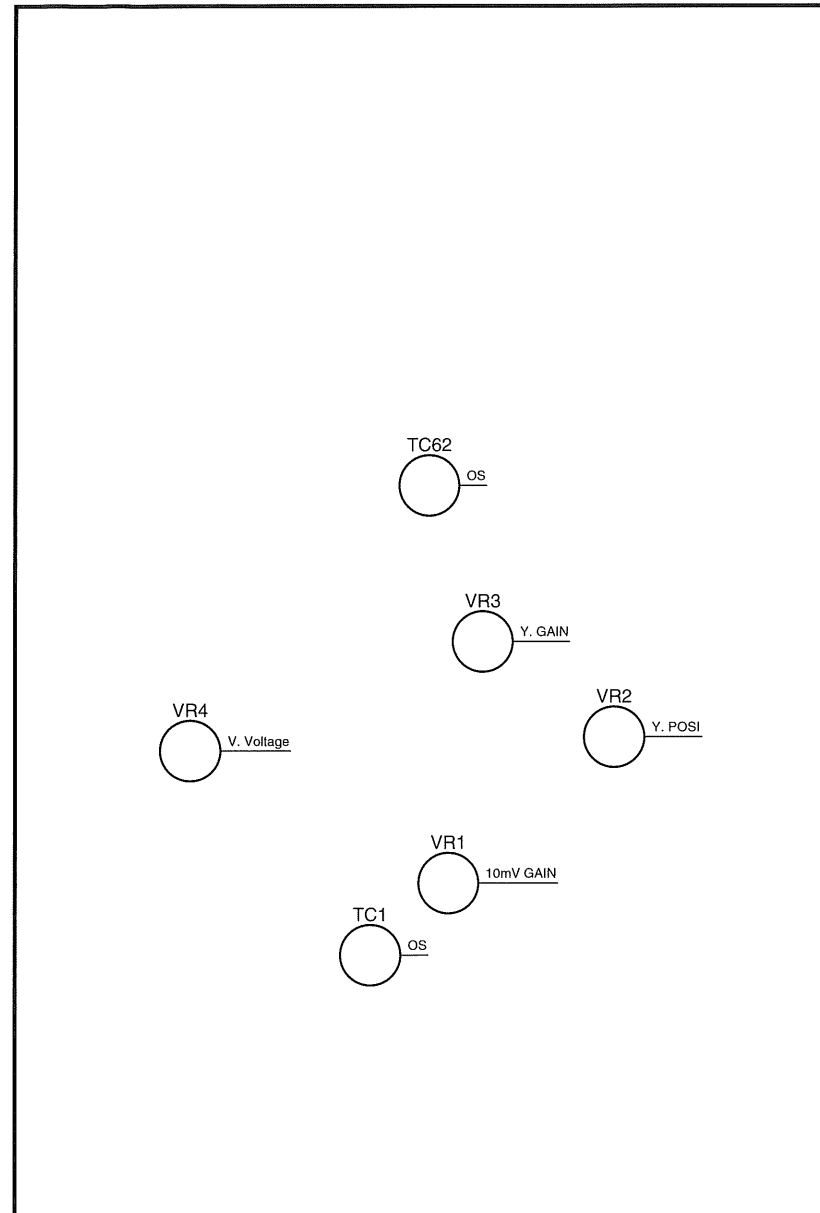
HORIZONTAL UNIT (X74-1580-0X)



FRONT

ADJUSTMENT

FINAL UNIT (X80-1370-0X)



FRONT

TROUBLESHOOTING

When operating the CS-5200, be sure to use the proper procedure and check all panel settings.

A wrong setting cause abnormal operation from even a good product. For example, observation of a waveform with high noise components is accompanied by jitter. In such a case, the jitter can be corrected by setting the trigger coupling to HFrej. If there is any function which you do not understand, check out by reading the instruction manual.

If the operation is abnormal even when the operating procedure is correct, remove the top case and bottom panel.

CAUTION

HIGH VOLTAGE PARTS ARE INSIDE THE EQUIPMENT. THEY ARE EXTREMELY DANGEROUS.

Check all PC boards to ensure that there is no unplugged connector or soldering defect.

Some problems may be corrected by applying correct adjustment. For example, if the trace moves up and down when the Vertical Variable control is turned, it can be corrected by adjusting the Variable balance. For the adjustment methods, read the descriptions of adjustment procedures.

The description in the troubleshooting section use the same circuit names as those used in the block diagram. Refer to the block diagram when reading the troubleshooting.

First, start with checking the power supply block. Check the voltages at U401 on X74-158.

pin no.	voltage
1	+140
4	+55
6	+12
8	-12
10	+5
11	-8

OK (Acceptable): Go to next step.

NG (Unacceptable): There is a problem in the power supply block. Check the regulator circuit

a: In case no spot is displayed on the CRT in the X-Y mode.

Check that voltages at pins 1 and 4 of P7 on the X74-1580.

OK: Check the voltages at pins 1 and 3 of P5 on the X80-1370.

OK: There is a problem in the BLK amp. (Go to b.)

NG: There is a problem in the vertical amp. (Go to i.)

NG: There is a problem in the horizontal amp. (Go to c.)

b: Check if the voltage at JW18 on X74-1580 is correct.

OK: There is a problem in the BLK amp.

NG: There is a problem in the HIGH Volts converter.

c: Short-circuit the bases of Q306 and Q307 on X74-1580.

A spot is displayed on the CRT:

There is a problem somewhere before the X amp. (Go to d.)

Nothing is displayed on the CRT:

Short the collectors of Q310 and Q311.

A spot is displayed on the CRT:

There is a problem in the MAG amp or R/O SW.

Nothing is displayed on the CRT:

There is a problem in H-FINAL.

d: Short-circuit the collector of Q151 on X74-1580 with the chassis.

A spot is displayed on the CRT:

There is a problem in the Vertical block.

Nothing is displayed on the CRT:

There is a problem in the X amp.

e: In case no trace is displayed on the CRT in the A sweep mode.

Measure the waveform at pin 12 of U102 on X74-1580.

OK: Measure every waveform after U102 to locate the defective position.

NG: Measure the A SWEEP GATE, A SWEEP, A SWEEP STOP and HOLD OFF waveforms to locate the defective position.

f: In case no trace is displayed on the CRT in the B sweep mode.

Measure the waveform at pin 12 of U105 on X74-1580.

OK: Measure every waveform after U105 to locate the defective position.

NG: Measure the B SWEEP GATE, B SWEEP, B SWEEP STOP and DTP circuit waveforms to locate the defective position.

g: Intensity is not modulated in ALT sweep mode.

Check the waveform at the collector of Q116 on X74-1580.

OK: There is a problem in INTEN.

NG: There is a problem in the BLK amp.

h: Triggering cannot be applied.

Check the waveform at the collector of Q151 on the X74-1580.

OK: Check the waveform at the collector of Q158 on X74-1580.

OK: There is a problem in the Schmitt circuit.

NG: There is a problem in the Trig. Coup.

NG: There is a problem in the trigger selector.

TROUBLESHOOTING

i: Trace is not displayed.

Short-circuit the bases of Q7 and Q8 on X80-1370 and check if a trace is displayed on or near the center.

OK: Short-circuit the bases of Q1 and Q2 on X80-1370 and check if a trace is displayed on or near the center.

OK: There is a problem in X73-2070. Check the defective point by shorting each signal line.

NG: There is a problem in the T.SEP amp or R/O SW on X80-1370.

NG: There is a problem in V. FINAL.

j: TV synchronization is impossible.

Check the waveforms of the video amp on X74-1580.

OK: There is a problem in the Schmitt circuit.

NG: There is a problem in the circuitry before the video amp.

Check the defective position following the signal flow.

Be sure to check both TV-H and TV-V.

k: The channels are not displayed properly.

Check the outputs from V-MODE LOGIC on X73-2070.

OK: There is a problem in the circuitry before the POSI amp of one of the channels. Check the waveforms.

NG: Check the V-CLK waveform.

OK: There is a problem in the V-MODE LOGIC.

NG: There is a problem in the H-MODE LOGIC on X74-1580.

l: ADD is not possible.

There is a problem in the delay line driver on X73-2070.

m: CHOP sweep is not possible.

Check the waveform at the collector of Q118 on X74-1580.

OK: There is a problem in the H-MODE LOGIC.

NG: There is a problem in the CHOP generator.

n: Auto free-run is not possible.

Check +5 V at pin 1 of U106 on X74-1580.

OK: There is a problem in the A sweep gate.

NG: There is a problem in the free-run circuit.

o: Characters are not displayed on the CRT.

- Check the CURSOR MODE SW and R/O INTEN.

- Check the blanking signals at P24-1, 3 and 5.

OK: Check the signals at ROX at P24-8 and ROY at P24-7.

If NG, go to the next check item. If OK, check V FINAL or H FINAL.

NG: There is a problem in the blanking circuitry.

(Check U15, U14, U5 and X2 and their surroundings.)

p: Character are not displayed properly on the CRT:

- Check if the CPU (U1) operates normally.

(Check the conditions of X1, 10 MHz, U1, data bus and address bus.)

- Trace ROX from the input to output to find if there is any abnormal position. Also check ROY from the input to output.

(Check U7, U9, U11, U13, U8, U10 and U12 and their surroundings.)

OK: There is a problem in V FINAL or H FINAL.

NG: There is a problem in the ROX or ROY output circuits.

q: Character data is not displayed properly on the CRT.

- Trace the character data input circuit and its surroundings to find if there is any abnormal position.

(Check U3, U5 and U17.)

OK: There is a problem in the Panel unit.

NG: There is a problem in the character data input circuit.

r: The cursor and DTP do not function properly.

- Check if the cursor and DTP voltages are output properly.

	⌋	⌋	CHECK POINT
Δ	0V	4V	P23-8
ΔREF	0V	4V	P23-14
DTP	4V	0V	P23-18

OK: There is a problem in the ROX or ROY output circuit.

NG: There is a problem in the Panel unit.

s: Abnormality occurs with other function than above.

Trace the signal path of the defective function referring to the block diagram to locate the defective position.

When all of the troubles have been repaired above, start re-adjustments following the adjustment procedures.

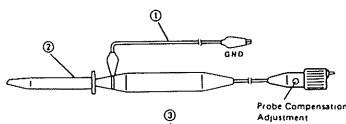
PARTS LIST

CS-5260

Y70-1960-02

REF. NO	PARTS NO	NAME & DESCRIPTION
	A63-0166-03	PANEL ASS'Y
	B41-0710-14	CAUTION LABEL, HIGH VOLTAGE
	B42-3820-05	LABEL; CARTON BOX
	B63-0218-20	INSTRUCTION MANUAL; JAPANESE
	B63-0219-30	INSTRUCTION MANUAL; ENGLISH
	E30-1929-05	BS POWER CORD
	E30-1950-05	JIS POWER CORD
	E30-1951-05	UL/CSA POWER CORD
	E30-1952-05	CEE POWER CORD
	F51-0031-05	FUSE(6X30MM) 630MA/250V
	F51-0033-05	FUSE(6X30MM) 1A/250V
	H10-2883-02	FORMED STYRENE PAD, FRONT
	H10-2884-02	FORMED STYRENE PAD, REAR
	H20-1727-04	VINYL COVER
	H53-0153-04	CARTON BOX
	W01-0406-14	ADJUSTMENT ROD
D1	LN322GP	LED; GREEN
D103	LN322GP	LED; GREEN
1	A01-4017-02	CASE, TOP
2	A01-4018-02	CASE, BOTTOM
3	A13-2205-02	FRAME, LEFT
4	A13-2206-02	FRAME, RIGHT
5	A13-2207-12	FRAME, CENTER
6	A21-2423-03	DECORATIVE PANEL, LARGE
7	A21-2425-04	DECORATIVE PANEL, SMALL
8	A22-1307-02	SUB PANEL
9	A63-0110-01	MOLD PANEL, LARGE
10	A63-0111-02	MOLD PANEL, SMALL
11	A83-0067-02	REAR PANEL
12	B11-0518-04	FILTER
13	B41-2069-04	CAUTION LABEL
14	B73-0087-04	NAME PLATE; MODEL NO.
15	D21-0935-04	EXTENSION SHAFT
16	E18-0365-15	AC SELECTOR
16A	E18-0366-15	AC SELECTOR WITH 5X20MM FUSE
17	E21-0686-04	TERMINAL, CAL
18	E23-0552-04	EARTH TERMINAL
20	F11-1206-13	SHIELD CASE, CRT
21	F11-1269-03	SHIELD CASE
22	F15-0733-04	FELT (CRT SHIELD)
23	F20-3013-03	INSULATOR, LARGE
24	F20-3014-04	INSULATOR, SMALL
25	F29-0528-05	INSULATOR TUBE
26	J02-0089-05	RUBBER FOOT
27	J02-0509-04	TILT STAND
28	J19-1622-05	CORD CLAMP
29	J19-1653-23	HOLDER FOR CRT
30	J21-2573-04	HOLDER FOR LEG
31	J21-4853-04	BRACKET, FRONT
32	J21-4854-04	BRACKET, REAR
33	J21-4855-04	BRACKET
34	J42-0558-05	BUSHING
35	J59-0403-05	NYLON RIVET (ILLUMI)
36	K01-0541-05	HANDLE
37	K21-0919-14	KNOB; B SWP
38	K21-0920-04	KNOB; VARI
39	K21-0940-04	KNOB; A SWP
40	K23-0818-04	KNOB; V/DIV
41	K24-3005-04	PUSH SW; POWER
42	K27-0590-04	PUSH BUTTON; GRAYWHITE
43	K27-3618-14	LEVER
44	K29-0877-04	KNOB; VR
45	L07-1509-05	POWER TRANSFORMER
46	L39-0531-05	ROTATION COIL
47	S40-2532-05	POWER SW
48	W01-0503-04	REAR RUBBER FOOT/CORD WRAP
49	X66-1400-00	PANEL UNIT
50	X73-2070-02	VERTICAL UNIT
51	X74-1580-02	HORIZONTAL UNIT
52	X77-1870-00	R/O UNIT
53	X80-1370-02	FINAL AMP UNIT
54	X81-3270-00	DELAY LINE UNIT
55	150JKN31	CRT

MODEL PC-31 (LOW CAPACITY PROBE)



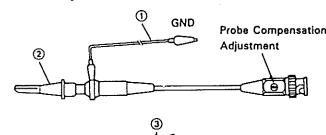
ITEM	DESCRIPTION	PARTS NO.
①	Ground Wire Assembly	E30-1883-08
②	Retractable Hook Tip	E29-0540-08
③	Marker (Orange)	B42-1950-08

CS-5265

Y70-1970-02

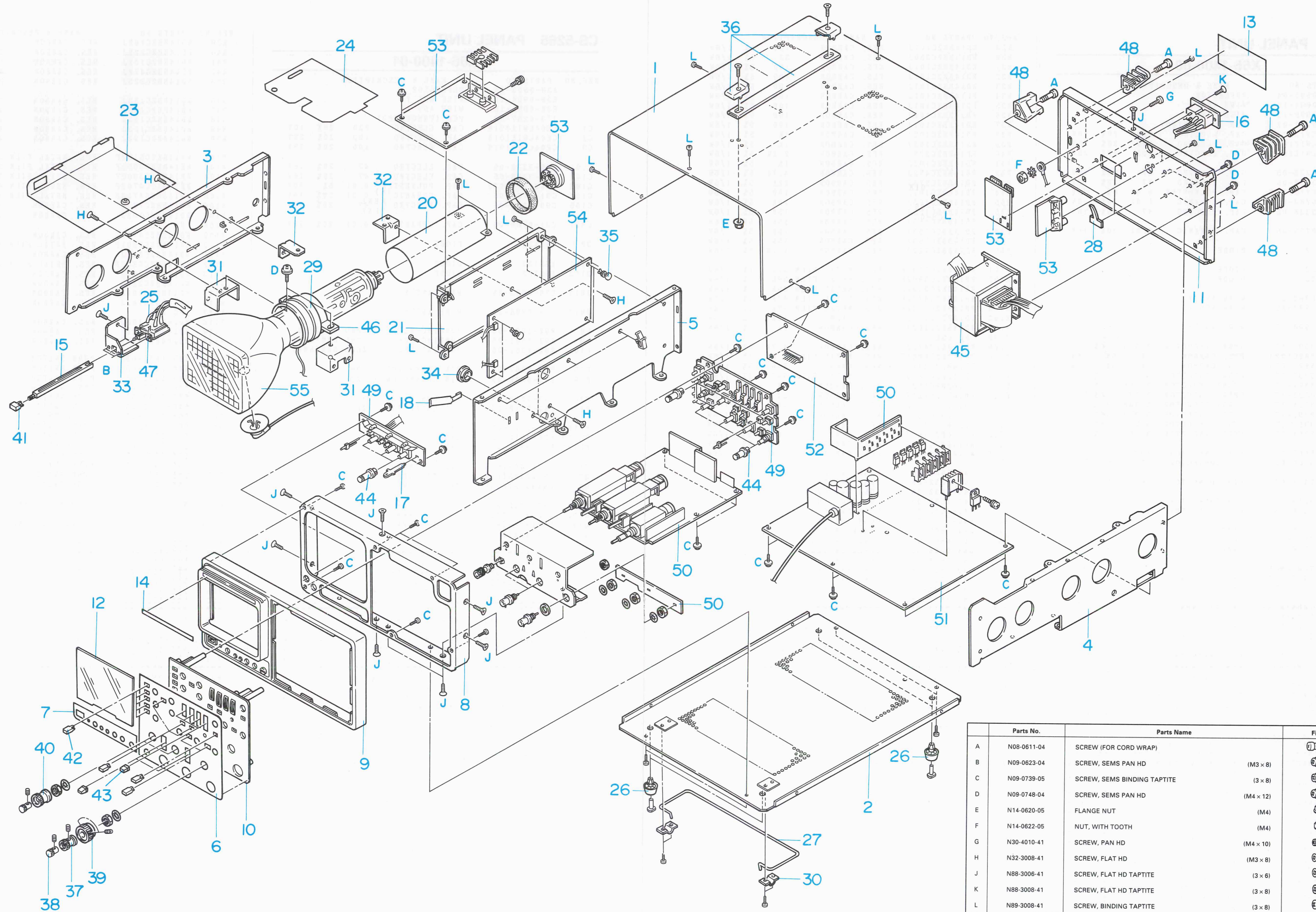
REF. NO	PARTS NO	NAME & DESCRIPTION
	A63-0168-03	PANEL ASS'Y
	B41-0710-14	CAUTION LABEL, HIGH VOLTAGE
	B42-3820-05	LABEL; CARTON BOX
	B63-0218-20	INSTRUCTION MANUAL; JAPANESE
	B63-0219-30	INSTRUCTION MANUAL; ENGLISH
	E30-1929-05	BS POWER CORD
	E30-1950-05	JIS POWER CORD
	E30-1951-05	UL/CSA POWER CORD
	E30-1952-05	CEE POWER CORD
	F51-0031-05	FUSE(6X30MM) 630MA/250V
	F51-0033-05	FUSE(6X30MM) 1A/250V
	H10-2883-02	FORMED STYRENE PAD, FRONT
	H10-2884-02	FORMED STYRENE PAD, REAR
	H20-1727-04	VINYL COVER
	H53-0155-04	CARTON BOX
	W01-0406-14	ADJUSTMENT ROD
D1	LN322GP	LED; GREEN
D103	LN322GP	LED; GREEN
1	A01-4017-02	CASE, TOP
2	A01-4018-02	CASE, BOTTOM
3	A13-2205-02	FRAME, LEFT
4	A13-2206-02	FRAME, RIGHT
5	A13-2207-12	FRAME, CENTER
6	A21-2424-03	DECORATIVE PANEL, LARGE
7	A21-2426-04	DECORATIVE PANEL, SMALL
8	A22-1307-02	SUB PANEL
9	A63-0110-01	MOLD PANEL, LARGE
10	A63-0111-02	MOLD PANEL, SMALL
11	A83-0067-02	REAR PANEL
12	B11-0518-04	FILTER
13	B41-2069-04	CAUTION LABEL
14	B73-0089-04	NAME PLATE; MODEL NO.
15	D21-0935-04	EXTENSION SHAFT
16	E18-0365-15	AC SELECTOR
16A	E18-0366-15	AC SELECTOR WITH 5X20MM FUSE
17	E21-0686-04	TERMINAL, CAL
18	E23-0552-04	EARTH TERMINAL
20	F11-1206-13	SHIELD CASE, CRT
21	F11-1269-03	SHIELD CASE
22	F15-0733-04	FELT (CRT SHIELD)
23	F20-3013-03	INSULATOR, LARGE
24	F20-3014-04	INSULATOR, SMALL
25	F29-0528-05	INSULATOR TUBE
26	J02-0089-05	RUBBER FOOT
27	J02-0509-04	TILT STAND
28	J19-1622-05	CORD CLAMP
29	J19-1653-23	HOLDER FOR CRT
30	J21-2573-04	HOLDER FOR LEG
31	J21-4853-04	BRACKET, FRONT
32	J21-4854-04	BRACKET, REAR
33	J21-4855-04	BRACKET
34	J42-0558-05	BUSHING
35	J59-0403-05	NYLON RIVET (ILLUMI)
36	K01-0541-05	HANDLE
37	K21-0919-14	KNOB; B SWP
38	K21-0920-04	KNOB; VARI
39	K21-0940-04	KNOB; A SWP
40	K23-0818-04	KNOB; V/DIV
41	K24-3005-04	PUSH SW; POWER
42	K27-0590-04	PUSH BUTTON; GRAYWHITE
43	K27-3618-14	LEVER
44	K29-0877-04	KNOB; VR
45	L07-1509-05	POWER TRANSFORMER
46	L39-0531-05	ROTATION COIL
47	S40-2532-05	POWER SW
48	W01-0503-04	REAR RUBBER FOOT/CORD WRAP
49	X66-1400-01	PANEL UNIT
50	X73-2070-03	VERTICAL UNIT
51	X74-1580-03	HORIZONTAL UNIT
53	X80-1370-03	FINAL AMP UNIT
54	X81-3270-00	DELAY LINE UNIT
55	150JKN31	CRT

MODEL PC-39 (LOW CAPACITY PROBE)



ITEM	DESCRIPTION	PARTS NO.
①	Ground Wire Assembly	E30-1883-08
②	Retractable Hook Tip	E29-0540-08
③	Marker (Orange)	B42-1950-08

DISASSEMBLY



	Parts No.	Parts Name	Figure
A	N08-0611-04	SCREW (FOR CORD WRAP)	
B	N09-0623-04	SCREW, SEMS PAN HD (M3 × 8)	
C	N09-0739-05	SCREW, SEMS BINDING TAPTITE (3 × 8)	
D	N09-0748-04	SCREW, SEMS PAN HD (M4 × 12)	
E	N14-0620-05	FLANGE NUT (M4)	
F	N14-0622-05	NUT, WITH TOOTH (M4)	
G	N30-4010-41	SCREW, PAN HD (M4 × 10)	
H	N32-3008-41	SCREW, FLAT HD (M3 × 8)	
J	N88-3006-41	SCREW, FLAT HD TAPTITE (3 × 6)	
K	N88-3008-41	SCREW, FLAT HD TAPTITE (3 × 8)	
L	N89-3008-41	SCREW, BINDING TAPTITE (3 × 8)	

