

KENWOOD

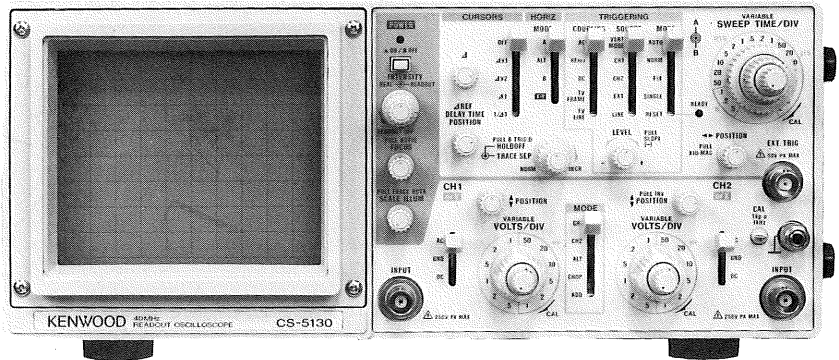
40MHz OSCILLOSCOPE

# CS-5130

## SERVICE MANUAL

S/No. 2110001 ~

KENWOOD CORPORATION



## **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.

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# SPECIFICATIONS

		<b>CS-5130</b>
<b>CRT</b>		150 mm rectangular with internal graticule
Acceleration Voltage		12 kV
Display Area		8 × 10 div (1 div = 10 mm)
<b>VERTICAL AXIS (CH1 and CH2)</b>		
Sensitivity		1 mV/div to 5 V/div: 1 mV to 2 mV/div ± 5%, 5 mV/div to 5 V/div ± 3%
Attenuator		12 steps, 1 mV/div to 5 V/div in 1-2-5 sequence Vernier control for fully adjustable sensitivity between steps
Input Impedance		1 MΩ ± 2%, approx. 30 pF
Frequency Response	DC	DC to 40 MHz, within -3 dB (5 mV/div to 5 V/div) DC to 15 MHz, within -3 dB (1 mV/div to 2 mV/div)
	AC	5 Hz to 40 MHz, within -3 dB (5 mV/div to 5 V/div) 5 Hz to 15 MHz, within -3 dB (1 mV/div to 2 mV/div)
Rise Time		8.7 ns (5 mV/div to 5 V/div) 17.5 ns (1 mV/div & 2 mV/div)
Signal Delay Time		Adequate to identify leading edge
Crosstalk		-40 dB or less (at 1 kHz)
Operating Modes	CH1	Single trace
	CH2	Single trace
	ALT	Two-waveform display, alternately
	CHOP	Two-waveform display, chopped
	ADD	CH1 + (± CH2) added display
Chop Frequency		Approx. 300 kHz
Channel Polarity		Normal or inverted, channel 2 only inverted
⚠ Maximum Input Voltage		500 Vp-p or 250 V (DC + AC peak)
<b>HORIZONTAL AXIS</b> Input thru CH2, × 10 MAG not included		
Operating Modes		X-Y operation is selectable with HORIZ MODE switch CH1 : Y axis CH2 : X axis
Sensitivity		Same as vertical axis (CH2)
Input Impedance		Same as vertical axis (CH2)
Frequency Response	DC	DC to 1 MHz, within -3 dB
	AC	5 Hz to 1 MHz, within -3 dB
X-Y Phase Difference		3° or less at 100 kHz
⚠ Maximum Input Voltage		Same as vertical axis (CH2)
<b>SWEEP</b>		
Type	A	A sweep
	ALT	A sweep (intensified for duration of B sweep) and B sweep (delayed sweep) alternating
	B	Delayed sweep
	X-Y	X-Y oscilloscope operation
Sweep Time	A	0.2 μs/div to 0.5 s/div ± 3%, in 20 ranges, in 1-2-5 sequence Vernier control for fully adjustable sweep time between steps
	B	0.2 μs/div to 50 ms/div ± 3%, in 17 ranges, in 1-2-5 sequence
Sweep Magnification		× 10 (ten times) ± 5% (± 8% in 0.2 μs-to-0.5 μs range)
Linearity		± 3% (± 5% for × 10 magnification)
Holdoff		Continuously variable from NORM to more than ten time (MAX)

# SPECIFICATIONS

CS-5130		
Trace Separation	Shifts B sweep trace continuously in vertical direction by 4 divisions or more with respect to A sweep	
Delayed Sweep	Continuous delay (AFTER DELAY) & triggered delay (B TRIG' D: triggered by A trigger)	
Delay Time	Continuous adjustable from 0.2 $\mu$ s/div to 0.5 s/div	
Delay Accuracy	$\pm$ (3% of set value + 1% of full scale) + (0 to 300 ns)	
Delayed Jitter	10000 : 1 of decoupled time axis A set value	
<b>TRIGGERING</b>		
Modes	AUTO, NORM, FIX, & SINGLE-RESET	
Trigger Source	VERT MODE	Triggered by input signal selected with vertical MODE selector
	CH1	Triggered by CH1 vertical signal
	CH2	Triggered by CH2 vertical signal
	LINE	Triggered by line frequency
	EXT	Triggered by external trigger signal
External Trigger Input Impedance	1 M $\Omega$ $\pm$ 2%, approx. 25 pF	
 MAX. EXT. Input Voltage	50 V (DC + AC peak)	
Coupling	AC, HFREJ, DC, TV-FRAME, & TV-LINE	
Trigger Sensitivity	At NORM position	
	AC	Trigger frequency range 10 Hz to 20 MHz (INT: 1 div, EXT: 0.15 Vp-p) 10 Hz to 40 MHz (INT: 1.5 div, EXT: 0.2 Vp-p)
	DC	Trigger frequency range DC to 20 MHz (INT: 1 div, EXT: 0.15 Vp-p) DC to 40 MHz (INT: 1.5 div, EXT: 0.2 Vp-p)
	HFREJ	Trigger frequency range is more than 50 kHz, and minimum amplitude (voltage) required for sync is increased.
	TV	FRAME, LINE INT: 1.0 div, EXT: 0.15 Vp-p
AUTO: Same as above specifications for above 50 Hz		FIX: 50 Hz to 20 MHz (INT: 1.5 div, EXT: 200 mV) 50 Hz to 40 MHz (INT: 2.0 div, EXT: 250 mV)
<b>CALIBRATION VOLTAGE</b>	1 V p-p $\pm$ 3%, square wave, positive polarity, approx. 1 kHz	
<b>INTENSITY MODULATION</b>		
Sensitivity	+ 5 V, positive voltage decreases brightness	
Input Impedance	Approx. 10 k $\Omega$	
Usable Frequency Range	DC to 5 MHz	
 Maximum Input Voltage	50 V (DC + AC peak)	
<b>VERTICAL AXIS SIGNAL OUTPUT (CH1 only)</b>		
Output voltage	Approx. 50 mVp-p/div (50 $\Omega$ termination)	
Output Impedance	Approx. 50 $\Omega$	
Frequency Response	100 Hz to 40 MHz, - 3 dB/50 $\Omega$ termination (1 mV/div, 2 mV/div: 100 Hz to 15 MHz, - 3 dB)	

# SPECIFICATIONS

		<b>CS-5130</b>
<b>READOUT</b>		
Set Value		CH1/CH2 scale factor (with probe detection); V-UNCAL, ADD, INVERT A/B sweep scale factor (magnification conversion): SWEEP-UNCAL, AFTER DELAY, TRIG' D, X-Y
Cursor Mode A mode only	$\Delta V1$	Voltage difference between $\Delta REF$ and $\Delta$ cursors on a CH1 scale factor basis
	$\Delta V2$	Voltage difference between $\Delta REF$ and $\Delta$ cursors on a CH2 scale factor basis
	$\Delta T$	Time difference between $\Delta REF$ and $\Delta$ cursors on the basis of A sweep scale factor
	$1/\Delta T$	Frequency between $\Delta REF$ and $\Delta$ cursors on the basis of A sweep scale factor
NOTE: The X-Y mode allows $\Delta V1$ measurement only.		
Cursor Measurement	Resolution	10 bits
	Measurement accuracy	± 4 %
	Measurable range	$\Delta V$ , Ratio: ± 3.6 div or more from the CRT center $\Delta T$ , $1/\Delta T$ , Ratio, Phase: ± 4.6 div or more from the CRT center
<b>TRACE ROTATION</b> (Electrical, adjustable from front panel)		
<b>POWER REQUIREMENT</b>		
Line Voltage		AC 100 V/120 V/220 V/240 V ± 10%
Line Frequency		50/60 Hz
Power Consumption		Approx. 47 W
<b>DIMENSIONS</b> (W×H×D)		319 (341)×132 (145)×380 (455) mm ( ) dimensions include protrusion from basic outline dimensions
<b>WEIGHT</b>		9.0 kg
<b>ENVIRONMENTAL</b>		
Within Specifications		10°C to 35°C, 85% max. relative humidity
Full Operation		0°C to 40°C, 85% max. relative humidity
<b>ACCESSORIES SUPPLIED</b>		
Probe		PC-33 (READOUT compatible probe) × 2
Attenuation		1/10
Input impedance		10 MΩ, 25 pF ± 10%
Power supply cable		1
Replacement Fuse		1 A × 2, 0.5 A × 2
Instruction Manual		1

\* Circuit and rating are subject to change without notice due to developments in technology.

# 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 on the rear panel. 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 100/120/220/240 V at frequencies from 50 Hz to 60 Hz.

### 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 a 100 V to 240 V, 50/60 Hz power source. Use the following procedure to change from 100 to 240 volt operation or vice versa.

1. Replace fuse F 1 with a fuse of appropriate value, 1 amp for 100 VAC to 120 VAC operation, 0.5 amp for 220 VAC to 240 VAC operation.
2. When performing the reinsertion of leadwire for the voltage conversion, the appropriate power cord should be used. (See Fig. 1.)

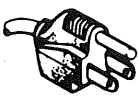
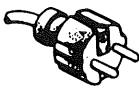


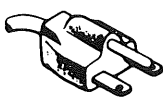
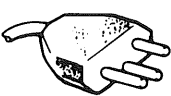
Plug configuration	Power cord and plug type	Factory installed instrument fuse	Line cord plug fuse	Parts No. for power cord set
	North American 120 volt/60 Hz Rated 15 amp (12 amp max; NEC)	1 A, 250 V Fast blow 6 × 30 mm	None	Cord: E30-1820-05
	Universal Europe 220 volt/50 Hz Rated 16 amp	North Europe 500 mA, 250 V Slow blow 5 × 20 mm	None	Cord: E30-1819-05
		Other Europe 0.5 A, 250 V Fast blow 6 × 30 mm		
	U.K. 240 volt/50 Hz Rated 13 amp	0.5 A, 250 V Fast blow 6 × 30 mm	0.8 A Type C	—
	Australian 240 volt/50 Hz Rated 10 amp	0.5 A, 250 V Fast blow 6 × 30 mm	None	Cord: E30-1821-05
	North American 240 volt/60 Hz Rated 15 amp (12 amp max; NEC)	0.5 A, 250 V Fast blow 6 × 30 mm	None	—
	Switzerland 240 volt/50 Hz Rated 10 amp	0.5 A, 250 V Fast blow 6 × 30 mm	None	—

Fig. 1 Power Input Voltage Configuration

# CIRCUIT DESCRIPTION

## Vertical Preamp Circuit (X73-1790-01)

The signal from the input terminals of CH1 OR Y and CH2 OR X is attenuated to the appropriate value by ATT and sent to head amplifiers Q3 to Q5 (CH2: Q103 to Q105). The signal is then sent to the cascade U2 (CH2: U102) through the GAIN switch (connected to the ATT).

The feedback of the direct current component is applied by the operation amplifier U1 (CH2: U101) to reduce the drift in the head amplifier.

The cascade amplifier U2 (CH2: U102) is a gain switch type of amplifier. The amplification degree (at X5 MAG) reaches five times the normal level (5 mV/div to 5V/div range) within the range of 1 mV/div, 2 mV/div. The output signal from the cascade AMP U1 (CH2: U101) is input to the second cascade amplifier Q6 to Q9 (CH2: Q106 to Q111).

The CH1 and CH2 signals are selected by the V-MODE switch and applied to the delay line driver Q201 and Q202. The Q110 and Q111 of CH2 are used for inversion.

## Trigger Signal Switch Circuit (X73-1790-01)

The signal output by the emitter of the CH1 and CH2 second cascade amplifier is used as the trigger signal for CH1 OUT/CH1 TRIG pickoff amplifiers Q11 and Q12 and CH2 TRIG pickoff amplifiers Q112 and Q113. The signal amplified by each pickoff amplifier for CH1 and CH2 is selected by the switch signal from the horizontal unit through P7 and applied to the trigger preamplifier of the horizontal unit through P4.

The signal that is picked up from the Q12 collector of the CH1 trigger pickoff amplifier is output from P1 through emitter follower Q13.

## Vertical Final Amplifier (X73-1790-01)

The signal from the delay line is amplified in the terminal by cascade amplifiers Q205 to Q207. The signal converted to the low impedance by the Q209 and Q210 emitter follower is amplified to an adequate level to drive the CRT y-deflection by final stage amplifiers Q211 to Q220.

## Power Supply Circuit (X73-1790-01)

The power supply consists of four stabilization and two destabilization systems. The standard power supply is +12V and has a voltage adjustment circuit. The -12V power supply uses a +12V reference voltage for stabilization. The +5V and +145V power supply uses a -12V reference voltage for stabilization. The scale illumination circuit power supply is  $\pm 18V$ . The voltage rectified by D301 is applied to the horizontal unit scale illumination circuit through P12.

The +18V is supplied to the primary side of the horizontal unit high-voltage oscillation circuit through P10.

## CAL Circuit (X73-1790-01)

The oscillation circuit produces a 1 kHz square wave by the C-MOS IC U351a and U351b multivibrator. The waveform is produced by the U351c and U351d and outputs the 1Vp-p CAL signal from P13 by the low-resistance separation.

## Trigger Circuit (X74-1490-01)

The trigger signal from the vertical section is sent to the source coupling switch through signal comparators Q1 and Q2 and added to the Q4 and Q5 level comparator by the low impedance signal of the differential amplifier at FET Q3. This signal is formed by the Schmidt trigger circuit that terminates the slope switch, activates the A and B sweep gate and automatic free run circuits in the oscillation circuit.

Q6 and Q7 are the signal differential detection circuits for the FIX synchronization amplified at Q8 and Q9. The mid-range voltage at this point is applied to the Schmidt simulation circuit. Q10, Q12 and the U1c are the synchronization signal separation circuit for the television synchronization. The X-signal for the X-Y operation is obtained from the CH2 trigger pickoff and applied to the horizontal amplifier Q301 at the Q16 to Q18 output circuit.

## Horizontal Sweep Circuit (X74-1490-01)

If the trigger pulse is applied to the U102a flip-flop, the output is switched and the Miller integrator, consisting of Q104 to Q108 and U103, starts the sweep. The sweep length of this sweep signal is determined at Q113 and the flip-flop U102b. After the stand-by time is determined by the Q110, Q111, and U112 hold-off circuits, the unit waits for the trigger signal.

After the delay time is determined by the voltage from the delay pickoff comparator Q211 to Q215 and the delay time position, the flip-flop U201a output is switched and the Miller integrator consisting of Q204 to Q208 and U202 starts the B-sweep.

The A- and B-sweep signals are switched by the horizontal switching circuit that includes the H-MODE switch, U203, U104 and applied to the horizontal amplifier Q301.

## Horizontal Amplifier Circuit (X74-1490-01)

The sweep signal of the sweep circuit is applied to the drive amplifier Q301 to Q304. The X1 or X10 gain setting is selected at this time. The current amplification signal is converted to the voltage signal at Q305 and Q306, and then amplified enough to drive the CRT deflection by the high amplification ratio and low-output impedance of the final amplifier Q307 to Q312.

## Z-axis Amplifier and High-voltage Circuit (X74-1490-01)

The unblanking signal from the blanking control circuit is inversion amplified by the blanking amplifier Q401, Q403, Q405 and Q407. It layers the cathode voltage at the direct current reproduction circuit at D405 and D406 and drives the first grid cathode of the CRT.

Q404, Q406 and Q408 produce the focus voltage from the blanking signal by the phase inversion amplifier for the linear focus.

The focus voltage is layered in the high-voltage in the direct current reproduction circuit D410 and D411 and drives the positive pole of the CRT terminal. The -1700V used for the cathode pole drive is produced by the control circuit U401 and the DC-DC converter at the blocking oscillator Q409. The third positive cathode voltage is produced by rectifying the DC-DC converter second side coil voltage six times.

# CIRCUIT DESCRIPTION

## Trace Rotation Circuit and Scale Illumination Circuit (X74-1490-01)

The trace rotation circuit drives the rotation coil located in the CRT cone by the current from the common emitter of the complimentary transistors Q410 and Q411. The scale illumination circuit performs the light adjustment by Q412 and Q413.

## Readout X-character Signal Switching Circuit (X74-1490-01)

The X-signal and the request signal from the readout unit (X77-1510-00) are applied to the switching amplifier Q501 and Q502 through the comparator Q503 and Q504 from P36.

The gain and center of the X-character signal are determined, supplied to the base of Q305 and Q306 of the horizontal axis amplifier which drives the horizontal axis final amplifier while the sweep is stopped.

## Readout Z-axis Signal Switching Circuit (X74-1490-01)

The blanking signal from the readout unit (X77-1510-00) is applied to the C-MOS IC U501 through P37. The pulse width output signal of the R521 and C503 timing is applied to the Z-axis input.

The unblanking signal is applied to the Z-axis input through Q505 and Q506 from P37. This signal is also applied to the readout unit as a readout-off signal through the operation amplifier U502 from P37.

## Readout Y-Character Signal Switching Circuit (X73-1790-01)

The Y-signal and the request signal from the readout unit (X77-1510-00) is applied to the switching amplifier Q401 and Q402 through the comparator Q403 and Q404 from P36. The gain and center of the Y-character signal is determined, supplied to the Q207 and Q208 emitters of the vertical axis final amplifier and drives the vertical axis final amplifier while the sweep is stopped.

## R/O UNIT (X77-1510-00)

The readout unit functions include the three features described below.

- 1) Import unit  
This unit imports the data for each switch for the CRT readout display. (This consists of U17-U24 in the IC).
- 2) Display unit  
This forms the X-axis and Y-axis for the CRT readout display. (This includes the U1-U5, U7, U8, U13, and R33 of each IC and the voltage).
- 3) Cursor unit  
This includes of A/D converter and calculator for the cursor measurement.  
(This includes U6, U8-U11, U14, U23 of the IC.)

### Import unit

This unit imports data for each switch operation. A one-chip MPU U23 transfers the data to the character generator (U7). A reference clock is provided from a 10-MHz oscillator that uses U16 and X1.

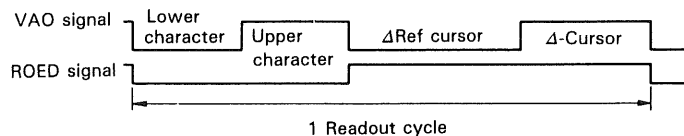
The A0 - A7 low order addresses are output to the data bus by time assignment. U18 latches the low order addresses by the ALE signal output from the MPU.

The switch data necessary for the monitor display is imported to the MPU every 80 ms through the I/O port of U19 - U22. U17 is output by the I/O port decoder and the output signal RS0-RS3 is output in 80 ms cycles.

### Display unit

The character display is controls the character generator U7 by the character counter (U8 DC1-CD7) and the dot counter (U8 DC0-DC4) using the random scan method (X-Y display).

The readout display is performed in 13.5 ms for each cycle. One cycle of the readout display is separated into four parts, low characters, high characters, the  $\Delta$ REF cursor and the  $\Delta$ -Cursor. The timing is then switched by pins U8-89 of the ROED signal and pins U8-U16 of the VAO signal.



5 × 7 dot configuration character data is input to the character generator U7.

The three bits DD0 - DD2 are X-axis data and the four bits DD3 - DD6 are Y-axis data. DD7 is the character start and end control bit.

The digital signal output from U7 is converted to each analog signal by the data converter U1 for the X-axis signal, V33 and R33 and the D/A converter for the Y-axis signal configured by U3 and R33. The X-axis and Y-axis signals are sent through analog switch U4 and U5 and U13 of the buffer amplifier to the Vertical unit (X73-1790-01).

The character dot display is controlled by the ROUB signal (U8-86 pin), ROB signal (U8-87 pin) and the ROQ signal (U8-88 pin).

The real waveform display is cleared by the ROB signal, the real waveform and the readout switch are performed by the ROQ signal and the readout dot display is performed by the ROUB signal.

The three signals described above are controlled by the ROSP signal in pin 83 of U8 (readout off signal  $\overline{R/O\ OFF}$ ).



# CIRCUIT DESCRIPTION

## Cursor Unit

The  $\pm 1.25$  V cursor reference voltage is formed by the low-resistance separation of the +10 V power supply voltage and output through U11, U15, Q1 and Q2. This  $\pm 1.25$  V corresponds to the full scale voltage of the 10-bit separation function of the cursor measurement.

The voltage set by the cursor VR is sent directly to the analog switch U14 for the X-axis measurement and reduced 80% for the Y-axis measurement. U14 performs the  $\Delta T$  and  $\Delta V$  switching and the  $\Delta REF$  and  $\Delta$ -Cursor switching.

The MPU U23 sends the 10-bit data to the D/A converter U9 where the data is converted to analog voltage. The converter U10 compares the voltage from analog voltage and the cursor VR and returns the output to MPU U23.

U8, U9, U10 and U23 obtained by this process configure the A/D converter. This A/D converter converts the analog voltage from the  $\Delta REF$  and  $\Delta$ -Cursor VR to 10-bit digital data. The conversion speed for the A/D converter is 80 ms.

Next, the MPU performs the cursor calculations using this converted 10-bit digital data. The analog voltage output from the D/A converter U9 is converted to the  $\Delta REF$  and  $\Delta$ -Cursor by analog switch U6 and is maintained in each hold circuit every 80 ms for the hold voltage.



# 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-706 (KENWOOD)	Impedance: More than 10 M $\Omega$ , Measuring range: 0.01 V to 199 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 $\Omega$ , 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-911A (KENWOOD)	—
Oscilloscope	CS-2110 (KENWOOD)	Sensitivity: more than 5 mV Frequency response: More than 100 MHz
Time-Marker Generator	TG-501 (Tektronix)	Time mark: 0.5 s to 0.1 $\mu$ s repetitive waveform
High-Voltage Probe	—	Input Impedance: 1000 M $\Omega$
Termination	—	Impedance: 50 $\Omega$ Accuracy: within 3%
Termination	—	3 watts type impedance: 50 $\Omega$
Attenuator	—	- 20 dB attenuation (50 $\Omega$ )

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, ASTIG	Optimum position
CH1, CH2 $\updownarrow$ POSITION	Mechanical center
CH1, CH2 STORAGE POSI	Mechanical center
$\blacktriangleleft \blacktriangleright$ POSITION/PULL $\times 10$ MAG	Mechanical center, push
VARIABLE, H.VARIABLE (VOLTS/DIV, SWEEP TIME/DIV)	CAL
AC-GND-DC (CH1 and CH2)	DC (GND at no signal)
Vertical MODE	CH1
CH2 PULL INV	Push (NORM)
TRIGGERING COUPLING	AC
TRIGGERING SOURCE	CH1
TRIGGERING LEVEL	Mechanical center, push
TRIGGERING MODE	AUTO
VOLTS/DIV (CH1 and CH2)	5 mV/DIV
A, B SWEEP TIME/DIV	1 ms/DIV
TRACE SEP	Fully CCW
HOLDOFF	Fully CCW, NORM, Push
HORIZONTAL MODE	A
DELAY TIME POSITION	Optimum position

Table 2

# ADJUSTMENT

## 1. POWER SUPPLY AND CRT SECTION ADJUSTMENTS

Item	Adjustment VR (TC)	P.C.B.	Procedure
+ 12 V	VR301	X73-1790	Adjust VR301 so that the voltage at pin 5 of the connector P14 is + 12 V.
CRT Center	VR202	X73-1790	By CH2 post, locate a point at which luminance line does not move on the PULL and PUSH setting of CH2 INV. Keep CH2 post as it is, and adjust VR202 to center on the screen.
Vertical Center Voltage	VR204	X73-1790	With short-circuiting held as it is, adjust VR204 so that the voltage between CRT socket pin "9" and GND is 75 V. * CRT socket pin "9" refers to titanium oxide porcelain capacitor C5. After adjustment, undo the short-circuiting.
Focus Center	VR402	X74-1490	Push the FOCUS knob in (for the FOCUS operation) and then set it to the mechanical center position. Pull the knob out (for the ASTIG operation), display a spot on the screen, and adjust the ASTIG control and VR402 to minimize the dimension of the spot.
B Intensity	VR403	X74-1490	SWEEP A : 0.1 ns/div. SWEEP B : 1 $\mu$ s/div. HORIZONTAL MODE ALT Set VR404 nearly at the center. (At that time, check that the difference in luminance between SWEEP A and SWEEP B is explicitly known.)
Intensity	VR401	X74-1490	Display the spot on the CRT screen, and adjust VR401 so that the spot disappears when the INTEN knob is set to the 10-o'clock position.

## 2. VERTICAL SECTION ADJUSTMENTS

Item	Adjustment VR (TC)	P.C.B.	Procedure
CH1 Waveform Shaping	TC2 TC4	X73-1790	AC-GND-DC : DC Apply 10 kHz square wave to CH1 INPUT (with the amplitude extending over 4 to 6 div). Set CH1 VOLTS/DIV to 0.1 V range (and 1 V range), and adjust TC2 (and TC4) so that the waveform becomes flat in both ranges.
CH2 Waveform Shaping	TC102 TC104	X73-1790	Adjust in the same way as for CH1.
CH1 Input Capacity	TC1 TC3	X73-1790	AC-GND-DC : DC CH1 VOLTS/DIV : 5 mV Connect the capacity meter to the CH1 INPUT, and measure the input capacity in the 5 mV range. Adjust TC1 and TC3, alternately, so that the input capacity in the 0.1 V and the 1 V ranges equals the same capacity as in the 5 mV range.
CH2 Input Capacity	TC101 TC103	X73-1790	Adjust in the same way as for CH1.
CH1 Step ATT Balance	VR1 VR3	X73-1790	Adjust VR3 so that the position of the luminescent line does not change even when the vertical attenuator is selected between 1 and 2 mV range. Switch the range between 2 and 5 mV ranges, and perform the same adjustment using VR1.
CH1 Variable Balance	VR6	X73-1790	VOLTS/DIV : 10 mV Adjust VR6 so that the position of the luminescent line does not change even if the VARIABLE knob is rotated. Vary the settings of the VOLTS/DIV and VARIABLE controls and see if the trace position also moves; if it does, adjust VR1, 3 and 6 again.

# ADJUSTMENT

Item	Adjustment VR (TC)	P.C.B.	Procedure
CH2 Step ATT Balance	VR101 VR103	X73-1790	Adjust in the same way as for CH1.
CH2 Variable Balance	VR106	X73-1790	Adjust in the same way as for CH1.
CH1 Position Center	VR7	X73-1790	CH1 POSITION : Mechanical center position CH1 VOLTS/DIV : 5 mV Adjust VR7 so that the trace is located on the center of the screen.
CH2 Position Center	VR107	X73-1790	Adjust in the same way as for CH1.
ADD position	VR201	X73-1790	Set the channel 1 and channel 2 position controls so that the trace is located on the center of the screen and select the vertical MODE switch to ADD position. Adjust VR201 to center the trace vertically.
CH1 Gain	VR9	X73-1790	CH1 VOLTS/DIV : 5 mV Input a square wave signal having an amplitude of 20 mV, and adjust VR9 so that the CRT amplitude becomes 4 div.
CH1 1 mV Range Gain	VR4	X73-1790	CH1 VOLTS/DIV : 1 mV Input a square wave signal having an amplitude of 5 mV, and adjust VR4 so that the CRT amplitude becomes 5 div.
CH2 Gain	VR109	X73-1790	Adjust in the same way as for CH1.
CH2 1 mV Range Gain	VR104	X73-1790	Adjust in the same way as for CH1.
X Gain	VR2	X74-1490	CH2 VOLTS/DIV : 5 mV HORIZONTAL MODE: X-Y Input the square wave signal having an amplitude of 20 mV into CH2 INPUT, and adjust VR2 so that the CRT amplitude in the horizontal direction becomes 4 div.

# ADJUSTMENT

## 3. TRIGGER SECTION ADJUSTMENTS

Item	Adjustment VR (TC)	P.C.B.	Procedure
Trigger Level Center	VR1	X74-1490	TRIGGERING MODE : AUTO SOURCE : CH1 COUPLING : AC LEVEL : Mechanical center position CH1 VOLTS/DIV : 5 mV Input a 1 kHz sine wave into CH1 INPUT, and adjust the oscillator so that the CRT amplitude becomes 6 div. Adjust VR1 so that start point of the luminescent line is at the center of the CRT (vertical direction).
CH1 Trigger DC Coupling	VR11	X73-1790	After adjusting the trigger level center, set the TRIGGERING COUPLING to the DC position. Adjust VR11 so that the start point of the luminescent line is at the same position as in the AC mode.
CH2 Trigger DC Coupling	VR111	X73-1790	TRIGGERING MODE : AUTO SOURCE : CH2 COUPLING : AC CH2 VOLTS/DIV : 5 mV Input a 1 kHz sine wave to CH2 INPUT, and adjust the oscillator so that the CRT amplitude becomes 6 div. Adjust the TRIGGERING LEVEL so that the start point of the luminescent line is at the center of the CRT. Set the TRIGGERING COUPLING to the DC position. Adjust VR111 so that the start point of the luminescent line is at the same position as in the AC mode.

## 4. HORIZONTAL SECTION ADJUSTMENTS

Item	Adjustment VR (TC)	P.C.B.	Procedure
B Sweep Start Point	VR202	X74-1490	HORIZONTAL MODE : ALT A and B SWEEP TIME/DIV: 1 ms Adjust VR202 to coincide the start point of B sweep with that of A sweep.
1 ms Range Sweep Time	VR101 VR201	X74-1490	SWEEP TIME/DIV : 1 ms Input a 1 ms marker signal into CH1 INPUT. Adjust VR201 so that the peak of the marker signal matches the CRT scale divided in 1 div.
10 $\mu$ s Range Sweep Time	TC101 TC201	X74-1490	SWEEP TIME/DIV : 10 $\mu$ s Input a 10 $\mu$ s marker signal into CH1 INPUT, and adjust in the same way as for 1 $\mu$ s adjustment.
$\times 10$ MAG Gain	VR302	X74-1490	HORIZONTAL MODE : A A SWEEP TIME/DIV : 1 ms Input a 1 ms marker signal into CH1 INPUT, and match the peak of the marker signal with the CRT scale divided in 1 div. Pull the PULL $\times 10$ MAG knob (to set to the $\times 10$ MAG status), and adjust VR302 so that the interval between peaks becomes 10 div.
$\times 10$ MAG Center	VR301	X74-1490	A SWEEP TIME/DIV : 1 ms Input a 5 ms marker signal into CH1 INPUT. Pull the PULL $\times 10$ MAG knob (to set to the $\times 10$ MAG status), and adjust the horizontal POSITION so that the peak of the waveform is at the vertical scale line at the center of the CRT. Push the PULL $\times 10$ MAG knob (to release the $\times 10$ MAG mode) and adjust VR301 so that the peak of the waveform matches the vertical scale line at the center of the CRT.

# ADJUSTMENT

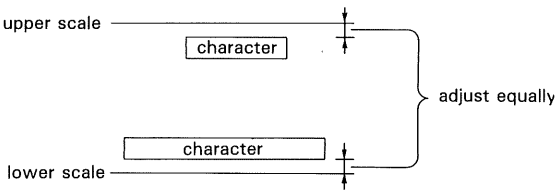
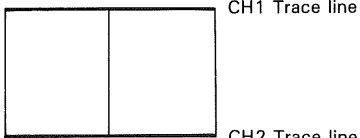
Item	Adjustment VR (TC)	P.C.B.	Procedure
Delay Time Position	VR203 VR204	X74-1490	<p>HORIZONTAL MODE : ALT            A SWEEP TIME/DIV : 0.1 ms            B SWEEP TIME/DIV : 1 <math>\mu</math>s</p> <p>Operate ◀▶ POSITION to bring the starting point of A trace to the left end of the graticule line on the CRT screen.</p> <p>Adjust VR203 so that B trace may appear on 0.2 div position when rotated the DELAY TIME POSITION control to counter-clockwise.</p> <p>Adjust VR204 so that B trace may appear on 10.2 div position when rotated the DELAY TIME POSITION control to clockwise.</p> <p>Repeat above 2 or 3 times.</p>
X Position Center	VR3	X74-1490	<p>Adjust the horizontal POSITION knob so that the sweep start point moves to the vertical scale line at the left end of CRT.</p> <p>Switch to the X-Y mode and adjust VR3 to bring the spot to the center of CRT screen.</p>

## 5. OVERSHOOT AND CAL ADJUSTMENTS

Item	Adjustment VR (TC)	P.C.B.	Procedure
Overshoot	<For CH1> VR205 TC203 VR203 TC201 TC202 VR8 TC6 VR2 TC5 <For CH2> VR108 TC106 VR102 TC105	X73-1790	<p>CH1, 2 VOLTS/DIV : 5 mV            CH1, 2 AC-GND-DC : DC            SWEEP TIME/DIV : 0.2 <math>\mu</math>s            PULL X10 MAG : PULL            CH1/2 ATT : 6 mV/div.            AC-GND-DC : DC            Sweep time : 0.2 <math>\mu</math>s/div.</p> <p>Connect the oscilloscope to CH1 OUT on the rear. (5 mV/div range)            Input a 1 MHz square wave signal to CH1 INPUT 6 divisions.</p> <ul style="list-style-type: none"> <li>• Perform a rough adjustment in the following procedure so as to suppress overshoot down to as less as possible.               <ol style="list-style-type: none"> <li>1. VR205 and TC203 for low frequency band.</li> <li>2. VR203, TC201 and TC202 for middle to high frequency band.</li> <li>3. VR5 and TC6 for middle frequency band.</li> </ol> </li> <li>• Set the square wave at CH1 OUT to a quantity of 6 divisions, and adjust VR2 and TC5 so that the square wave at CH1 out is formed as shown on the right.</li> <li>• Adjust the waveform in the following procedure.               <ol style="list-style-type: none"> <li>1. VR8 and TC6 for middle frequency band.</li> <li>2. VR203, TC201 and TC202 for middle to high frequency band.</li> <li>3. VR205 and TC203 for low frequency band.</li> </ol> </li> <li>• Input a 1 MHz square wave signal to CH2 INPUT 6 divisions.</li> <li>• Adjust the waveform.               <ol style="list-style-type: none"> <li>1. TC106 and VR108 for middle frequency band.</li> <li>2. TC105 and VR102 for high frequency band.</li> </ol> </li> </ul> <p>After adjustment, check if the frequency response is adequate in more than 4.8 divisions.</p>
CAL Adjustment	VR351	X73-1790	<p>Connect the oscilloscope to the CAL terminal and set it to 0.2 V/div. Adjust VR351 so that the amplitude is of 5 divisions for 40 MHz input.</p>

# ADJUSTMENT

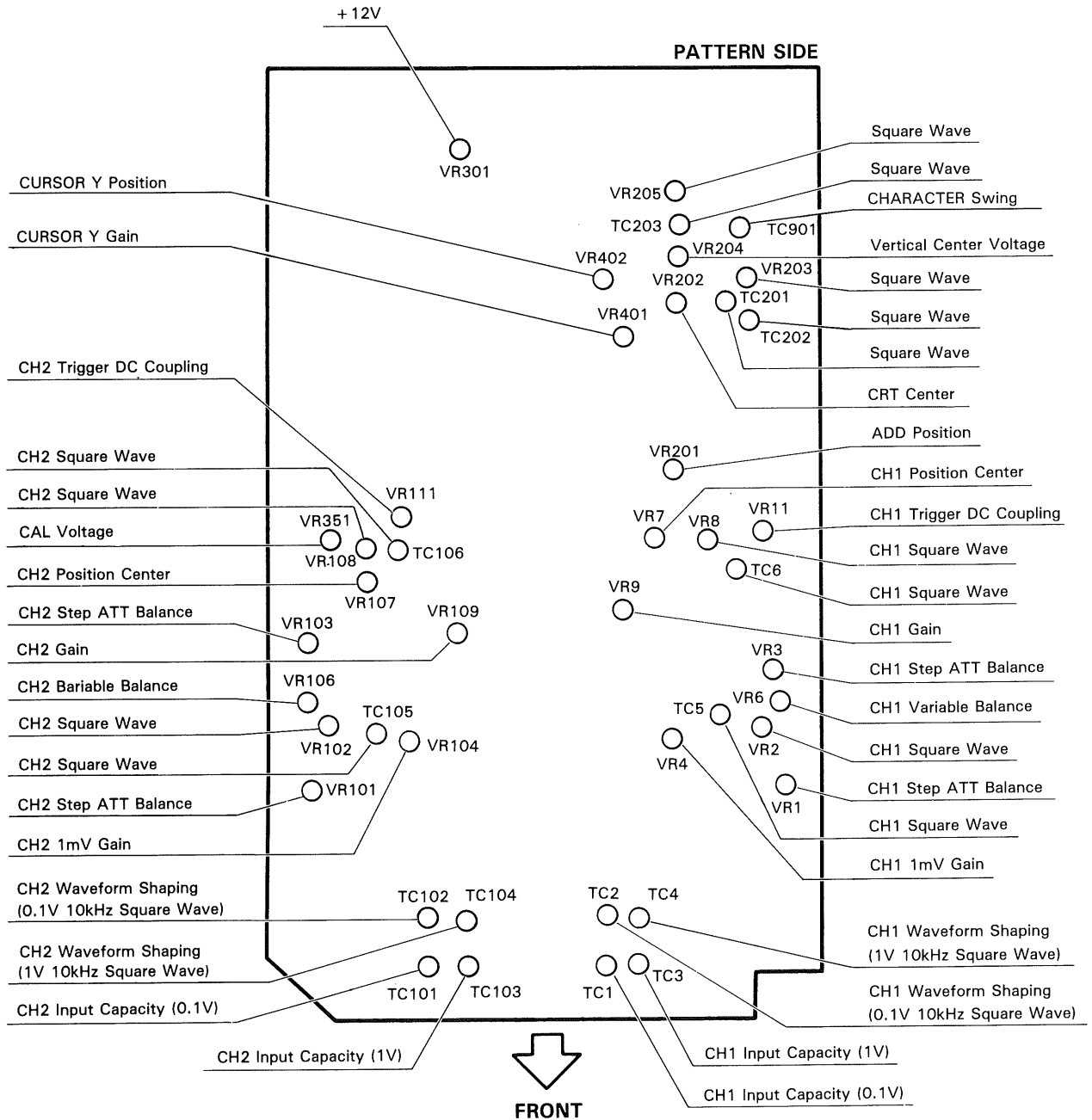
## 6. CURSOR SECTION ADJUSTMENT

Item	Adjustment VR (TC)	P.C.B.	Procedure
Cursor Y Gain and Position	VR401 VR402	X73-1790	<p>CURSORS : <math>\Delta V1</math>  <math>\Delta</math> : Turn fully clockwise  <math>\Delta REF</math> : Turn fully counterclockwise</p> <p>Adjust VR401 so that the interval between cursors becomes 8 div.            Adjust VR402 so that the two cursors move to the upper and lower ends of the horizontal scale line in the CRT.            If it is impossible, adjust the interval between cursors and the horizontal scale line becomes the same for both upper and lower ends.</p>
R/O CHARACTER Position	VR2	X77-1510	<p>Use VR2 to adjust the read out characters so that they have same distance from that upper and lower scales of the screen.</p> 
Cursor X Gain and Position	VR501 VR502	X74-1490	<p>CURSORS : <math>\Delta T</math>  <math>\Delta</math> : Turn fully clockwise  <math>\Delta REF</math> : Turn fully counterclockwise</p> <p>Adjust VR501 so that the interval between two cursors becomes 10 div.            Adjust VR502 so that the two cursors move onto the vertical scale lines at the left the right ends of CRT.</p>
R/O Cursor Length	VR1	X77-1510	<p>CURSORS : <math>\Delta V1</math></p> <p>Adjust VR1 to bring the left end of the cursor on the vertical scale line at the first division to the right of the left side of CRT screen.</p>
CHARACTER Swing	TC901	X73-1790	<p>CURSORS : <math>\Delta T</math>            HORIZ MODE : ALT            A SWEEP TIME/DIV : 5 ms</p>  <p>Adjust the CH1 and CH2 trace lines with the <math>\blacklozenge</math> POSI. as shown in the right sketch, then, adjust with TC901 so that the longitudinal direction swing of the readout characters disappears. When the SWEEP TIME is 5 to 1 <math>\mu s</math>, make sure that no character swing appears.</p>



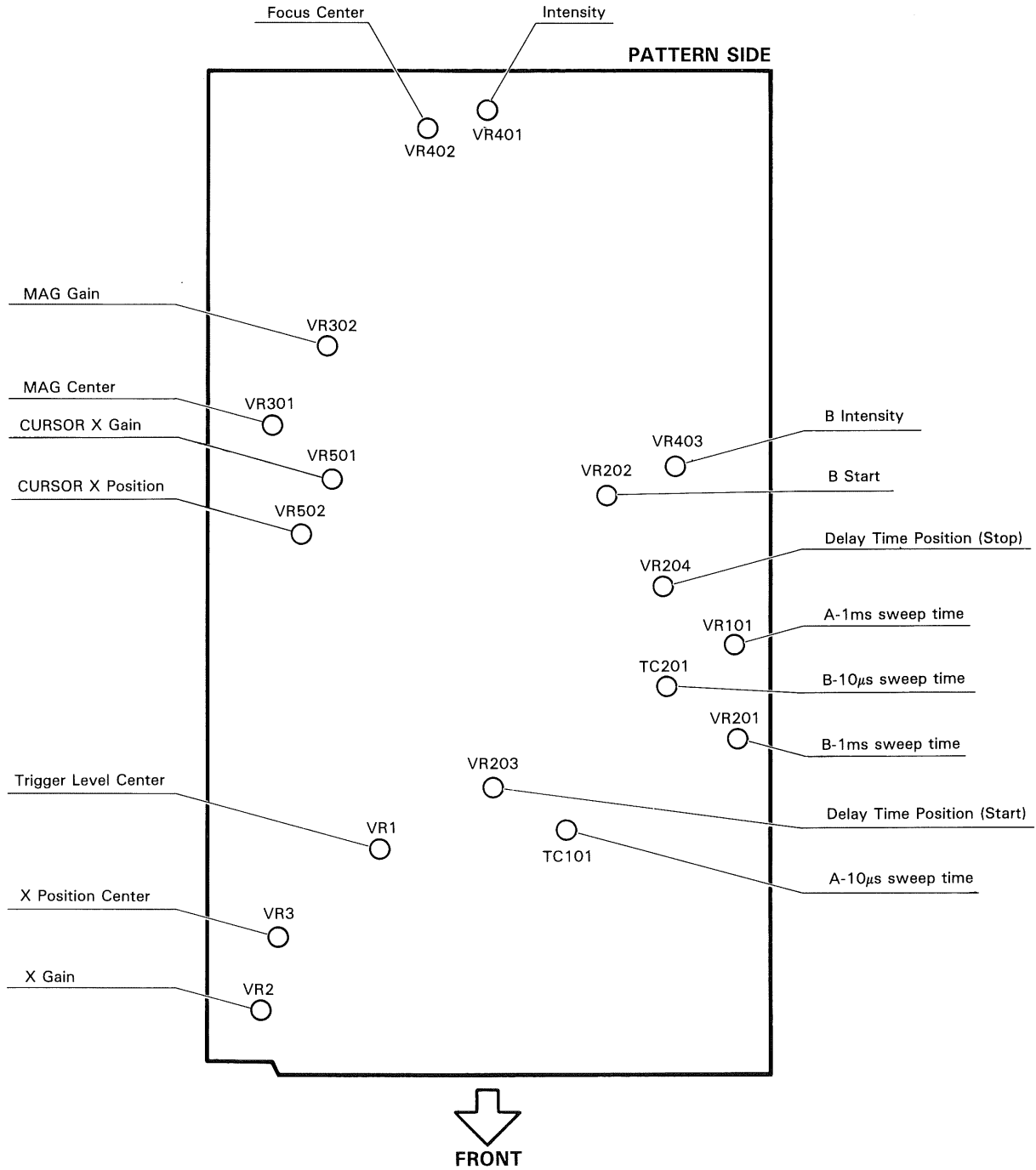
# ADJUSTMENT

## VERTICAL UNIT (X73-1790-01)



# ADJUSTMENT

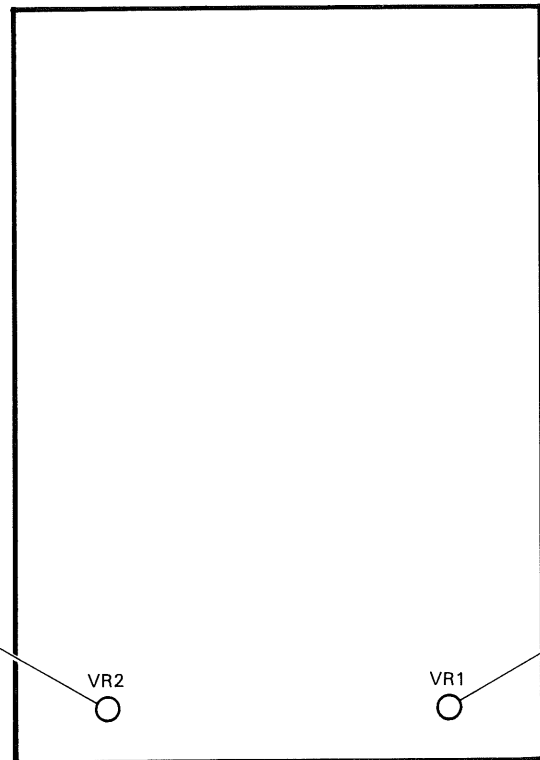
## HORIZONTAL UNIT (X74-1490-01)



# ADJUSTMENT

R/O UNIT (X77-1510-00)