PARTS LIST

CS-5260 PANEL UNIT

X66-1400-00

REF. NO	PARTS NO	NAME & DESCRIPTION				
	A33-0505-04	REFLECTOR				
	E38-0994-15	WIRE ASS'Y				
	E38-0995-15	WIRE ASS'Y				
	J73-0287-02	PCB (UNMOUNTED)				
C1	CE04LW1A221M	CAP. ELECTRO	220	20%	10V	
C2	CE04LW1E101M	CAP. ELECTRO	100	20%	25V	
C3	CE04LW1E101M	CAP. ELECTRO	100	20%	25V	
C101	C90-3228-05	CAP. ELECTRO	47	20%	16V	
C102	C90-3228-05	CAP. ELECTRO	47	20%	16V	
C103	CF92FY1H103J	CAP. POLYESTER	0.01	5%	50V	
C104	C91-0769-05	CAP. CERAMIC	0.01	20%	16V	
C105	C90-3228-05	CAP. ELECTRO	47	20%	16V	
C801	C91-0769-05	CAP. CERAMIC	0.01	20%	16V	
D2	1SS132	DIODE				
D101	1SS132	DIODE				
D102	1SS132	DIODE				
JW11	E38-0992-25	WIRE ASS'Y				
JW12	E38-0993-25	WIRE ASS'Y				
JW17	E38-0996-15	WIRE ASS'Y				
L1	L40-3391-17	FERRI INDUCTOR	3.3UH	10%		
L2	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
L3	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
L4	L40-3391-17	FERRI INDUCTOR	3.3UH	10%		
L5	L40-3391-17	FERRI INDUCTOR	3.3UH	10%		
L6	L40-3391-17	FERRI INDUCTOR	3.3UH	10%		
L7	L40-3391-17	FERRI INDUCTOR	3.3UH	10%		
L8	L40-3391-17	FERRI INDUCTOR	3.3UH	10%		
L9	L40-3391-17	FERRI INDUCTOR	3.3UH	10%		
L10	L40-3391-17	FERRI INDUCTOR	3.3UH	10%		
P15	E40-5067-05	PIN CONNECTOR	10P			
P16	E40-5069-05	PIN CONNECTOR	12P			
P23	E40-7411-05	PIN CONNECTOR	26P			
P26	E40-0218-05	PIN CONNECTOR	2P			
P27	E40-0218-05	PIN CONNECTOR	2P			
PL101	B30-3016-05	LAMP				
PL102	B30-3016-05	LAMP				
PL103	B30-3016-05	LAMP				
Q1	2SC1740S(R,S)	TR. SI, NPN				
Q2	2SC1740S(R,S)	TR. SI, NPN				
Q3	2SA933S(R,S)	TR. SI, PNP				
Q101	2SC1740S(R,S)	TR. SI, NPN				
Q102	2SC1740S(R,S)	TR. SI, NPN				
Q103	2SC1318A(R)	TR. SI, NPN				
Q104	2SA720A(R)	TR. SI, PNP				
R1	R90-1182-05	RES. NETWORK				
R2	R90-1182-05	RES. NETWORK				
R3	R90-1182-05	RES. NETWORK				
R4	R90-1182-05	RES. NETWORK				
R5	RN14BK2C1002D	RES. METAL FILM	10K	0.5%	1/6W	
R6	RN14BK2C2002D	RES. METAL FILM	20K	0.5%	1/6W	
R7	R92-1061-05	JUMPING RES.	ZERO	0HM(5MM)		
R8	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R9	RN14BK2C2203F	RES. METAL FILM	220K	1%	1/6W	
R10	RN14BK2C2202F	RES. METAL FILM	22K	1%	1/6W	
R11	RN14BK2C2002D	RES. METAL FILM	20K	0.5%	1/6W	
R12	RN14BK2C2002D	RES. METAL FILM	20K	0.5%	1/6W	
R13	RD14BB2C361J	RES. CARBON	360	5%	1/6W	
R14	RN14BK2C1962D	RES. METAL FILM	19.6K	0.5%	1/6W	
R15	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R16	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R17	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R18	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R19	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R20	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R21	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R22	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R23	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R24	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R25	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R26	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R27	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R28	RD14BB2C101J	RES. CARBON	100	5%	1/6W	

REF. NO	PARTS NO	NAME & DESCRIPTION				
R29	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R30	RD14BB2C330J	RES. CARBON	33	5%	1/6W	
R31	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R32	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R33	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R34	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R35	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R36	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R37	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R38	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R39	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R40	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W	
R41	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R42	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R43	RD14BB2C223J	RES. CARBON	22K	5%	1/6W	
R44	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R45	RD14BB2C103J	RES. CARBON	10K	5%	1/6W	
R46	RD14BB2C153J	RES. CARBON	15K	5%	1/6W	
R47	RD14BB2C153J	RES. CARBON	15K	5%	1/6W	
R48	RD14BB2C153J	RES. CARBON	15K	5%	1/6W	
R49	RD14BB2C153J	RES. CARBON	15K	5%	1/6W	
R50	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W	
R101	RN14BK2C5102F	RES. METAL FILM	51K	1%	1/6W	
R102	RN14BK2C3902F	RES. METAL FILM	39K	1%	1/6W	
R103	RN14BK2C3902F	RES. METAL FILM	39K	1%	1/6W	
R104	RN14BK2C4702F	RES. METAL FILM	47K	1%	1/6W	
R105	RN14BK2C4702F	RES. METAL FILM	47K	1%	1/6W	
R106	RD14BB2C183J	RES. CARBON	18K	5%	1/6W	
R107	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R108	NO USE					
R109	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W	
R110	RN14BK2C6801F	RES. METAL FILM	6.8K	1%	1/6W	
R111	RD14BB2C241J	RES. CARBON	240	5%	1/6W	
R112	RN14BK2C6800F	RES. METAL FILM	680	1%	1/6W	
R113	RD14BB2C102J	RES. CARBON	1K	5%	1/6W	
R114	RD14BB2C220J	RES. CARBON	22	5%	1/6W	
R115	RD14BB2C101J	RES. CARBON	100	5%	1/6W	
R116	RD14BB2C182J	RES. CARBON	1.8K	5%	1/6W	
R117	RD14BB2C123J	RES. CARBON	12K	5%	1/6W	
R118	RD14BB2C163J	RES. CARBON	16K	5%	1/6W	
R119	RD14BB2C123J	RES. CARBON	12K	5%	1/6W	
R120	RD14BB2C473J	RES. CARBON	47K	5%	1/6W	
S1	S40-1532-05	PUSH SWITCH				
S2	S40-1532-05	PUSH SWITCH				
S3	S40-1532-05	PUSH SWITCH				
S4	S40-1532-05	PUSH SWITCH				
S5	S40-1532-05	PUSH SWITCH				
S6	S40-1532-05	PUSH SWITCH				
S7	S64-0605-05	LEVER SWITCH				
S8	S64-0605-05	LEVER SWITCH				
S9	S64-0606-05	LEVER SWITCH				
S10	S64-0604-05	LEVER SWITCH				
S11	S40-1532-05	PUSH SWITCH				
S12	S40-1532-05	PUSH SWITCH				
S13	S40-1532-05	PUSH SWITCH				
S14	S40-1532-05	PUSH SWITCH				
S15	S40-7411-05	PUSH SWITCH				
U1	NJM4558L	IC,DUAL OP AMP				
U101	NJM4558L	IC,DUAL OP AMP				
VR1	R05-3521-05	V. R.				20KB
VR2	R05-3521-05	V. R.				20KB
VR3	R05-3521-05	V. R.				20KB
VR4	R05-3521-05	V. R.				20KB
VR5	R05-3521-05	V. R.				20KB
VR6	R05-3527-05	V. R.				20KB
VR7	R05-3521-05	V. R.				20KB
VR8	R05-3527-05	V. R.				20KB
VR9	R05-3527-05	V. R.				20KB
VR101	R05-3521-05	V. R.				20KB
VR102	R05-3521-05	V. R.				20KB
VR103	R12-5540-05	RES. SEMI FIXED				100KB
VR104	R12-5540-05	RES. SEMI FIXED				100KB
VR105	R05-3521-05	V. R.				20KB

PARTS LIST

CS-5265 PANEL UNIT

X66-1400-01

REF. NO	PARTS NO	NAME & DESCRIPTION				
	A33-0505-04	REFLECTOR				
	E38-0994-15	WIRE ASS'Y				
	E38-0995-15	WIRE ASS'Y				
	J73-0287-02	PCB (UNMOUNTED)				
C1	CE04LW1A221M	CAP. ELECTRO	220	20%	10V	
C2	CE04LW1E101M	CAP. ELECTRO	100	20%	25V	
C3	CE04LW1E101M	CAP. ELECTRO	100	20%	25V	
C101	C90-3228-05	CAP. ELECTRO	47	20%	16V	
C102	C90-3228-05	CAP. ELECTRO	47	20%	16V	
C103	CF92FY1H103J	CAP. POLYESTER	0.01	5%	50V	
C104	C91-0769-05	CAP. CERAMIC	0.01	20%	16V	
C105	C90-3228-05	CAP. ELECTRO	47	20%	16V	
C801	C91-0769-05	CAP. CERAMIC	0.01	20%	16V	
D2	1SS132	DIODE				
D101	1SS132	DIODE				
D102	1SS132	DIODE				
JW12	E38-0993-25	WIRE ASS'Y				
JW17	E38-0996-15	WIRE ASS'Y				
L8	R92-1061-05	JUMPING RES.	ZERO	0HM(5MM)		
L9	R92-1061-05	JUMPING RES.	ZERO	0HM(5MM)		
L10	R92-1061-05	JUMPING RES.	ZERO	0HM(5MM)		
P15	E40-5067-05	PIN CONNECTOR	10P			
P16	E40-5069-05	PIN CONNECTOR	12P			
P26	E40-0218-05	PIN CONNECTOR	2P			
P27	E40-0218-05	PIN CONNECTOR	2P			
PL101	B30-3016-05	LAMP				
PL102	B30-3016-05	LAMP				
PL103	B30-3016-05	LAMP				
Q1	2SC1740S(R,S)	TR. SI, NPN				
Q2	2SC1740S(R,S)	TR. SI, NPN		</		

PARTS LIST

CS-5260 VERTICAL UNIT

X73-2070-02

REF. NO	PARTS NO	NAME & DESCRIPTION			
	A22-1308-03	SUB PANEL			
	E21-0667-05	METAL TERMINAL			
	E23-0149-05	GND TERMINAL			
	F01-2318-04	HEAT SINK			
	F10-1590-14	SHIELD PLATE, ATT			
	F10-1668-04	SHIELD PLATE			
	J30-0623-04	SPACER			
	J73-0283-22	PCB (UNMOUNTED)			
C2	CC45FCH1H101J	CAP. CERAMIC	100P	5%	50V
C7	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C30	C91-0747-05	CAP. CERAMIC	150P	10%	50V
C31	C91-0747-05	CAP. CERAMIC	150P	10%	50V
C32	C91-0748-05	CAP. CERAMIC	180P	10%	50V
C33	C91-2595-05	CAP. CERAMIC	68P	5%	50V
C34	CE04LW0J331M	CAP. ELECTRO	330	20%	6.3V
C35	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C36	C91-0745-05	CAP. CERAMIC	100P	10%	50V
C37	C91-0745-05	CAP. CERAMIC	100P	10%	50V
C38	C91-0745-05	CAP. CERAMIC	100P	10%	50V
C39	CE04CW1C470M	CAP. ELECTRO	47	20%	16V
C40	CE04LW1A470M	CAP. ELECTRO	47	20%	10V
C51	CE04LW1C101M	CAP. ELECTRO	100	20%	16V
C52	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C53	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C54	CE04LW1C330M	CAP. ELECTRO	33	20%	16V
C57	CE04HW1C220M	CAP. ELECTRO	22	20%	16V
C58	CC45FCH1H680J	CAP. CERAMIC	68P	5%	50V
C59	CE04LW1E470M	CAP. ELECTRO	47	20%	25V
C102	C91-2580-05	CAP. POLYESTER	0.047	10%	400V
C103	C91-2579-05	CAP. POLYESTER	0.01	10%	400V
C104	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C105	CE04LW1A101M	CAP. ELECTRO	100	20%	10V
C106	NO USE				
C107	CC45FCH1H070D	CAP. CERAMIC	7P	0.5P	50V
C110	CC45FCH1H680J	CAP. CERAMIC	68P	5%	50V
C111	NO USE				
C112	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P	50V
C113	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C114	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C117	CE04CW1C470M	CAP. ELECTRO	47	20%	16V
C118	CE04LW1C101M	CAP. ELECTRO	100	20%	16V
C122	CC45FCH1H560J	CAP. CERAMIC	56P	5%	50V
C125	CF92FY1H332J	CAP. POLYESTER	3300P	5%	50V
C202	C91-2580-05	CAP. POLYESTER	0.047	10%	400V
C203	C91-2579-05	CAP. POLYESTER	0.01	10%	400V
C204	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C205	CE04LW1A101M	CAP. ELECTRO	100	20%	10V
C206	NO USE				
C207	CC45FCH1H070D	CAP. CERAMIC	7P	0.5P	50V
C210	CC45FCH1H680J	CAP. CERAMIC	68P	5%	50V
C211	NO USE				
C212	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P	50V
C213	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C214	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C217	CE04CW1C470M	CAP. ELECTRO	47	20%	16V
C218	CE04LW1C101M	CAP. ELECTRO	100	20%	16V
C221	CE04LW1E470M	CAP. ELECTRO	47	20%	25V
C222	CC45FCH1H560J	CAP. CERAMIC	56P	5%	50V
C225	CF92FY1H332J	CAP. POLYESTER	3300P	5%	50V
C301	CC45FCH1H070D	CAP. CERAMIC	7P	0.5P	50V
C302	CC45FCH1H150J	CAP. CERAMIC	15P	5%	50V
C303	CC45FCH1H150J	CAP. CERAMIC	15P	5%	50V
C304	NO USE				
C305	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C306	CC45FCH1H220J	CAP. CERAMIC	22P	5%	50V
C307	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C313	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C314	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C315	NO USE				
C316	CE04EW1E470M	CAP. ELECTRO	47	20%	25V

REF. NO	PARTS NO	NAME & DESCRIPTION			
C319	CE04LW1C470M	CAP. ELECTRO	47	20%	16V
C401	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C402	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C403	CE04LW1C470M	CAP. ELECTRO	47	20%	16V
C404	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C405	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C406	NO USE				
C407	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C410	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C411	NO USE				
C412	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C418	CE04EW1A101M	CAP. ELECTRO	100	20%	10V
C451	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C452	C91-0769-05	CAP. CERAMIC	0.01	20%	16V
C901	CK45B1H102K	CAP. CERAMIC	1000P	10%	50V
D2	1SS132	DIODE			
D31	1SS132	DIODE			
D32	1SS132	DIODE			
D35	1SS132	DIODE			
D36	1SS132	DIODE			
D37	1SS132	DIODE			
D101	1SS132	DIODE			
D102	1SS132	DIODE			
D103	1SS132	DIODE			
D104	1SS132	DIODE			
D105	1SS132	DIODE			
D106	1SS132	DIODE			
D107	1SS132	DIODE			
D108	1SS132	DIODE			
D201	1SS132	DIODE			
D202	1SS132	DIODE			
D203	1SS132	DIODE			
D204	1SS132	DIODE			
D205	1SS132	DIODE			
D206	1SS132	DIODE			
D207	1SS132	DIODE			
D208	1SS132	DIODE			
D301	1SS132	DIODE			
D302	1SS132	DIODE			
D303	1SS132	DIODE			
D304	1SS132	DIODE			
D305	1SS132	DIODE			
D306	1SS132	DIODE			
D307	1SS132	DIODE			
D308	1SS132	DIODE			
D309	1SS132	DIODE			
JW6	E38-0985-05	WIRE ASS'Y:V TO H TRG			
JW10	E38-0986-05	WIRE ASS'Y:V TO H SWP			
JW301	E38-0987-15	WIRE ASS'Y:CH3 INPUT			
JW401	E38-0984-15	WIRE ASS'Y:PROBE DETECTION			
JW501	E38-0983-25	WIRE ASS'Y:SUB PANEL TO GND			
L1	L79-0553-05	NOISE FILTER			
L40	L40-2201-17	FERRI INDUCTOR	22UH	10%	
L51	L40-4791-17	FERRI INDUCTOR	4.7UH	10%	
L52	L40-4791-17	FERRI INDUCTOR	4.7UH	10%	
L301	L40-4781-17	FERRI INDUCTOR	0.47UH	10%	
P1	E04-0260-05	BNC RECEPTACLE (READOUT)			
P2	E04-0260-05	BNC RECEPTACLE (READOUT)			
P3	E04-0259-05	BNC RECEPTACLE			
P4	E40-7515-05	PIN CONNECTOR	3P		
P9	E40-7518-05	PIN CONNECTOR	6P		
P10	NO USE				
P11	E40-3242-05	PIN CONNECTOR	7P		
P12	E40-5066-05	PIN CONNECTOR	9P		
P13	E40-7515-05	PIN CONNECTOR	3P		
P201	E40-7432-05	PIN CONNECTOR	13P		
P202	E40-7423-05	PIN CONNECTOR	4P		

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION			
P203	E40-7430-05	PIN CONNECTOR	11P		
P204	E40-7426-05	PIN CONNECTOR	7P		
P205	E40-7422-05	PIN CONNECTOR	3P		
P206	E40-7426-05	PIN CONNECTOR	7P		
P207	E40-7432-05	PIN CONNECTOR	13P		
P208	E40-7432-05	PIN CONNECTOR	13P		
Q1	2SC1740S(R,S)	TR. SI, NPN			
Q2	2SC3779(D)	TR. SI, NPN			
Q3	2SC3779(D)	TR. SI, NPN			
Q32	2SC3066(G)	TR. SI, NPN			
Q33	2SC1740S(R,S)	TR. SI, NPN			
Q34	2SA933S(R,S)	TR. SI, PNP			
Q51	2SC1923(O)	TR. SI, NPN			
Q101	2SC1923(O)	TR. SI, NPN			
Q102	2SK404(E)	FET, N-CHANNEL			
Q103	2SC1907	TR. SI, NPN			
Q106	2SC3779(D)	TR. SI, NPN			
Q107	2SC3779(D)	TR. SI, NPN			
Q108	2SA1459(K)	TR. SI, PNP			
Q109	2SA1459(K)	TR. SI, PNP			
Q110	2SA1459(K)	TR. SI, PNP			
Q111	2SA1459(K)	TR. SI, PNP			
Q112	2SA1161	TR. SI, PNP			
Q113	2SA1161	TR. SI, PNP			
Q114	2SA1459(K)	TR. SI, PNP			
Q201	2SC1923(O)	TR. SI, NPN			
Q202	2SK404(E)	FET, N-CHANNEL			
Q203	2SC1907	TR. SI, NPN			
Q206	2SC3779(D)	TR. SI, NPN			
Q207	2SC3779(D)	TR. SI, NPN			
Q208	2SA1459(K)	TR. SI, PNP			
Q209	2SA1459(K)	TR. SI, PNP			
Q210	2SA1459(K)	TR. SI, PNP			
Q211	2SA1459(K)	TR. SI, PNP			
Q212	2SA1161	TR. SI, PNP			
Q213	2SA1161	TR. SI, PNP			
Q214	2SA1459(K)	TR. SI, PNP			
Q215	2SC1740S(R,S)	TR. SI, NPN			
Q302	2SC1923(O)	TR. SI, NPN			
Q303	2SK404(E)	FET, N-CHANNEL			
Q304	2SC1907	TR. SI, NPN			
Q305	2SA1459(K)	TR. SI, PNP			
Q306	2SA1459(K)	TR. SI, PNP			
Q307	2SC1907	TR. SI, NPN			
Q308	2SC1907	TR. SI, NPN			
Q309	2SC1907	TR. SI, NPN			
Q310	2SA1459(K)	TR. SI, PNP			
Q311	2SA1459(K)	TR. SI, PNP			
Q312	2SC1907	TR. SI, NPN			
Q313	2SA1459(K)	TR. SI, PNP			
Q314	2SA1459(K)	TR. SI, PNP			
R1	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W
R2	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W
R3	RN14BK2C2001F	RES. METAL FILM	2K	1%	1/6W
R6	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R7	RD14BB2C473J	RES. CARBON	47K	5%	1/6W
R8	RN14BK2C3900F	RES. METAL FILM	390	1%	1/6W
R9	RN14BK2C3900F	RES. METAL FILM	390	1%	1/6W
R10	RN14BK2C7500F	RES. METAL FILM	750	1%	1/6W
R11	RN14BK2C7500F	RES. METAL FILM	750	1%	1/6W
R12					

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
R201	RD14BB2E220J	RES. CARBON 22 5% 1/4W
R202	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R203	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R204	RD14BB2C105J	RES. CARBON 1M 5% 1/6W
R207	RD14BB2C684J	RES. CARBON 680K 5% 1/6W
R208	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R209	RD14BB2C132J	RES. CARBON 1.3K 5% 1/6W
R210	NO USE	
R211	RD14BB2C160J	RES. CARBON 16 5% 1/6W
R212	RD14BB2C2200F	RES. METAL FILM 220 1% 1/6W
R213	NO USE	
R214	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R215	RD14BK2C1301F	RES. METAL FILM 1.3K 1% 1/6W
R216	RD14BK2C1301F	RES. METAL FILM 1.3K 1% 1/6W
R217	RD14BK2C3301F	RES. METAL FILM 3.3K 1% 1/6W
R218	RD14BK2C2401F	RES. METAL FILM 2.4K 1% 1/6W
R219	RD14BK2C5100F	RES. METAL FILM 510 1% 1/6W
R220	RD14BB2C301J	RES. CARBON 300 5% 1/6W
R221	RD14BK2C1004F	RES. METAL FILM 1M 1% 1/6W
R222	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R223	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R224	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R225	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R226	RD14BB2C273J	RES. CARBON 27K 5% 1/6W
R227	RD14BB2C163J	RES. CARBON 16K 5% 1/6W
R228	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R229	NO USE	
R230	RD14BB2C823J	RES. CARBON 82K 5% 1/6W
R231	NO USE	
R232	RD14BK2C4701F	RES. METAL FILM 4.7K 1% 1/6W
R233	RD14BK2C4701F	RES. METAL FILM 4.7K 1% 1/6W
R234	RD14BK2C1002F	RES. METAL FILM 10K 1% 1/6W
R235	RD14BK2C1002F	RES. METAL FILM 10K 1% 1/6W
R236	RD14BK2C1301F	RES. METAL FILM 1.3K 1% 1/6W
R237	RD14BK2C1301F	RES. METAL FILM 1.3K 1% 1/6W
R238	RD14BK2C1801F	RES. METAL FILM 1.8K 1% 1/6W
R239	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R240	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R241	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
R242	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
R243	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R244	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R245	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R246	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R247	RD14BK2C1001F	RES. METAL FILM 1K 1% 1/6W
R248	RD14BB2C273J	RES. CARBON 27K 5% 1/6W
R249	RD14BB2C181J	RES. CARBON 180 5% 1/6W
R250	RD14BB2C333J	RES. CARBON 33K 5% 1/6W
R251	RD14BB2C513J	RES. CARBON 51K 5% 1/6W
R252	RD14BB2C333J	RES. CARBON 33K 5% 1/6W
R253	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R254	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R255	RD14BB2C752J	RES. CARBON 7.5K 5% 1/6W
R256	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R257	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R258	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R259	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R260	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R261	RD14BB2C431J	RES. CARBON 430 5% 1/6W
R262	RD14BB2C820J	RES. CARBON 82 5% 1/6W
R263	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
R264	RD14BB2C622J	RES. CARBON 6.2K 5% 1/6W
R265	RD14BB2C362J	RES. CARBON 3.6K 5% 1/6W
R266	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R267	RD14BB2C473J	RES. CARBON 47K 5% 1/6W
R268	RD14BB2C361J	RES. CARBON 360 5% 1/6W
R269	RD14BB2C271J	RES. CARBON 270 5% 1/6W
R270	R92-1578-05	RES. LINEAR PCT 3.9K 5% 1/6W
R271	RD14BB2C121J	RES. CARBON 120 5% 1/6W
R272	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R273	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R274	RD14BB2C201J	RES. CARBON 200 5% 1/6W
R275	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R276	NO USE	
R277	RD14BB2C473J	RES. CARBON 47K 5% 1/6W
R300	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R301	RD14BK2C8003F	RES. METAL FILM 800K 1% 1/6W
R302	RD14BK2C2003F	RES. METAL FILM 200K 1% 1/6W
R303	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R304	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R305	RD14BB2C331J	RES. CARBON 330 5% 1/6W
R306	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R307	RD14BB2C822J	RES. CARBON 8.2K 5% 1/6W
R308	RD14BB2C302J	RES. CARBON 3K 5% 1/6W
R309	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R310	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R311	RD14BB2C362J	RES. CARBON 3.6K 5% 1/6W
R312	RD14BB2C362J	RES. CARBON 3.6K 5% 1/6W