FRONT



R/O CHARACTER Position

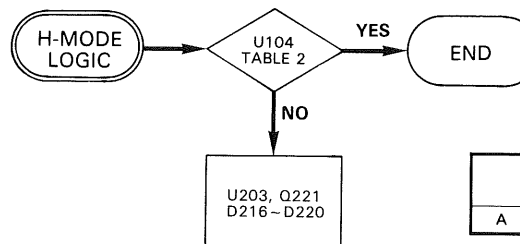
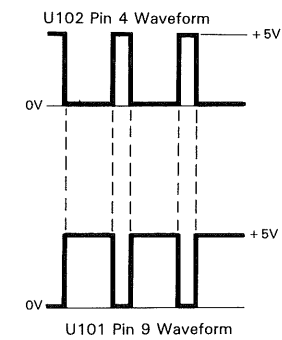
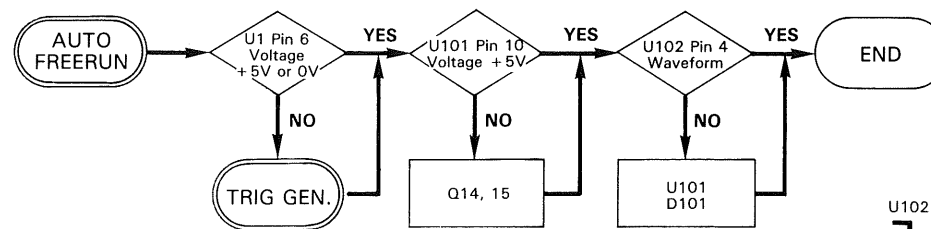
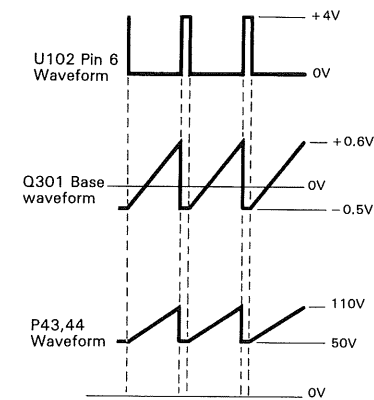
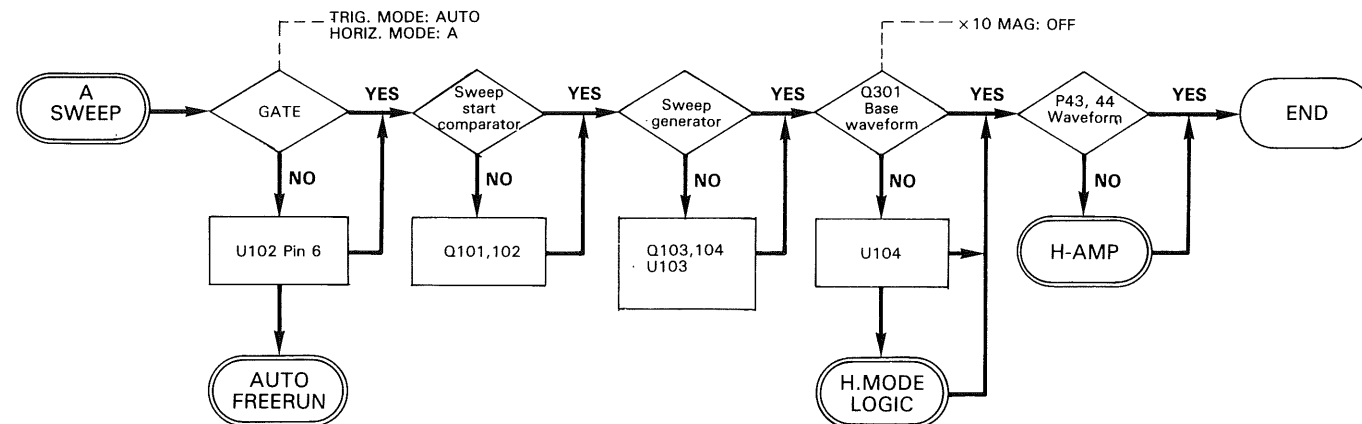
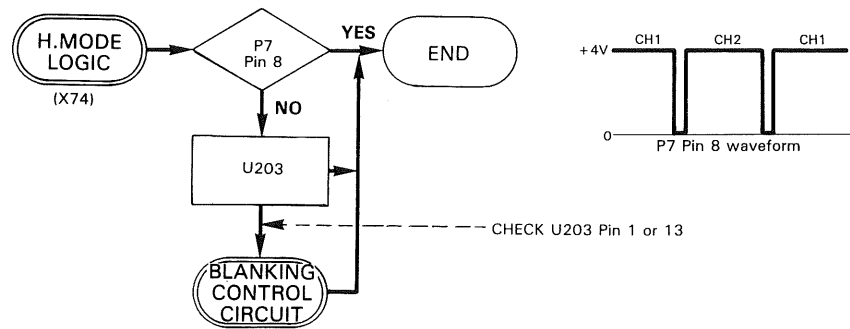
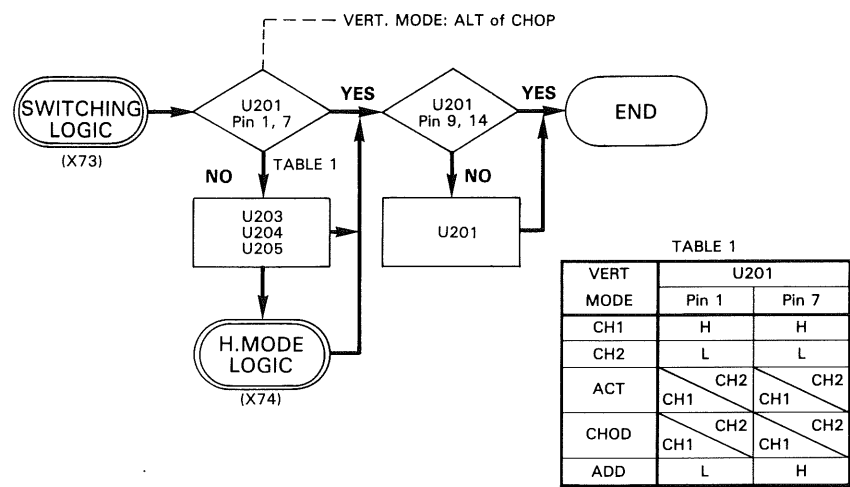
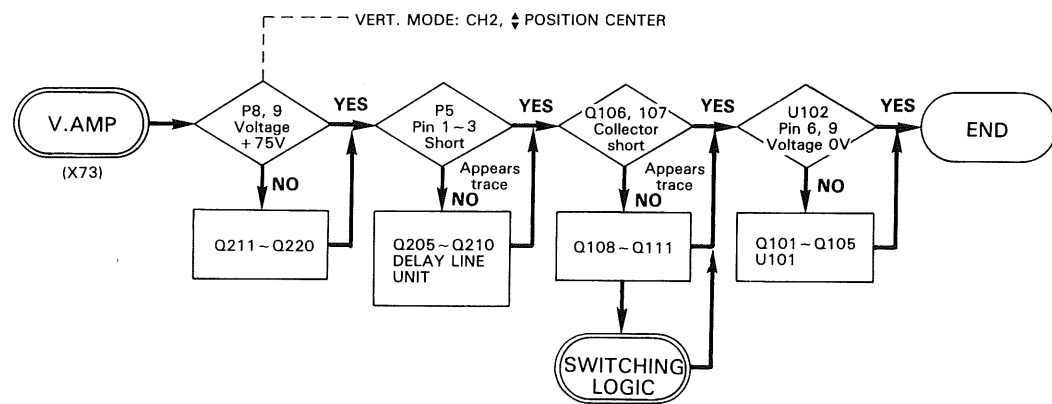
VR2

CURSOR Length

VR1

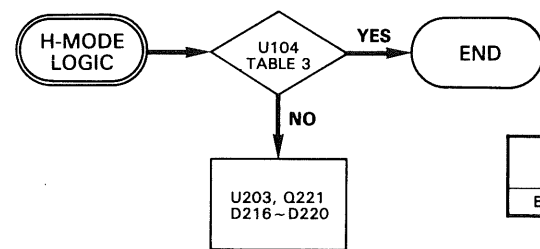
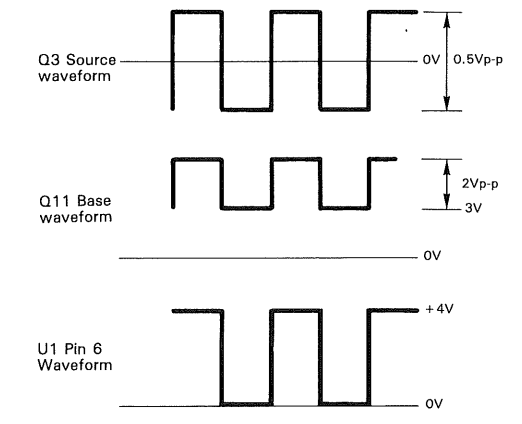
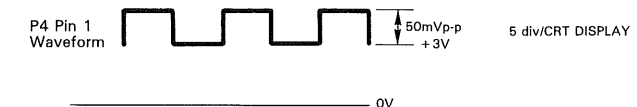
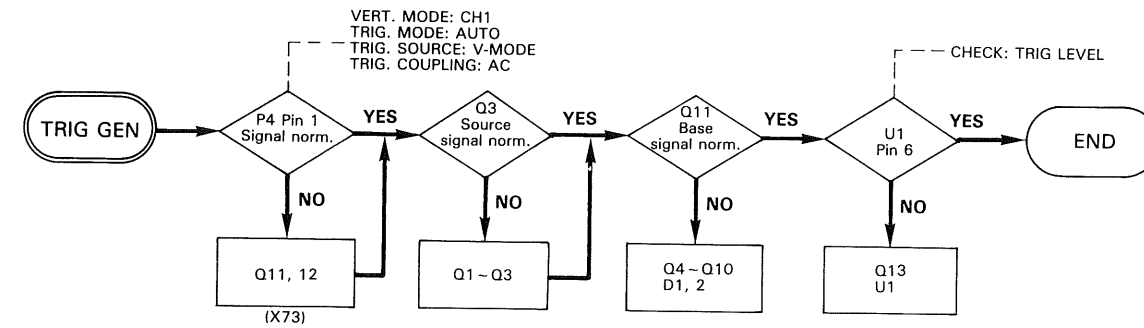
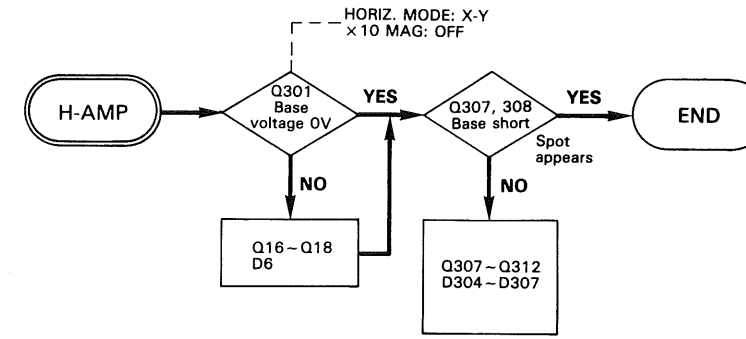
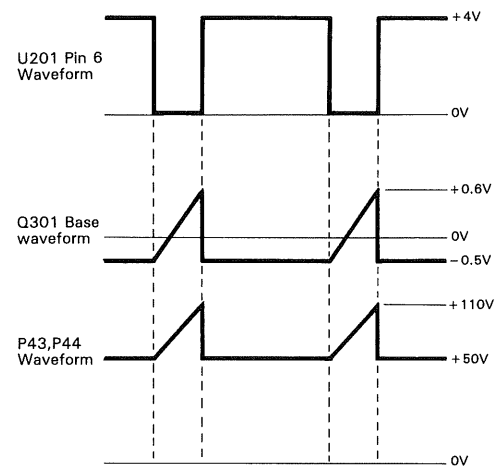
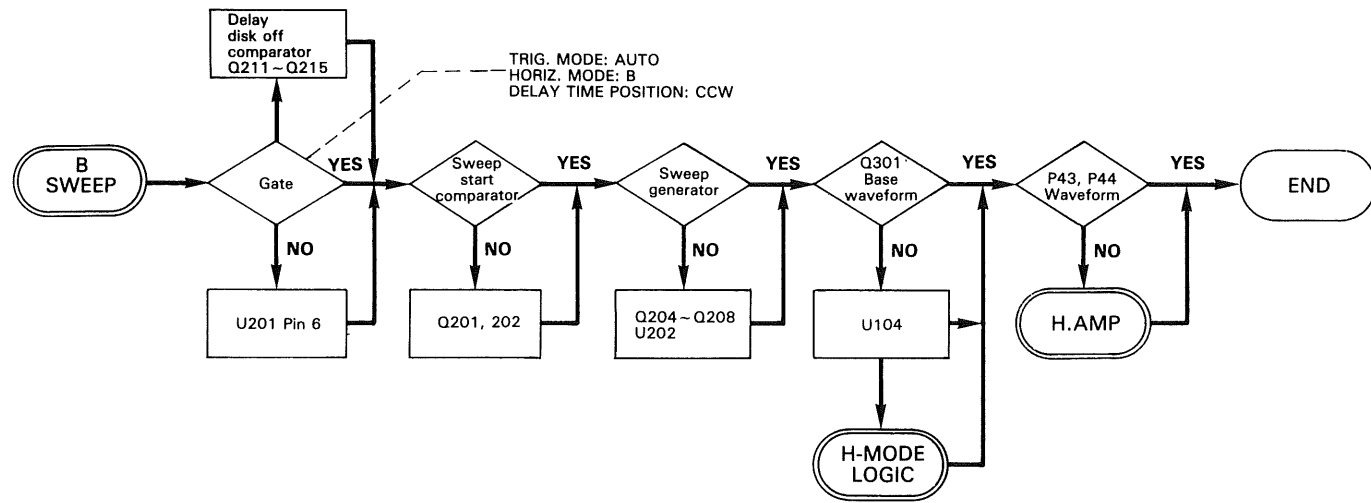


# TROUBLESHOOTING



	U104			
	Pin 9	Pin 10	Pin 11	Pin 15
A	H	H	L	L

# TROUBLESHOOTING

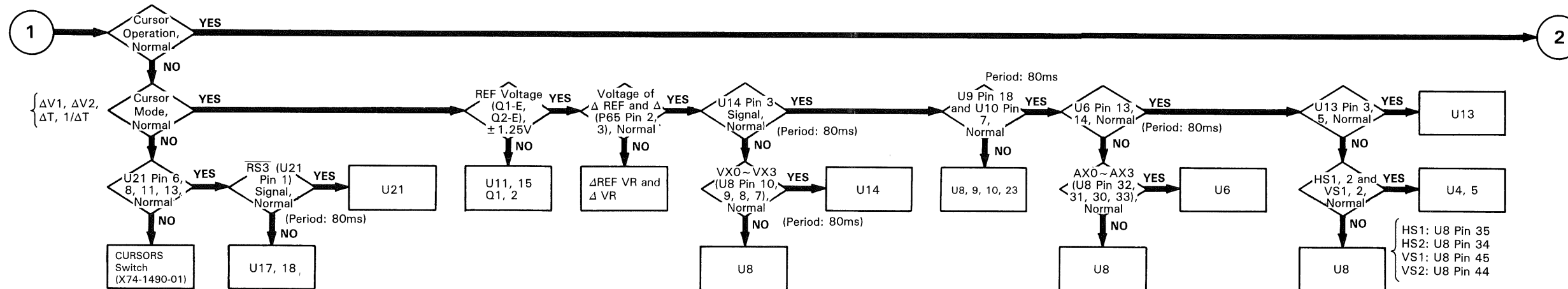
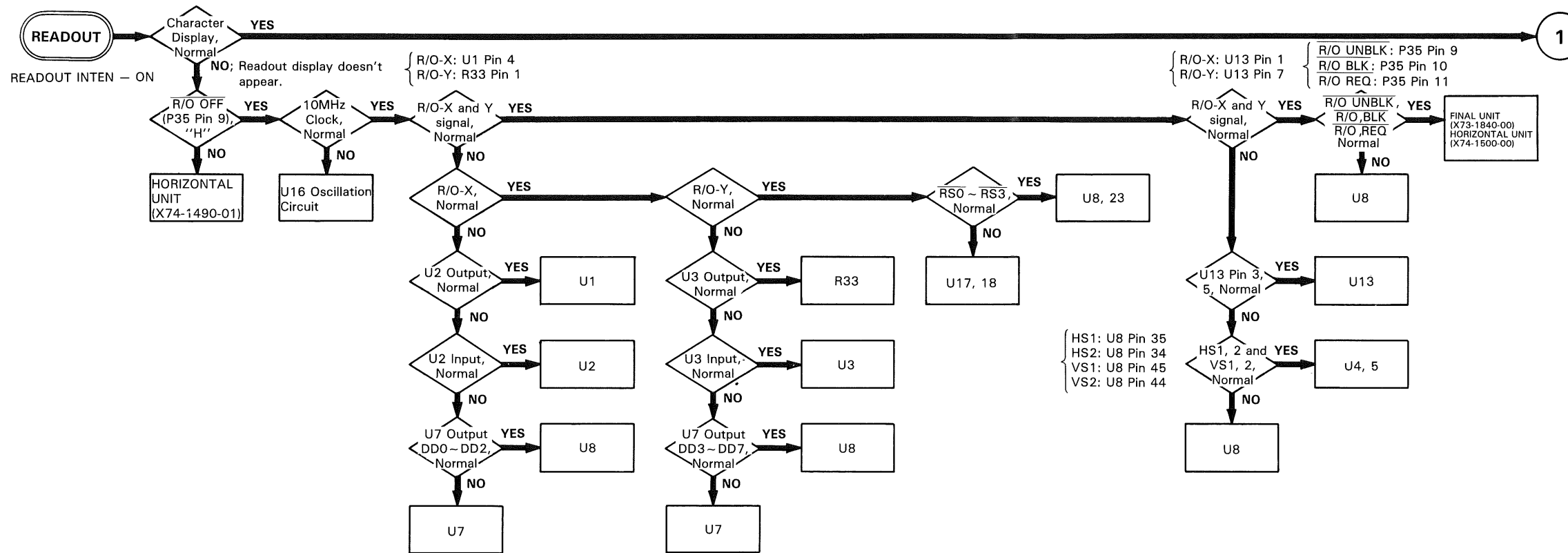


**TABLE 3**

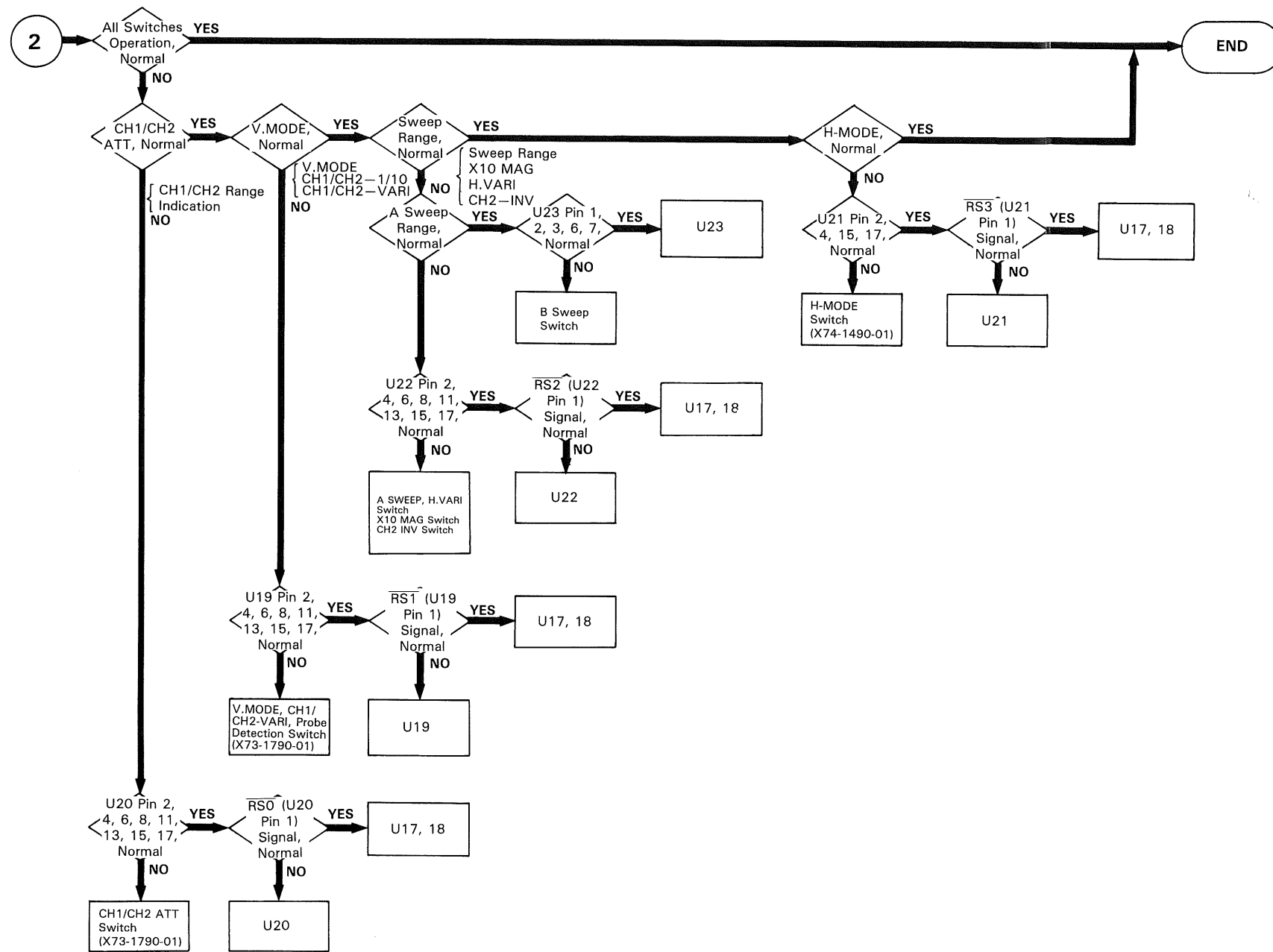
		U104			
		Pin 9	Pin 10	Pin 11	Pin 15
B	H	L	H	H	H

# TROUBLESHOOTING

## READOUT SECTION



# TROUBLESHOOTING





# TROUBLESHOOTING

## READOUT SIGNAL TABLE

### (1) CH1 (CH2) Vertical Attenuator

VOLTS/DIV	U20 Pin 13 (17) "ATT3"	U20 Pin 6 (2) "ATT2"	U20 Pin 11 (15) "ATT1"	U20 Pin 8 (4) "ATTO"	Display
1 mV	1	1	1	1	CH1 (CH2) 1 mV
2 mV	1	1	1	0	CH1 (CH2) 2 mV
5 mV	1	1	0	1	CH1 (CH2) 5 mV
10 mV	1	1	0	0	CH1 (CH2) 10 mV
20 mV	1	0	1	1	CH1 (CH2) 20 mV
50 mV	1	0	1	0	CH1 (CH2) 50 mV
0.1 V	1	0	0	1	CH1 (CH2) 0.1 V
0.2 V	1	0	0	0	CH1 (CH2) 0.2 V
0.5 V	0	1	1	1	CH1 (CH2) 0.5 V
1 V	0	1	1	0	CH1 (CH2) 1 V
2 V	0	1	0	1	CH1 (CH2) 2 V
5V	0	1	0	0	CH1 (CH2) 5 V

### (2) CH1 (CH2) Vertical Gain VARIABLE

V. VARIABLE	U19 Pin 8 (11) "CH1 (CH2)/VARI"	Display
CAL	1	Space
UNCAL	0	>

### (7) Horizontal Magnification

Magnification (PULL × 10 MAG)	U22 Pin 15 "H-MAG"	Display
Normal	1	SWEEP TIME/DIV × 1 Indication
× 10 MAG	0	SWEEP TIME/DIV × 1/10 Indication

### (8) Sweep Time VARIABLE

H.VARIABLE	U22 Pin 2 "H-VARI"	Display
CAL	1	Space
UNCAL	0	>

### (9) Horizontal MODE

H.MODE	U21 Pin 4 "X-Y"	Display
Sweep	1	Space
X-Y	0	X-Y

### (3) CH1 (CH2) Probe

Probe	U19 Pin 6 (13) "CH1 (CH2)/PROBE"	Display
1/1	1	VOLTS/DIV × 1 Indication
1/10	0	VOLTS/DIV × 10 Indication

### (4) CH2 Polarity

Polarity (PULL INV)	U22 Pin 17 "CH2/INV"	Display
Normal	1	Space
Invert	0	↓

### (10) Cursor MODE

CURSORS	U21 Pin 13 "CURSOR- MODE 3"	U21 Pin 6 "CURSOR- MODE 2"	U21 Pin 11 "CURSOR- MODE 1"	U21 Pin 8 "CURSOR- MODE 0"	Display
OFF	1	1	1	1	No Cursor Line
ΔV1	1	1	1	0	Two Horizontal Cursor Lines
ΔV2	1	1	0	1	Two Horizontal Cursor Lines
ΔT	1	0	1	1	Two Vertical Cursor Lines
1/ΔT	0	1	1	1	Two Vertical Cursor Lines

### (5) Vertical MODE

MODE	U19 Pin 17 "V.MODE 3"	U19 Pin 2 "V.MODE 2"	U19 Pin 15 "V.MODE 1"	U19 Pin 4 "V.MODE 0"	Display
CH1	1	1	1	1	CH1
CH2	1	1	1	0	CH2
ATL	1	1	0	1	CH1 CH2
CHOP	1	0	1	1	CH1 CH2
ADD	0	1	1	1	CH1 + CH2

### (6) A Sweep Range

SWEEP TIME/DIV	U22 Pin 4 "SWEEP 4"	U22 Pin 13 "SWEEP 3"	U22 Pin 6 "SWEEP 2"	U22 Pin 11 "SWEEP 1"	U22 Pin 8 "SWEEP 0"	Display
0.5 s	1	1	1	0	0	A: 0.5 s
0.2 s	1	1	0	1	1	A: 0.2 s
0.1 s	1	1	0	1	0	A: 0.1 s
50 ms	1	1	0	0	1	A: 50 ms
20 ms	1	1	0	0	0	A: 20 ms
10 ms	1	0	1	1	1	A: 10 ms
5 ms	1	0	1	1	0	A: 5 ms
2 ms	1	0	1	0	1	A: 2 ms
1 ms	1	0	1	0	0	A: 1 ms
0.5 ms	1	0	0	1	1	A: 0.5 ms
0.2 ms	1	0	0	1	0	A: 0.2 ms
0.1 ms	1	0	0	0	1	A: 0.1 ms
50 μs	1	0	0	0	0	A: 50 μs
20 μs	0	1	1	1	1	A: 20 μs
10 μs	0	1	1	1	0	A: 10 μs
5 μs	0	1	1	0	1	A: 5 μs
2 μs	0	1	1	0	0	A: 2 μs
1 μs	0	1	0	1	1	A: 1 μs
0.5 μs	0	1	0	1	0	A: 0.5 μs
0.2 μs	0	1	0	0	1	A: 0.2 μs
0.1 μs	0	1	0	0	0	A: 0.1 μs
50 ns	0	0	1	1	1	A: 50 ns