REF. NO	PARTS NO	NAME & DESCRIPTION
R313	RD14BB2C621J	RES. CARBON 620 5% 1/6W
R314	RD14BB2C131J	RES. CARBON 130 5% 1/6W
R315	NO USE	
R316	RD14BK2C7500F	RES. METAL FILM 750 1% 1/6W
R317	RD14BB2C112J	RES. CARBON 1.1K 5% 1/6W
R318	RD14BB2C112J	RES. CARBON 1.1K 5% 1/6W
R319	RD14BK2C4300F	RES. METAL FILM 430 1% 1/6W
R320	RD14BK2C3301F	RES. METAL FILM 3.3K 1% 1/6W
R321	RD14BK2C6801F	RES. METAL FILM 6.8K 1% 1/6W
R322	RD14BK2C8200F	RES. METAL FILM 820 1% 1/6W
R323	RD14BK2C8200F	RES. METAL FILM 820 1% 1/6W
R324	RD14BB2C203J	RES. CARBON 20K 5% 1/6W
R325	RD14BB2C333J	RES. CARBON 33K 5% 1/6W
R326	RD14BB2C473J	RES. CARBON 47K 5% 1/6W
R327	RD14BB2C362J	RES. CARBON 3.6K 5% 1/6W
R328	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W
R329	RD14BB2C362J	RES. CARBON 3.6K 5% 1/6W
R330	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W
R331	NO USE	
R332	RD14BB2C113J	RES. CARBON 11K 5% 1/6W
R333	RD14BB2C302J	RES. CARBON 3K 5% 1/6W
R334	RD14BB2C122J	RES. CARBON 1.2K 5% 1/6W
R335	RD14BB2C821J	RES. CARBON 820 5% 1/6W
R336	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R337	RD14BB2C132J	RES. CARBON 1.3K 5% 1/6W
R338	R92-1577-05	RES. LINEAR PCT 1K 5% 1/6W
R339	NO USE	
R340	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R341	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R342	NO USE	
R343	RD14BB2C121J	RES. CARBON 120 5% 1/6W
R344	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R345	R92-1579-05	RES. LINEAR PCT 220
R346	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R347	RD14BB2C362J	RES. CARBON 3.6K 5% 1/6W
R348	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R401	RD14BK2C2201F	RES. METAL FILM 2.2K 1% 1/6W
R407	RD14BK2C2201F	RES. METAL FILM 2.2K 1% 1/6W
R413	RD14BK2C1801D	RES. METAL FILM 1.8K 0.5% 1/6W
R414	RD14BK2C1002D	RES. METAL FILM 10K 0.5% 1/6W
R415	RD14BK2C2002D	RES. METAL FILM 20K 0.5% 1/6W
R416	RD14BK2C4022D	RES. METAL FILM 40.2K 0.5% 1/6W
R417	RD14BK2C8062D	RES. METAL FILM 80.6K 0.5% 1/6W
R418	RD14BK2C1603D	RES. METAL FILM 160K 0.5% 1/6W
R419	RD14BK2C2153D	RES. METAL FILM 215K 0.5% 1/6W
R420	NO USE	
R421	RD14BK2C1801D	RES. METAL FILM 1.8K 0.5% 1/6W
R422	RD14BK2C1002D	RES. METAL FILM 10K 0.5% 1/6W
R423	RD14BK2C2002D	RES. METAL FILM 20K 0.5% 1/6W
R424	RD14BK2C4022D	RES. METAL FILM 40.2K 0.5% 1/6W
R425	RD14BK2C8062D	RES. METAL FILM 80.6K 0.5% 1/6W
R426	RD14BK2C1603D	RES. METAL FILM 160K 0.5% 1/6W
R427	RD14BK2C2153D	RES. METAL FILM 215K 0.5% 1/6W
R428	NO USE	
R429	RD14BK2C5101F	RES. METAL FILM 5.1K 1% 1/6W
R430	RD14BK2C1003D	RES. METAL FILM 100K 0.5% 1/6W
R431	RD14BK2C5002D	RES. METAL FILM 50K 0.5% 1/6W
R432	RD14BK2C3002D	RES. METAL FILM 30K 0.5% 1/6W
R433	RD14BK2C2002D	RES. METAL FILM 20K 0.5% 1/6W
R434	NO USE	
R435	RD14BK2C1502F	RES. METAL FILM 15K 1% 1/6W
R436	RD14BK2C1003D	RES. METAL FILM 100K 0.5% 1/6W
R437	RD14BK2C5002D	RES. METAL FILM 50K 0.5% 1/6W
R438	RD14BK2C3002D	RES. METAL FILM 30K 0.5% 1/6W
R439	RD14BK2C2002D	RES. METAL FILM 20K 0.5% 1/6W
R440	RD14BK2C2101F	RES. METAL FILM 2.1K 1% 1/6W
R441	RD14BB2C152J	RES. CARBON 1.5K 5% 1/6W
R442	RD14BK2C1002F	RES. METAL FILM 10K 1% 1/6W
R443	RD14BK2C2002F	RES. METAL FILM 20K 1% 1/6W
R444	RD14BK2C4022F	RES. METAL FILM 40.2K 1% 1/6W
R445	RD14BK2C8062F	RES. METAL FILM 80.6K 1% 1/6W
R446	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R447	RD14BB2C221J	RES. CARBON 220 5% 1/6W
S101	S64-0603-05	LEVER SWITCH
S102	S60-0611-05	ATTENUATOR
S201	S64-0603-05	LEVER SWITCH
S202	S60-0611-05	ATTENUATOR
S401	S60-0613-05	ROTARY SWITCH
TC105	C91-1239-05	CAP. CERAMIC 15P 5% 50V
TC106	C05-0469-05	CAP. TRIMMER 10P
TC205	C05-0470-05	CAP. TRIMMER 20P
TC206	C05-0469-05	CAP. TRIMMER 10P

REF. NO	PARTS NO	NAME & DESCRIPTION
TC301	C05-0469-05	CAP. TRIMMER 10P
TC302	C05-0469-05	CAP. TRIMMER 10P
TC303	C05-0469-05	CAP. TRIMMER 10P
TH101	112-102-2	THERMISTOR
TH102	112-201-2FM	THERMISTOR
TH201	112-102-2	THERMISTOR
TH202	112-201-2FM	THERMISTOR
TH301	112-201-2FM	THERMISTOR
U1	KMS01	IC, LINEAR
U2	SN74LS158N	IC, QUAD 2-1 DATA SELECTOR/MPX
U3	SN74LS112AN	IC, DUAL J-K F.F.
U4	SN74LS00N	IC, QUAD 2-INPUT NAND GATE
U101	KMC13	IC, LINEAR
U102	KMC12	IC, LINEAR
U201	KMC13	IC, LINEAR
U202	KMC12	IC, LINEAR
U401	NJM072L	IC, J-FET INPUT OP AMP
U402	NJM072D	IC, J-FET INPUT OP AMP
U403	NJM4558L	IC, DUAL OP AMP
U404	TC4053BP	IC, TRIPLE 2-CH MPX/DE-MPX
U405	TC4053BP	IC, TRIPLE 2-CH MPX/DE-MPX
VR1	R12-0679-05	RES. SEMI FIXED 22KB
VR31	R12-0880-05	RES. SEMI FIXED 220
VR102	R12-0885-05	RES. SEMI FIXED 100
VR103	R12-0680-05	RES. SEMI FIXED 47K
VR104	R12-0885-05	RES. SEMI FIXED 100
VR105	R12-0679-05	RES. SEMI FIXED 22KB
VR106	R12-0679-05	RES. SEMI FIXED 22KB
VR202	R12-0885-05	RES. SEMI FIXED 100
VR203	R12-0680-05	RES. SEMI FIXED 47K
VR204	R12-0885-05	RES. SEMI FIXED 100
VR205	R12-0679-05	RES. SEMI FIXED 22KB
VR206	R12-0679-05	RES. SEMI FIXED 22KB
VR207	R12-0885-05	RES. SEMI FIXED 100
VR208	R12-0885-05	RES. SEMI FIXED 100
VR301	R12-0887-05	RES. SEMI FIXED 470
VR302	R12-0680-05	RES. SEMI FIXED 47K
VR303	R12-0679-05	RES. SEMI FIXED 22KB
VR402	R12-3599-05	RES. SEMI FIXED 22K
VR403	R12-3599-05	RES. SEMI FIXED 22K

CS-5265 VERTICAL UNIT

X73-2070-03

REF. NO	PARTS NO	NAME & DESCRIPTION
A22	1308-03	SUB PANEL
E21	0667-05	METAL TERMINAL
E23	0149-05	GND TERMINAL
F01	2318-04	HEAT SINK
F10	1590-14	SHIELD PLATE, ATT
F10	1668-04	SHIELD PLATE
J30	0623-04	SPACER
J73	0283-22	PCB (UNMOUNTED)
C2	CC45FCH1H101J	CAP. CERAMIC 100P 5% 50V
C7	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C30	C91-0747-05	CAP. CERAMIC 150P 10% 50V
C31	C91-0747-05	CAP. CERAMIC 150P 10% 50V
C32	C91-0748-05	CAP. CERAMIC 180P 10% 50V
C33	C91-2595-05	CAP. CERAMIC 68P 5% 50V
C34	CE04LW0J331M	CAP. ELECTRO 330 20% 6.3V
C35	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C36	C91-0745-05	CAP. CERAMIC 100P 10% 50V
C37	C91-0745-05	CAP. CERAMIC 100P 10% 50V
C38	C91-0745-05	CAP. CERAMIC 100P 10% 50V
C39	CE04CW1C470M	CAP. ELECTRO 47 20% 16V
C40	CE04LW1A470M	CAP. ELECTRO 47 20% 10V
C51	CE04LW1C101M	CAP. ELECTRO 100 20% 16V
C52	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C53	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C54	CE04LW1C330M	CAP. ELECTRO 33 20% 16V

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
C57	CE04HW1C220M	CAP. ELECTRO 22 20% 16V
C58	CC45FCH1H680J	CAP. CERAMIC 68P 5% 50V
C59	CE04LW1E470K	CAP. ELECTRO 47 20% 25V
C102	C91-2580-05	CAP. POLYESTER 0.047 10% 400V
C103	C91-2579-05	CAP. POLYESTER 0.01 10% 400V
C104	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C105	CE04LW1A101M	CAP. ELECTRO 100 20% 10V
C106	NO USE	
C107	CC45FCH1H070D	CAP. CERAMIC 7P 0.5P 50V
C110	CC45FCH1H680J	CAP. CERAMIC 68P 5% 50V
C111	NO USE	
C112	CC45FCH1H100D	CAP. CERAMIC 10P 0.5P 50V
C113	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C114	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C117	CE04CW1C470M	CAP. ELECTRO 47 20% 16V
C118	CE04LW1C101M	CAP. ELECTRO 100 20% 16V
C122	CC45FCH1H560J	CAP. CERAMIC 56P 5% 50V
C125	CF92FV1H332J	CAP. POLYESTER 3300P 5% 50V
C202	C91-2580-05	CAP. POLYESTER 0.047 10% 400V
C203	C91-2579-05	CAP. POLYESTER 0.01 10% 400V
C204	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C205	CE04LW1A101M	CAP. ELECTRO 100 20% 10V
C206	NO USE	
C207	CC45FCH1H070D	CAP. CERAMIC 7P 0.5P

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION	REF. NO	PARTS NO	NAME & DESCRIPTION
D201	1SS132	DIODE	Q213	2SA1161	TR. SI, PNP
D202	1SS132	DIODE	Q214	2SA1459(K)	TR. SI, PNP
D203	1SS132	DIODE	Q215	2SC1740S(R,S)	TR. SI, NPN
D204	1SS132	DIODE	Q302	2SC1923(O)	TR. SI, NPN
D205	1SS132	DIODE	Q303	2SK404(E)	FET, N-CHANNEL
D206	1SS132	DIODE	Q304	2SC1907	TR. SI, NPN
D207	1SS132	DIODE	Q305	2SA1459(K)	TR. SI, PNP
D208	1SS132	DIODE	Q306	2SA1459(K)	TR. SI, PNP
D301	1SS132	DIODE	Q307	2SC1907	TR. SI, NPN
D302	1SS132	DIODE	Q308	2SC1907	TR. SI, NPN
D303	1SS132	DIODE	Q309	2SC1907	TR. SI, NPN
D304	1SS132	DIODE	Q310	2SA1459(K)	TR. SI, PNP
D305	1SS132	DIODE	Q311	2SA1459(K)	TR. SI, PNP
D306	1SS132	DIODE	Q312	2SC1907	TR. SI, NPN
D307	1SS132	DIODE	Q313	2SA1459(K)	TR. SI, PNP
D308	1SS132	DIODE	Q314	2SA1459(K)	TR. SI, PNP
D309	1SS132	DIODE	R1	RN14BK2C2002F	RES. METAL FILM 20K 1% 1/6W
JW6	E38-0985-05	WIRE ASS'Y;V TO H TRG	R2	RN14BK2C2001F	RES. METAL FILM 2K 1% 1/6W
JW10	E38-0986-05	WIRE ASS'Y;V TO H SWP	R3	RN14BK2C2001F	RES. METAL FILM 2K 1% 1/6W
JW301	E38-0987-15	WIRE ASS'Y;CH3 INPUT	R6	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
JW501	E38-0983-25	WIRE ASS'Y;SUB PANEL TO GND	R7	RD14BB2C473J	RES. CARBON 47K 5% 1/6W
L1	L79-0553-05	NOISE FILTER	R8	RN14BK2C3900F	RES. METAL FILM 390 1% 1/6W
L40	L40-2201-17	FERRI INDUCTOR 22UH 10%	R9	RN14BK2C3900F	RES. METAL FILM 390 1% 1/6W
L51	L40-4791-17	FERRI INDUCTOR 4.7UH 10%	R10	RN14BK2C7500F	RES. METAL FILM 750 1% 1/6W
L52	L40-4791-17	FERRI INDUCTOR 4.7UH 10%	R11	RN14BK2C7500F	RES. METAL FILM 750 1% 1/6W
L301	L40-4781-17	FERRI INDUCTOR 0.47UH 10%	R12	RQ2-1553-05	RES. SPECIAL POWER 620 5% 1W
P1	E04-0259-05	BNC RECEPTACLE	R17	RN14BK2C6200F	RES. METAL FILM 620 1% 1/6W
P2	E04-0259-05	BNC RECEPTACLE	R18	RN14BK2C6200F	RES. METAL FILM 620 1% 1/6W
P3	E04-0259-05	BNC RECEPTACLE	R19	RN14BK2C39ROF	RES. METAL FILM 39 1% 1/6W
P4	E40-7515-05	PIN CONNECTOR 3P	R20	RN14BK2C39ROF	RES. METAL FILM 39 1% 1/6W
P9	E40-7518-05	PIN CONNECTOR 6P	R21	NO USE	
P12	E40-5066-05	PIN CONNECTOR 9P	R22	RN14BK2C6802F	RES. METAL FILM 68K 1% 1/6W
P13	E40-7515-05	PIN CONNECTOR 3P	R31	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
P201	E40-7432-05	PIN CONNECTOR 13P	R32	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
P202	E40-7423-05	PIN CONNECTOR 4P	R33	RD14BB2C751J	RES. CARBON 750 5% 1/6W
P203	E40-7430-05	PIN CONNECTOR 11P	R34	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
P204	E40-7426-05	PIN CONNECTOR 7P	R35	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
P205	E40-7422-05	PIN CONNECTOR 3P	R36	R90-0645-05	RES. NETWORK 4X10K
P206	E40-7426-05	PIN CONNECTOR 7P	R37	RD14BB2C122J	RES. CARBON 1.2K 5% 1/6W
P207	E40-7432-05	PIN CONNECTOR 13P	R38	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
P208	E40-7432-05	PIN CONNECTOR 13P	R39	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
Q1	2SC1740S(R,S)	TR. SI, NPN	R40	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
Q2	2SC3779(D)	TR. SI, NPN	R41	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
Q3	2SC3779(D)	TR. SI, NPN	R42	RD14BB2C100J	RES. CARBON 10 5% 1/6W
Q32	2SC3066(G)	TR. SI, NPN	R43	RD14BB2C100J	RES. CARBON 10 5% 1/6W
Q33	2SC1740S(R,S)	TR. SI, NPN	R44	RD14BB2C223J	RES. CARBON 22K 5% 1/6W
Q34	2SA933S(R,S)	TR. SI, PNP	R45	RD14BB2C223J	RES. CARBON 22K 5% 1/6W
Q51	2SC1923(O)	TR. SI, NPN	R52	RD14BB2C391J	RES. CARBON 390 5% 1/6W
Q101	2SC1923(O)	TR. SI, NPN	R59	RD14BB2C432J	RES. CARBON 4.3K 5% 1/6W
Q102	2SK404(E)	FET, N-CHANNEL	R62	RD14BB2C101J	RES. CARBON 100 5% 1/6W
Q103	2SC1907	TR. SI, NPN	R63	RD14BB2C201J	RES. CARBON 200 5% 1/6W
Q106	2SC3779(D)	TR. SI, NPN	R64	RD14BB2C133J	RES. CARBON 13K 5% 1/6W
Q107	2SC3779(D)	TR. SI, NPN	R65	RD14BB2C910J	RES. CARBON 91 5% 1/6W
Q108	2SA1459(K)	TR. SI, PNP	R66	RD14BB2C910J	RES. CARBON 91 5% 1/6W
Q109	2SA1459(K)	TR. SI, PNP	R67	RD14BB2C470J	RES. CARBON 47 5% 1/6W
Q110	2SA1459(K)	TR. SI, PNP	R68	RD14BB2C470J	RES. CARBON 47 5% 1/6W
Q111	2SA1459(K)	TR. SI, PNP	R69	RD14BB2C470J	RES. CARBON 47 5% 1/6W
Q112	2SA1161	TR. SI, PNP	R70	RD14BB2C470J	RES. CARBON 47 5% 1/6W
Q113	2SA1161	TR. SI, PNP	R71	RD14BB2C470J	RES. CARBON 47 5% 1/6W
Q114	2SA1459(K)	TR. SI, PNP	R101	RD14BB2E220J	RES. CARBON 22 5% 1/4W
Q201	2SC1923(O)	TR. SI, NPN	R102	NO USE	
Q202	2SK404(E)	FET, N-CHANNEL	R103	RD14BB2C220J	RES. CARBON 22 5% 1/6W
Q203	2SC1907	TR. SI, NPN	R104	RD14BB2C105J	RES. CARBON 1M 5% 1/6W
Q206	2SC3779(D)	TR. SI, NPN	R107	RD14BB2C684J	RES. CARBON 680K 5% 1/6W
Q207	2SC3779(D)	TR. SI, NPN	R108	RD14BB2C220J	RES. CARBON 22 5% 1/6W
Q208	2SA1459(K)	TR. SI, PNP	R109	RD14BB2C132J	RES. CARBON 1.3K 5% 1/6W
Q209	2SA1459(K)	TR. SI, PNP	R110	NO USE	
Q210	2SA1459(K)	TR. SI, PNP	R111	RD14BB2C160J	RES. CARBON 16 5% 1/6W
Q211	2SA1459(K)	TR. SI, PNP	R112	RN14BK2C2700F	RES. METAL FILM 270 1% 1/6W
Q212	2SA1161	TR. SI, PNP	R113	NO USE	
			R114	RD14BB2C220J	RES. CARBON 22 5% 1/6W
			R115	RN14BK2C1301F	RES. METAL FILM 1.3K 1% 1/6W
			R116	RN14BK2C1301F	RES. METAL FILM 1.3K 1% 1/6W
			R117	RN14BK2C3301F	RES. METAL FILM 3.3K 1% 1/6W
			R118	RN14BK2C2401F	RES. METAL FILM 2.4K 1% 1/6W
			R119	RN14BK2C5100F	RES. METAL FILM 510 1% 1/6W
			R120	RD14BB2C301J	RES. CARBON 300 5% 1/6W
			R121	RN14BK2C1004F	RES. METAL FILM 1M 1% 1/6W
			R122	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
			R123	RD14BB2C331J	RES. CARBON 330 5% 1/6W
			R124	RD14BB2C103J	RES. CARBON 10K 5% 1/6W

PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION	REF. NO	PARTS NO	NAME & DESCRIPTION
C402	CE04W2E100M	CAP. ELECTRO 10 20% 250V	D303	MTZ3.0JA	DIODE,ZENER
C403	CE04LW1E220M	CAP. ELECTRO 22 20% 25V	D304	1SS132	DIODE
C404	CE04EW2A471M	CAP. ELECTRO 470 20% 100V	D305	1SS132	DIODE
C405	CE04LW2A220M	CAP. ELECTRO 22 20% 100V	D306	MA700	DIODE
C406	CE04EW1E472M	CAP. ELECTRO 4700 20% 25V	D307	MA700	DIODE
C407	CE04LW1C331M	CAP. ELECTRO 330 20% 16V	D308	TLR112	LED,RED
C408	CE04EW1E472M	CAP. ELECTRO 4700 20% 25V	D309	TLR112	LED,RED
C409	CE04EW1C332M	CAP. ELECTRO 3300 20% 16V	D312	MTZ5.1JB	DIODE,ZENER
C410	CE04LW0J471M	CAP. ELECTRO 470 20% 6.3V	D313	1SS132	DIODE
C411	CE04LW1C331M	CAP. ELECTRO 330 20% 16V	D314	NO USE	
C412	CE04LW0J331M	CAP. ELECTRO 330 20% 6.3V	D315	1SS132	DIODE
C413	CE04LW1C101M	CAP. ELECTRO 100 20% 16V	D316	MTZ3.0JA	DIODE,ZENER
C414	CE04LW1C101M	CAP. ELECTRO 100 20% 16V	D401	S1VB60	DIODE,STACK
C415	CE04EW1E102M	CAP. ELECTRO 1000 20% 25V	D402	S1VB60	DIODE,STACK
C416	CE04EW1E102M	CAP. ELECTRO 1000 20% 25V	D403	S4VB20F	DIODE,STACK
C417	C91-0761-05	CAP. CERAMIC 2200P 20% 50V	D404	S1VB60	DIODE,STACK
C418	C91-0757-05	CAP. CERAMIC 1000P 10% 50V	D405	1SS132	DIODE
C801	C91-0769-05	CAP. CERAMIC 0.01 20% 16V	D406	1SS132	DIODE
C901	CF92V1H103J	CAP. POLYESTER 0.01 5% 50V	D407	MTZ13JC	DIODE,ZENER
D1	MA700	DIODE	D408	MTZ13JC	DIODE,ZENER
D2	MA700	DIODE	D409	MTZ7.5JA	DIODE,ZENER
D3	MA700	DIODE	D801	MA700	DIODE
D4	MA700	DIODE	F201	F53-0107-05	THERMAL FUSE 400MA/125V
D5	MA700	DIODE	JW1	E38-1005-05	WIRE ASS'Y;3P
D6	1SS132	DIODE	JW2	E38-1006-05	WIRE ASS'Y;6P
D7	1SS132	DIODE	JW9	E38-0988-15	WIRE ASS'Y;H TO V
D8	1SS132	DIODE	JW14	E38-0989-05	WIRE ASS'Y;H TO FINAL
D9	1SS132	DIODE	JW18	E38-0990-05	WIRE ASS'Y;H TO CRT
D10	1SS132	DIODE	JW19	E38-0991-05	WIRE ASS'Y;H TO BNC
D11	1SS132	DIODE	K301	S76-0627-05	RELAY
D12	MA700	DIODE	L101	L79-0553-05	NOISE FILTER
D13	1SS132	DIODE	L201	L40-1545-06	FERRI INDUCTOR 150MH 5%
D14	1SS132	DIODE	L202	L40-1011-04	FERRI INDUCTOR 100UH 10%
D15	1SS132	DIODE	L203	L40-1011-04	FERRI INDUCTOR 100UH 10%
D16	1SS132	DIODE	L204	L40-3925-05	FERRI INDUCTOR 3.9MH 5%
D17	1SS132	DIODE	L301	L40-1001-11	FERRI INDUCTOR 10UH 10%
D18	1SS132	DIODE	NL201	NE-38B	NEON LAMP
D101	1SS132	DIODE	NL202	NE-38B	NEON LAMP
D102	1SS132	DIODE	NL203	NE-38B	NEON LAMP
D103	1SS132	DIODE	NL204	NE-38B	NEON LAMP
D104	1SS132	DIODE	P6	E40-7515-05	PIN CONNECTOR 3P
D105	1SS132	DIODE	P7	E40-7519-05	PIN CONNECTOR 4P
D106	1SS132	DIODE	P8	E40-7040-05	PIN CONNECTOR 13P
D107	1SS132	DIODE	P9	NO USE	
D108	1SS132	DIODE	P10	E40-5066-05	PIN CONNECTOR 9P
D109	MA700	DIODE	P15	E40-5067-05	PIN CONNECTOR 10P
D110	1SS132	DIODE	P16	E40-5069-05	PIN CONNECTOR 12P
D111	NO USE		P17	E40-3306-05	PIN CONNECTOR 9P
D112	1SS132	DIODE	P20	E40-3299-05	PIN CONNECTOR 2P
D113	1SS132	DIODE	Q3	2SC1740S(R,S)	TR. SI, NPN
D114	MA700	DIODE	Q4	2SC1923(O)	TR. SI, NPN
D115	1SS132	DIODE	Q5	2SC1923(O)	TR. SI, NPN
D116	NO USE		Q6	2SC3779(D)	TR. SI, NPN
D117	1SS132	DIODE	Q7	2SC3779(D)	TR. SI, NPN
D118	1SS132	DIODE	Q8	NO USE	
D119	1SS132	DIODE	Q9	2SA1459(K)	TR. SI, PNP
D120	1SS132	DIODE	Q10	2SC1740S(R,S)	TR. SI, NPN
D121	1SS132	DIODE	Q11	2SC1740S(R,S)	TR. SI, NPN
D122	1SS132	DIODE	Q12	2SA1005(K)	TR. SI, PNP
D123	1SS132	DIODE	Q13	2SC1740S(R,S)	TR. SI, NPN
D124	1SS132	DIODE	Q14	2SC1740S(R,S)	TR. SI, NPN
D125	1SS132	DIODE	Q15	2SA1005(K)	TR. SI, PNP
D126	1SS132	DIODE	Q16	2SA1005(K)	TR. SI, PNP
D127	1SS132	DIODE	Q17	2SA933S(R,S)	TR. SI, PNP
D128	1SS132	DIODE	Q18	2SA933S(R,S)	TR. SI, PNP
D129	1SS132	DIODE	Q19	2SC1740S(R,S)	TR. SI, NPN
D130	MA700	DIODE	Q20	2SA933S(R,S)	TR. SI, PNP
D131	NO USE		Q21	2SC1907	TR. SI, NPN
D132	MA700	DIODE	Q28	2SA1459(K)	TR. SI, PNP
D133	MA700	DIODE	Q101	2SK170(V)	FET, N-CHANNEL
D201	1SS132	DIODE	Q102	2SC1923(O)	TR. SI, NPN
D202	1SS132	DIODE	Q103	2SA933S(R,S)	TR. SI, PNP
D203	1SS83	DIODE			
D204	1SS83	DIODE			
D205	1SS83	DIODE			
D206	1SS83	DIODE			
D207	1SS83	DIODE			
D208	1SS83	DIODE			
D209	1SS83	DIODE			
D210	1SS83	DIODE			
D211	1SS132	DIODE			
D212	1SS132	DIODE			
D213	1SS132	DIODE			

PARTS LIST

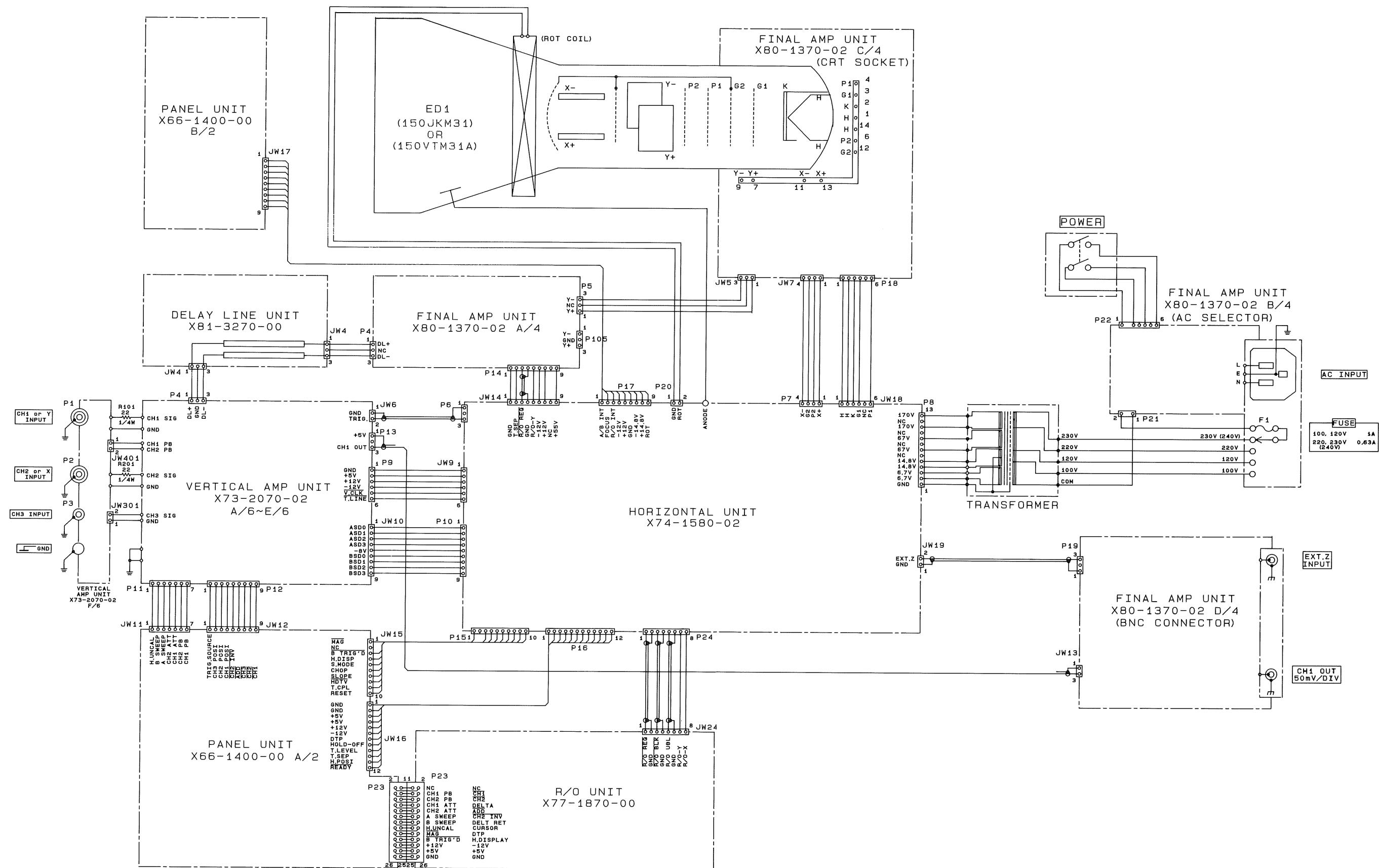
REF. NO	PARTS NO	NAME & DESCRIPTION
R208	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R209	RD14BB2C151J	RES. CARBON 150 5% 1/6W
R210	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R211	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R212	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R213	RD14BB2E223J	RES. CARBON 22K 5% 1/4W
R214	RD14BB2E223J	RES. CARBON 22K 5% 1/4W
R215	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R216	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R217	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R218	RD14BB2C181J	RES. CARBON 180 5% 1/6W
R219	RD14BB2C121J	RES. CARBON 120 5% 1/6W
TC1	C05-0469-05	CAP. TRIMMER 10P
TC62	C05-0472-05	CAP. TRIMMER 50P
TH1	112-103-2FM	THERMISTOR
TH2	112-103-2FM	THERMISTOR
VR1	R12-1857-05	RES. SEMI FIXED 1K
VR2	NO. USE	
VR3	R12-1860-05	RES. SEMI FIXED 1KB
VR4	R12-0679-05	RES. SEMI FIXED 22KB

DELAY LINE UNIT

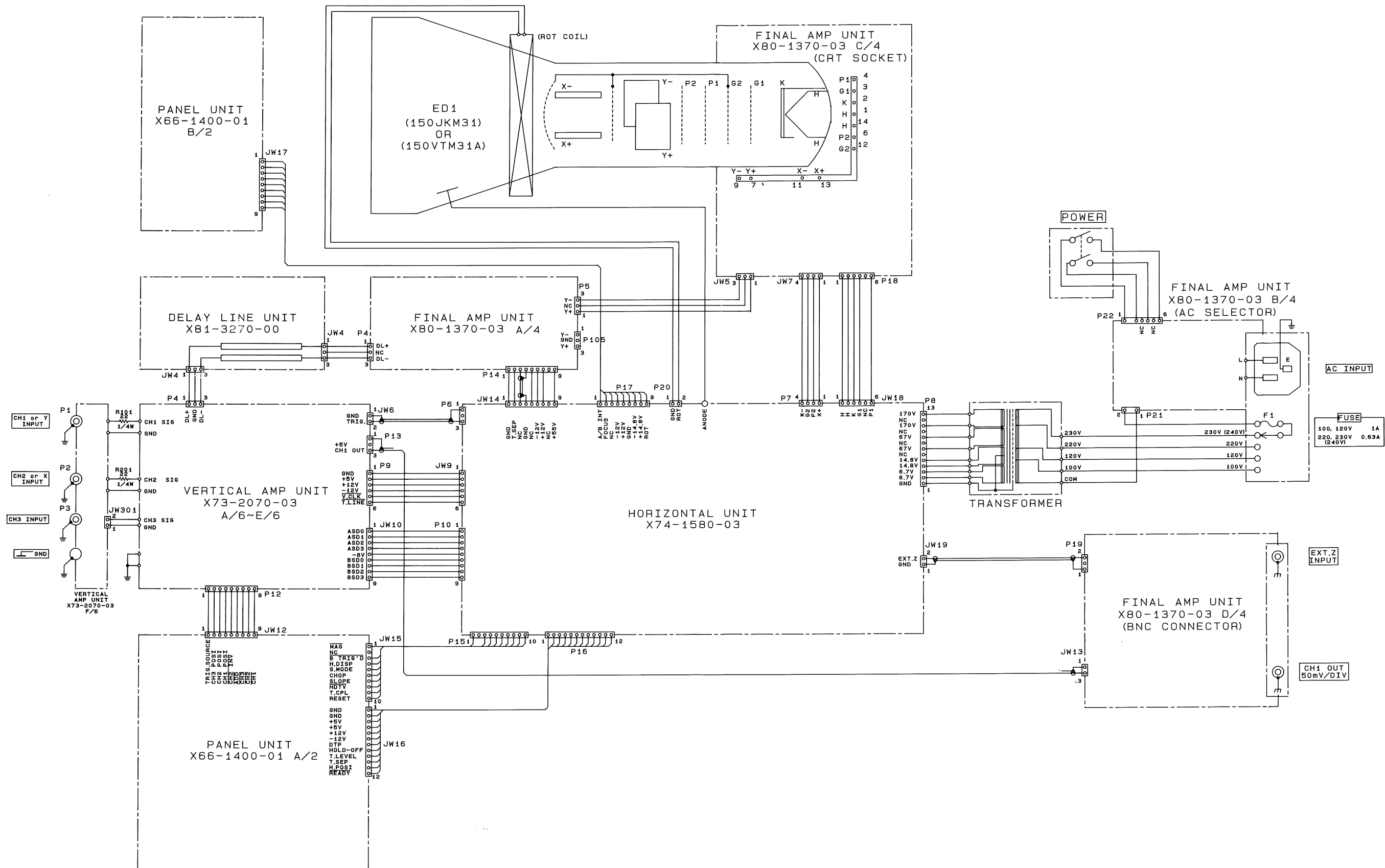
X81-3270-00

REF. NO	PARTS NO	NAME & DESCRIPTION
	J73-0286-03	PCB (UNMOUNTED)
	R92-1061-05	JUMPING RES. ZERO OHM (5MM)
JW4	E38-1001-05	WIRE ASS'Y

CS-5260 SCHEMATIC DIAGRAM

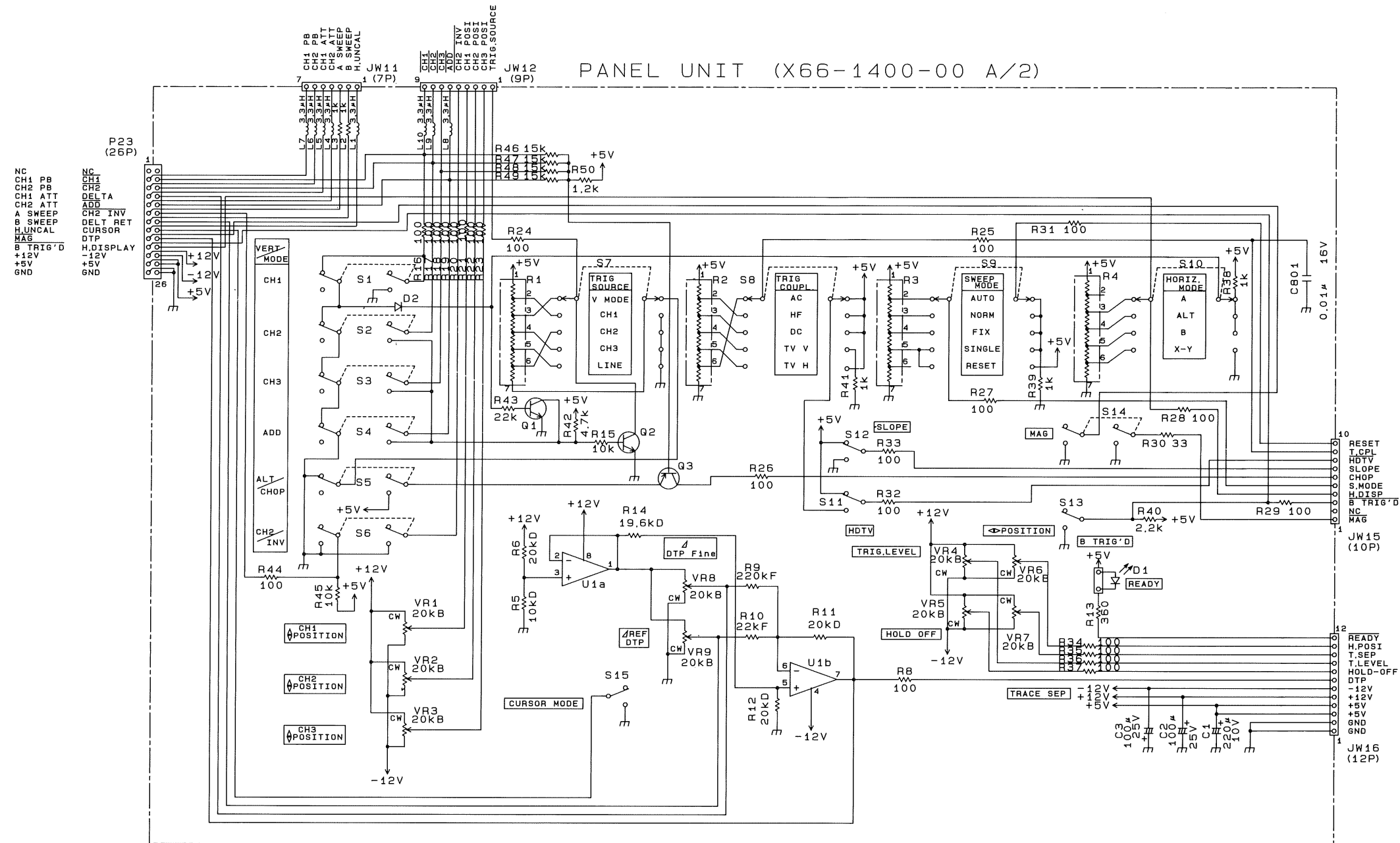


CS-5265 SCHEMATIC DIAGRAM

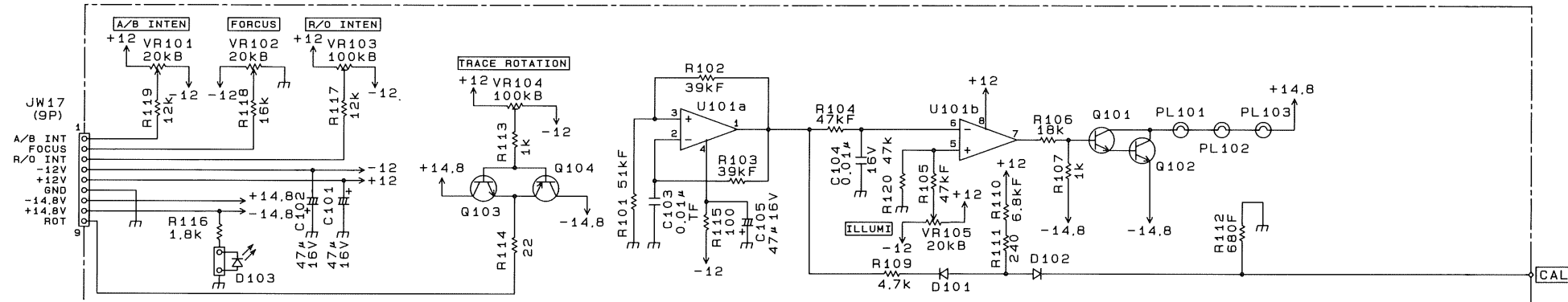


CS-5260 SCHEMATIC DIAGRAM

PANEL UNIT (X66-1400-00)

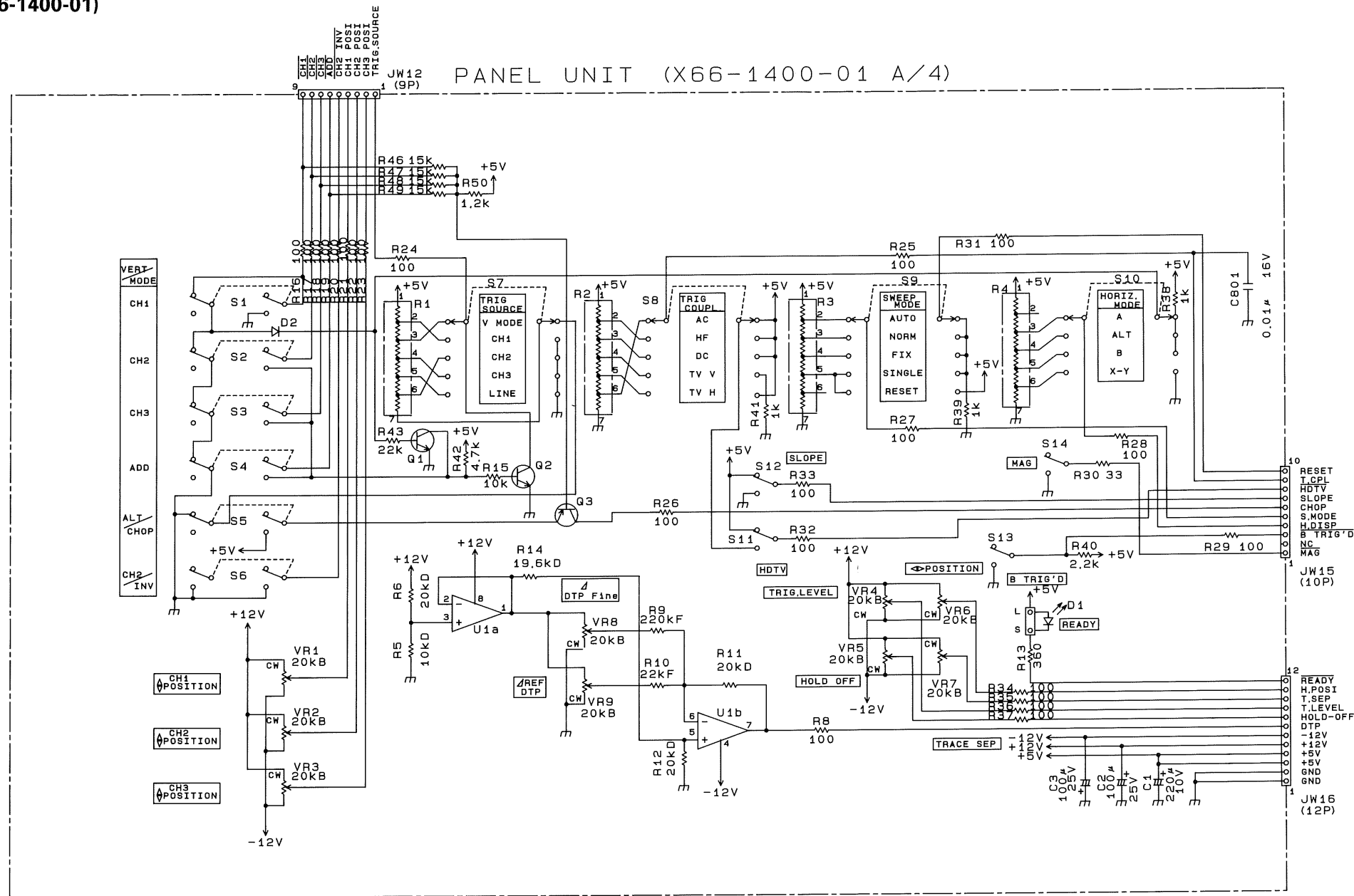


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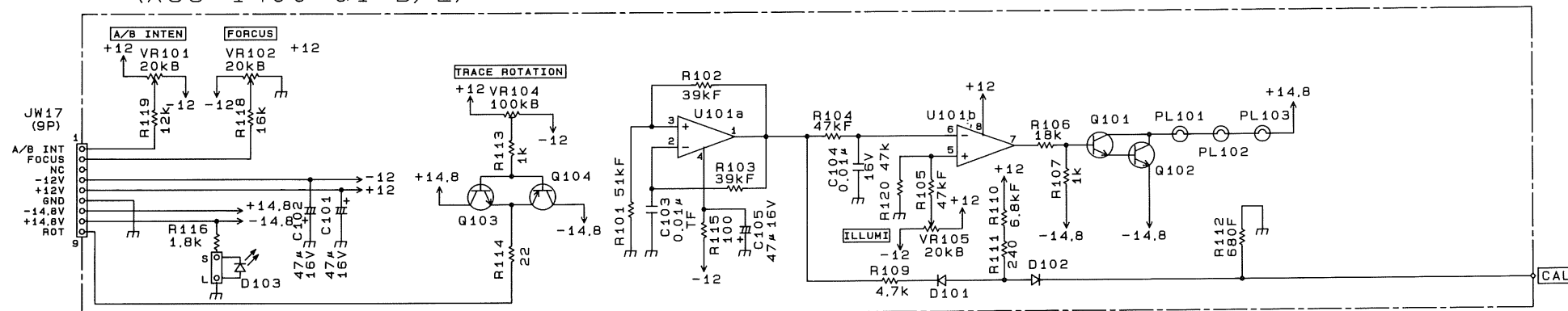