### B Sweep Range

SWEEP TIME/DIV	U23 Pin 7 "SWEEP 4"	U23 Pin 6 "SWEEP 3"	U23 Pin 3 "SWEEP 2"	U23 Pin 2 "SWEEP 1"	U23 Pin 1 "SWEEP 0"	Display
50 ms	1	1	0	0	1	B: 50 ms
20 ms	1	1	0	0	0	B: 20 ms
10 ms	1	0	1	1	1	B: 10 ms
5 ms	1	0	1	1	0	B: 5 ms
2 ms	1	0	1	0	1	B: 2 ms
1 ms	1	0	1	0	0	B: 1 ms
0.5 ms	1	0	0	1	1	B: 0.5 ms
0.2 ms	1	0	0	1	0	B: 0.2 ms
0.1 ms	1	0	0	0	1	B: 0.1 ms
50 μs	1	0	0	0	0	B: 50 μs
20 μs	0	1	1	1	1	B: 20 μs
10 μs	0	1	1	1	0	B: 10 μs
5 μs	0	1	1	0	1	B: 5 μs
2 μs	0	1	1	1	0	B: 2 μs
1 μs	0	1	0	1	1	B: 1 μs
0.5 μs	0	1	0	1	0	B: 0.5 μs
0.2 μs	0	1	0	0	1	B: 0.2 μs
0.1 μs	0	1	0	0	0	B: 0.1 μs
50 ns	0	0	1	1	1	B: 50 ns

# PARTS LIST

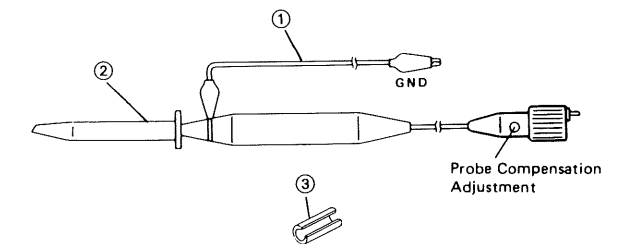
## CS-5130 UNIT

### Y70-1620-00

REF.NO	PARTS NO	NAME & DESCRIPTION
	A20-2829-03	PANEL ASS'Y
	B30-0952-05	LAMP (T4.2 8V 0.15A)
	B41-0710-04	CAUTION LABEL (HIGH VOLTAGE)
	B50-7666-10	INSTRUCTION MANUAL, JAPANESE
	B50-7667-20	INSTRUCTION MANUAL, ENGLISH
	E31-0564-05	WIRE ASS'Y(GND GREEN)
	E31-2861-05	WIRE ASS'Y (INLET-FILTER P69)
	E31-5501-05	WIRE ASS'Y(CH1 BNC P18)
	E31-5502-05	WIRE ASS'Y(CH1 OUT P1)
	E31-5506-05	WIRE ASS'Y(CH2 BNC P19)
	E31-5509-05	WIRE ASS'Y(CAL)
	E31-5511-05	WIRE ASS'Y(FOR P21)
	E31-5516-05	WIRE ASS'Y(EXT. TRIG)
	E31-5519-05	WIRE ASS'Y(READY LED)
	E31-5526-05	WIRE ASS'Y(Z AXIS P45)
	E31-5537-05	WIRE ASS'Y(CURSOR VR P65)
	E31-5549-05	WIRE ASS'Y(FOR P30,50,52)
	F05-1023-05	FUSE(6X30MM) 1A
	F05-5013-05	FUSE(6X30MM) 0.5A
	F05-5016-05	FUSE(5X20MM) 500MAT
	H01-5888-04	CARTON BOX
	H10-2828-12	FOAMED STYRENE PAD (FRONT)
	H10-2829-12	FOAMED STYRENE PAD (REAR)
	H20-1727-04	VINYL COVER
	H25-0029-04	POLYETHYLENE BAG (FUSE)
	J61-0408-05	WIRE WRAPPING BAND
	W03-2307-05	R/O PROBE (PC-33)
C1	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C2	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
R1	RD14BB2E220J	RES. CARBON 22 5% 1/4W
R2	RD14BB2E220J	RES. CARBON 22 5% 1/4W
1	A01-1154-22	CASE (BOTTOM)
2	A01-1193-02	CASE (TOP)
3	A13-0914-02	FRAME (L)
4	A13-0917-02	FRAME (R, LOWER)
5	A13-0922-22	FRAME (CENTER)
6	A13-0923-02	FRAME (R, UPPER)
7	A20-2822-21	MOLDED PANEL
8	A21-1137-03	DECORATIVE PANEL
9	A22-0870-02	SUB PANEL
10	A23-1682-02	REAR PANEL
11	B07-0716-03	FILTER FRAME
12	B19-0749-04	FILTER
13	B30-0951-25	SCALE ILLUMI LAMP ASS'Y
14	B30-0957-05	LED (LN322GPT)
15	B40-2765-04	NAME PLATE (SERIAL NO)
16	B40-2910-03	NAME PLATE (MODEL)
17	B41-0803-04	CAUTION LABEL
18	D21-0915-04	EXTENSION SHAFT
19	D22-0501-04	JOINT & COUPLING
20	E04-0259-05	BNC RECEPTACLE
21A	E18-0365-05	AC SELECTOR WITH 6X30MM FUSE
21B	E18-0366-15	AC SELECTOR WITH 5X20MM FUSE
22	E21-0660-04	TERMINAL, CAL
23	E21-0667-05	METAL TERMINAL
24	E23-0513-05	EARTH LUG, BNC
25	E23-0552-04	EARTH TERMINAL
26A	E30-1818-05	JIS POWER CORD
26B	E30-1819-05	CEE POWER CORD
26C	E30-1820-05	UL/CSA POWER CORD
26D	E30-1821-05	SAA POWER CORD
26E	E30-1644-15	BS POWER CORD
27	F09-0512-04	EDGING
28	F11-1206-03	CRT SHIELD
29	F15-0733-04	FELT (CRT SHIELD)
30	F20-0658-04	INSULATED SHEET
31	F20-0667-04	INSULATED SHEET
32	F20-0685-14	INSULATED SHEET
33	G01-0909-04	COIL SPRING (CAL SHIELD)
34	J02-0089-05	RUBBER FOOT (REAR)
35	J02-0512-05	FOOT (SMALL)
36	J02-0515-04	TILT STAND
37	J10-0418-12	BEZEL
38	J19-1651-04	BLACKET
39	J19-1652-04	BLACKET FOR P.C.B.
40	J19-1653-23	HOLDER FOR CRT
41	J19-1654-14	HOLDER FOR LED
42	J21-2573-04	HOLDER FOR LEG
43	J21-4594-23	BRACKET FOR CRT
45	J61-0516-05	SUPPORT
46	J42-0533-04	BUSHING (FREE)
47	J59-0403-05	NYLON RIVET (ILLUMI)

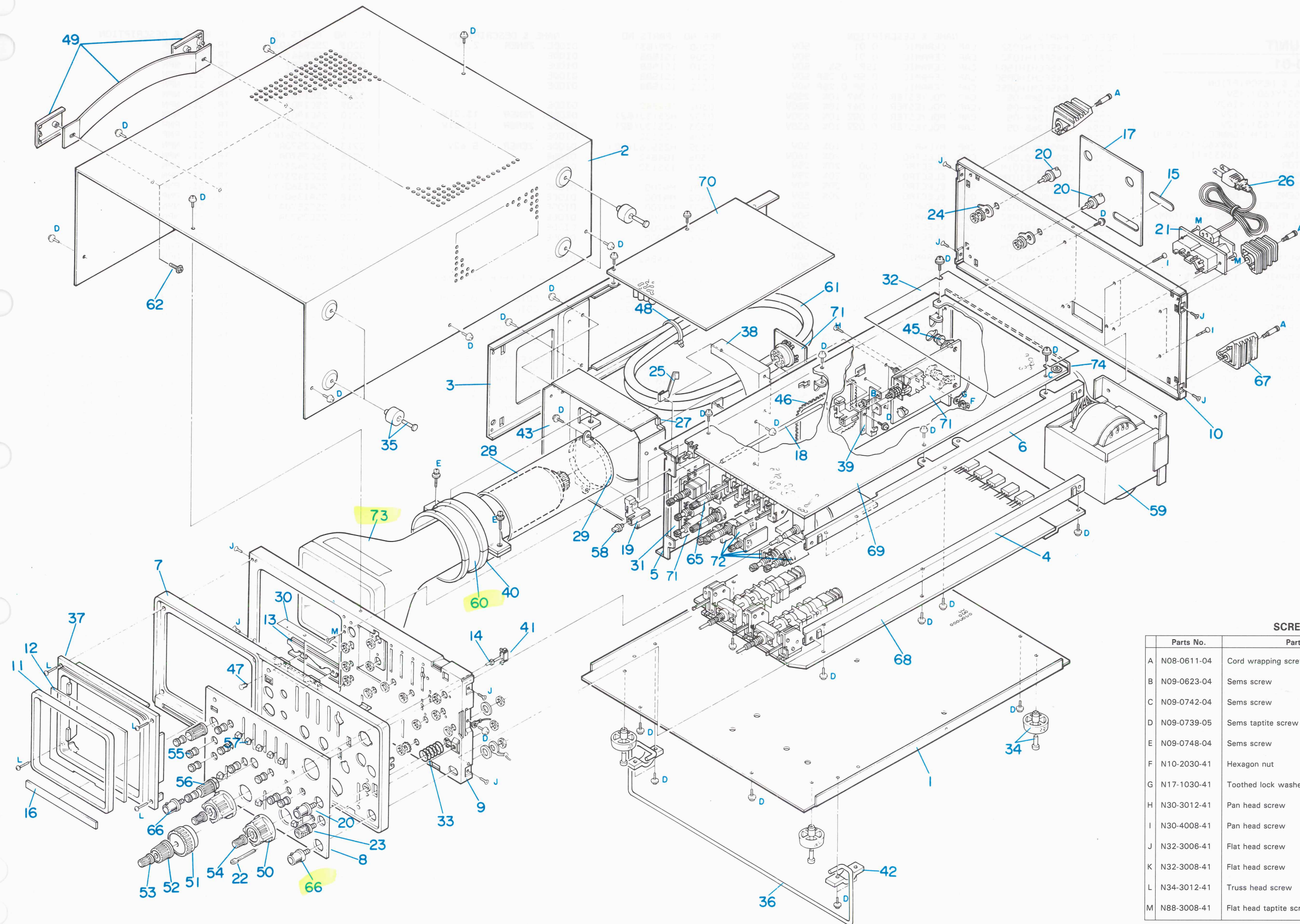
REF.NO	PARTS NO	NAME & DESCRIPTION
48	J61-0509-05	WIRE WRAPPING BAND
49	K01-0409-05	HANDLE
50	K21-0892-03	KNOB (VOLTS/DIV)
51	K21-0895-13	KNOB
52	K21-0896-13	KNOB
53	K21-0897-14	KNOB
54	K21-0899-04	KNOB
55	K23-0808-03	KNOB
56	K23-0809-03	KNOB
57	K27-0537-04	KNOB, FOR LEVER SWITCH
58	K27-0538-04	KNOB (FOR PUSH SWITCH)
59	L01-9746-05	POWER TRANSFORMER
60	L39-0526-25	ROTATOR COIL
61	L76-0114-05	DELAY LINE
62	N09-0777-05	SEMS SCREW(M4X6)
65	R29-1501-05	V.R. 1KB
66	E04-0260-05	BNC RECEPTACLE (READOUT)
67	W01-0503-04	REAR RUBBER FOOT/CORD WRAP
68	X73-1790-01	VERTICAL UNIT
69	X74-1490-01	HORIZONTAL UNIT
70	X77-1510-00	READOUT UNIT
71	X80-1060-03	LINE FILTER UNIT
72	X81-2710-00	VR UNIT
73	150VTM31	CRT
74	A13-0942-13	FRAME

## MODEL PC-33 (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



## SCREWS

Parts No.	Parts Name	Figure
A N08-0611-04	Cord wrapping screw	
B N09-0623-04	Sems screw (M3×8)	
C N09-0742-04	Sems screw (M3×8)	
D N09-0739-05	Sems tapitite screw (3×8)	
E N09-0748-04	Sems screw (M4×12)	
F N10-2030-41	Hexagon nut	
G N17-1030-41	Toothed lock washer	
H N30-3012-41	Pan head screw (M3×12)	
I N30-4008-41	Pan head screw (M4×6)	
J N32-3006-41	Flat head screw (M3×6)	
K N32-3008-41	Flat head screw (M3×8)	
L N34-3012-41	Truss head screw (M3×12)	
M N88-3008-41	Flat head tapitite screw (3×8)	

# PARTS LIST

## VERTICAL UNIT X73-1790-01

REF. NO	PARTS NO	NAME & DESCRIPTION
	E31-5544-05	WIRE ASS'Y(60).+5V
	E31-5545-05	WIRE ASS'Y(61).+160V
	E31-5546-05	WIRE ASS'Y(62).-12V
	E31-5547-05	WIRE ASS'Y(63).+12V
	E31-5548-05	LEAD WIRE WITH CONNOC. +5V.R/D
	F01-0863-03	HEAT SINK 169X60XT1.6
	F01-0864-04	HEAT SINK 61X33XT1
	F20-0516-05	INSULATOR
	J25-5258-12	PCB (UNMOUNTED)
	N09-0626-04	SCREW,SEMS M3X10
	N09-0742-04	SCREW,SEMS M3X8
	N19-0191-05	WASHER NONMETAL
	R92-0150-05	JUMPING RES. ZERO OHM(10MM)
	R92-1061-05	JUMPING RES. ZERO OHM (5MM)
C001	C91-0501-05	CAP. METAL FILM 0.047 10% 630V
C004	C91-1270-05	CAP. POLYESTER 0.001 10% 400V
C005	CC45FCH1H020C	CAP. CERAMIC 2P 0.25P 50V
C006	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C007	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C008	CC45FCH1H150J	CAP. CERAMIC 15P 5% 50V
C009	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C010	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C011	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C012	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C015	CC45FSL1H151J	CAP. CERAMIC 150P 5% 50V
C016	CC45FCH1H560J	CAP. CERAMIC 56P 5% 50V
C017	CC45FCH1H820J	CAP. CERAMIC 82P 5% 50V
C018	CC45FCH1H820J	CAP. CERAMIC 82P 5% 50V
C019	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V
C020	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V
C021	CC45FCH1H101J	CAP. CERAMIC 100P 5% 50V
C022	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C023	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C024	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V
C025	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C026	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V
C027	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C028	NO USE	
C029	CE04BW1E330M	CAP. ELECTRO 33 20% 25V
C030	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C031	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C101	C91-0501-05	CAP. METAL FILM 0.047 10% 630V
C104	C91-1270-05	CAP. POLYESTER 0.001 10% 400V
C105	CC45FCH1H020C	CAP. CERAMIC 2P 0.25P 50V
C106	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C107	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C108	CC45FCH1H150J	CAP. CERAMIC 15P 5% 50V
C109	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C110	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C111	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C112	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C115	CC45FSL1H151J	CAP. CERAMIC 150P 5% 50V
C116	CC45FCH1H560J	CAP. CERAMIC 56P 5% 50V
C117	CC45FCH1H820J	CAP. CERAMIC 82P 5% 50V
C118	CC45FCH1H820J	CAP. CERAMIC 82P 5% 50V
C119	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V
C120	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V
C121	CC45FCH1H101J	CAP. CERAMIC 100P 5% 50V
C122	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C123	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C124	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C125	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C126	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V
C127	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C128	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C129	CC45FCH1H270J	CAP. CERAMIC 27P 5% 50V
C205	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C206	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C207	CC45FSL1H681J	CAP. CERAMIC 680P 5% 50V
C208	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C209	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C210	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C211	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C214	CC45FCH1H070D	CAP. CERAMIC 7P 0.5P 50V
C215	NO USE	

REF. NO	PARTS NO	NAME & DESCRIPTION
C216	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C217	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C218	CC45FCH1H150J	CAP. CERAMIC 15P 5% 50V
C219	CC45FCH1HOR5C	CAP. CERAMIC 0.5P 0.25P 50V
C220	CC45FCH1HOR5C	CAP. CERAMIC 0.5P 0.25P 50V
C221	C91-1269-05	CAP. POLYESTER 0.047 10% 250V
C222	C91-1269-05	CAP. POLYESTER 0.047 10% 250V
C223	C91-1268-05	CAP. POLYESTER 0.022 10% 630V
C224	C91-1268-05	CAP. POLYESTER 0.022 10% 630V
C225	NO USE	
C226	C092FM1H104K	CAP. MYLAR 0.1 10% 50V
C227	CE04W2C010M	CAP. ELECTRO 1 20% 160V
C228	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
C229	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
C230	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C231	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C232	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C233	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C234	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C235	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C236	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C237	C91-1309-05	CAP. CERAMIC 0.01 10% 500V
C238	C092M1H104K	CAP. MYLAR 0.1 10% 50V
C239	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C301	CE04EW1V102M	CAP. ELECTRO 1000 20% 35V
C302	CE04EW1V222M	CAP. ELECTRO 2200 20% 35V
C303	NO USE	
C304	CE04EW1H100M	CAP. ELECTRO 10 20% 50V
C305	CE04W2E470M	CAP. ELECTRO 47 20% 250V
C306	CE04W2E2R2M	CAP. ELECTRO 2.2 20% 250V
C307	CE04W2C010M	CAP. ELECTRO 1 20% 160V
C308	C092FM1H223K	CAP. MYLAR 0.022 10% 50V
C309	C092FM1H223K	CAP. MYLAR 0.022 10% 50V
C351	C092FM1H103J	CAP. MYLAR 0.01 5% 50V
C352	C092FM1H103J	CAP. MYLAR 0.01 5% 50V
C353	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V
C354	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C355	CE04EW1E470M	CAP. ELECTRO 47 20% 25V
C404	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C405	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C406	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C407	NO USE	
C408	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C409	C91-0769-05	CAP. CERAMIC 0.01 20% 16V
C410	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C411	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C412	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C413	CK45FF1H1032	CAP. CERAMIC 0.01 50V
C451	CE04EW1C222M	CAP. ELECTRO 2200 20% 16V
C452	CE04EW1E470M	CAP. ELECTRO 47 20% 25V
C801	CC45CH1H680J	CAP. CERAMIC 68P 5% 50V
C802	C092M1H102K	CAP. MYLAR 1000P 10% 50V
C803	C092M1H103K	CAP. MYLAR 0.01 10% 50V
C804	CK45F1H1032	CAP. CERAMIC 0.01 50V
C805	NO USE	
C806	C092M1H104K	CAP. MYLAR 0.1 10% 50V
C807	CE04EW1A331M	CAP. ELECTRO 330 20% 10V
D001	1S1588	DIODE
D002	1S1588	DIODE
D003	1S1588	DIODE
D004	1S1588	DIODE
D005	1S1588	DIODE
D006	1S1588	DIODE
D007	1S1588	DIODE
D101	MA700	DIODE
D101	1S1588	DIODE
D102	1S1588	DIODE
D103	1S1588	DIODE
D104	1S1588	DIODE
D105	1S1588	DIODE
D106	1S1588	DIODE
D201	1S1588	DIODE
D202	1S1588	DIODE
D203	1S1588	DIODE
D204	1S1588	DIODE
D205	MA700	DIODE
D206	MA700	DIODE
D207	H22(B3)	DIODE, ZENER 2.2V

# PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
D208	H22(B3)	DIODE, ZENER 2.2V
D209	1S1588	DIODE
D210	1S1588	DIODE
D211	1S1588	DIODE
D212	1S1588	DIODE
D301	1G4B42	DIODE
D302	H2S13J(B2)	DIODE, ZENER 13.21V
D303	H2S13J(B2)	DIODE, ZENER 13.21V
D304	1S1588	DIODE
D305	H2S5.6J(B2)	DIODE, ZENER 5.62V
D306	1G4B42	DIODE
D307	1S1588	DIODE
D401	MA700	DIODE
D402	MA700	DIODE
D403	MA700	DIODE
D404	MA700	DIODE
D405	MA700	DIODE
D406	MA700	DIODE
D451	1G4B42	DIODE
JW071	E31-5766-05	WIRE ASS'Y(FOR 2SD1666)
L201	L40-2282-13	AXIAL COIL 0.22UH
L202	L40-2282-13	AXIAL COIL 0.22UH
L401	L40-1001-13	FERRI INDUCTOR 10UH
L402	L40-1001-13	FERRI INDUCTOR 10UH
P001	E40-0273-05	PIN CONNECTOR 2P
P002	E40-0373-05	PIN CONNECTOR 3P
P003	E40-0773-05	PIN CONNECTOR 7P
P004	E40-0273-05	PIN CONNECTOR 2P
P005	E40-0373-05	PIN CONNECTOR 3P
P006	E40-0373-05	PIN CONNECTOR 3P
P007	E40-0973-05	PIN CONNECTOR 9P
P008	E23-0401-05	PIN TERMINAL
P009	E23-0401-05	PIN TERMINAL
P010	E40-0273-05	PIN CONNECTOR 2P
P011	E40-3912-05	PIN CONNECTOR 5P
P012	E40-0373-05	PIN CONNECTOR 3P
P013	E40-0273-05	PIN CONNECTOR 2P
P014	E40-0673-05	PIN CONNECTOR 6P
P015	E40-0473-05	PIN CONNECTOR 4P
P016	E40-0673-05	PIN CONNECTOR 6P
P017	E40-0773-05	PIN CONNECTOR 7P
P018	E40-0273-05	PIN CONNECTOR 2P
P019	E40-0273-05	PIN CONNECTOR 2P
P020	E40-4248-05	PIN CONNECTOR 2P
P021	E40-0273-05	PIN CONNECTOR 2P
P035	E40-0373-05	PIN CONNECTOR 3P
P057	E40-0473-05	PIN CONNECTOR 4P
Q001	2SC1907	TR. SI, NPN
Q002	2SK304(E)	FET, N-CHANNEL
Q003	2SC945(Q)	TR. SI, NPN
Q004	2SA844(D)	TR. SI, PNP
Q005	2SC945(Q)	TR. SI, NPN
Q006	2SA1005(K)	TR. SI, PNP
Q007	2SA1005(K)	TR. SI, PNP
Q008	2SA838(B)	TR. SI, PNP
Q009	2SA838(B)	TR. SI, PNP
Q010	2SC945(Q)	TR. SI, NPN
Q011	2SA1005(K)	TR. SI, PNP
Q012	2SA1005(K)	TR. SI, PNP
Q013	2SC1907	TR. SI, NPN
Q101	2SC1907	TR. SI, NPN
Q102	2SK304(E)	FET, N-CHANNEL
Q103	2SC945(Q)	TR. SI, NPN
Q104	2SA844(D)	TR. SI, PNP
Q105	2SC945(Q)	TR. SI, NPN
Q106	2SA1005(K)	TR. SI, PNP
Q107	2SA1005(K)	TR. SI, PNP
Q108	2SA838(B)	TR. SI, PNP
Q109	2SA838(B)	TR. SI, PNP
Q110	2SA838(B)	TR. SI, PNP
Q111	2SA838(B)	TR. SI, PNP
Q112	2SA1005(K)	TR. SI, PNP
Q113	2SA1005(K)	TR. SI, PNP
Q201	2SA1206(K)	TR. SI, PNP
Q202	2SA1206(K)	TR. SI, PNP

REF. NO	PARTS NO	NAME & DESCRIPTION
Q203	2SC945(Q)	TR. SI, NPN
Q204	2SA844(D)	TR. SI, PNP
Q205	2SC1907	TR. SI, NPN
Q206	2SC1907	TR. SI, NPN
Q207	2SC1907	TR. SI, NPN
Q208	2SC1907	TR. SI, NPN
Q209	2SC1907	TR. SI, NPN
Q210	2SC1907	TR. SI, NPN
Q211	2SA1206(K)	TR. SI, PNP
Q212	2SA1206(K)	TR. SI, PNP
Q213	2SC2570A	TR. SI, NPN
Q214	2SC2570A	TR. SI, NPN
Q215	2SC3423(Y)	TR. SI, NPN
Q216	2SC3423(Y)	TR. SI, NPN
Q217	2SA1360(Y)	TR. SI, PNP
Q218	2SA1360(Y)	TR. SI, PNP
Q219	2SC2570A	TR. SI, NPN
Q220	2SC2570A	TR. SI, NPN
Q301	2SD880(Y)	TR. SI, NPN
Q302	2SB834(Y)	TR. SI, PNP
Q303	2SD880(Y)	TR. SI, NPN
Q304	2SB861(C)	TR. SI, PNP
Q401	2SC1907	TR. SI, NPN
Q402	2SC1907	TR. SI, NPN
Q403	2SA1005(K)	TR. SI, PNP
Q404	2SA1005(K)	TR. SI, PNP
0801	2SD1666	TR. SI, NPN
R001	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R012	RN14BK2E1004F	RES. METAL FILM 1M 1% 1/4W
R013	RD14BB2E824J	RES. CARBON 820K 5% 1/4W
R014	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R015	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R016	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R017	RD14BB2C681J	RES. CARBON 680 5% 1/6W
R018	RD14BB2C392J	RES. CARBON 3.9K 5% 1/6W
R019	RD14BB2C822J	RES. CARBON 8.2K 5% 1/6W
R020	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R021	NO USE	
R022	RD14BB2C391J	RES. CARBON 390 5% 1/6W
R023	RD14BB2C122J	RES. CARBON 1.2K 5% 1/6W
R024	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R025	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R033	RD14BB2C121J	RES. CARBON 120 5% 1/6W
R034	RD14BB2C121J	RES. CARBON 120 5% 1/6W
R035	RD14BB2C681J	RES. CARBON 680 5% 1/6W
R036	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R037	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R038	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R039	RD14BB2C473J	RES. CARBON 47K 5% 1/6W
R040	RD14BB2C477J	RES. CARBON 4.7 5% 1/6W
R041	RD14BB2C270J	RES. CARBON 27 5% 1/6W
R042	RD14BB2C270J	RES. CARBON 27 5% 1/6W
R043	RD14BB2C473J	RES. CARBON 47K 5% 1/6W

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION	REF.NO	PARTS NO	NAME & DESCRIPTION
R072	RD148B2C221J	RES. CARBON 220 5% 1/6W	R219	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R073	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W	R220	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R074	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R221	RN148K2C91ROF	RES. METAL FILM 91.0 1% 1/6W
R075	RD148B2C101J	RES. CARBON 100 5% 1/6W	R222	RN148K2C91ROF	RES. METAL FILM 91.0 1% 1/6W
R076	RD148B2C152J	RES. CARBON 1.5K 5% 1/6W	R223	RD148B2C470J	RES. CARBON 47 5% 1/6W
R077	RD148B2C100J	RES. CARBON 10 5% 1/6W	R224	RD148B2C470J	RES. CARBON 47 5% 1/6W
R078	RD148B2C390J	RES. CARBON 39 5% 1/6W	R225	RD148B2C201J	RES. CARBON 200 5% 1/6W
R101	RD148B2C220J	RES. CARBON 22 5% 1/6W	R226	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R112	RN148K2E1004F	RES. METAL FILM 1M 1% 1/4W	R227	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R113	RD148B2E824J	RES. CARBON 820K 5% 1/4W	R228	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W
R114	RD148B2E102J	RES. CARBON 1K 5% 1/4W	R229	RD148B2C104J	RES. CARBON 100K 5% 1/6W
R115	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R230	RD148B2C104J	RES. CARBON 100K 5% 1/6W
R116	RD148B2C101J	RES. CARBON 100 5% 1/6W	R231	RD148B2C470J	RES. CARBON 47 5% 1/6W
R117	RD148B2C681J	RES. CARBON 680 5% 1/6W	R232	RD148B2C470J	RES. CARBON 47 5% 1/6W
R118	RD148B2C392J	RES. CARBON 3.9K 5% 1/6W	R233	RD148B2C562J	RES. CARBON 5.6K 5% 1/6W
R119	RD148B2C822J	RES. CARBON 8.2K 5% 1/6W	R234	RD148B2C682J	RES. CARBON 6.8K 5% 1/6W
R120	RD148B2C562J	RES. CARBON 5.6K 5% 1/6W	R235	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R121	NO USE		R236	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R122	RD148B2C391J	RES. CARBON 390 5% 1/6W	R237	RD148B2C470J	RES. CARBON 47 5% 1/6W
R123	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W	R238	RD148B2C470J	RES. CARBON 47 5% 1/6W
R124	RD148B2C100J	RES. CARBON 10 5% 1/6W	R239	RD148B2C152J	RES. CARBON 1.5K 5% 1/6W
R125	RD148B2C100J	RES. CARBON 10 5% 1/6W	R240	RD148B2C152J	RES. CARBON 1.5K 5% 1/6W
R133	RD148B2C121J	RES. CARBON 120 5% 1/6W	R241	RD148B2C202J	RES. CARBON 2K 5% 1/6W
R134	RD148B2C121J	RES. CARBON 120 5% 1/6W	R242	RD148B2C202J	RES. CARBON 2K 5% 1/6W
R135	RD148B2C681J	RES. CARBON 680 5% 1/6W	R243	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R136	RD148B2C562J	RES. CARBON 5.6K 5% 1/6W	R244	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R137	RD148B2C562J	RES. CARBON 5.6K 5% 1/6W	R245	RD148B2C220J	RES. CARBON 22 5% 1/6W
R138	RD148B2C101J	RES. CARBON 100 5% 1/6W	R246	RD148B2C220J	RES. CARBON 22 5% 1/6W
R139	RD148B2C473J	RES. CARBON 47K 5% 1/6W	R249	RD148B2C103J	RES. CARBON 10K 5% 1/6W
R140	RD148B2C4R7J	RES. CARBON 4.7 5% 1/6W	R250	RD148B2C220J	RES. CARBON 22 5% 1/6W
R141	RD148B2C270J	RES. CARBON 27 5% 1/6W	R251	RD148B2C220J	RES. CARBON 22 5% 1/6W
R142	RD148B2C270J	RES. CARBON 27 5% 1/6W	R252	RS14GB3A333J	RES. METAL FILM 33K 5% 1W
R143	RD148B2C473J	RES. CARBON 47K 5% 1/6W	R253	RS14GB3A333J	RES. METAL FILM 33K 5% 1W
R144	RN148K2C56R0F	RES. METAL FILM 56.0 1% 1/6W	R254	RD148B2C820J	RES. CARBON 82 5% 1/6W
R145	RN148K2C56R0F	RES. METAL FILM 56.0 1% 1/6W	R255	RD148B2C820J	RES. CARBON 82 5% 1/6W
R146	RN148K2C4700F	RES. METAL FILM 470 1% 1/6W	R256	RD148B2H473J	RES. CARBON 47K 5% 1/2W
R147	RN148K2C4700F	RES. METAL FILM 470 1% 1/6W	R257	RD148B2H473J	RES. CARBON 47K 5% 1/2W
R148	RD148B2C271J	RES. CARBON 270 5% 1/6W	R258	RD148B2C4R7J	RES. CARBON 4.7 5% 1/6W
R149	RN148K2C6800F	RES. METAL FILM 680 1% 1/6W	R259	RD148B2C4R7J	RES. CARBON 4.7 5% 1/6W
R150	RN148K2C6800F	RES. METAL FILM 680 1% 1/6W	R260	RD148B2C511J	RES. CARBON 510 5% 1/6W
R151	RD148B2C220J	RES. CARBON 22 5% 1/6W	R261	RD148B2C511J	RES. CARBON 510 5% 1/6W
R152	RD148B2C220J	RES. CARBON 22 5% 1/6W	R262	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W
R153	RD148B2C121J	RES. CARBON 120 5% 1/6W	R263	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W
R154	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W	R264	RD148B2C4R7J	RES. CARBON 4.7 5% 1/6W
R155	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W	R265	RD148B2C4R7J	RES. CARBON 4.7 5% 1/6W
R156	RD148B2C181J	RES. CARBON 180 5% 1/6W	R266	RD148B2C331J	RES. CARBON 330 5% 1/6W
R157	RD148B2C181J	RES. CARBON 180 5% 1/6W	R267	RD148B2C100J	RES. CARBON 10 5% 1/6W
R158	RD148B2C101J	RES. CARBON 100 5% 1/6W	R268	RD148B2C100J	RES. CARBON 10 5% 1/6W
R159	RD148B2C622J	RES. CARBON 6.2K 5% 1/6W	R269	RD148B2C100J	RES. CARBON 10 5% 1/6W
R160	RD148B2C622J	RES. CARBON 6.2K 5% 1/6W	R270	RD148B2C100J	RES. CARBON 10 5% 1/6W
R161	RD148B2C470J	RES. CARBON 47 5% 1/6W	R271	RD148B2C100J	RES. CARBON 10 5% 1/6W
R162	RD148B2C470J	RES. CARBON 47 5% 1/6W	R272	RD148B2C100J	RES. CARBON 10 5% 1/6W
R163	RD148B2C470J	RES. CARBON 47 5% 1/6W	R273	RD148B2C100J	RES. CARBON 10 5% 1/6W
R164	RD148B2C470J	RES. CARBON 47 5% 1/6W	R274	RD148B2C100J	RES. CARBON 10 5% 1/6W
R165	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W	R275	RD148B2C100J	RES. CARBON 10 5% 1/6W
R166	RD148B2C221J	RES. CARBON 220 5% 1/6W	R301	RD148B2H2R2J	RES. CARBON 2.2 5% 1/2W
R167	RD148B2C221J	RES. CARBON 220 5% 1/6W	R302	RD148B2C101J	RES. CARBON 100 5% 1/6W
R168	RD148B2C151J	RES. CARBON 150 5% 1/6W	R303	RS14GB3A101J	RES. METAL FILM 100 5% 1W
R169	RD148B2C151J	RES. CARBON 150 5% 1/6W	R304	RN148K2C1202F	RES. METAL FILM 12K 1% 1/6W
R170	RD148B2C820J	RES. CARBON 82 5% 1/6W	R305	RN148K2C1202F	RES. METAL FILM 12K 1% 1/6W
R171	RN148K2C1001F	RES. METAL FILM 1K 1% 1/6W	R306	RS14GB3A1R0J	RES. METAL FILM 1 5% 1W
R172	RN148K2C1001F	RES. METAL FILM 1K 1% 1/6W	R307	RD148B2C101J	RES. CARBON 100 5% 1/6W
R173	RD148B2C221J	RES. CARBON 220 5% 1/6W	R308	RS14GB3A101J	RES. METAL FILM 100 5% 1W
R174	RD148B2C221J	RES. CARBON 220 5% 1/6W	R309	RD148B2C562J	RES. CARBON 5.6K 5% 1/6W
R201	RD148B2C221J	RES. CARBON 220 5% 1/6W	R310	RD148B2C562J	RES. CARBON 5.6K 5% 1/6W
R202	RD148B2C221J	RES. CARBON 220 5% 1/6W	R311	RD148B2C562J	RES. CARBON 5.6K 5% 1/6W
R203	RN148K2C4700F	RES. METAL FILM 470 1% 1/6W	R312	RS14GB3A330J	RES. METAL FILM 33 5% 1W
R204	RN148K2C4700F	RES. METAL FILM 470 1% 1/6W	R313	RD148B2C151J	RES. CARBON 150 5% 1/6W
R205	RD148B2C682J	RES. CARBON 6.8K 5% 1/6W	R314	RN148K2C3901F	RES. METAL FILM 3.9K 1% 1/6W
R206	RD148B2C682J	RES. CARBON 6.8K 5% 1/6W	R315	RN148K2C9101F	RES. METAL FILM 9.1K 1% 1/6W
R207	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W	R316	RS14GB3D272J	RES. METAL FILM 2.7K 5% 2W
R208	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W	R317	RS14GB3D272J	RES. METAL FILM 2.7K 5% 2W
R209	RD148B2C820J	RES. CARBON 82 5% 1/6W	R318	RD148B2C100J	RES. CARBON 10 5% 1/6W
R210	RD148B2C820J	RES. CARBON 82 5% 1/6W	R319	RD148B2C101J	RES. CARBON 100 5% 1/6W
R211	RD148B2C681J	RES. CARBON 680 5% 1/6W	R320	RD148B2C221J	RES. CARBON 220 5% 1/6W
R212	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R321	RN148K2C1203F	RES. METAL FILM 120K 1% 1/6W
R213	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R322	RN148K2C1002F	RES. METAL FILM 10K 1% 1/6W
R214	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R323	RD148B2C561J	RES. CARBON 560 5% 1/6W
R215	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R324	RD148B2E225J	RES. CARBON 2.2M 5% 1/4W
R216	R90-0645-05	RES. NETWORK 4X10K 5%	R325	RD148B2E225J	RES. CARBON 2.2M 5% 1/4W
R217	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R351	RD148B2C154J	RES. CARBON 150K 5% 1/6W
R218	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R352	RD148B2C103J	RES. CARBON 10K 5% 1/6W
			R353	RD148B2C103J	RES. CARBON 10K 5% 1/6W

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION
R354	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R355	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R356	RD14BB2C224J	RES. CARBON 220K 5% 1/6W
R357	RD14BB2C474J	RES. CARBON 470K 5% 1/6W
R358	RD14BB2C474J	RES. CARBON 470K 5% 1/6W
R359	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R360	RN14BK2C1102F	RES. METAL FILM 11K 1% 1/6W
R361	RN14BK2C7500F	RES. METAL FILM 750 1% 1/6W
R362	NO USE	
R363	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R405	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R406	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R407	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R408	NO USE	
R409	RN14BK2C1201F	RES. METAL FILM 1.2K 1% 1/6W
R410	RN14BK2C1201F	RES. METAL FILM 1.2K 1% 1/6W
R411	RN14BK2C1151F	RES. METAL FILM 1.15K 1% 1/6W
R412	RD14BB2C111J	RES. CARBON 110 5% 1/6W
R413	RD14BB2C912J	RES. CARBON 9.1K 5% 1/6W
R414	NO USE	
R415	RD14BB2C751J	RES. CARBON 750 5% 1/6W
R416	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R417	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R418	RN14BK2C8201F	RES. METAL FILM 8.2K 1% 1/6W
R419	RN14BK2C2201F	RES. METAL FILM 2.2K 1% 1/6W
R420	RN14BK2C8200F	RES. METAL FILM 820 1% 1/6W
R421	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R422	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R423	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R424	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R425	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R426	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R427	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R428	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R429	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R430	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R431	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R432	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R433	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R434	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R435	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R436	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R437	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R438	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R439	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R801	RD14BB2C2R2J	RES. CARBON 2.2 5% 1/6W
R802	RD14BB2C752J	RES. CARBON 7.5K 5% 1/6W
R803	RD14BB2C134J	RES. CARBON 130K 5% 1/6W
R804	RD14BB2C154J	RES. CARBON 150K 5% 1/6W
R805	RD14BB2C132J	RES. CARBON 1.3K 5% 1/6W
R806	RD14BB2C163J	RES. CARBON 16K 5% 1/6W
R807	RD14BB2C271J	RES. CARBON 270 5% 1/6W
S001	S32-2012-05	LEVER SWITCH 2-3
S002	S02-4510-05	ROTARY SWITCH
S101	S32-2012-05	LEVER SWITCH 2-3
S102	S02-4510-05	ROTARY SWITCH
S201	S32-4008-05	LEVER SWITCH 4-5
TC005	C05-0455-05	CAP. TRIMMER 30PF
TC006	C05-0456-05	CAP. TRIMMER 60PF
TC105	C05-0455-05	CAP. TRIMMER 30PF
TC106	C05-0456-05	CAP. TRIMMER 60PF
TC201	C05-0454-05	CAP. TRIMMER 20PF
TC202	C05-0454-05	CAP. TRIMMER 20PF
TC203	C05-0455-05	CAP. TRIMMER 30PF
TC901	C05-0371-05	CAP. TRIMMER 10P
TH021	112-251-2	THERMISTOR
TH121	112-251-2	THERMISTOR
U001	LF411CN*	IC, DUAL JFET INPUT OP AMP
U002	CA3086	IC, NPN TRANSISTOR ARRAY
U101	LF411CN	IC, DUAL JFET INPUT OP AMP
U102	CA3086	IC, NPN TRANSISTOR ARRAY

REF.NO	PARTS NO	NAME & DESCRIPTION
U201	SN74LS47N	IC, DECODER/DRIVER
U202	SN74LS00N	IC, QUAD 2 INPUT NAND
U203	SN74LS00N	IC, QUAD 2 INPUT NAND
U204	SN74LS112AN	IC, DUAL JK-FF
U205	SN74LS00N	IC, QUAD 2 INPUT NAND
U301	UPC4558C	IC, OP AMP
U302	UPC4558C	IC, OP AMP
U351	TC4011BP*	IC, QUAD 2-INPUT NAND GATE
U451	TA78005AP	IC, 3-TERMINAL REGULATOR
VR001	R12-3550-05	RES. SEMI FIXED 20K B
VR002	R12-0577-05	RES. SEMI FIXED 500 B
VR003	R12-3550-05	RES. SEMI FIXED 20K B
VR004	R12-0575-05	RES. SEMI FIXED 100 B
VR005	NO USE	
VR006	R12-3550-05	RES. SEMI FIXED 20K B
VR007	R12-0577-05	RES. SEMI FIXED 500 B
VR008	R12-0577-05	RES. SEMI FIXED 500 B
VR009	R12-1545-05	RES. SEMI FIXED 1K B
VR010	NO USE	
VR011	R12-1545-05	RES. SEMI FIXED 1K B
VR101	R12-3550-05	RES. SEMI FIXED 20K B
VR102	R12-0577-05	RES. SEMI FIXED 500 B
VR103	R12-3550-05	RES. SEMI FIXED 20K B
VR104	R12-0575-05	RES. SEMI FIXED 100 B
VR105	NO USE	
VR106	R12-3550-05	RES. SEMI FIXED 20K B
VR107	R12-0577-05	RES. SEMI FIXED 500 B
VR108	R12-0577-05	RES. SEMI FIXED 500 B
VR109	R12-1545-05	RES. SEMI FIXED 1K B
VR110	NO USE	
VR111	R12-1545-05	RES. SEMI FIXED 1K B
VR201	R12-0577-05	RES. SEMI FIXED 500 B
VR202	R12-0576-05	RES. SEMI FIXED 200 B
VR203	R12-0577-05	RES. SEMI FIXED 500 B
VR204	R12-0576-05	RES. SEMI FIXED 200 B
VR205	R12-1546-05	RES. SEMI FIXED 2K B
VR301	R12-1545-05	RES. SEMI FIXED 1K B
VR351	R12-0577-05	RES. SEMI FIXED 500 B
VR401	R12-1545-05	RES. SEMI FIXED 1K B
VR402	R12-1546-05	RES. SEMI FIXED 2K B

# PARTS LIST

## HORIZONTAL UNIT

### X74-1490-01

REF.NO	PARTS NO	NAME & DESCRIPTION			
	F01-0867-05	HEAT SINK			
	F11-1208-13	SHIELD CASE			
	F15-0727-04	HOLDER (NEON LAMP)			
	F20-0516-05	INSULATOR			
	F20-0675-04	INSULATED SHEET			
	J25-5259-12	PCB (UNMOUNTED)			
	J25-5268-04	PCB (UNMOUNTED) 86X46			
	J42-0538-04	BUSHING			
	J61-0501-05	BOARD SUPPORT			
	N19-0191-05	WASHER NONMETAL			
	N30-3006-41	SCREW, PAN HD M3X6			
	R92-0150-05	JUMPING RES. ZERO OHM(10MM)			
	R92-1061-05	JUMPING RES. ZERO OHM (5MM)			
C002	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C003	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C004	CQ92FM1H223K	CAP. MYLAR	0.022	10% 50V	
C005	CC45FCH1H221J	CAP. CERAMIC	220P	5% 50V	
C006	CC45FCH1H470J	CAP. CERAMIC	47P	5% 50V	
C007	CC45CH1H101J	CAP. CERAMIC	100P	5% 50V	
C008	CC45FSL1H271J	CAP. CERAMIC	270P	5% 50V	
C009	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C010	CE04EW1E470M	CAP. ELECTRO	47	20% 25V	
C011	CE04EW1E470M	CAP. ELECTRO	47	20% 25V	
C012	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C013	CS15E1V010M	CAP. TANTALUM	1	20% 35V	
C014	CC45FCH1H030C	CAP. CERAMIC	3P	0.25P 50V	
C015	CQ92FM1H103K	CAP. MYLAR	0.01	10% 50V	
C016	CC45FCH1H470J	CAP. CERAMIC	47P	5% 50V	
C017	CE04EW1E470M	CAP. ELECTRO	47	20% 25V	
C018	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C019	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C020	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C021	CC45FCH1H101J	CAP. CERAMIC	100P	5% 50V	
C022	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C023	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C101	CC45FSL1H561J	CAP. CERAMIC	560P	5% 50V	
C102	NO USE				
C103	CQ92FM1H104K	CAP. MYLAR	0.1	10% 50V	
C104	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C105	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C106	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C107	CC45FCH1H820J	CAP. CERAMIC	82P	5% 50V	
C108	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C109	C91-0574-05	CAP. MYLAR	1	5% 100V	
C110	NO USE				
C111	CC45FCH1H050C	CAP. CERAMIC	5P	0.25P 50V	
C112	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C113	CC45FCH1H221J	CAP. CERAMIC	220P	5% 50V	
C114	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C115	CE04EW1E470M	CAP. ELECTRO	47	20% 25V	
C116	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C117	CQ92FM1H473K	CAP. MYLAR	0.047	10% 50V	
C118	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P 50V	
C119	CC45FCH1H470J	CAP. CERAMIC	47P	5% 50V	
C120	CQ92FM1H104K	CAP. MYLAR	0.1	10% 50V	
C121	CK45FB1H102K	CAP. CERAMIC	1000P	10% 50V	
C122	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C123	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C124	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C125	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C126	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C127	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C128	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C201	CC45FSL1H561J	CAP. CERAMIC	560P	5% 50V	
C202	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C203	CQ92FM1H104K	CAP. MYLAR	0.1	10% 50V	
C204	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C205	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C206	CE04EW1H100M	CAP. ELECTRO	10	20% 50V	
C207	CC45FCH1H820J	CAP. CERAMIC	82P	5% 50V	
C208	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C209	C91-0574-05	CAP. MYLAR	1	5% 100V	
C210	NO USE				
C211	CC45FCH1H050C	CAP. CERAMIC	5P	0.25P 50V	
C212	CE04EW1E101M	CAP. ELECTRO	100	20% 25V	
C213	CC45FCH1H050C	CAP. CERAMIC	5P	0.25P 50V	
C214	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P 50V	
C215	NO USE				
C216	CE04EW1E100M	CAP. ELECTRO	10	20% 25V	

REF.NO	PARTS NO	NAME & DESCRIPTION			
C217	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V
C218	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C219	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C220	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C221	CC45FCH1H151J	CAP. CERAMIC	150P	5%	50V
C222	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C223	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C224	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C225	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C226	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C227	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C228	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C229	NO USE				
C230	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C231	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C301	CC45FCH1H820J	CAP. CERAMIC	82P	5%	50V
C302	CC45FSL1H471J	CAP. CERAMIC	470P	5%	50V
C303	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C304	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C305	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C306	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C307	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C308	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C401	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C402	CC45FCH1H221J	CAP. CERAMIC	220P	5%	50V
C403	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C404	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C405	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C406	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C407	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C408	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C409	C91-1266-05	CAP. CERAMIC	1000P		6KV
C410	C91-1266-05	CAP. CERAMIC	1000P		6KV
C411	C91-1266-05	CAP. CERAMIC	1000P		6KV
C412	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C413	C91-1266-05	CAP. CERAMIC	1000P		6KV
C414	C91-1266-05	CAP. CERAMIC	1000P		6KV
C415	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C416	C91-1267-05	CAP. CERAMIC	4700P		3KV
C417	C91-1267-05	CAP. CERAMIC	4700P		3KV
C418	CS15E1V010M	CAP. TANTALUM	1	20%	35V
C419	CK45FB1H222K	CAP. CERAMIC	2200P	10%	50V
C420	CQ92FM1H223K	CAP. MYLAR	0.022	10%	50V
C421	CE04EW1H220M	CAP. ELECTRO	22	20%	50V
C422	C91-1264-05	CAP. CERAMIC	22P		3KV
C423	C91-1267-05	CAP. CERAMIC	4700P		3KV
C424	C91-1267-05	CAP. CERAMIC	4700P		3KV
C425	C91-1267-05	CAP. CERAMIC	4700P		3KV
C426	CE04W2C100M	CAP. ELECTRO	10	20%	160V
C427	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C434	C91-1309-05	CAP. CERAMIC	0.01	10%	500V
C503	CC45FSL1H331J	CAP. CERAMIC	330P	5%	50V
C504	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C505	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C506	NO USE				
C507	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C701	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C702	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C703	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C801	CE04EW1C102M	CAP. ELECTRO	1000	20%	16V
C802	CC45CH1H101J	CAP. CERAMIC	100P	5%	50V
C803	CK45F1H103Z	CAP. CERAMIC	0.01		50V
C804	CQ92M1H104K	CAP. MYLAR	0.1	10%	50V
C805	CK45F1H103Z	CAP. CERAMIC	0.01		50V
D001	1SS132	DIODE			
D002	1SS132	DIODE			
D003	1SS86	DIODE			
D004	1SS132	DIODE			
D005	1S1588	DIODE			
D006	1SS132	DIODE			
D101	1SS132	DIODE			
D102	1SS132	DIODE			
D103	1S1588	DIODE			
D104	1S1588	DIODE			
D105	1SS132	DIODE			
D106	1SS132	DIODE			
D107	1SS132	DIODE			

# PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION
D108	1SS132	DIODE
D109	1SS132	DIODE
D110	1SS132	DIODE
D111	1SS132	DIODE
D112	1SS132	DIODE
D113	HZS6.8J(B2)	DIODE, ZENER 6.79V
D201	1S1588	DIODE
D202	1S1588	DIODE
D203	1S1588	DIODE
D204	1SS132	DIODE
D205	1SS132	DIODE
D206	1SS132	DIODE
D207	1SS132	DIODE
D208	1SS132	DIODE
D209	1SS132	DIODE
D210	1SS132	DIODE
D211	1S1588	DIODE
D212	1SS132	DIODE
D213	1SS132	DIODE
D214	1S1588	DIODE
D215	1SS132	DIODE
D216	1SS132	DIODE
D217	1SS132	DIODE
D218	1S1588	DIODE
D219	1SS132	DIODE
D220	1SS132	DIODE
D301	1S1588	DIODE
D302	MA700	DIODE
D303	MA700	DIODE
D304	1SS86	DIODE
D305	1S1588	DIODE
D306	1S1588	DIODE
D307	1SS83	DIODE
D401	1SS132	DIODE
D402	HZ2(B3)	DIODE, ZENER 2.2V
D403	HZ2(B3)	DIODE, ZENER 2.2V
D404	1SS83	DIODE
D405	1SS83	DIODE
D406	1SS83	DIODE
D407	1SS83	DIODE
D408	1SS83	DIODE
D409	1SS83	DIODE
D410	1SS83	DIODE
D411	1SS83	DIODE
D412	1SS132	DIODE
D413	HZSS.6J(B2)	DIODE, ZENER 5.62V
D414	1SS132	DIODE
D415	1SS132	DIODE
D416	Y10GA	DIODE
D423	HZ36L(2)	DIODE, ZENER 36V
D424	HZ36L(2)	DIODE, ZENER 36V
D425	HZ36L(2)	DIODE, ZENER 36V
D426	B30-0957-05	LED (LN3226PT)
D502	MA700	DIODE
D503	MA700	DIODE
D504	1SS132	DIODE
D505	1SS132	DIODE
D506	1SS132	DIODE
D507	1SS132	DIODE
D508	NO USE	
D509	1S1588	DIODE
D510	MA700	DIODE
D511	MA700	DIODE
D512	1S1588	DIODE
D801	RD30E(B3)	DIODE, ZENER 29.09V
D802	1SS132	DIODE
D803	1SS132	DIODE
JW001	E31-5539-05	WIRE ASS'Y
JW002	E31-5540-05	WIRE ASS'Y
JW003	E31-5541-05	WIRE ASS'Y
JW010	E31-5514-15	WIRE ASS'Y
JW014	E31-5510-25	WIRE ASS'Y
JW039	E31-5533-15	WIRE ASS'Y
L101	L40-2292-02	FERRI INDUCTOR 2.2UH 20%

REF. NO	PARTS NO	NAME & DESCRIPTION
L201	L40-2292-02	FERRI INDUCTOR 2.2UH 20%
L401	L40-1011-13	FERRI INDUCTOR 100UH 10%
NE401	NE-2B	NEON LAMP
NE402	NE-2B	NEON LAMP
P004	E40-0273-05	PIN CONNECTOR 2P
P007	E40-0973-05	PIN CONNECTOR 9P
P021	E40-0273-05	PIN CONNECTOR 2P
P022	E40-0673-05	PIN CONNECTOR 6P
P023	E23-0401-05	PIN TERMINAL
P024	E40-0373-05	PIN CONNECTOR 3P
P025	E40-0573-05	PIN CONNECTOR 5P
P026	E40-0273-05	PIN CONNECTOR 2P
P027	NO USE	
P028	E40-0373-05	PIN CONNECTOR 3P
P029	E40-0873-05	PIN CONNECTOR 8P
P030	E40-0273-05	PIN CONNECTOR 2P
P031	E40-0373-05	PIN CONNECTOR 3P
P032	E23-0401-05	PIN TERMINAL
P033	E40-0573-05	PIN CONNECTOR 5P
P034	E23-0401-05	PIN TERMINAL
P035	NO USE	
P036	E40-0373-05	PIN CONNECTOR 3P
P037	E40-0373-05	PIN CONNECTOR 3P
P038	E40-0473-05	PIN CONNECTOR 4P
P039	E40-0473-05	PIN CONNECTOR 4P
P040	NO USE	
P041	E40-0273-05	PIN CONNECTOR 2P
P042	E40-0373-05	PIN CONNECTOR 3P
P043	E23-0401-05	PIN TERMINAL
P044	E23-0401-05	PIN TERMINAL
P045	E40-0273-05	PIN CONNECTOR 2P
P046	E40-7033-05	PIN CONNECTOR 2P
P047	E40-5331-05	PIN CONNECTOR 5P
P048	E40-0273-05	PIN CONNECTOR 2P
P049	NO USE	
P050	E40-0473-05	PIN CONNECTOR 4P
P051	E40-0273-05	PIN CONNECTOR 2P
P052	E40-0473-05	PIN CONNECTOR 4P
P053	E40-0273-05	PIN CONNECTOR 2P
P080	E40-0673-05	PIN CONNECTOR 6P
P081	E40-0216-05	PIN CONNECTOR 2P
P412	E40-0373-05	PIN CONNECTOR 3P
Q001	2SA1005(K)	TR. SI, PNP
Q002	2SA1005(K)	TR. SI, PNP
Q003	2SK304(E)	FET, N-CHANNEL
Q004	2SC1907	TR. SI, NPN
Q005	2SC1907	TR. SI, NPN
Q006	2SA844(D)	TR. SI, PNP
Q007	2SA844(D)	TR. SI, PNP
Q008	2SA844(D)	TR. SI, PNP
Q009	2SA844(D)	TR. SI, PNP
Q010	2SK117(BL)	FET, N-CHANNEL
Q011	2SA838(B)	TR. SI, PNP
Q012	2SA1015(Y)	TR. SI, PNP
Q013	2SC1907	TR. SI, NPN
Q014	2SA844(D)	TR. SI, PNP
Q015	2SC1907	TR. SI, NPN
Q016	2SC945(Q)	TR. SI, NPN
Q017	2SC945(Q)	TR. SI, NPN
Q018	2SA844(D)	TR. SI, PNP
Q101	2SA844(D)	TR. SI, PNP
Q102	2SA844(D)	TR. SI, PNP
Q103	2SA844(D)	TR. SI, PNP
Q104	2SA838(B)	TR. SI, PNP
Q105	2SC1843(E)	TR. SI, NPN
Q106	2SK117(BL)	FET, N-CHANNEL
Q107	2SK170(V)	FET, N-CHANNEL
Q108	2SA844(D)	TR. SI, PNP
Q109	2SA844(D)	TR. SI, PNP
Q110	2SC945(Q)	TR. SI, NPN
Q111	2SC945(Q)	TR. SI, NPN
Q112	2SC945(Q)	TR. SI, NPN
Q113	2SC945(Q)	TR. SI, NPN
Q201	2SA844(D)	TR. SI, PNP
Q202	2SA844(D)	TR. SI, PNP



# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION	REF.NO	PARTS NO	NAME & DESCRIPTION
Q203	2SAB44(D)	TR. SI, PNP	R034	RD14BB2C201J	RES. CARBON 200 5% 1/6W
Q204	2SAB38(B)	TR. SI, PNP	R035	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
Q205	2SC1843(E)	TR. SI, NPN	R036	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
Q206	2SK117(BL)	FET, N-CHANNEL	R037	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
Q207	2SK170(V)	FET, N-CHANNEL	R038	RD14BB2C202J	RES. CARBON 2K 5% 1/6W
Q208	2SAB44(D)	TR. SI, PNP	R039	RD14BB2C474J	RES. CARBON 470K 5% 1/6W
Q209	2SAB44(D)	TR. SI, PNP	R040	RD14BB2C473J	RES. CARBON 47K 5% 1/6W
Q210	2SA1015(Y)	TR. SI, PNP	R041	RD14BB2C331J	RES. CARBON 330 5% 1/6W
Q211	2SK170(V)	FET, N-CHANNEL	R042	RD14BB2C220J	RES. CARBON 22 5% 1/6W
Q212	2SK170(V)	FET, N-CHANNEL	R043	RD14BB2C561J	RES. CARBON 560 5% 1/6W
Q213	2SC945(O)	TR. SI, NPN	R044	RD14BB2C391J	RES. CARBON 390 5% 1/6W
Q214	2SAB44(D)	TR. SI, PNP	R045	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
Q215	2SAB44(D)	TR. SI, PNP	R046	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
Q216	2SC945(O)	TR. SI, NPN	R047	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
Q217	2SC945(O)	TR. SI, NPN	R048	RD14BB2C681J	RES. CARBON 680 5% 1/6W
Q218	2SC945(O)	TR. SI, NPN	R049	RD14BB2C123J	RES. CARBON 12K 5% 1/6W
Q219	2SA1005(K)	TR. SI, PNP	R050	RD14BB2C152J	RES. CARBON 1.5K 5% 1/6W
Q220	2SA1005(K)	TR. SI, PNP	R051	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
Q221	2SC945(O)	TR. SI, NPN	R052	RD14BB2C223J	RES. CARBON 22K 5% 1/6W
Q301	2SC945(O)	TR. SI, NPN	R053	RD14BB2C100J	RES. CARBON 10 5% 1/6W
Q302	2SC945(O)	TR. SI, NPN	R101	RD14BB2C473J	RES. CARBON 47K 5% 1/6W
Q303	2SA1015(Y)	TR. SI, PNP	R102	RD14BB2C151J	RES. CARBON 150 5% 1/6W
Q304	2SA1015(Y)	TR. SI, PNP	R103	RD14BB2C181J	RES. CARBON 180 5% 1/6W
Q305	2SC1907	TR. SI, NPN	R104	RD14BB2C470J	RES. CARBON 47 5% 1/6W
Q306	2SC1907	TR. SI, NPN	R105	RD14BB2C470J	RES. CARBON 47 5% 1/6W
Q307	2SC1907	TR. SI, NPN	R106	RD14BB2C152J	RES. CARBON 1.5K 5% 1/6W
Q308	2SAB38(B)	TR. SI, PNP	R107	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
Q309	2SD668A(C)	TR. SI, NPN	R108	RD14BB2C470J	RES. CARBON 47 5% 1/6W
Q310	2SD668A(C)	TR. SI, NPN	R109	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
Q311	2SB648A(C)	TR. SI, PNP	R110	RD14BB2C223J	RES. CARBON 22K 5% 1/6W
Q312	2SB648A(C)	TR. SI, PNP	R111	RD14BB2C331J	RES. CARBON 330 5% 1/6W
Q401	2SA1005(K)	TR. SI, PNP	R112	RD14BB2C330J	RES. CARBON 33 5% 1/6W
Q402	2SA1005(K)	TR. SI, PNP	R113	RD14BB2C153J	RES. CARBON 15K 5% 1/6W
Q403	2SC1907	TR. SI, NPN	R114	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
Q404	2SC1907	TR. SI, NPN	R115	RD14BB2C333J	RES. CARBON 33K 5% 1/6W
Q405	2SD668A(C)	TR. SI, NPN	R116	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
Q406	2SD668A(C)	TR. SI, NPN	R117	RN14BK2E3004F	RES. METAL FILM 3M 1% 1/4W
Q407	2SD668A(C)	TR. SI, NPN	R118	RN14BK2C1004F	RES. METAL FILM 1M 1% 1/6W
Q408	2SD668A(C)	TR. SI, NPN	R119	RN14BK2C5003F	RES. METAL FILM 500K 1% 1/6W
Q409	2SD880(Y)	TR. SI, NPN	R120	RN14BK2C3003F	RES. METAL FILM 300K 1% 1/6W
Q410	2SC945(O)	TR. SI, NPN	R121	RN14BK2C1003F	RES. METAL FILM 100K 1% 1/6W
Q411	2SA1015(Y)	TR. SI, PNP	R122	RN14BK2C5002F	RES. METAL FILM 50K 1% 1/6W
Q501	2SC1907	TR. SI, NPN	R123	RN14BK2C3002F	RES. METAL FILM 30K 1% 1/6W
Q502	2SC1907	TR. SI, NPN	R124	RN14BK2C1002F	RES. METAL FILM 10K 1% 1/6W
Q503	2SA1005(K)	TR. SI, PNP	R125	RN14BK2C5001F	RES. METAL FILM 5K 1% 1/6W
Q504	2SA1005(K)	TR. SI, PNP	R126	RN14BK2C3001F	RES. METAL FILM 3K 1% 1/6W
Q505	2SA1005(K)	TR. SI, PNP	R127	RN14BK2C1001F	RES. METAL FILM 1K 1% 1/6W
Q506	2SC945(O)	TR. SI, NPN	R128	RN14BK2C1001F	RES. METAL FILM 1K 1% 1/6W
R001	RD14BB2C220J	RES. CARBON 22 5% 1/6W	R129	RD14BB2C392J	RES. CARBON 3.9K 5% 1/6W
R002	RD14BB2C102J	RES. CARBON 1K 5% 1/6W	R130	RD14BB2C183J	RES. CARBON 18K 5% 1/6W
R003	RN14BK2C1001F	RES. METAL FILM 1K 1% 1/6W	R131	RD14BB2C121J	RES. CARBON 120 5% 1/6W
R004	RD14BB2C681J	RES. CARBON 680 5% 1/6W	R132	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R005	RD14BB2C912J	RES. CARBON 9.1K 5% 1/6W	R133	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R006	RD14BB2C302J	RES. CARBON 3K 5% 1/6W	R134	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R007	RD14BB2E220J	RES. CARBON 22 5% 1/4W	R135	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R008	RD14BB2C560J	RES. CARBON 56 5% 1/6W	R136	RD14BB2C223J	RES. CARBON 22K 5% 1/6W
R009	RD14BB2C103J	RES. CARBON 10K 5% 1/6W	R137	RD14BB2C561J	RES. CARBON 560 5% 1/6W
R010	RD14BB2C473J	RES. CARBON 47K 5% 1/6W	R138	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R011	RN14BK2E1004F	RES. METAL FILM 1M 1% 1/4W	R139	RD14BB2C821J	RES. CARBON 820 5% 1/6W
R012	RD14BB2C103J	RES. CARBON 10K 5% 1/6W	R140	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R013	RD14BB2C330J	RES. CARBON 33 5% 1/6W	R141	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R014	RD14BB2C152J	RES. CARBON 1.5K 5% 1/6W	R142	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R015	RD14BB2C151J	RES. CARBON 150 5% 1/6W	R143	RN14BK2C2002F	RES. METAL FILM 20K 1% 1/6W
R016	RD14BB2C392J	RES. CARBON 3.9K 5% 1/6W	R144	RN14BK2C3302F	RES. METAL FILM 33K 1% 1/6W
R017	RD14BB2C392J	RES. CARBON 3.9K 5% 1/6W	R145	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R018	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W	R146	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R019	RD14BB2C102J	RES. CARBON 1K 5% 1/6W	R147	RD14BB2C682J	RES. CARBON 6.8K 5% 1/6W
R020	RD14BB2C681J	RES. CARBON 680 5% 1/6W	R148	RD14BB2C392J	RES. CARBON 3.9K 5% 1/6W
R021	RD14BB2C681J	RES. CARBON 680 5% 1/6W	R149	RD14BB2C220J	RES. CARBON 22 5% 1/6W
R022	RD14BB2C681J	RES. CARBON 680 5% 1/6W	R150	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R023	RD14BB2C681J	RES. CARBON 680 5% 1/6W	R151	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R024	RD14BB2C104J	RES. CARBON 100K 5% 1/6W	R201	RD14BB2C151J	RES. CARBON 150 5% 1/6W
R025	RD14BB2C104J	RES. CARBON 100K 5% 1/6W	R202	RD14BB2C181J	RES. CARBON 180 5% 1/6W
R026	RD14BB2C103J	RES. CARBON 10K 5% 1/6W	R203	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R027	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W	R204	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R028	RD14BB2C223J	RES. CARBON 22K 5% 1/6W	R205	RD14BB2C152J	RES. CARBON 1.5K 5% 1/6W
R029	RD14BB2C474J	RES. CARBON 470K 5% 1/6W	R206	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R030	RD14BB2C474J	RES. CARBON 470K 5% 1/6W	R207	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R031	RD14BB2C301J	RES. CARBON 300 5% 1/6W	R208	RD14BB2C470J	RES. CARBON 47 5% 1/6W
R032	RD14BB2C910J	RES. CARBON 91 5% 1/6W	R209	RD14BB2C223J	RES. CARBON 22K 5% 1/6W
R033	RD14BB2C271J	RES. CARBON 270 5% 1/6W	R210	RD14BB2C331J	RES. CARBON 330 5% 1/6W
			R211	RD14BB2C330J	RES. CARBON 33 5% 1/6W
			R212	RD14BB2C183J	RES. CARBON 18K 5% 1/6W

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION	REF.NO	PARTS NO	NAME & DESCRIPTION
R213	RD148B2C183J	RES. CARBON 18K 5% 1/6W	R329	RN148K2C1003F	RES. METAL FILM 100K 1% 1/6W
R214	RD148B2C333J	RES. CARBON 33K 5% 1/6W	R330	RD148B2C470J	RES. CARBON 47 5% 1/6W
R215	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R331	RD148B2C470J	RES. CARBON 47 5% 1/6W
R216	RN148K2E3004F	RES. METAL FILM 3M 1% 1/4W			
R217	RN148K2C1004F	RES. METAL FILM 1M 1% 1/6W	R401	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W
R218	RN148K2C5003F	RES. METAL FILM 500K 1% 1/6W	R402	RD148B2C561J	RES. CARBON 560 5% 1/6W
R219	RN148K2C3003F	RES. METAL FILM 300K 1% 1/6W	R403	RD148B2C101J	RES. CARBON 100 5% 1/6W
R220	RN148K2C1003F	RES. METAL FILM 100K 1% 1/6W	R404	RD148B2C123J	RES. CARBON 12K 5% 1/6W
R221	RN148K2C5002F	RES. METAL FILM 50K 1% 1/6W	R405	RD148B2C101J	RES. CARBON 100 5% 1/6W
R222	RN148K2C3002F	RES. METAL FILM 30K 1% 1/6W	R406	RD148B2C221J	RES. CARBON 220 5% 1/6W
R223	RN148K2C1002F	RES. METAL FILM 10K 1% 1/6W	R407	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W
R224	RN148K2C5001F	RES. METAL FILM 5K 1% 1/6W	R408	RD148B2C331J	RES. CARBON 330 5% 1/6W
R225	RN148K2C3001F	RES. METAL FILM 3K 1% 1/6W	R409	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W
R226	RN148K2C1001F	RES. METAL FILM 1K 1% 1/6W	R410	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W
R227	RN148K2C1001F	RES. METAL FILM 1K 1% 1/6W	R411	RD148B2C473J	RES. CARBON 47K 5% 1/6W
R228	RD148B2C392J	RES. CARBON 3.9K 5% 1/6W	R412	RD148B2C331J	RES. CARBON 330 5% 1/6W
R229	RD148B2C183J	RES. CARBON 18K 5% 1/6W	R413	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W
R230	RD148B2C121J	RES. CARBON 120 5% 1/6W	R414	RD148B2H473J	RES. CARBON 47K 5% 1/2W
R231	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W	R415	RD148B2H473J	RES. CARBON 47K 5% 1/2W
R232	RD148B2C182J	RES. CARBON 1.8K 5% 1/6W	R416	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W
R233	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R417	RD148B2H473J	RES. CARBON 47K 5% 1/2W
R234	RD148B2C471J	RES. CARBON 470 5% 1/6W	R418	RD148B2H473J	RES. CARBON 47K 5% 1/2W
R235	RD148B2C153J	RES. CARBON 15K 5% 1/6W	R419	RD148B2C681J	RES. CARBON 680 5% 1/6W
R236	RD148B2C822J	RES. CARBON 8.2K 5% 1/6W	R420	RD148B2C681J	RES. CARBON 680 5% 1/6W
R237	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W	R421	RD148B2C101J	RES. CARBON 100 5% 1/6W
R238	RD148B2C242J	RES. CARBON 2.4K 5% 1/6W	R422	RD148B2C101J	RES. CARBON 100 5% 1/6W
R239	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W	R423	RD148B2E332J	RES. CARBON 3.3K 5% 1/4W
R240	RD148B2C822J	RES. CARBON 8.2K 5% 1/6W	R424	R92-1057-05	RES. METAL FILM 2.2M 5% 1/2W
R241	RD148B2C561J	RES. CARBON 560 5% 1/6W	R425	RD148B2C823J	RES. CARBON 82K 5% 1/6W
R242	RD148B2C563J	RES. CARBON 56K 5% 1/6W	R426	R92-1057-05	RES. METAL FILM 2.2M 5% 1/2W
R243	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W	R427	R92-1007-05	RES. CARBON 10M 5% 1/2W
R244	RD148B2C221J	RES. CARBON 220 5% 1/6W	R428	R92-1007-05	RES. CARBON 10M 5% 1/2W
R245	RD148B2C561J	RES. CARBON 560 5% 1/6W	R429	RD148B2E102J	RES. CARBON 1K 5% 1/4W
			R430	RD148B2E102J	RES. CARBON 1K 5% 1/4W
R248	RN148K2C2002F	RES. METAL FILM 20K 1% 1/6W	R431	RD148B2C101J	RES. CARBON 100 5% 1/6W
R249	RN148K2C3302F	RES. METAL FILM 33K 1% 1/6W	R432	RD148B2C101J	RES. CARBON 100 5% 1/6W
R250	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R433	R92-1057-05	RES. METAL FILM 2.2M 5% 1/2W
R251	RD148B2C561J	RES. CARBON 560 5% 1/6W	R434	RD148B2C103J	RES. CARBON 10K 5% 1/6W
R252	RD148B2C471J	RES. CARBON 470 5% 1/6W	R435	R92-1007-05	RES. CARBON 10M 5% 1/2W
R253	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R436	R92-1007-05	RES. CARBON 10M 5% 1/2W
R254	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R437	R92-1418-05	RES. METAL 6.8M 1% 1W
R255	RD148B2C223J	RES. CARBON 22K 5% 1/6W	R438	R92-1419-05	RES. METAL FILM 10M 1% 1W
R256	RD148B2C333J	RES. CARBON 33K 5% 1/6W	R439	RD148B2C471J	RES. CARBON 470 5% 1/6W
R257	RD148B2C562J	RES. CARBON 5.6K 5% 1/6W	R440	RN148K2C1103F	RES. METAL FILM 110K 1% 1/6W
R258	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W	R441	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W
R259	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R442	RN148K2C8201F	RES. METAL FILM 8.2K 1% 1/6W
R260	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W	R443	RN148K2C1202F	RES. METAL FILM 12K 1% 1/6W
R261	RD148B2C392J	RES. CARBON 3.9K 5% 1/6W	R444	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R262	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R445	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W
R263	RD148B2C103J	RES. CARBON 10K 5% 1/6W	R446	RS148B3A1R0J	RES. METAL FILM 1 5% 1W
R264	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R447	RD148B2H223J	RES. CARBON 22K 5% 1/2W
R265	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R448	RD148B2C104J	RES. CARBON 100K 5% 1/6W
R266	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R449	RD148B2C473J	RES. CARBON 47K 5% 1/6W
R267	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W	R450	NO USE	
R268	RD148B2C100J	RES. CARBON 10 5% 1/6W	R451	RD148B2C681J	RES. CARBON 680 5% 1/6W
R269	RD148B2C100J	RES. CARBON 10 5% 1/6W	R452	RD148B2C470J	RES. CARBON 47 5% 1/6W
			R453	RS148B3A102J	RES. METAL FILM 1K 5% 1W
R301	RD148B2C471J	RES. CARBON 470 5% 1/6W	R454	RS148B3A750J	RES. METAL FILM 75 5% 1W
R302	RD148B2C392J	RES. CARBON 3.9K 5% 1/6W	R455	RS148B3A750J	RES. METAL FILM 75 5% 1W
R303	RN148K2E1501F	RES. METAL FILM 1.5K 1% 1/4W	R456	RD148B2C304J	RES. CARBON 300K 5% 1/6W
R304	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W	R457	RD148B2C682J	RES. CARBON 6.8K 5% 1/6W
R305	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W			
R306	RD148B2C682J	RES. CARBON 6.8K 5% 1/6W	R501	RD148B2C104J	RES. CARBON 100K 5% 1/6W
R307	RD148B2C471J	RES. CARBON 470 5% 1/6W	R502	RD148B2C104J	RES. CARBON 100K 5% 1/6W
R308	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R503	RD148B2C103J	RES. CARBON 10K 5% 1/6W
R309	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R504	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W
R310	RN148K2E47R0F	RES. METAL FILM 47.0 1% 1/4W	R505	RD148B2C102J	RES. CARBON 1K 5% 1/6W
R311	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W	R506	RN148K2C3301F	RES. METAL FILM 3.3K 1% 1/6W
R312	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W	R507	RN148K2C3301F	RES. METAL FILM 3.3K 1% 1/6W
R313	RN148K2C1001F	RES. METAL FILM 1K 1% 1/6W	R508	RD148B2C122J	RES. CARBON 1.2K 5% 1/6W
R314	RN148K2C1001F	RES. METAL FILM 1K 1% 1/6W	R509	RD148B2C561J	RES. CARBON 560 5% 1/6W
R315	RN148K2C7500F	RES. METAL FILM 750 1% 1/6W	R510	RD148B2C103J	RES. CARBON 10K 5% 1/6W
R316	RD148B2C331J	RES. CARBON 330 5% 1/6W	R511	RD148B2C103J	RES. CARBON 10K 5% 1/6W
R317	RD148B2C331J	RES. CARBON 330 5% 1/6W	R512	RD148B2C751J	RES. CARBON 750 5% 1/6W
R318	RD148B2C123J	RES. CARBON 12K 5% 1/6W			
R319	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W	R515	RN148K2C8201F	RES. METAL FILM 8.2K 1% 1/6W
R320	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W	R516	RN148K2C2201F	RES. METAL FILM 2.2K 1% 1/6W
R321	RD148B2C393J	RES. CARBON 39K 5% 1/6W	R517	RN148K2C8200F	RES. METAL FILM 820 1% 1/6W
R322	RD148B2C104J	RES. CARBON 100K 5% 1/6W	R518	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W
R323	RD148B2C104J	RES. CARBON 100K 5% 1/6W	R519	RD148B2C103J	RES. CARBON 10K 5% 1/6W
R324	RD148B2C152J	RES. CARBON 1.5K 5% 1/6W	R520	RD148B2C104J	RES. CARBON 100K 5% 1/6W
R325	RD148B2C152J	RES. CARBON 1.5K 5% 1/6W	R521	RD148B2C622J	RES. CARBON 6.2K 5% 1/6W
R326	RD148B2C331J	RES. CARBON 330 5% 1/6W	R522	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W
R327	RD148B2C331J	RES. CARBON 330 5% 1/6W	R523	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W
R328	RN148K2C1003F	RES. METAL FILM 100K 1% 1/6W	R524	RD148B2C101J	RES. CARBON 100 5% 1/6W