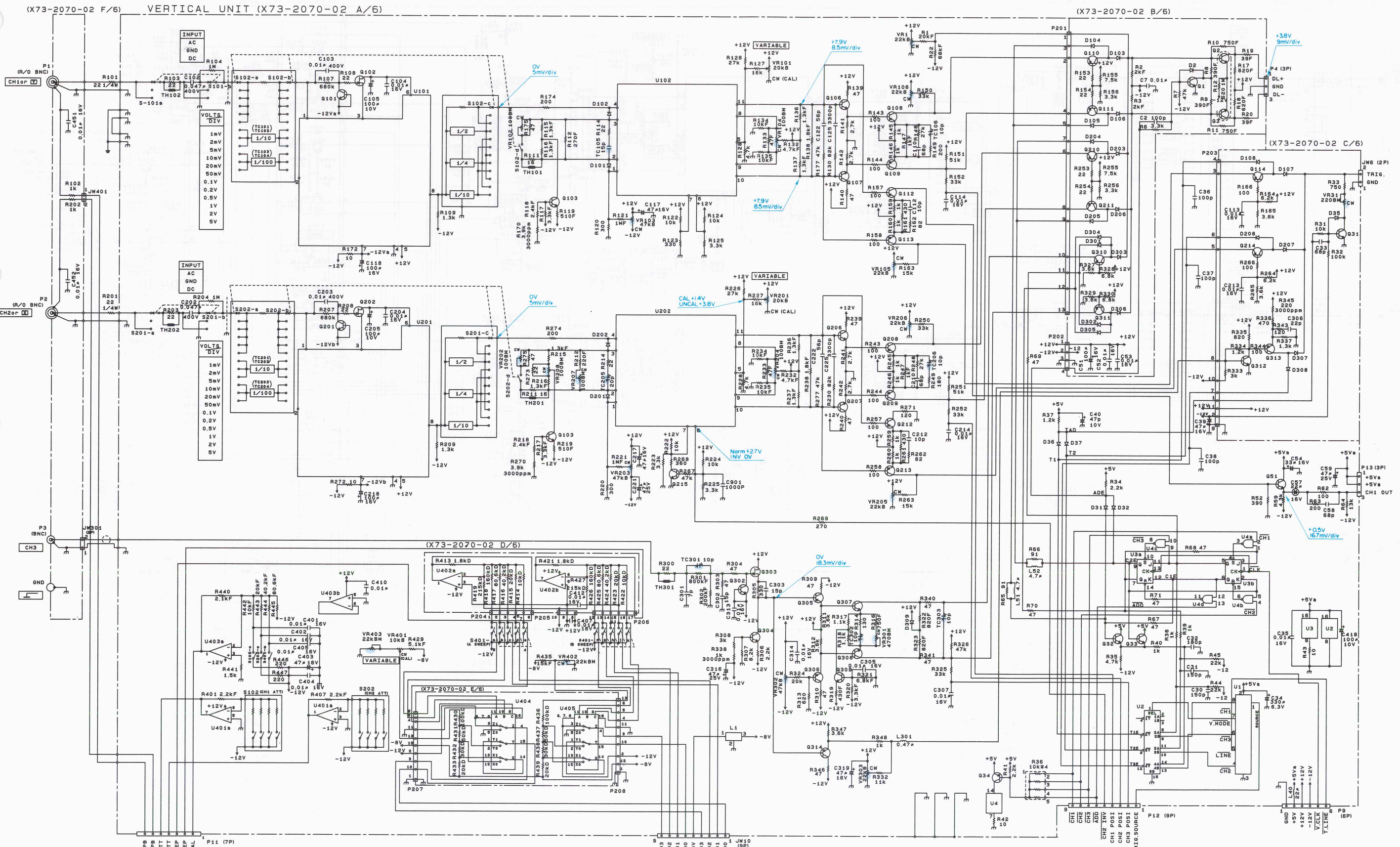
CS-5265 SCHEMATIC DIAGRAM

PANEL UNIT (X66-1400-01)

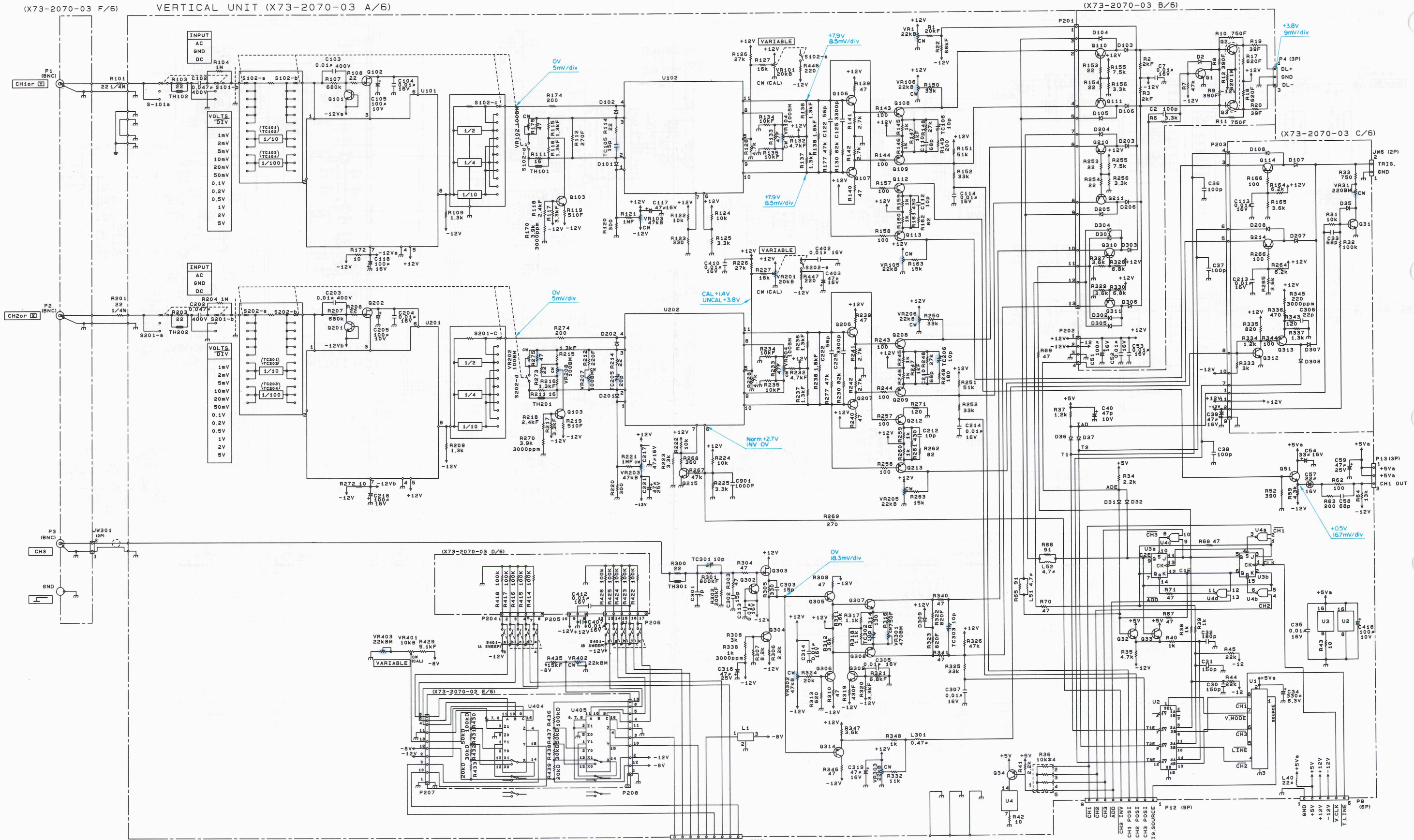


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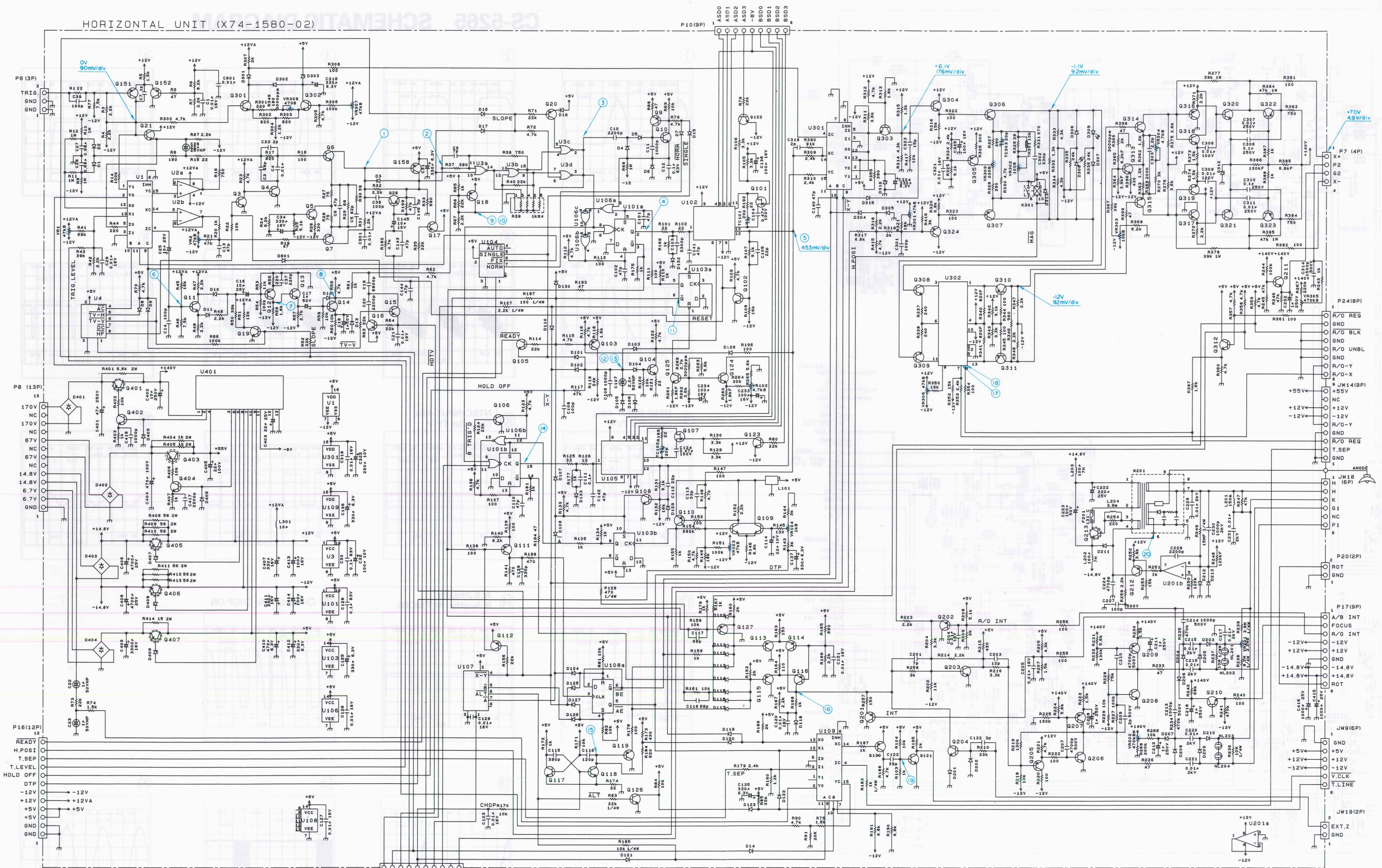
U1	:KMS01	Q1. 33. 215	:2SC1740S (R, S)	Q112. 113. 212. 213	:2SA1161
U2	:SN74LS158N	Q2. 3. 106. 107. 206. 207	:2SC3779 (D)		
U3	:SN74LS112AN	Q3	:2SA933S (R, S)	D2. 31. 309. 35-37. 401-108. 201-208	:15S132
U4	:SN74LS00N	Q51. 101. 201. 30	:2SC1923 (O)		
U101. 201	:KMC13	Q102. 202. 303	:2SK404 (E)		
U102. 202	:KMC12	Q103. 203. 304. 307. 309. 312	:2SC1807		
U401	:NJM072L	Q108-111. 114.	:2SC1458 (K)		
U402	:NJM072D	Q109. 310. 311.			
U403	:NJM4558L				
U404. 405	:TC4053BP				



U1	:KMS01	Q1. 33. 215	:2SC1740S (R, S)	Q103. 203. 304.	307-309. 312	D2. 31. 33.	35-37. 40. 108. 201-208
U2	:SN74LS158N	Q2. 3. 106. 107.	206. 207	Q108-111. 314.	306. 310. 311. 314. 305	301-305	
U3	:SN74LS112AN	Q32	:2SC3779 (D)	Q109-110. 311. 314.	306. 310. 311. 314. 305		
U4	:SN74LS00N	Q34	:2SC3066 (G)	Q112. 113. 212.	307-309. 312		
U101. 201	:KMC13	Q51. 101. 201. 302	:2SA933S (R, S)	Q112. 113. 212.	307-309. 312		
U102. 202	:KMC12	Q51. 101. 201. 302	:2SC1923 (O)	Q112. 113. 212.	307-309. 312		
U404. 405	:TC4053BP	Q102. 202. 303	:2SK404 (E)	Q112. 113. 212.	307-309. 312		

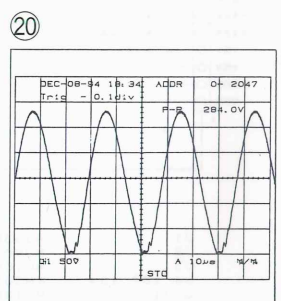
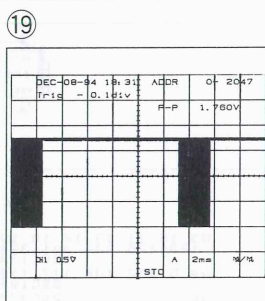
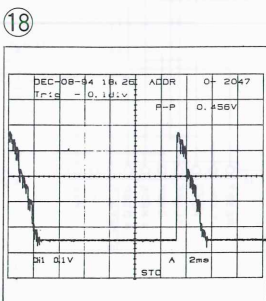
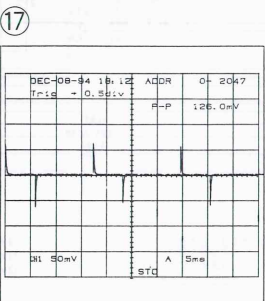
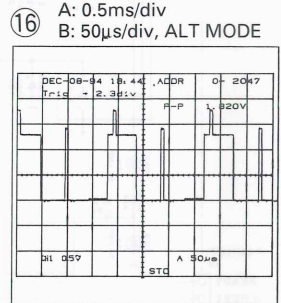
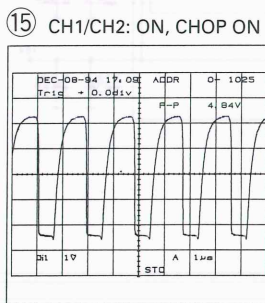
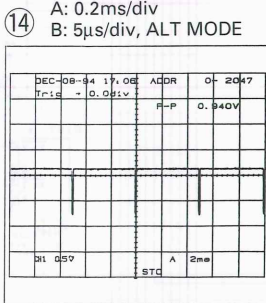
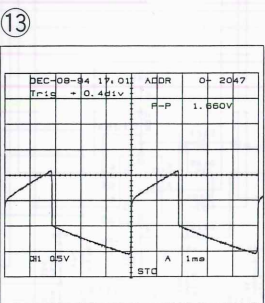
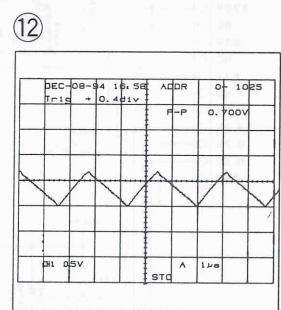
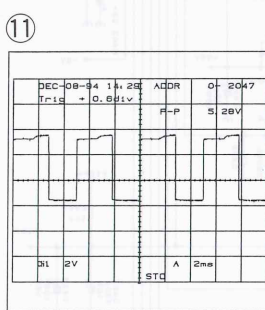
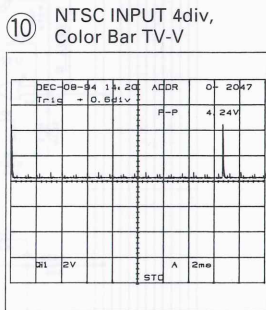
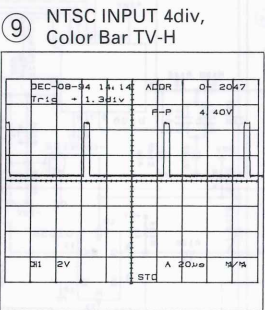
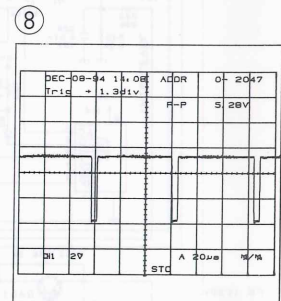
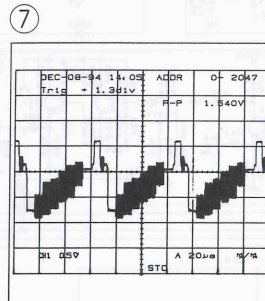
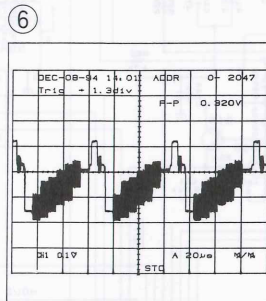
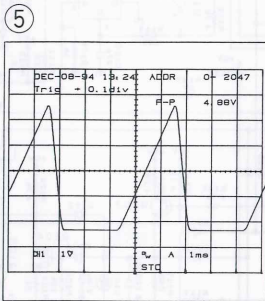
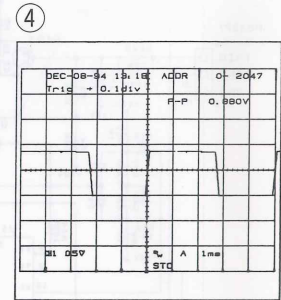
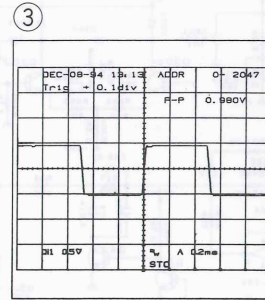
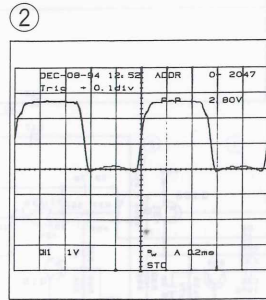
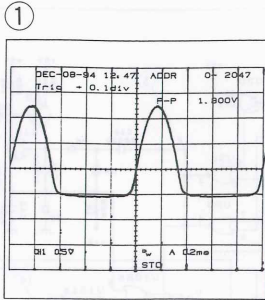
HORIZONTAL UNIT (X74-1580-02)

HORIZONTAL UNIT (X74-1580-02)



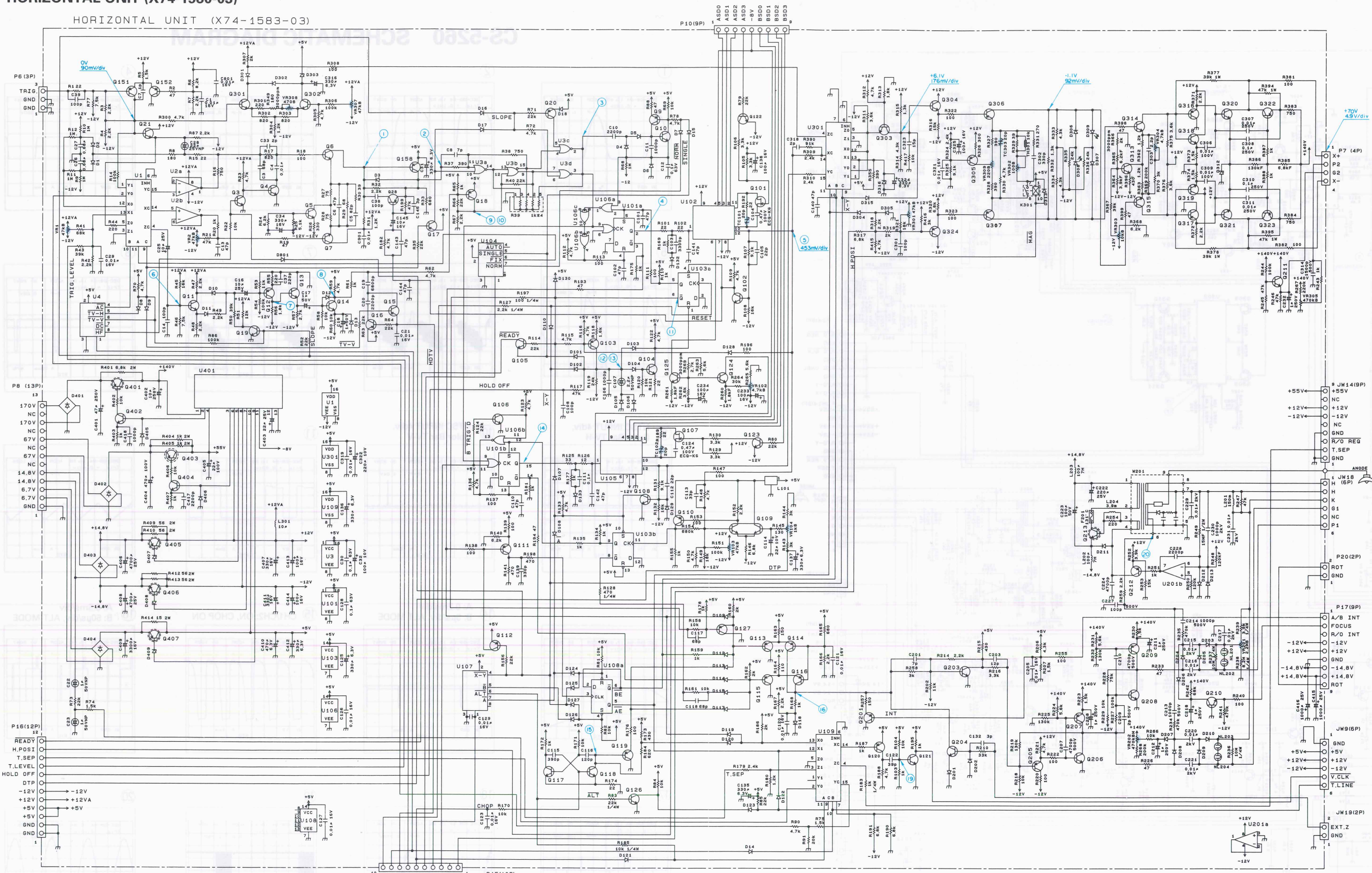
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U2	: NJM072BD	Q4	: 2SB1015 (Y)	Q308, 309	: TLR112				
U3	: MC10H102L	Q5	: 2SD1405 (Y)	D312	: MTZ5.1JB				
U4, 104, 107	: KMS01	Q6, 7		D401, 402, 404	: S1V850				
U101	: MC10H131L	Q8, 9		D403	: S4V8201				
U102, 105	: KMD05	Q10, 11, 12, 13		D407, 408	: MTZ13.0C				
U103, 108	: SN74ALS74AN	Q14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000							