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION
R525	RD14BB2C222J	RES. CARBON 2.2K 5% 1/6W
R526	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R527	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R528	RD14BB2C303J	RES. CARBON 30K 5% 1/6W
R529	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R530	RD14BB2C474J	RES. CARBON 470K 5% 1/6W
R531	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R532	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R533	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R534	R90-0665-05	RES. NETWORK 7X10K
R535	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R536	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R537	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R701	R90-0664-05	RES. NETWORK 10X10K
R702	R90-0664-05	RES. NETWORK 10X10K
R801	RD14BB2C151J	RES. CARBON 150 5% 1/6W
R802	RD14BB2C120J	RES. CARBON 12 5% 1/6W
R803	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R804	RD14BB2C561J	RES. CARBON 560 5% 1/6W
R805	RD14BB2C163J	RES. CARBON 16K 5% 1/6W
R806	RD14BB2C272J	RES. CARBON 2.7K 5% 1/6W
S001	S33-2501-05	LEVER SWITCH 2-5
S002	S32-4008-05	LEVER SWITCH 4-5
S101	S33-4503-05	LEVER SWITCH 4-5 (H.MODE)
S102	S29-4502-05	ROTARY SWITCH (SWEEP TIME)
S202	S32-4009-05	LEVER SWITCH 4-4
S501	S33-2501-05	LEVER SWITCH 2-5
T401	L19-0421-05	CONVERTOR TRANSFORMER
TC101	C05-0454-05	CAP. TRIMMER 20PF
TC201	C05-0454-05	CAP. TRIMMER 20PF
U001	SN74LS00N	IC. QUAD 2 INPUT NAND
U101	SN74LS00N	IC. QUAD 2 INPUT NAND
U102	SN74LS112AN	IC. DUAL JK-FF
U103	TLO81CP	IC. BI-FET O.P AMP
U104	TC4053BP	IC. 2-CH ANALOG MULTIPLEXER
U201	SN74LS112AN	IC. DUAL JK-FF
U202	TLO81CP	IC. BI-FET O.P AMP
U203	SN74LS112AN	IC. DUAL JK-FF
U401	LF13741N	IC. MONOLITHIC JFET INPUT OP
U501	TC74HC123AP	IC. DUAL RETRIGG. MONO. MULTIVI
U502	NJM4558D	IC. DUAL OP AMP
U701	DTM-5020	IC. GATE ARRAY
U702	DTM-5020	IC. GATE ARRAY
VR001	R12-2522-05	RES. SEMI FIXED 5K B
VR002	R12-0575-05	RES. SEMI FIXED 100 B
VR003	R12-0577-05	RES. SEMI FIXED 500 B
VR101	R12-3549-05	RES. SEMI FIXED 10K B
VR102	RO6-3502-05	V.R. 10K B
VR201	R12-3549-05	RES. SEMI FIXED 10K B
VR202	R12-1545-05	RES. SEMI FIXED 1K B
VR203	R12-1545-05	RES. SEMI FIXED 1K B
VR204	R12-3550-05	RES. SEMI FIXED 20K B
VR301	R12-1546-05	RES. SEMI FIXED 2K B
VR302	R12-0575-05	RES. SEMI FIXED 100 B
VR401	R12-4516-05	RES. SEMI FIXED 50K B
VR402	R12-8501-05	RES. SEMI FIXED 2.2M B
VR403	R12-3549-05	RES. SEMI FIXED 10K B
VR501	R12-0577-05	RES. SEMI FIXED 500 B
VR502	R12-1545-05	RES. SEMI FIXED 1K B
W001	W02-0488-05	HIGH VOLTAGE BLOCK

## R/O UNIT

### X77-1510-00

REF.NO	PARTS NO	NAME & DESCRIPTION
	J25-5232-12	PCB (UNMOUNTED)
C001	CE04EW1A470M	CAP. ELECTRO 47 20% 10V
C002	C91-1245-05	CAP. CERAMIC 0.1 12V
C003	C91-0769-05	CAP. AXIAL 0.01 20% 16V
C004	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C005	NO USE	
C006	CC45FSL1H331J	CAP. CERAMIC 330P 5% 50V
C007	CC45FCH1H680J	CAP. CERAMIC 68P 5% 50V
C008	CF92FV1H334J	CAP. POLYESTER 0.33 5% 50V
C009	CF92FV1H334J	CAP. POLYESTER 0.33 5% 50V
C010	CF92FV1H334J	CAP. POLYESTER 0.33 5% 50V
C011	CF92FV1H334J	CAP. POLYESTER 0.33 5% 50V
C012	NO USE	
C013	CC45FCH1H101J	CAP. CERAMIC 100P 5% 50V
C016	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C017	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C018	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C019	CE04EW1C220M	CAP. ELECTRO 22 20% 16V
C020	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C021	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C022	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C023	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C024	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C025	CE04EW1C220M	CAP. ELECTRO 22 20% 16V
C026	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C027	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C028	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C029	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C030	CE04EW1C220M	CAP. ELECTRO 22 20% 16V
C031	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C032	C91-1245-05	CAP. CERAMIC 0.1 12V
C033	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C034	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C035	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C036	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C037	CE04EW1C220M	CAP. ELECTRO 22 20% 16V
C038	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C039	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C042	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C043	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C046	C91-1245-05	CAP. CERAMIC 0.1 12V
C047	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C048	CE04EW1C220M	CAP. ELECTRO 22 20% 16V
C049	CE04EW1C220M	CAP. ELECTRO 22 20% 16V
C050	C91-0769-05	CAP. AXIAL 0.01 20% 16V
C051	C91-0769-05	CAP. AXIAL 0.01 20% 16V
C052	C91-0769-05	CAP. AXIAL 0.01 20% 16V
C053	C91-0769-05	CAP. AXIAL 0.01 20% 16V
C054	CE04EW1A101M	CAP. ELECTRO 100 20% 10V
C055	NO USE	
C056	C91-1245-05	CAP. CERAMIC 0.1 12V
C057	C91-1245-05	CAP. CERAMIC 0.1 12V
C058	C91-1245-05	CAP. CERAMIC 0.1 12V
C059	C91-1245-05	CAP. CERAMIC 0.1 12V
C060	C91-1245-05	CAP. CERAMIC 0.1 12V
C061	C91-1245-05	CAP. CERAMIC 0.1 12V
C062	C91-1245-05	CAP. CERAMIC 0.1 12V
C066	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V
C067	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V
C068	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V
C071	C91-1249-05	CAP. NETWORK 0.01X13
C072	C91-1249-05	CAP. NETWORK 0.01X13
C073	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C074	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C075	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C076	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C077	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C078	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C079	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C080	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C081	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C082	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C083	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C084	CK45FF1H103Z	CAP. CERAMIC 0.01 50V
C085	CK45FF1H103Z	CAP. CERAMIC 0.01 50V

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION			REF.NO	PARTS NO	NAME & DESCRIPTION
C901	CK45F1H103Z	CAP. CERAMIC	0.01	50V	U015	NJM4558D	IC,DUAL OP AMP
D001	MA700	DIODE			U016	SN74LS04N	IC,HEX INVERTER
D002	MA700	DIODE			U017	HD74HC138AP	IC,3 TO 8 DECODER MULTIPLEXER
L001	L40-1011-04	FERRI INDUCTOR	100UH		U018	HD74HC373AP	IC,OCTAL D-LATCHES
P015	E40-0473-05	PIN CONNECTOR	4P		U019	SN74LS244N	IC,OCTAL BUFFER
P016	E40-1373-05	PIN CONNECTOR	13P		U020	SN74LS244N	IC,OCTAL BUFFER
P033	E40-1173-05	PIN CONNECTOR	11P		U021	SN74LS244N	IC,OCTAL BUFFER
P034	NO USE				U022	SN74LS244N	IC,OCTAL BUFFER
P035	E40-0973-05	PIN CONNECTOR	9P		U023	CTM5040	IC, CPU
P057	E40-0473-05	PIN CONNECTOR	4P		VR001	R12-1538-05	RES. SEMI FIXED 1KB
P065	E40-0473-05	PIN CONNECTOR	4P		VR002	R12-2520-05	RES. SEMI FIXED 5KB
P080	E40-1173-05	PIN CONNECTOR	11P		X001	L78-0107-05	CERAMIC RESONATOR (10MHZ)
Q001	2SC2785(F)	TR. SI, NPN					
Q002	2SA1175(F)	TR. SI, PNP					
R001	RD14BB2C682J	RES. CARBON	6.8K	5% 1/6W			
R002	RD14BB2C512J	RES. CARBON	5.1K	5% 1/6W			
R005	RD14BB2C103J	RES. CARBON	10K	5% 1/6W			
R006	RD14BB2C102J	RES. CARBON	1K	5% 1/6W			
R007	RD14BB2C104J	RES. CARBON	100K	5% 1/6W			
R008	RN14BK2C1202F	RES. METAL FILM	12K	1% 1/6W			
R009	RD14BB2C123J	RES. CARBON	12K	5% 1/6W			
R010	RN14BK2C6200F	RES. METAL FILM	620	1% 1/6W			
R011	RN14BK2C6200F	RES. METAL FILM	620	1% 1/6W			
R012	RN14BK2C9531F	RES. METAL FILM	9.53K	1% 1/6W			
R013	RN14BK2C1301F	RES. METAL FILM	1.3K	1% 1/6W			
R014	RN14BK2C9101F	RES. METAL FILM	9.1K	1% 1/6W			
R015	RD14BB2C102J	RES. CARBON	1K	5% 1/6W			
R016	RD14BB2C331J	RES. CARBON	330	5% 1/6W			
R017	RN14BK2C9101F	RES. METAL FILM	9.1K	1% 1/6W			
R018	RD14BB2C102J	RES. CARBON	1K	5% 1/6W			
R019	RD14BB2C331J	RES. CARBON	330	5% 1/6W			
R020	RN14BK2C3602F	RES. METAL FILM	36K	1% 1/6W			
R021	RD14BB2C622J	RES. CARBON	6.2K	5% 1/6W			
R022	RN14BK2C7501F	RES. METAL FILM	7.5K	1% 1/6W			
R023	RN14BK2C7501F	RES. METAL FILM	7.5K	1% 1/6W			
R024	RN14BK2C3602F	RES. METAL FILM	36K	1% 1/6W			
R025	RD14BB2C622J	RES. CARBON	6.2K	5% 1/6W			
R026	RD14BB2C473J	RES. CARBON	47K	5% 1/6W			
R027	RD14BB2C473J	RES. CARBON	47K	5% 1/6W			
R028	NO USE						
R029	RN14BK2C1202F	RES. METAL FILM	12K	1% 1/6W			
R030	RN14BK2C1101F	RES. METAL FILM	1.1K	1% 1/6W			
R031	RD14BB2C562J	RES. CARBON	5.6K	5% 1/6W			
R032	RD14BB2C622J	RES. CARBON	6.2K	5% 1/6W			
R033	R90-0654-05	RES. NETWORK	COMPLEX, Y				
R034	NO USE						
R035	RD14BB2C5R6J	RES. CARBON	5.6	5% 1/6W			
R036	RD14BB2C103J	RES. CARBON	10K	5% 1/6W			
R037	RD14BB2C103J	RES. CARBON	10K	5% 1/6W			
R038	NO USE						
R039	RD14BB2C153J	RES. CARBON	15K	5% 1/6W			
R040	RD14BB2C103J	RES. CARBON	10K	5% 1/6W			
R043	R90-0653-05	RES. NETWORK	8X10K	5%			
R044	RD14BB2C472J	RES. CARBON	4.7K	5% 1/6W			
R045	NO USE						
R046	RD14BB2C101J	RES. CARBON	100	5% 1/6W			
R050	RD14BB2C301J	RES. CARBON	300	5% 1/6W			
R051	RD14BB2C301J	RES. CARBON	300	5% 1/6W			
R052	RD14BB2C301J	RES. CARBON	300	5% 1/6W			
U001	DAC0808LCN	IC,8-BIT D/A CONVERTER					
U002	HD74HC564AP	IC,OCTAL D FLIP-FLOP					
U003	HD74HC244AP	IC,OCTAL BUFFER					
U004	HD14052BP	IC,DUAL ANALOG MULTIPLEXER					
U005	HD14052BP	IC,DUAL ANALOG MULTIPLEXER					
U006	HD14051BP	IC,ANALOG MULTIPLEXER					
U007	MBM27C64*T	IC,CHARACTOR GENERATOR					
U008	CTM5020	IC,GATE ARRAY (R/D CONTROLLER)					
U009	AM6012DC	IC,12-BIT D/A CONVERTER					
U010	NJM311D	IC,COMPARATOR					
U011	NJM4558D	IC,DUAL OP AMP					
U012	R90-0655-05	CR NETWORK					
U013	NJM072BD	IC,JFET INPUT OP AMP					
U014	HD14051BP	IC,ANALOG MULTIPLEXER					

# PARTS LIST

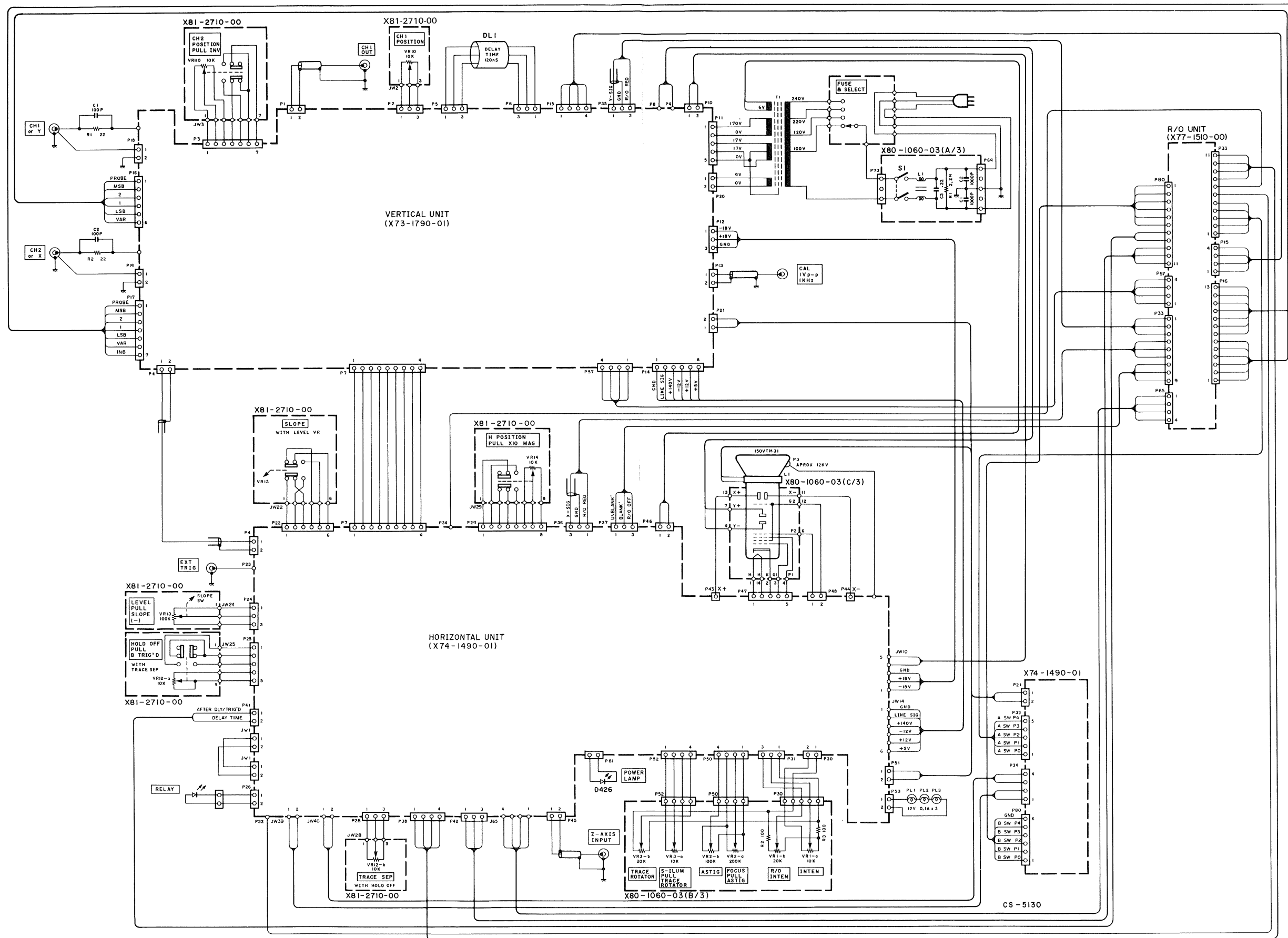
## LINE FILTER UNIT X80-1060-03

REF.NO	PARTS NO	NAME & DESCRIPTION
	E01-0103-05	CRT SOCKET
	E31-5505-05	WIRE ASS'Y (+Y,-Y)
	E31-5524-05	WIRE ASS'Y (+X,-X)
	E31-5528-05	WIRE ASS'Y (P2,G2)
	E31-5532-15	WIRE ASS'Y (P1,G1,K)
	J25-5179-33	PCB (UNMOUNTED)
	R92-0150-05	JUMPING RES. ZERO OHM(10MM)
C001	C91-0575-05	CAP. CERAMIC 1000P 4KV
C002	C91-0575-05	CAP. CERAMIC 1000P 4KV
C003	C91-0551-05	CAP. POLYESTER 0.22 10% 630V
C004	CC45CH2HOR5C	CAP. CERAMIC 0.5P 0.25P 500V
L001	L33-0808-05	CHOKO COIL
P030	E40-0574-05	PIN CONNECTOR 5P
P050	E40-0474-05	PIN CONNECTOR 4P
P051	NO USE	
P052	E40-0474-05	PIN CONNECTOR 4P
P069	E40-0530-05	PIN CONNECTOR 5P
P073	E40-0330-05	PIN CONNECTOR 3P
R001	RD14BY2H225J	RES. CARBON 2.2M 5% 1/2W
R002	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R003	RD14BB2C101J	RES. CARBON 100 5% 1/6W
S001	S40-2524-05	PUSH SWITCH (POWER)
VR001	R10-9508-05	V.R.(INTENSITY) 10KB/20KB
VR002	R10-9506-05	V.R.(FOCUS/ASTIG) 200KB/100KB
VR003	R10-9507-05	V.R.(ILLUM/ROTA) 10KB/20KB

## VR UNIT X81-2710-00

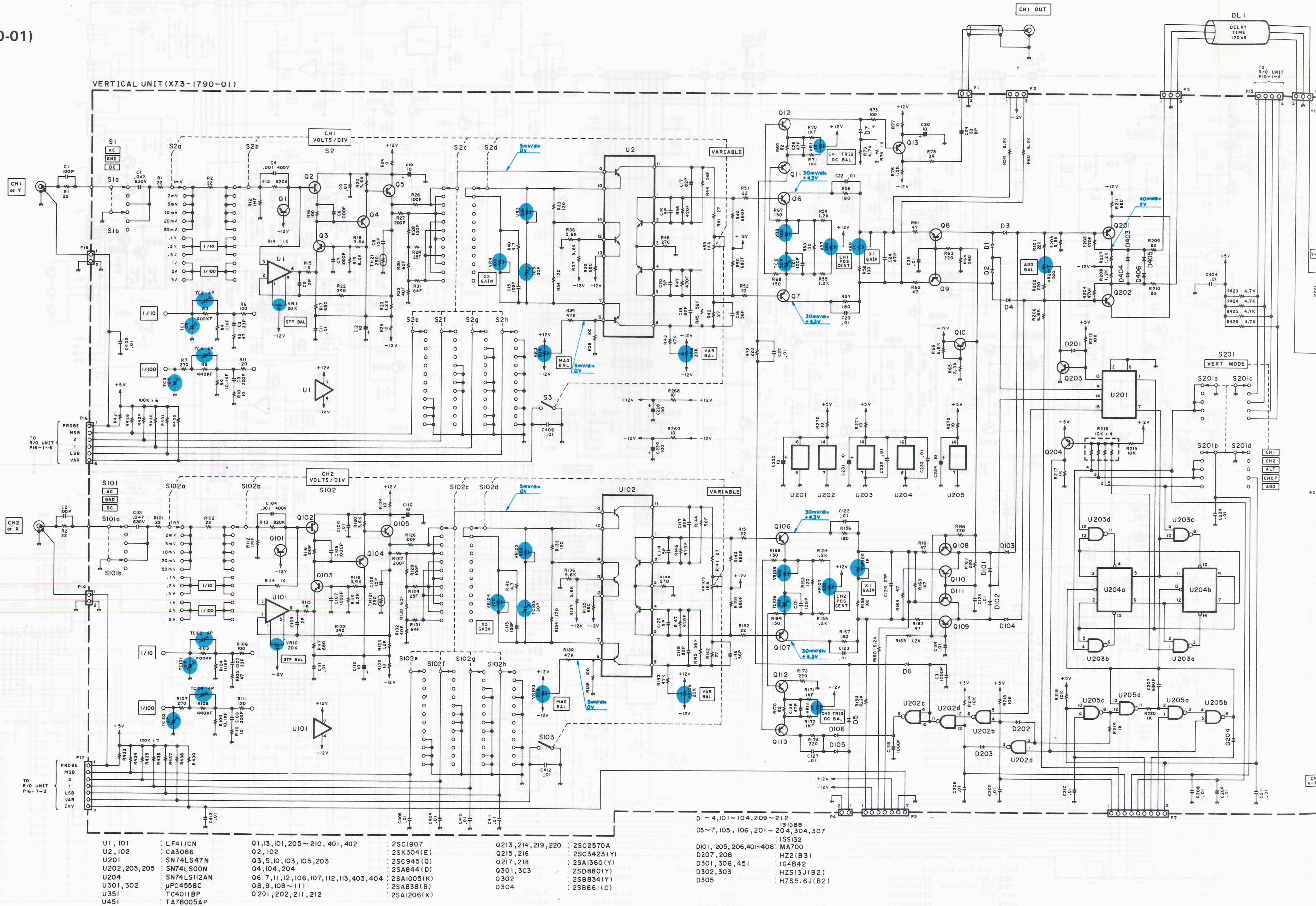
REF.NO	PARTS NO	NAME & DESCRIPTION
	J25-5354-03	PCB (UNMOUNTED)
JW002	E31-5503-05	WIRE ASS'Y
JW003	E31-5507-05	WIRE ASS'Y
JW022	E31-5517-05	WIRE ASS'Y
JW023	NO USE	
JW024	E31-5518-05	WIRE ASS'Y
JW025	E31-5520-15	WIRE ASS'Y
JW028	E31-5522-15	WIRE ASS'Y
JW029	E31-5523-05	WIRE ASS'Y
VR010	R01-3522-05	V.R. 2X10K B
VR011	NO USE	
VR012	R06-2505-05	VR WITH SWITCH 2X10K B
VR013	R01-5513-05	VR WITH SWITCH 100K B
VR014	R01-3523-05	VR WITH SWITCH 10K B
VR110	R01-3523-05	VR WITH SWITCH 10K B