CS-5260 SCHEMATIC DIAGRAM



HORIZONTAL UNIT (X74-1580-03)

HORIZONTAL UNIT (X74-1583-03)

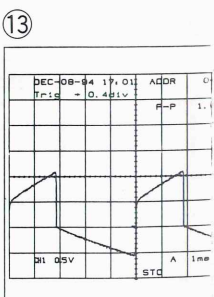
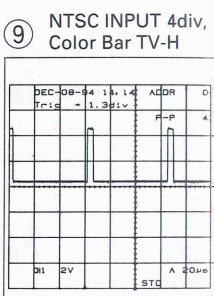
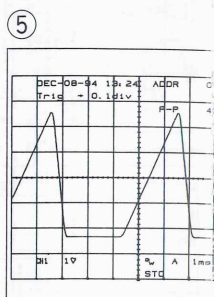
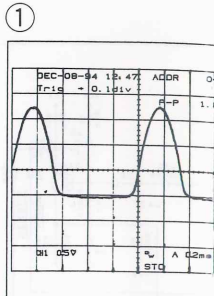


U1	: 4053BP	Q3, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26
U2	: NUM072BD	Q101, 107
U3	: MC10H102L	Q109, 208
U4, 107, 104	: KMS01	Q207, 208
U101	: MC10H131L	Q210, 211, 402, 404
U102, 105	: KM005	Q213
U103, 108	: SN74ALS74AN	Q220, 321
U106	: SN74ALS02N	Q322, 323
U109, 301	: TC74HC4053AP	Q401
U201	: NJM4558D	
U401	: KMA02	

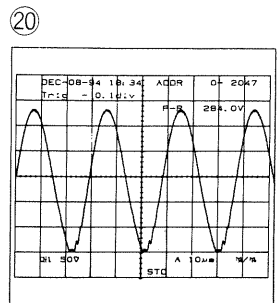
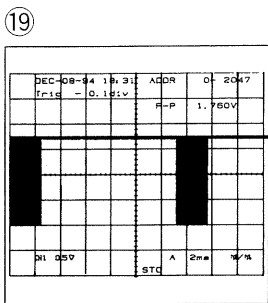
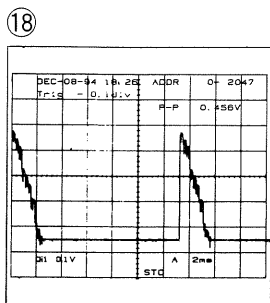
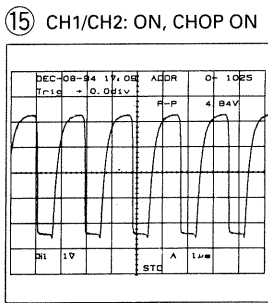
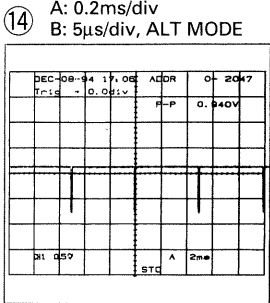
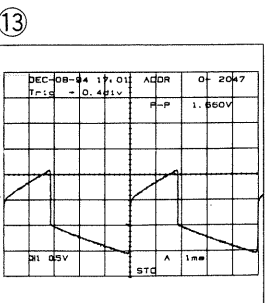
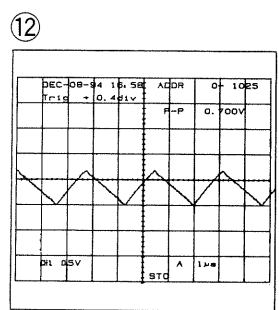
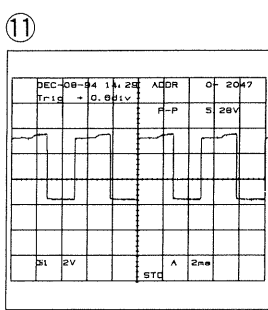
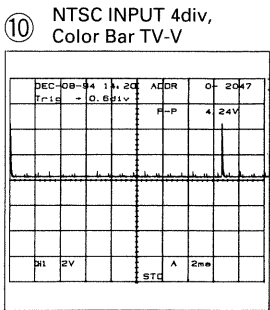
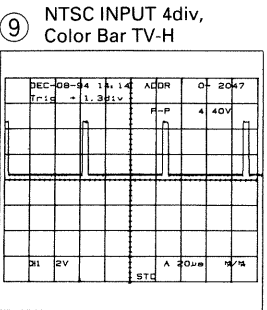
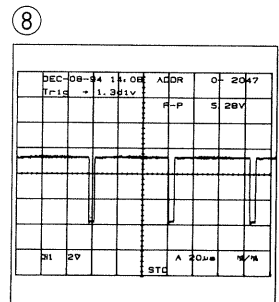
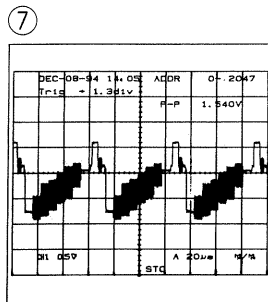
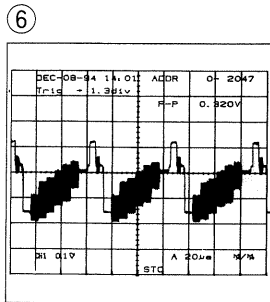
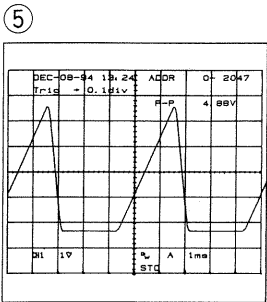
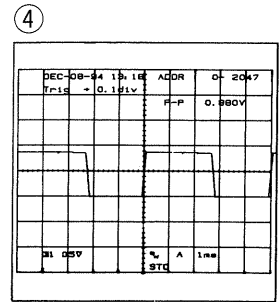
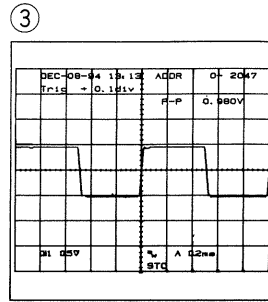
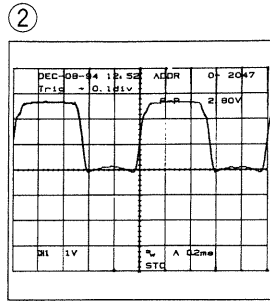
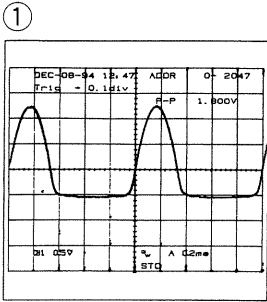
Q21, 314, 315, 319	: 2SA1304	Q403	: 2SA1304
Q101, 107	: 2SK170 (V)	Q405, 407	: 2SB1015 (Y)
Q109, 208	: 2SC3056 (G)	Q406	: 2SD1406 (Y)
Q207, 208	: 2SC3779 (D)		
Q210, 211, 402, 404	: 2SA1208 (S)		
Q213	: 2SC2551 (O)		
Q220, 321	: 2SD913 (E)		
Q322, 323	: 2SA1828 (E)		
Q401	: 2SA1499 (P)		

D203-210	: 1SS83	TH301	: 112-103-2FM
D303, 316	: MT23.0JA		
D308, 309	: TLR112		
D312	: MT25.1JB		
D401, 402, 404	: S1VB60		
D403	: S4VB20F		
D407, 408	: MT213JC		
D409	: MT27.5JA		

NL201-204 : NE-38

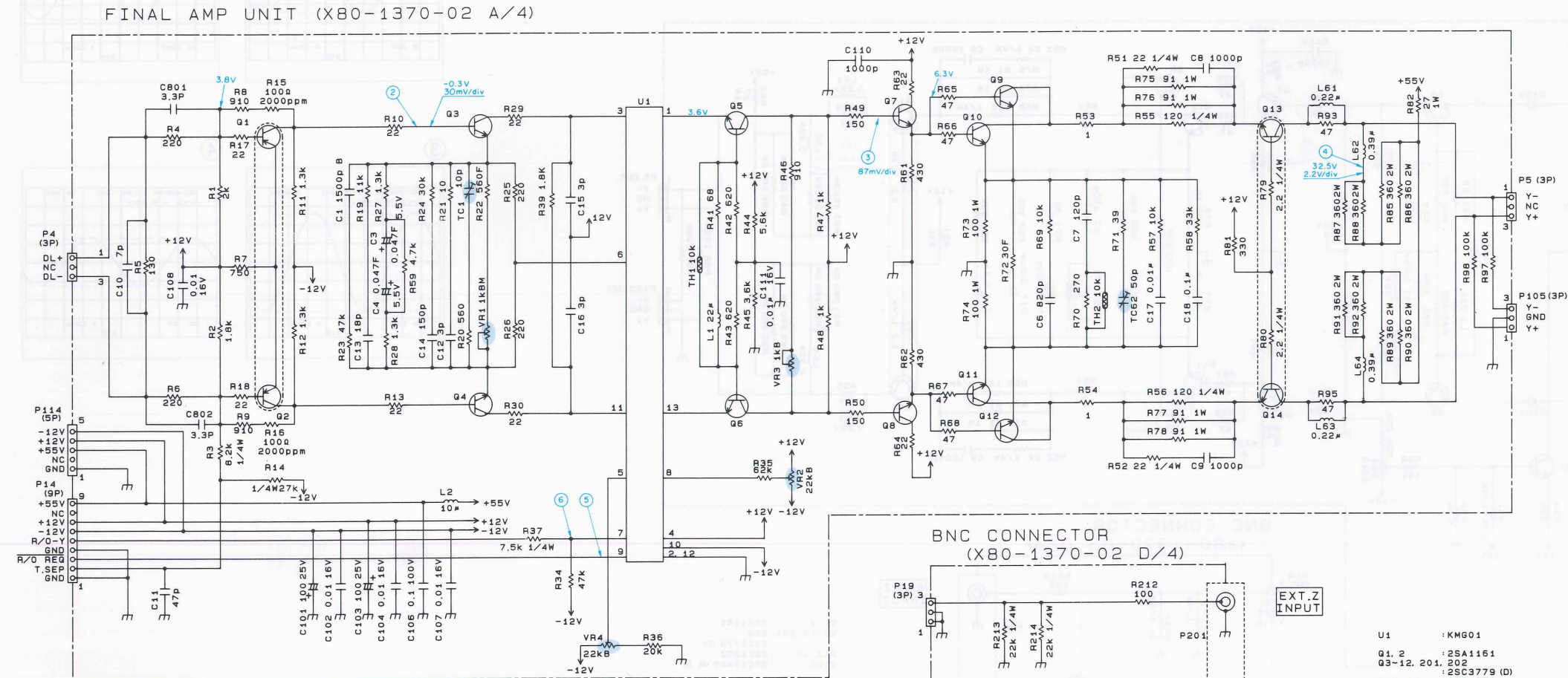


CS-5265 SCHEMATIC DIAGRAM

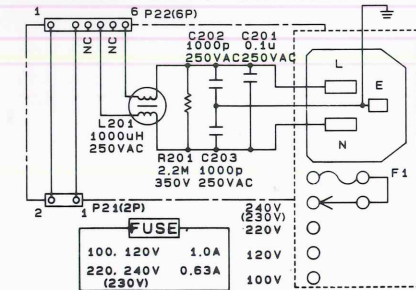


CS-5260 SCHEMATIC DIAGRAM

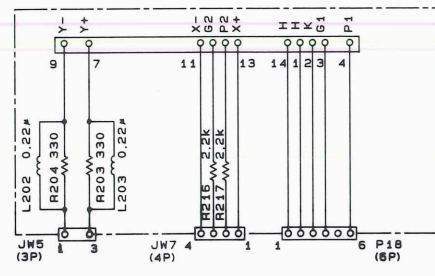
FINAL AMP UNIT (X80-1370-02)



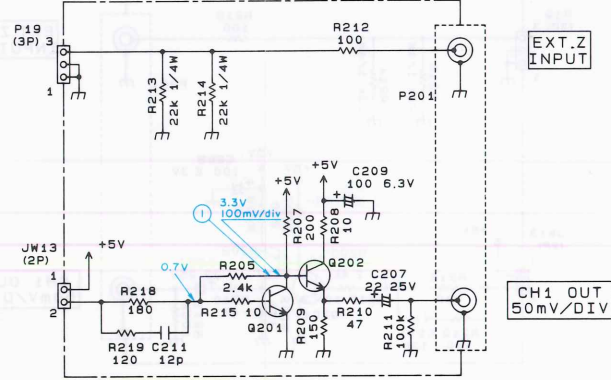
AC SELECTOR (X80-1370-02 B/4)



CRT SOCKET (X80-1370-02 C/4)

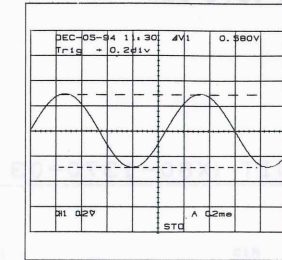


BNC CONNECTOR (X80-1370-02 D/4)

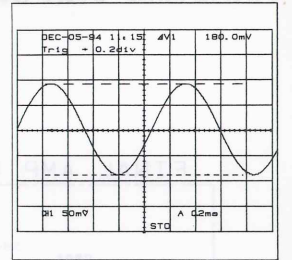


- U1 : KMG01
- Q1, 2 : 2SA1161
- Q3-12, 20 : 2SC1202
- Q13, 14 : 2SC3779 (D)
- : 2SC1252
- TH1, 2 : 112-103-2FM

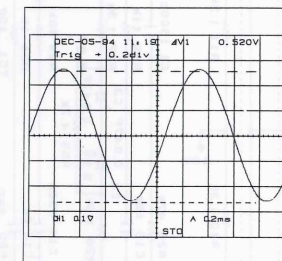
① INPUT: 1kHz 6div
5mV/div



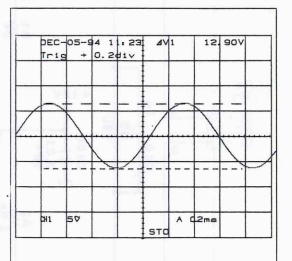
②



③

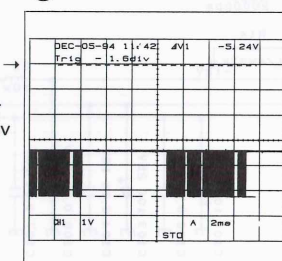


④

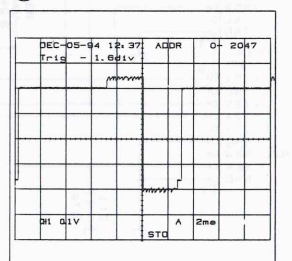


⑤

GND
CH1
ΔV1 cursor
+3div, -3div

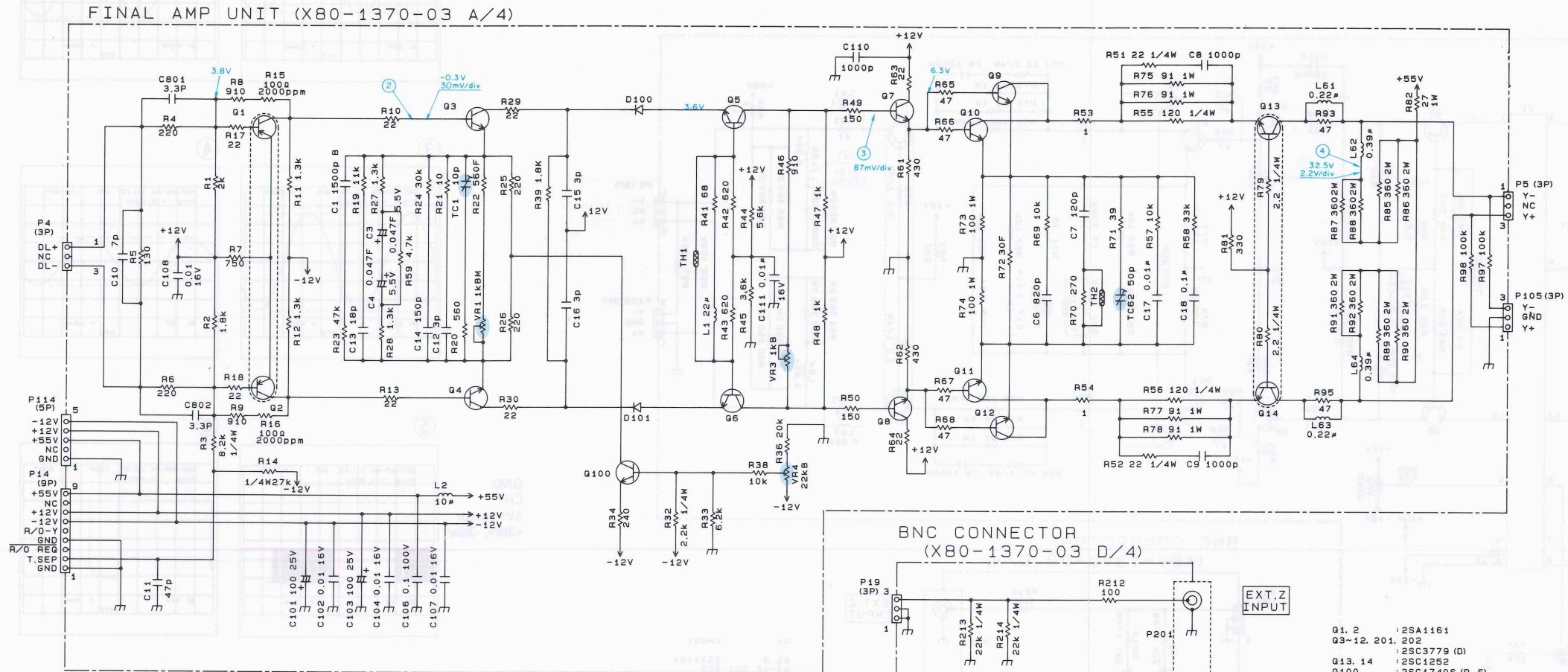


⑥



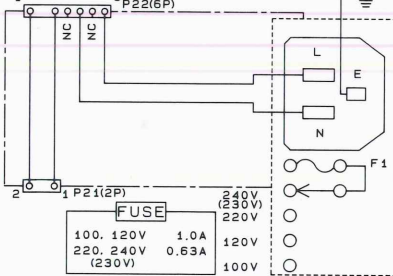
CS-5265 SCHEMATIC DIAGRAM

FINAL AMP UNIT (X80-1370-03)

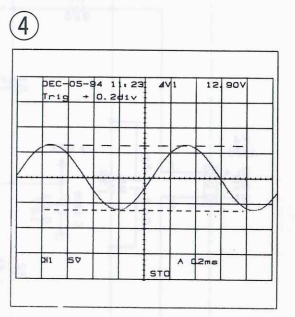
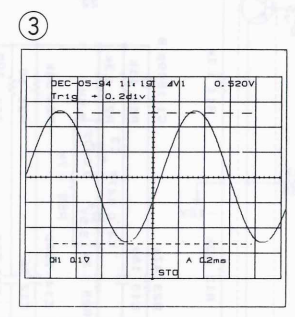
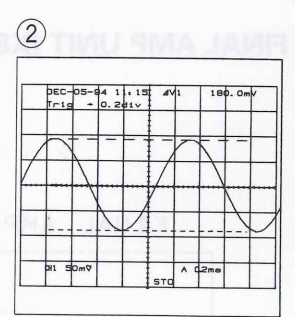
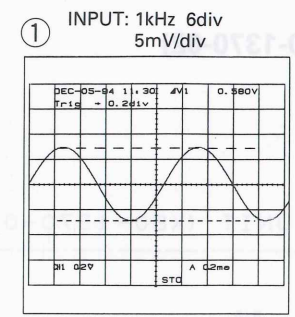
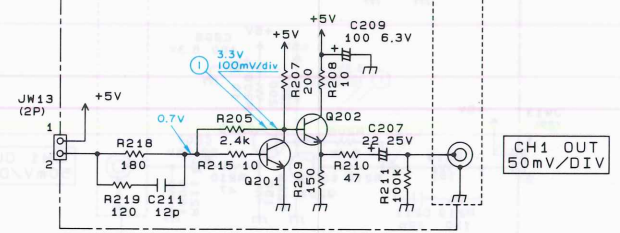
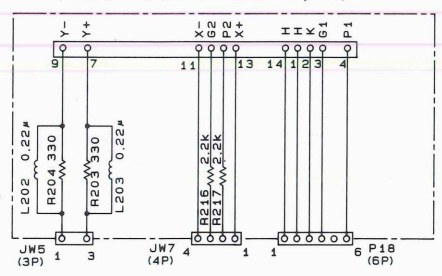


- Q1, 2 : 2SA1161
- Q3-12, 201, 202 : 2SC3779 (D)
- Q13, 14 : 2SC1252
- Q100 : 2SC1740S (R, S)
- D100, 101 : MA700
- TH1, 2 : 112-103-2FM

AC SELECTOR (X80-1370-03 B/4)



CRT SOCKET (X80-1370-03 C/4)



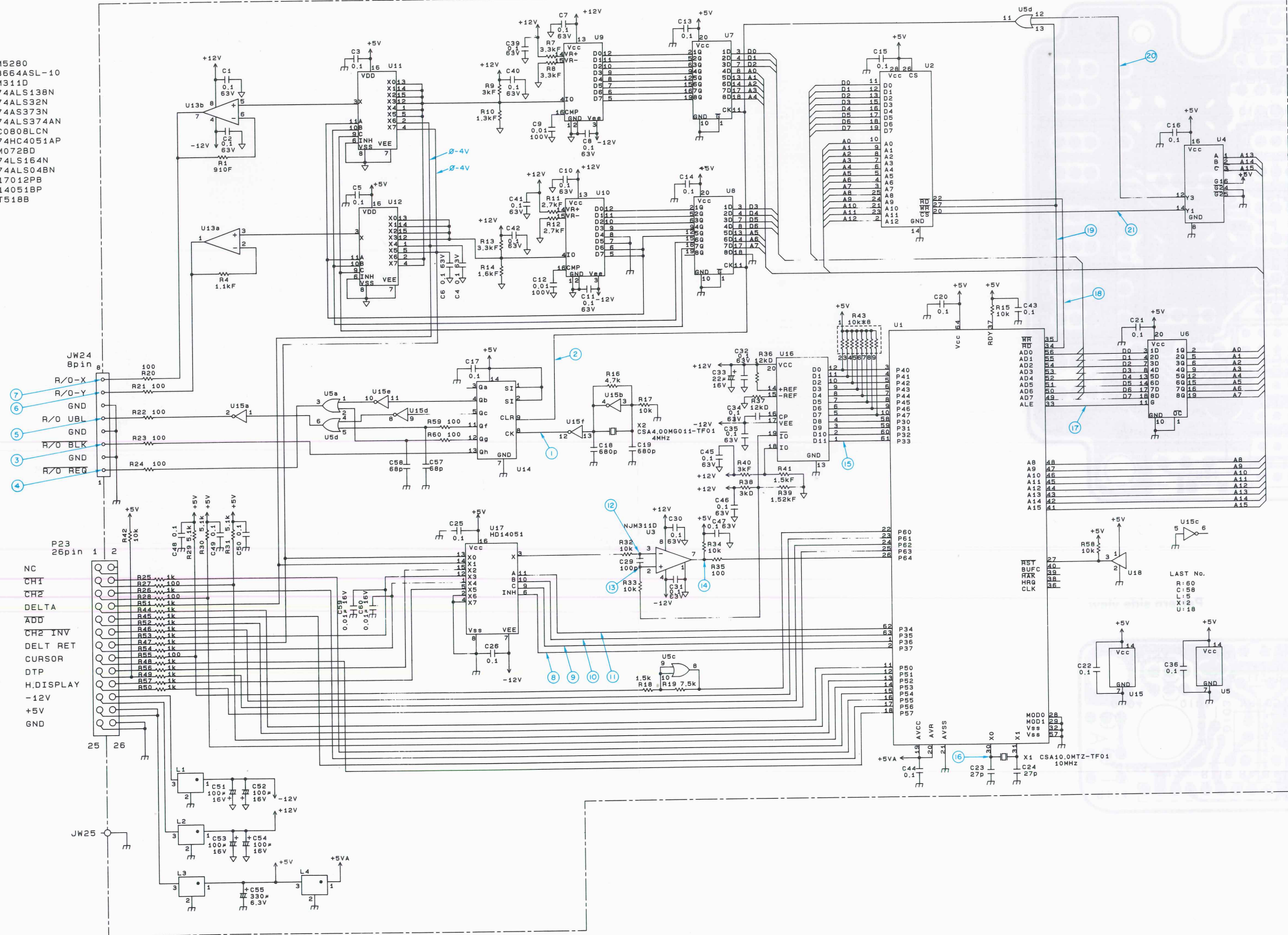
CS-5260 SCHEMATIC DIAGRAM

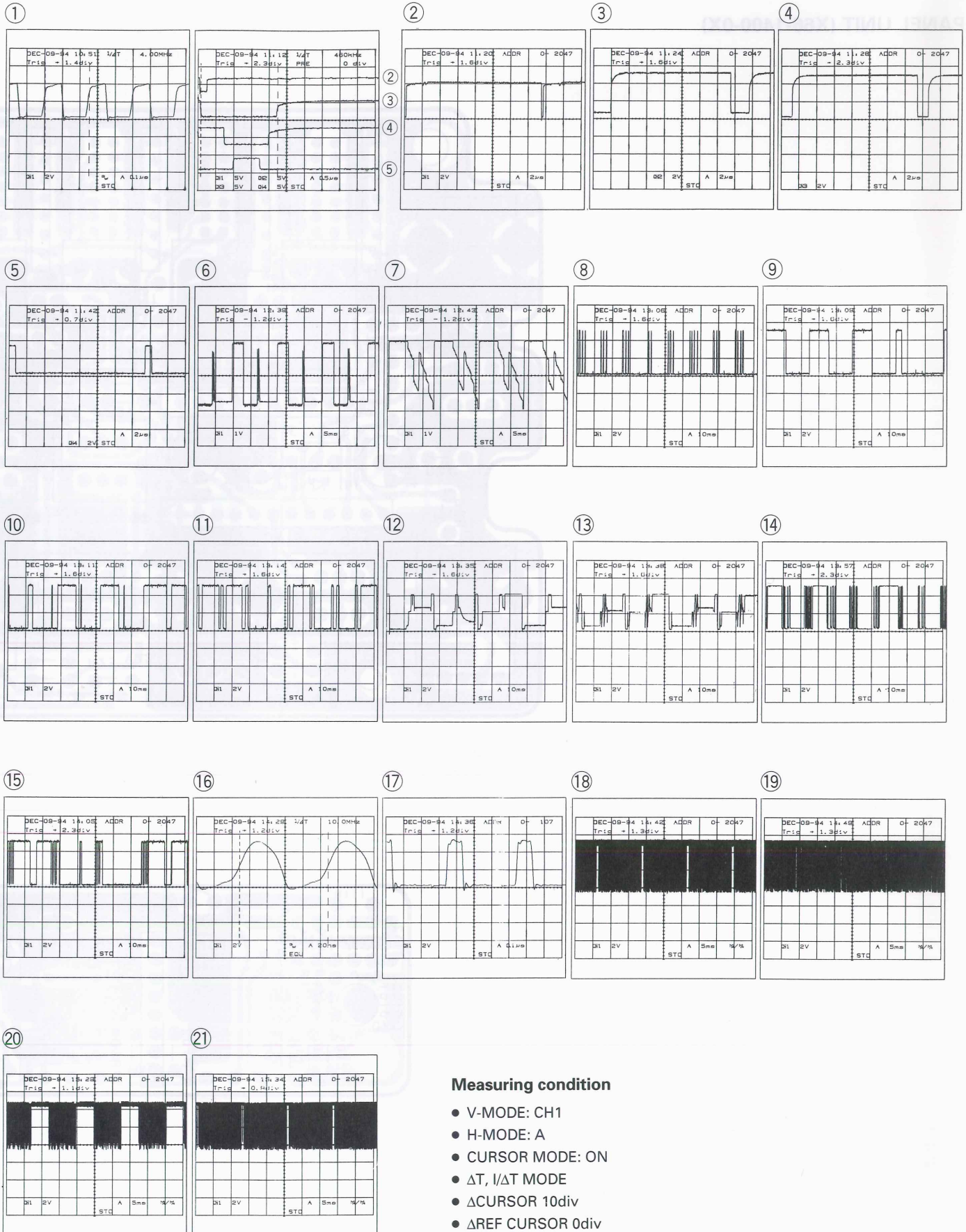
R/O UNIT (X77-1870-00)

R/O UNIT (X77-1870-00)

- U1 : CTM5280
- U2 : LC3664ASL-10
- U3 : NJM311D
- U4 : SN74ALS138N
- U5 : SN74ALS32N
- U6 : SN74AS373N
- U7, 8 : SN74ALS374AN
- U9, 10 : DAC0808LCN
- U11, 12 : TC74HC4051AP
- U13 : NJM072BD
- U14 : SN74LS164N
- U15 : SN74ALS04BN
- U16 : HA17012PB
- U17 : HD14051BP
- U18 : PST518B

- | | |
|----------|-----------|
| NC | NC |
| CH1 PB | CH1 |
| CH2 PB | CH2 |
| CH1 ATT | DELTA |
| CH2 ATT | ADD |
| A SWEEP | CH2 INV |
| B SWEEP | DELT RET |
| H.U.NCAL | CURSOR |
| WAG | DTP |
| B TRIG'D | H.DISPLAY |
| +12V | -12V |
| +5V | +5V |
| GND | GND |





Measuring condition

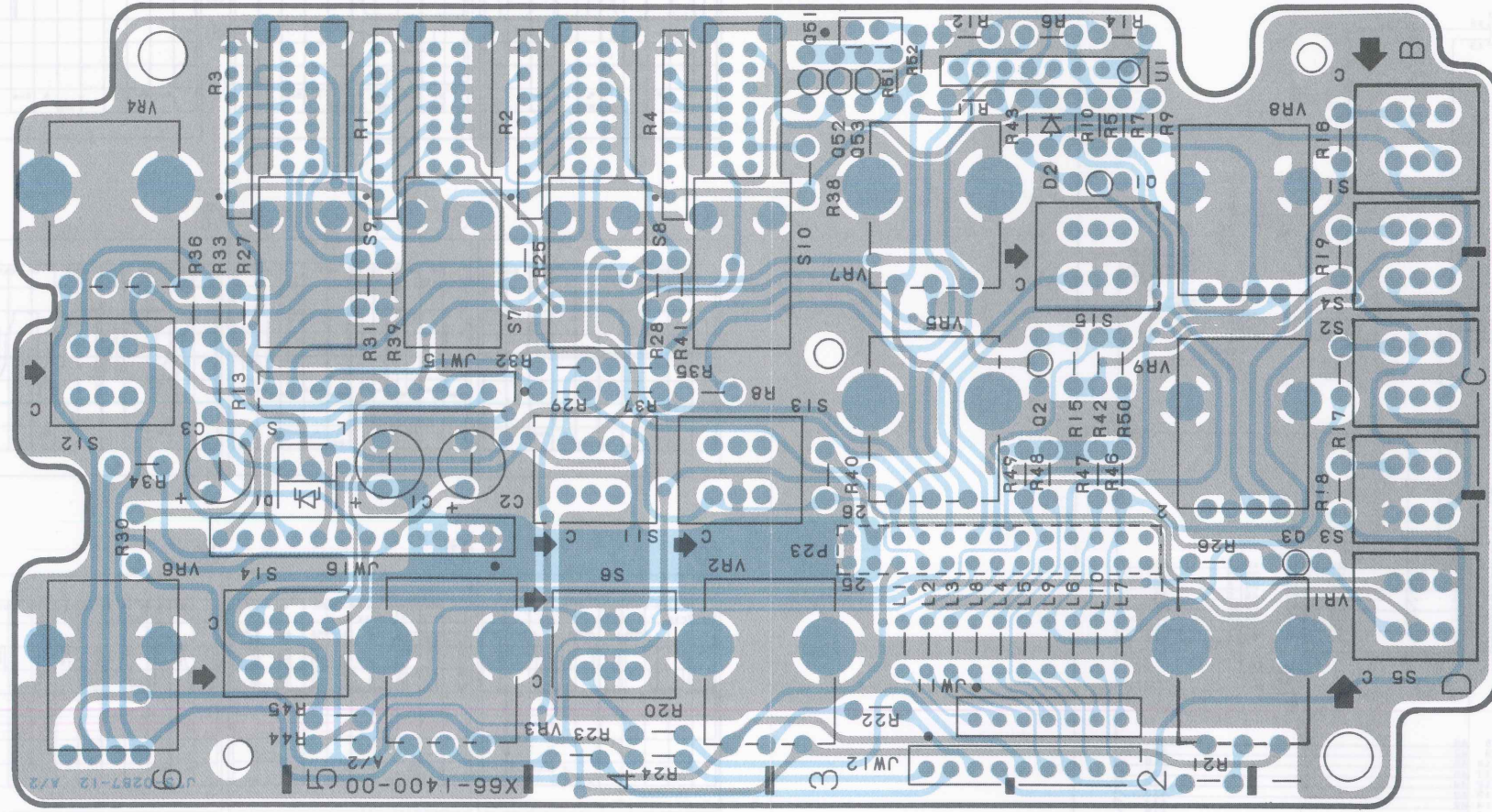
- V-MODE: CH1
- H-MODE: A
- CURSOR MODE: ON
- $\Delta T, I/\Delta T$ MODE
- Δ CURSOR 10div
- Δ REF CURSOR 0div

P.C. BOARD

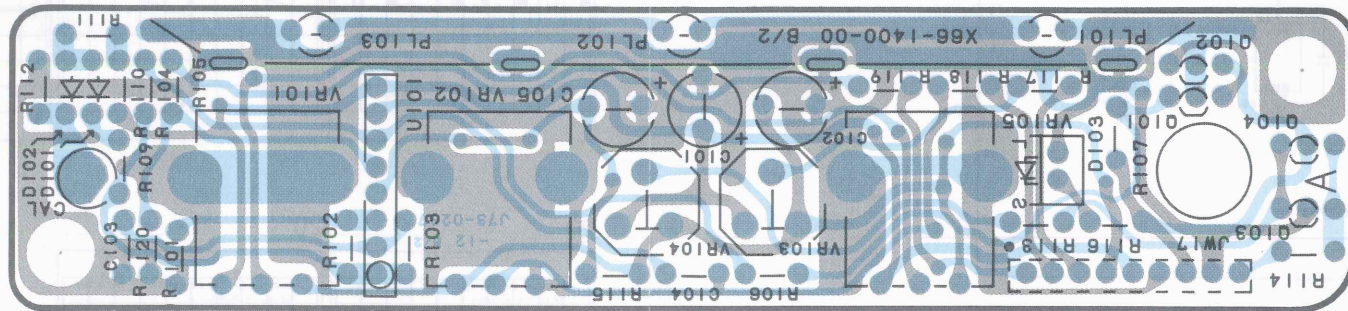
CS-5280 SCHEMATIC DIAGRAM

PANEL UNIT (X66-1400-0X)

Pattern side view



Pattern side view

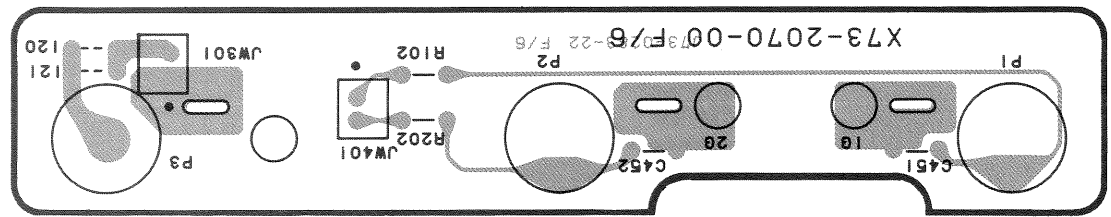
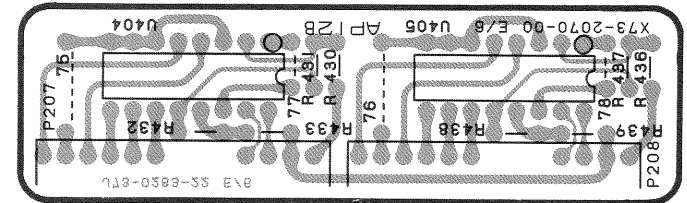
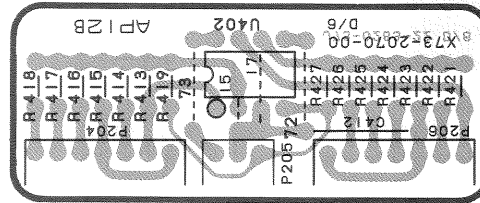
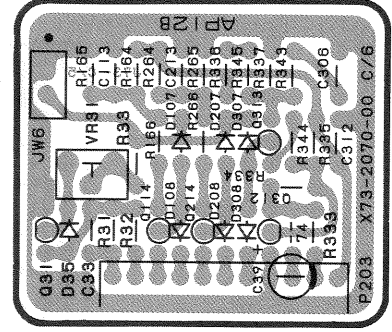
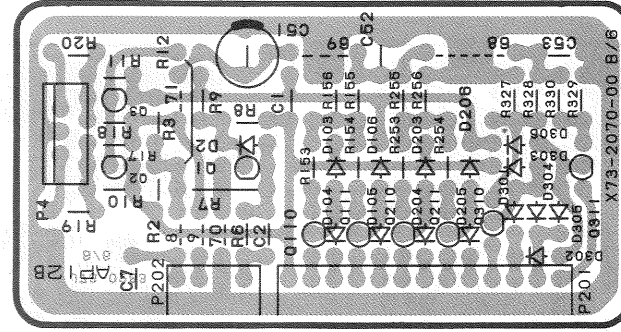
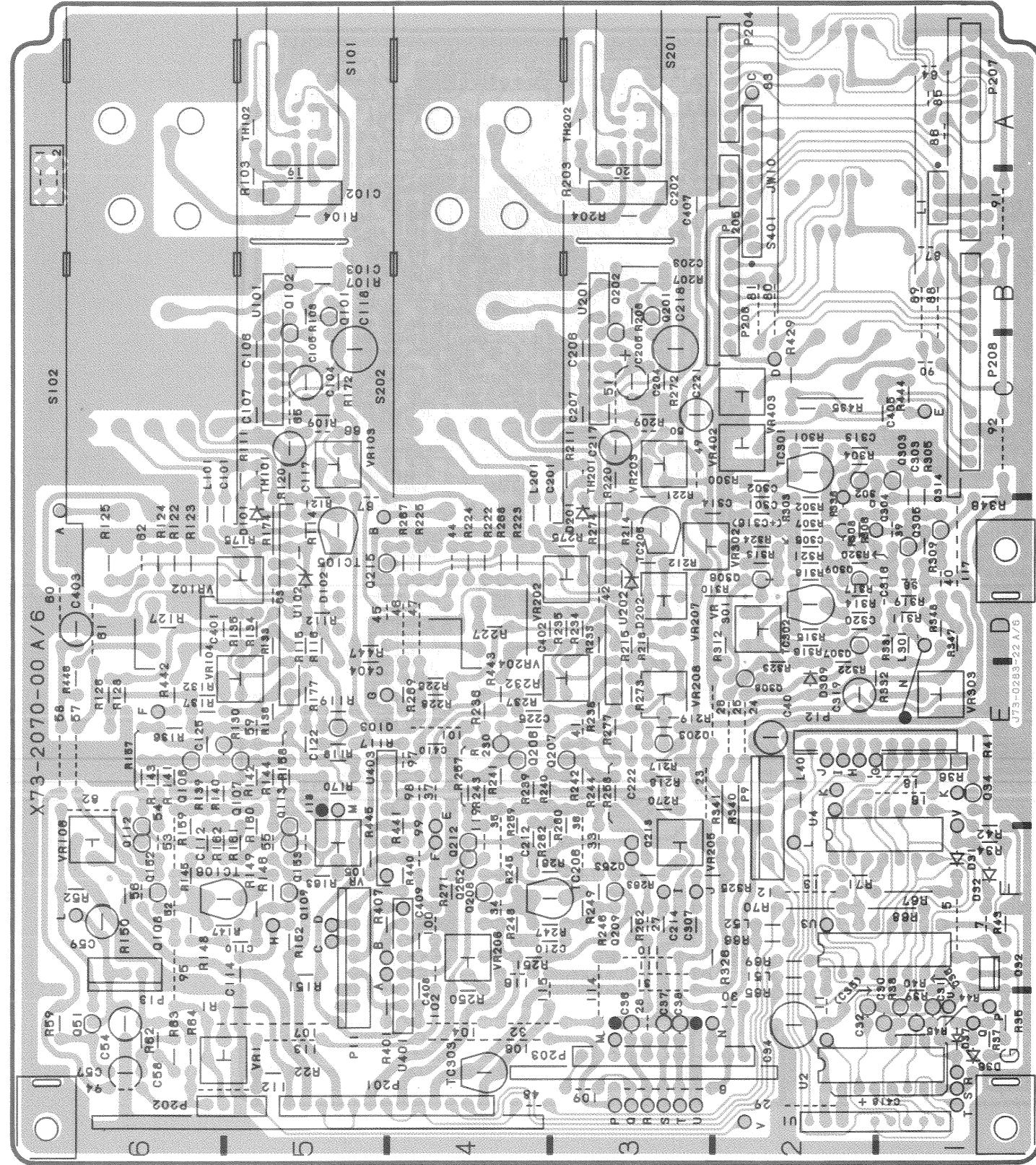


Measuring condition
 * V MODE - CH1
 * H MODE - A
 * CURSOR MODE - ON
 * ST. VST MODE
 * CURSOR MODE - ON
 * VEE CURSOR ON

P.C. BOARD

VERTICAL UNIT (X73-2070-0X)

Pattern side view

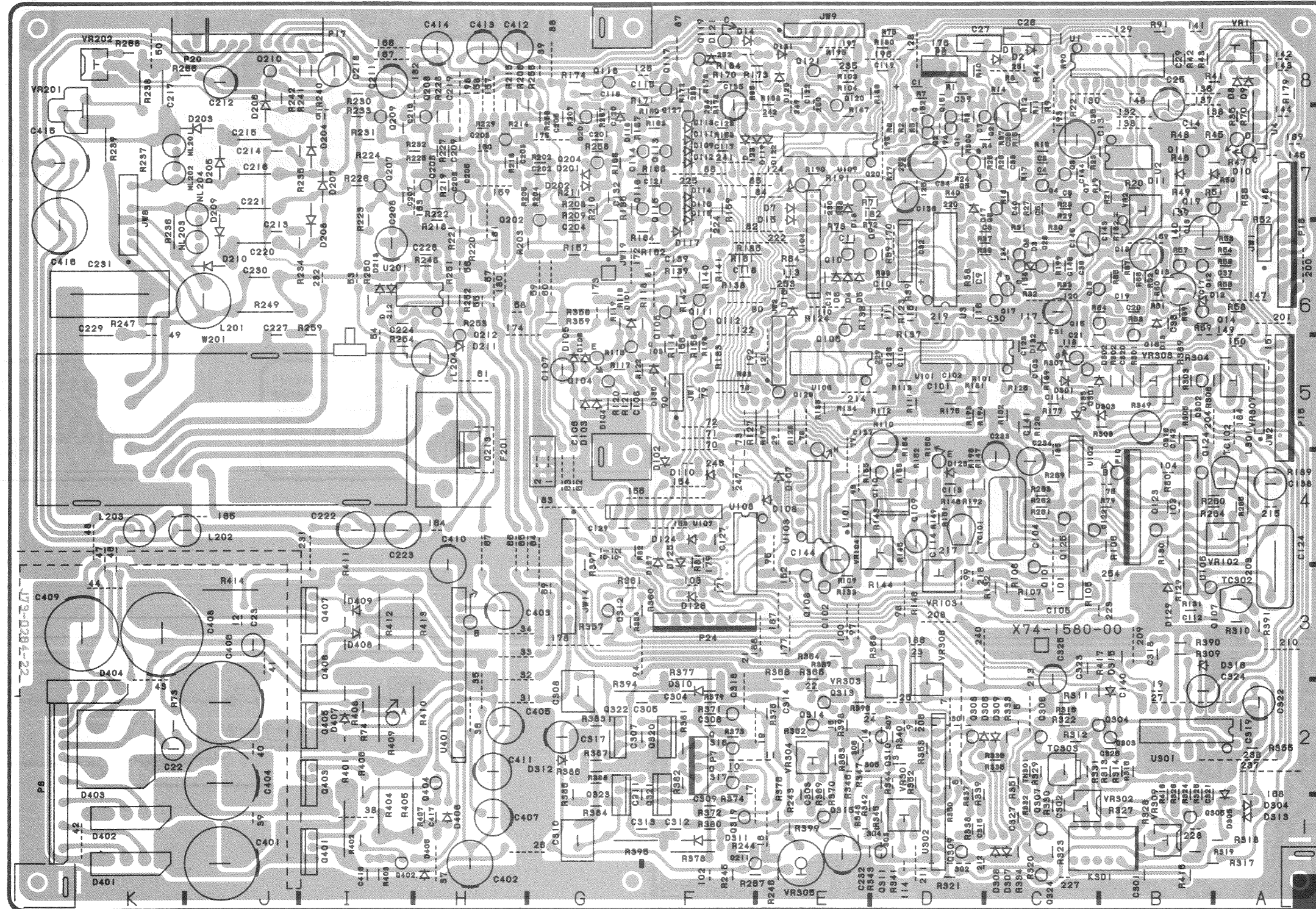


Pattern side view

P.C. BOARD

HORIZONTAL UNIT (X74-1580-0X)

Pattern side view



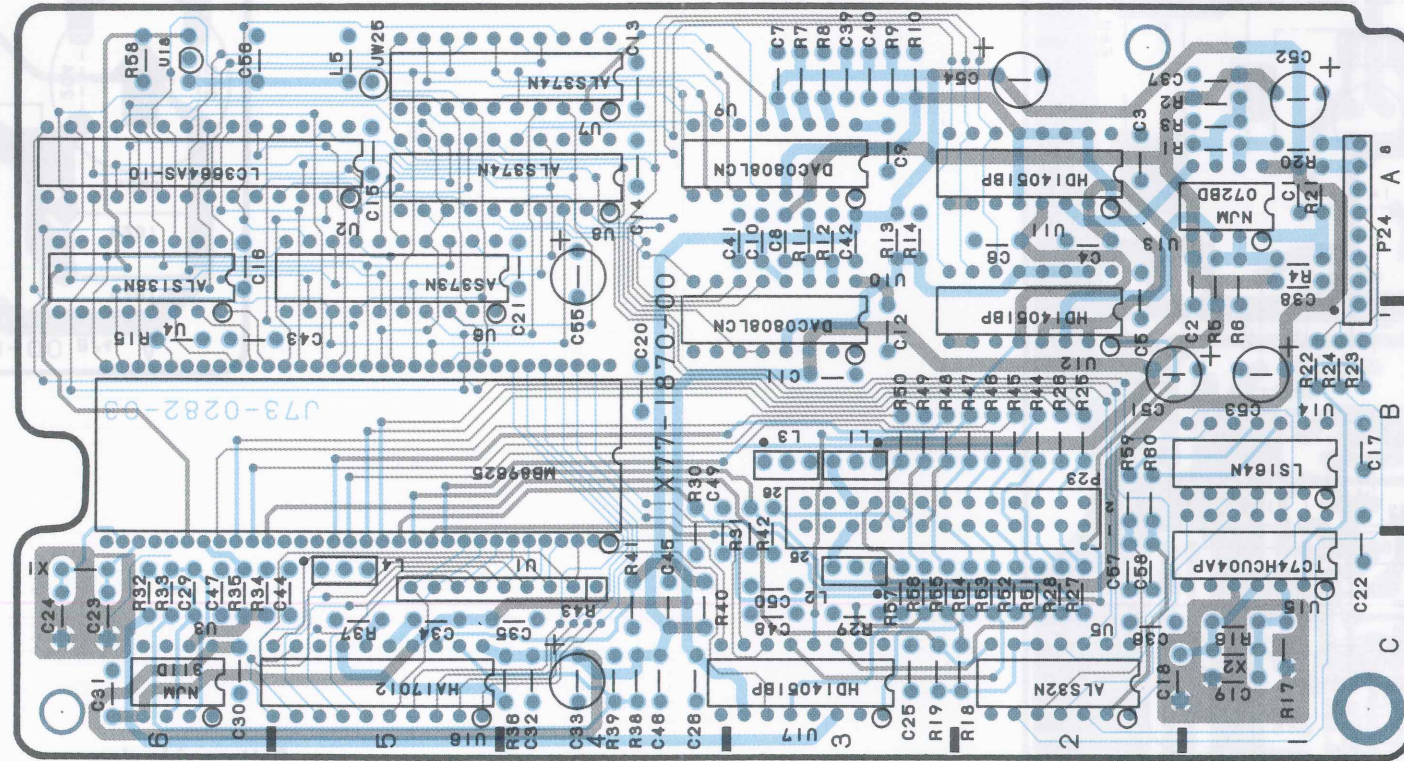
P.C. BOARD

R/O UNIT (X77-1870-0X)

FINAL AMP UNIT (X80-1370-0X)

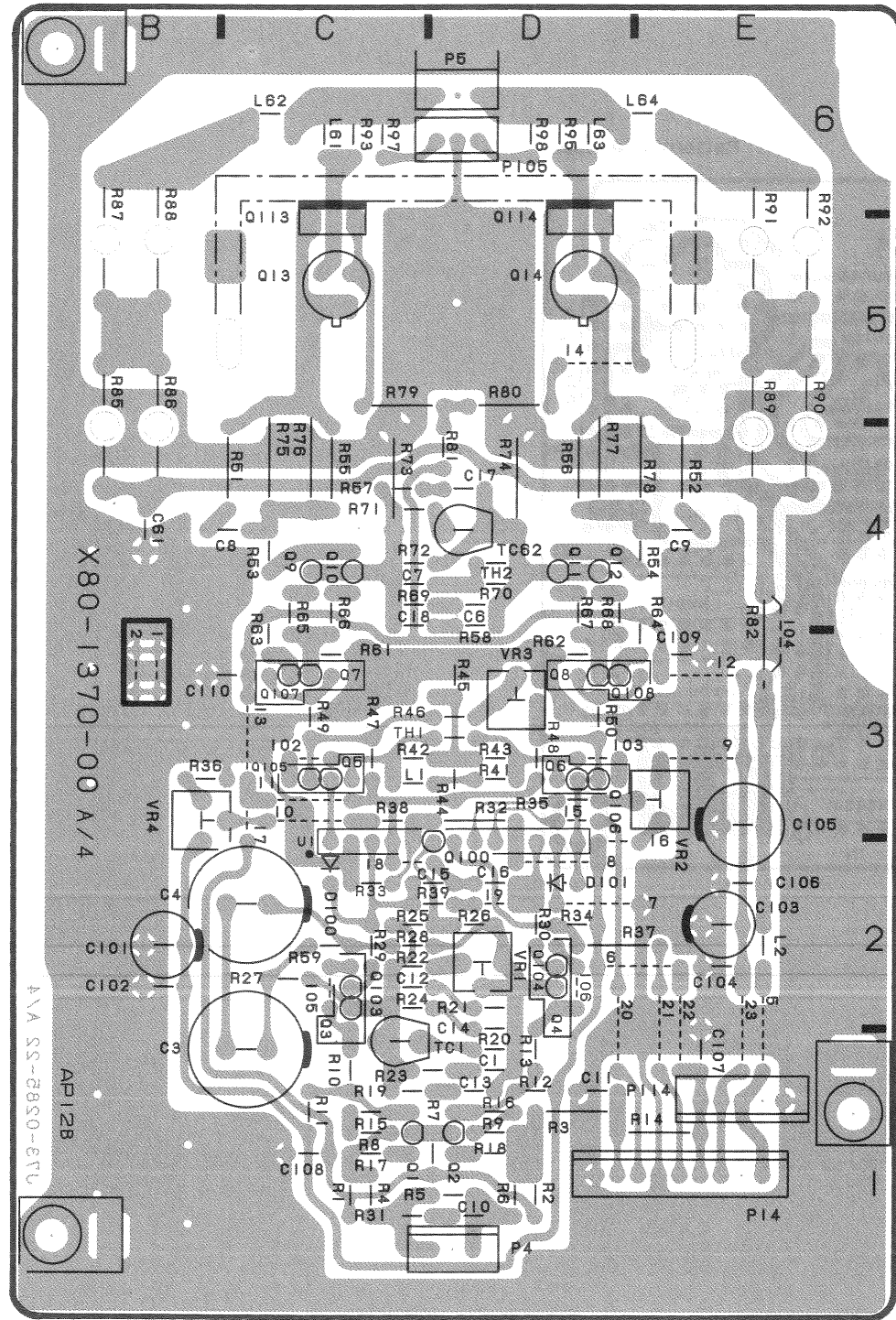
Pattern side view

Pattern side view

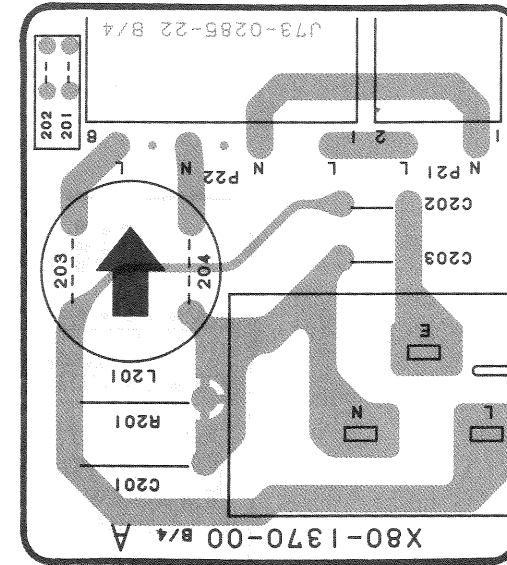


P.C. BOARD

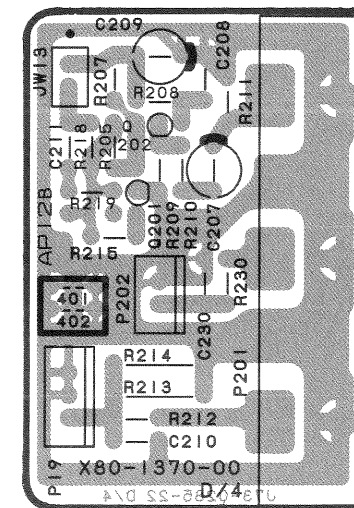
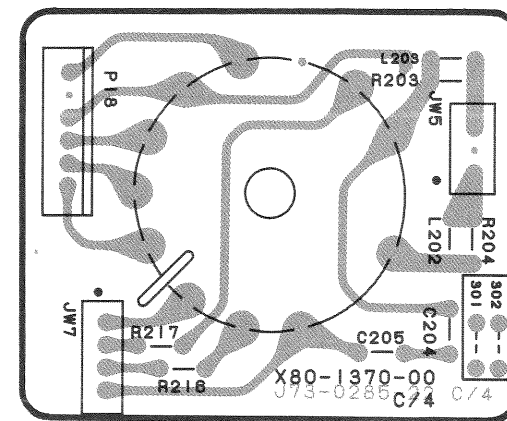
FINAL AMP UNIT (X80-1370-0X)



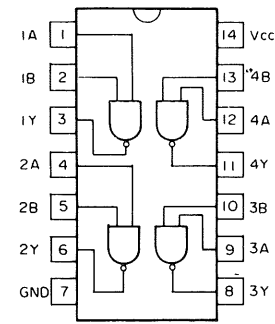
Pattern side view



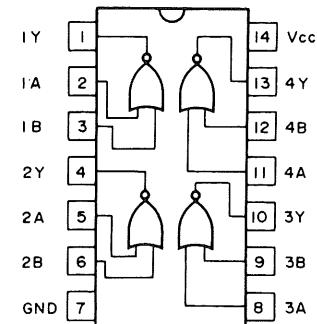
Pattern side view



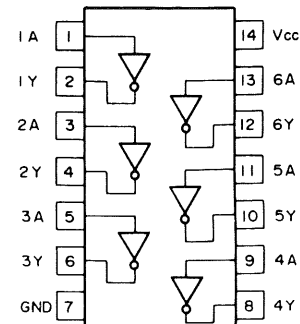
SEMICONDUCTORS



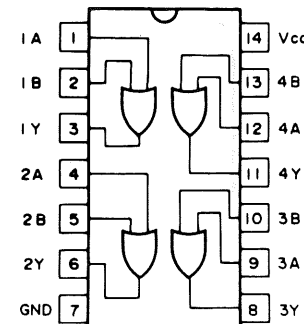
SN74LS00N



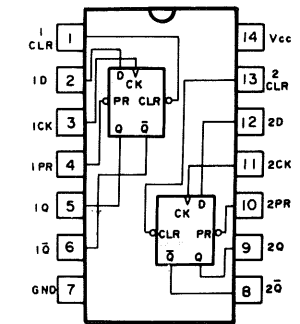
SN74ALS02N



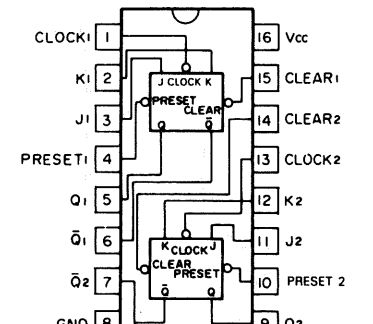
SN74ALS04BN



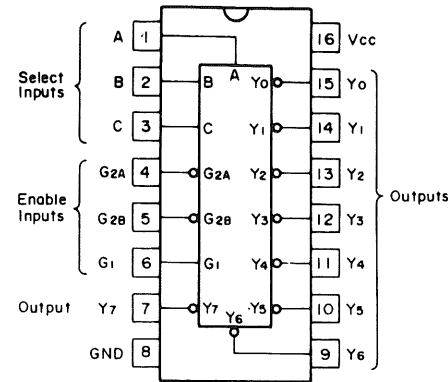
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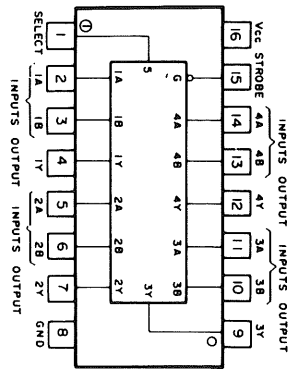
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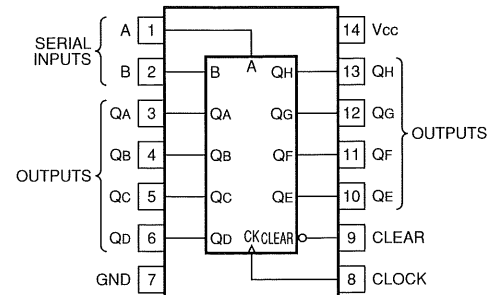
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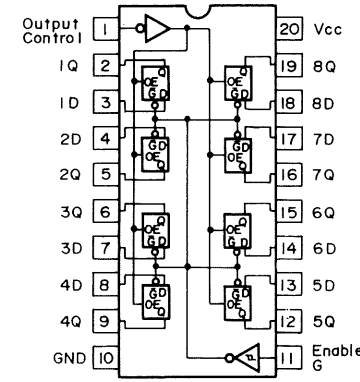
SN74ALS138N



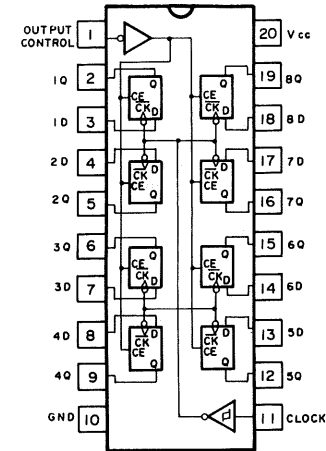
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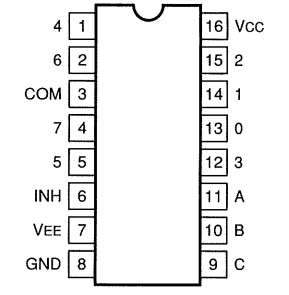
SN74LS164N



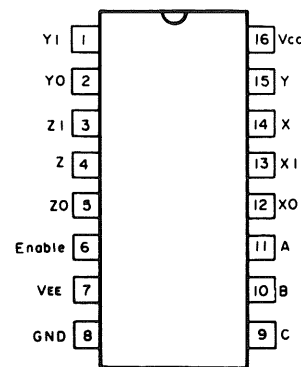
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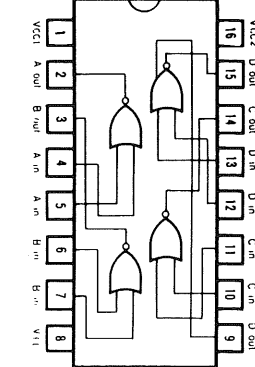
SN74ALS374AN



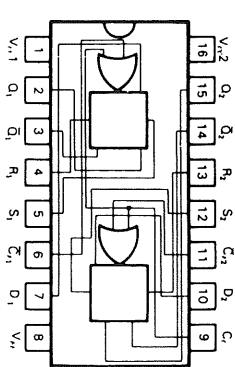
TC74HC4051AP



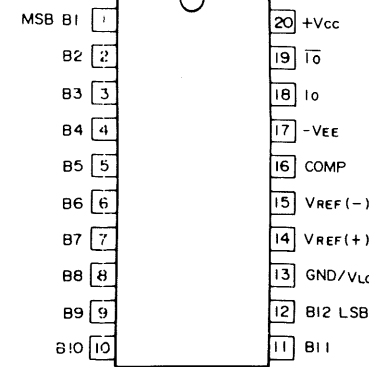
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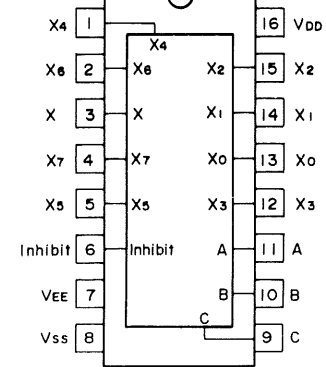
MC10102L
MC10H102L



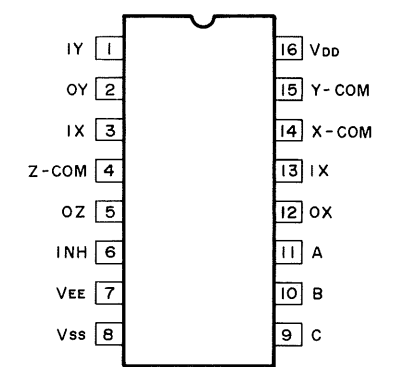
MC10131L
MC10H131L



HA17012PB

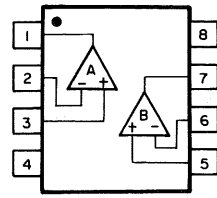


HD14051BP



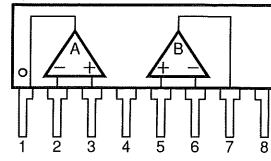
TC4053BP

SEMICONDUCTORS



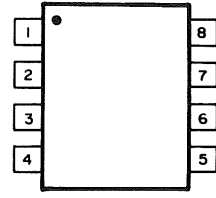
- Pin name
1. A OUTPUT
 2. A (-) INPUT
 3. A (+) INPUT
 4. V⁻
 5. B (+) INPUT
 6. B (-) INPUT
 7. B OUTPUT
 8. V⁺

NJM072BD
NJM072D
NJM4558D



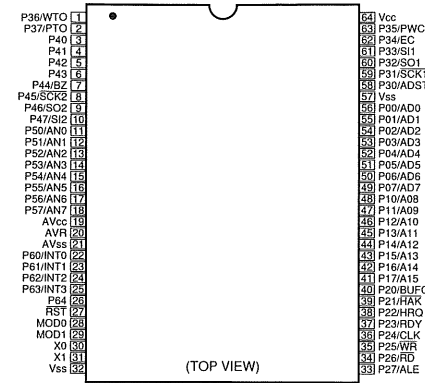
- Pin name
1. A OUTPUT
 2. A-INPUT
 3. A+INPUT
 4. V⁻
 5. B+INPUT
 6. B-INPUT
 7. B OUTPUT
 8. V⁺

NJM072L
NJM4558L

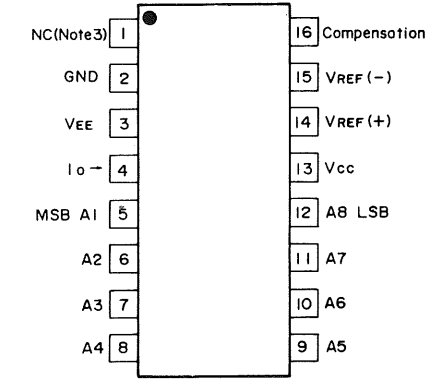


- Pin name
1. GROUND
 2. + INPUT
 3. - INPUT
 4. V⁻
 5. BAL
 6. BAL/STROBE
 7. OUTPUT
 8. V⁺

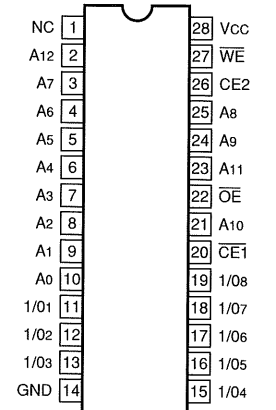
NJM311D



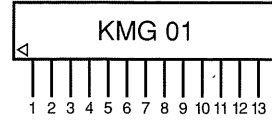
CTM5280



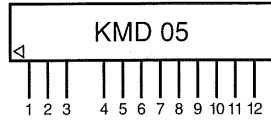
DAC0808LCN



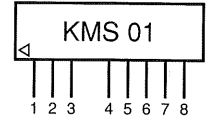
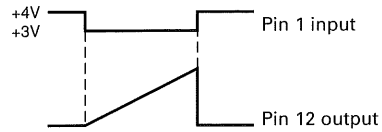
LC3664ASL-10



1. MIX signal output A
2. GND
3. Signal input A
4. + power supply
5. Bias setting
6. External control
7. R/O character signal input
8. R/O character position input
9. R/O switching signal
10. - power
11. Signal input B
12. GND
13. MIX signal output B



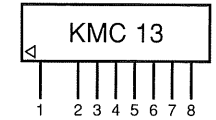
1. Sweep gate input
2. Sweep range input A
3. Sweep range input B
4. Sweep reference voltage input
5. Sweep range input C
6. Offset input
7. - power
8. GND
9. + power
10. External capacitor connection
11. External FET connection
12. Sweep signal output



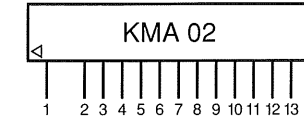
1. Analog signal input
2. + power
3. GND
4. Digital signal output A
5. Digital signal output B
6. Digital signal output C
7. Digital signal output D
8. Digital signal output E

Analog signal input [V]	Output				
	A	B	C	D	E
0.25 ~ 0.45	L	H	H	H	H
0.95 ~ 1.15	H	L	H	H	H
1.65 ~ 1.85	H	H	L	H	H
2.35 ~ 2.55	H	H	H	L	H
3.05 ~ 3.25	H	H	H	H	L

L : 1.0 [V] max
H : 4.5 [V] min

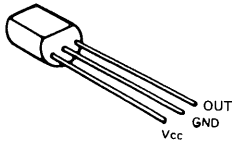


1. Signal input
2. Compensation
3. FET (source) connection
4. GND
5. + power
6. FET (drain) connection
7. - power
8. Signal output

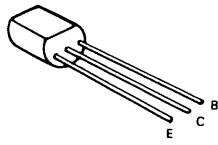


1. +140 V output
2. +140 V control
3. +55 V control
4. +55 V output
5. +12 V control
6. +12 V output
7. -12 V control
8. -12 V output
9. +5 V control
10. +5 V output
11. Sweep time reference voltage output
12. External capacitor connection
13. GND

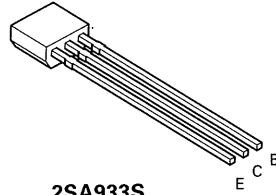
SEMICONDUCTORS



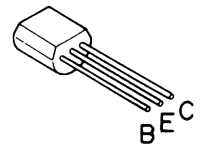
PST518B



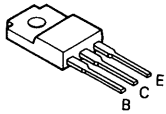
2SA720 (R)
2SA1005 (K)
2SA1208 (S)
2SC1318A (R)
2SC1907
2SC1923 (O)
2SC2551 (O)
2SC2910 (S)



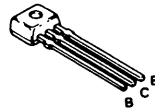
2SA933S
2SC1740S (R,S)



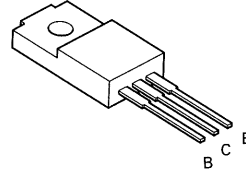
2SA1161
2SC2644
2SC3779 (D)



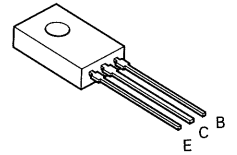
2SA1304
2SB1015 (Y)
2SD1406 (Y)



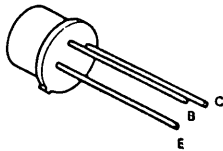
2SA1459 (K)



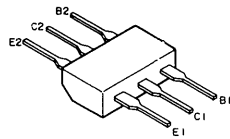
2SA1499 (P)



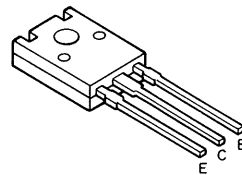
2SA1828 (E)
2SC4732 (E)



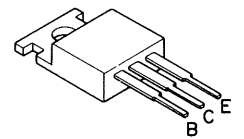
2SC1252



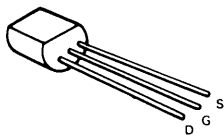
2SC3066 (G)



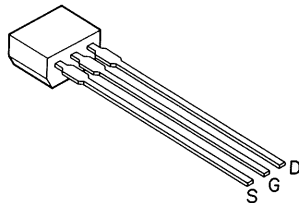
2SC3952 (D)



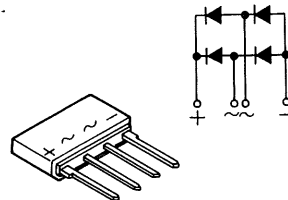
2SD613 (E)



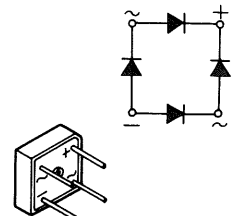
2SK170 (V)



2SK404 (E)



S1VB60



S4VB20F

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