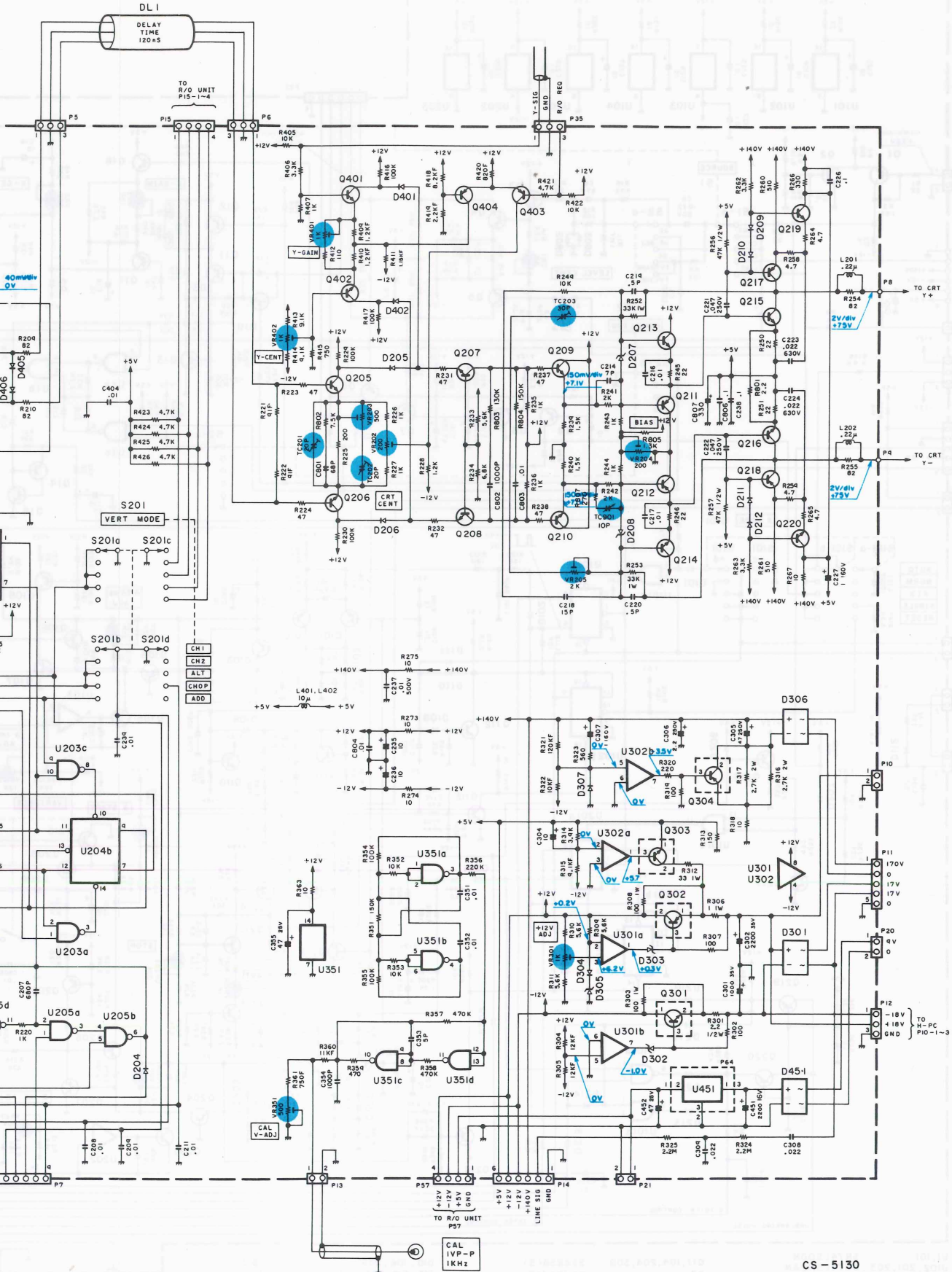
# SCHEMATIC DIAGRAM



# SCHEMATIC DIAGRAM

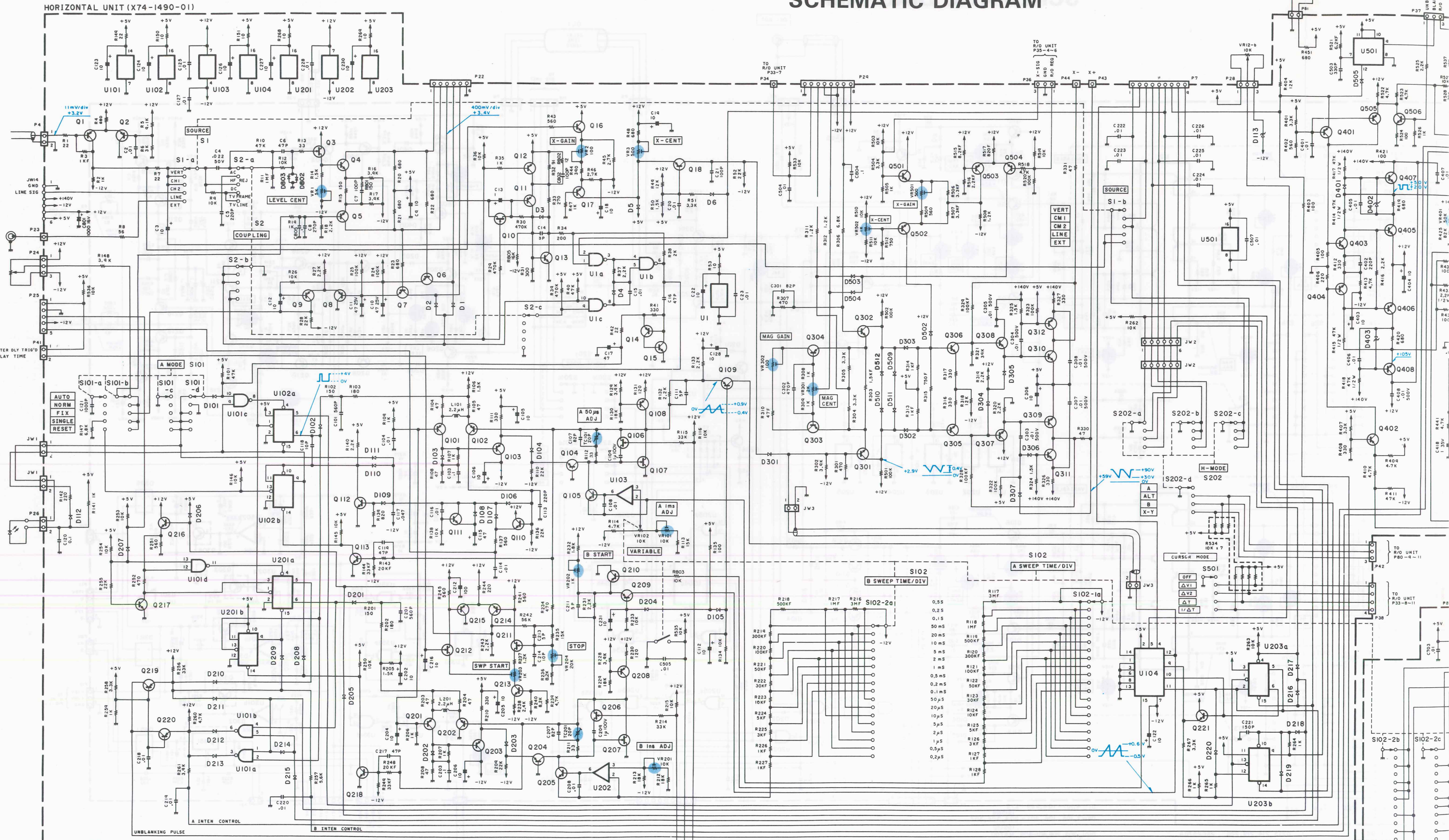
## VERTICAL UNIT (X73-1790-01)



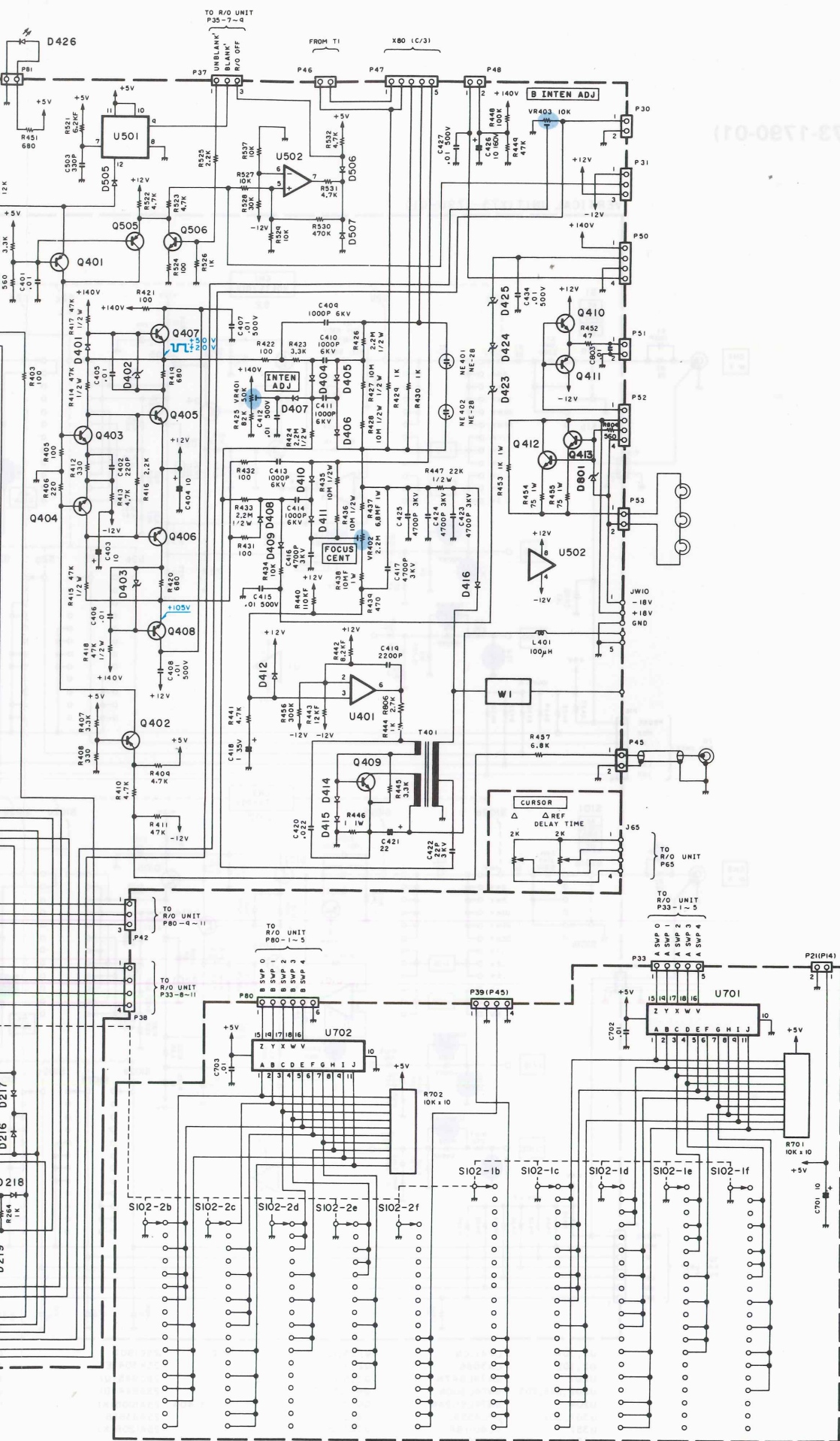


CS-5130





- |                              |   |   |  |   |                       |
|------------------------------|---|---|--|---|-----------------------|
| U1, 101 : SN74LS00N          | Q11, 104, 204, 308 : 2SA838(B)                        | Q10, 106, 206 : 2SK117(BL)                              | Q1, 2, 219, 220, 401, 402 : 2SA1005(K) | D1, 2, 4, 6, 10, 102, 105-112, 204-210, 212, 213 : 2SA1005(K) | D307, 404~411 : 1SS83 |
| U102, 201, 203 : SN74LS112AN | Q3 : 2SK304(E)  | Q12, 210, 303, 304, 411 : 2SA1015(Y)                    | 503~505 : 2SA1005(K)                   | 215-217, 219, 220, 401, 412, 414, 415 : 2SA1005(K)            | D402, 403 : HZ2(B3)   |
| U103, 202 : TL081CP          | Q4, 5, 13, 15, 305~307, 403 : 2SC1907                 | Q16, 17, 110~113, 213, 216~218, 221, 301, 302 : 2SC1907 | Q309, 310, 405~408 : 2SD668(A,C)       | 503~507, 802, 803 : 1SS132                                    | D416 : Y10GA          |
| U104 : TC4053BP              | 410, 506 : 2SC1907                                    | 410, 506 : 2SC1907                                      | Q311, 312 : 2SB648(A,C)                | 803 : 1SS132  | D423~425 : HZ36L(2)   |
| U401 : LF1374IN              | Q6~9, 14, 18, 101~103, 108, 109, 201~203 : 2SC1843(E) | Q105, 205 : 2SC1843(E)                                  | Q409 : 2SD980(Y)                       | D302, 303, 502, 503, 510, 511 : MA700                         | D426 : B30-0957-05    |
| U501 : TC74HC123AP           | 208, 209, 214, 215 : 2SA844(D)                        | Q107, 207, 211, 212 : 2SK170(V)                         | Q409 : 2SD980(Y)                       | D302, 303, 502, 503, 510, 511 : MA700                         | D801 : RD30E(B3)      |
| U502 : NJM4558D              |   |   | Q412, 413 : 2SC1846(R)                 | 505, 306, 509, 512 : 1S1588                                   | D802, 803 : 1SS32     |
| U701, 702 : DTM-5020         |   |   |  |   |                       |

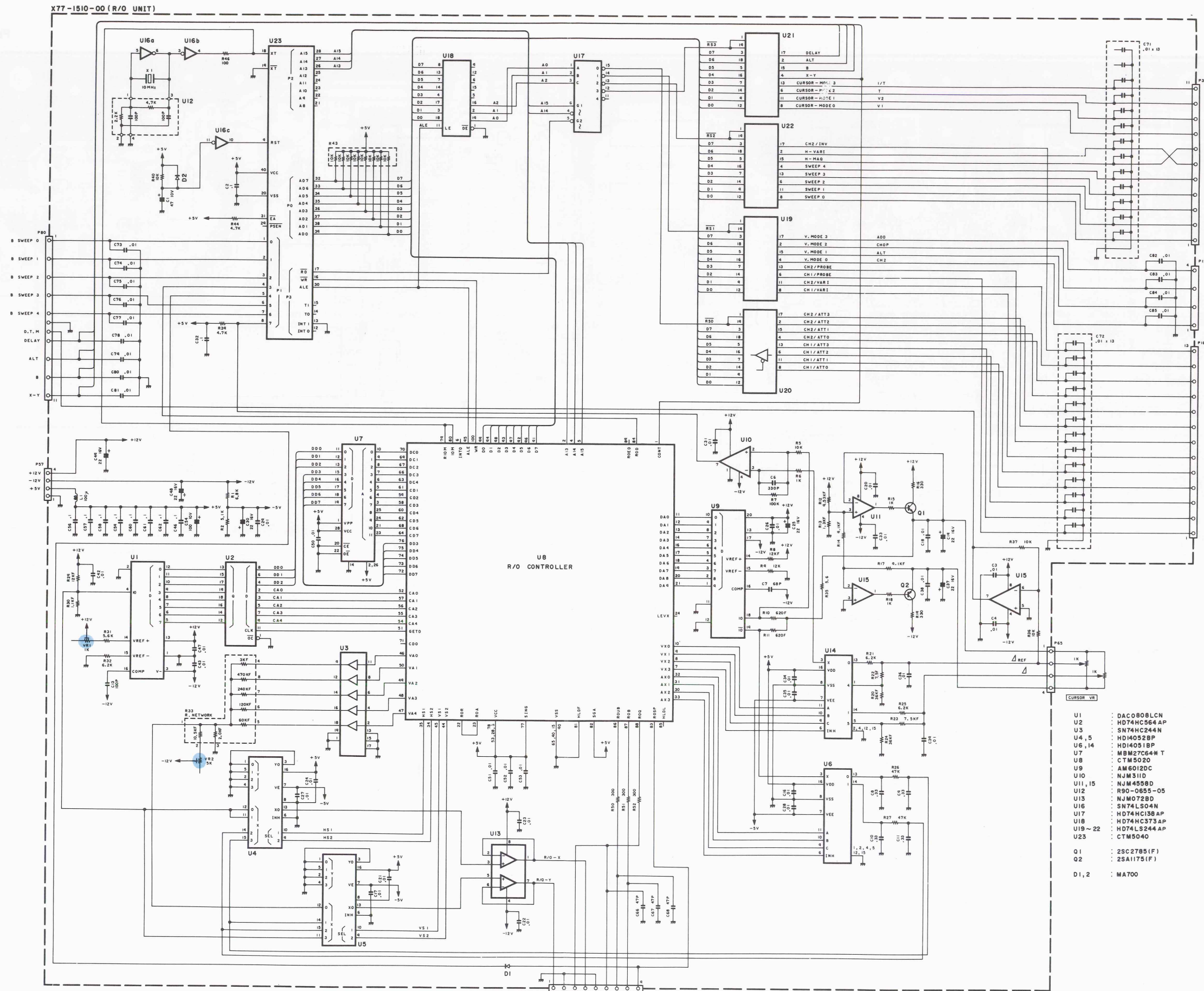


VERTICAL UNIT (X73-1790-01)

# SCHEMATIC DIAGRAM

VERTICAL UNIT (X73-1510-00)

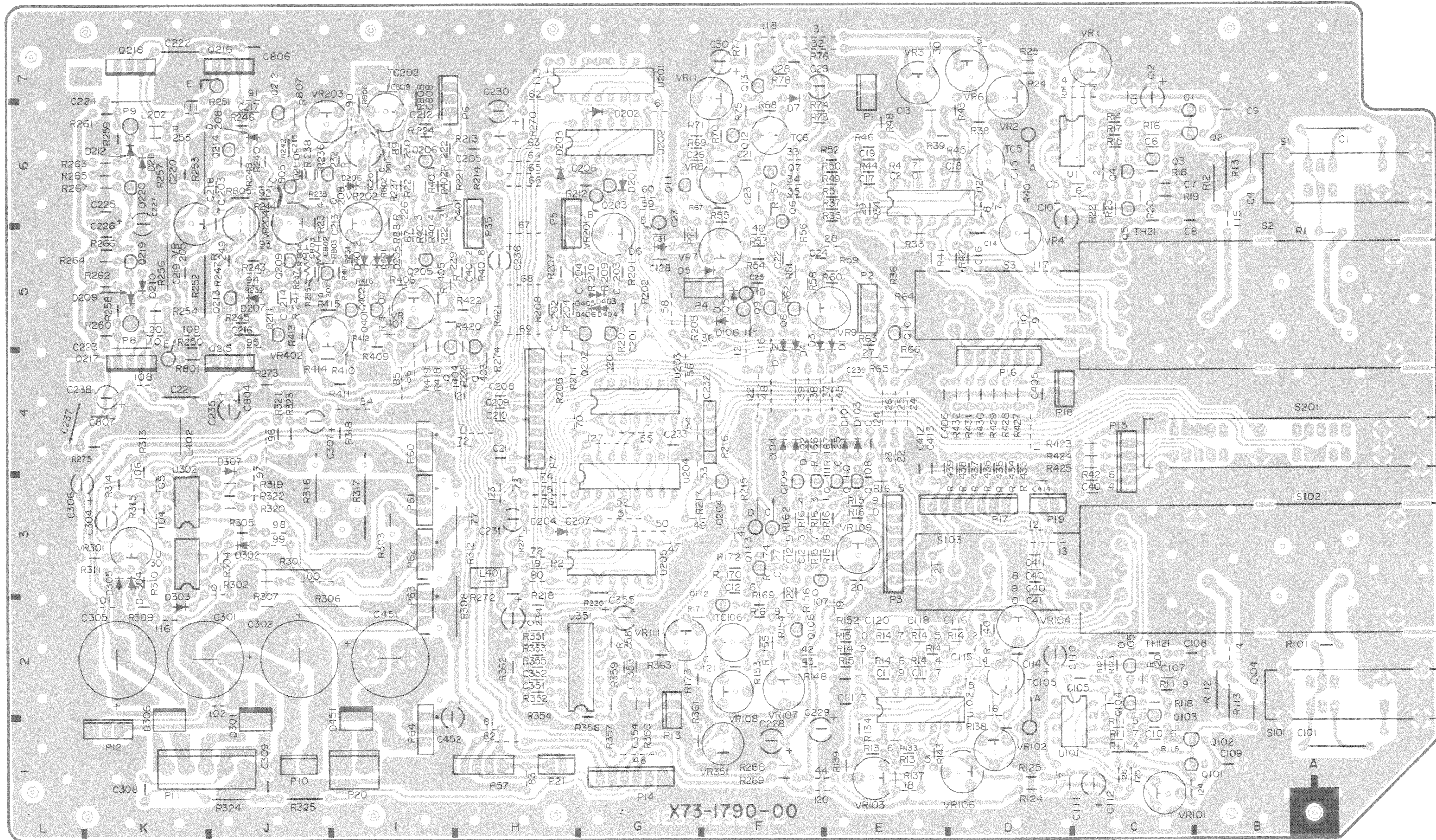
R/O UNIT (X77-1510-00)



- |          |                |
|----------|----------------|
| U1       | : DAC0808LCN   |
| U2       | : HD74HC564 AP |
| U3       | : SN74HC244 N  |
| U4, 5    | : HD14052BP    |
| U6, 14   | : HD14051BP    |
| U7       | : MBM27C64* T  |
| U8       | : CTM5020      |
| U9       | : AM6012DC     |
| U10      | : NJM511D      |
| U11, 15  | : NJM4558D     |
| U12      | : R90-0655-05  |
| U13      | : NJM072BD     |
| U16      | : SN74LS04N    |
| U17      | : HD74HC138 AP |
| U18      | : HD74HC375 AP |
| U19 ~ 22 | : HD74LS244 AP |
| U23      | : CTM5040      |
| Q1       | : 2SC2785(F)   |
| Q2       | : 2SA1175(F)   |
| D1, 2    | : MAT00        |

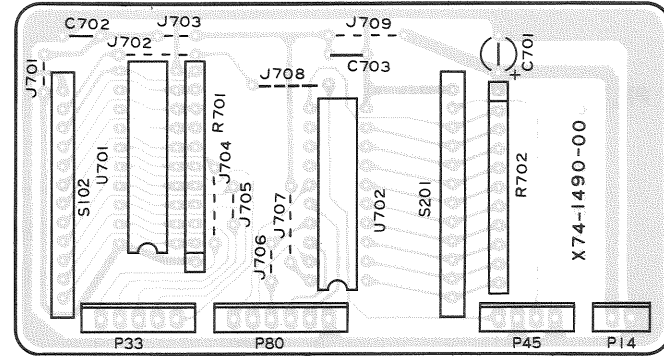
# P.C. BOARD

Pattern side view

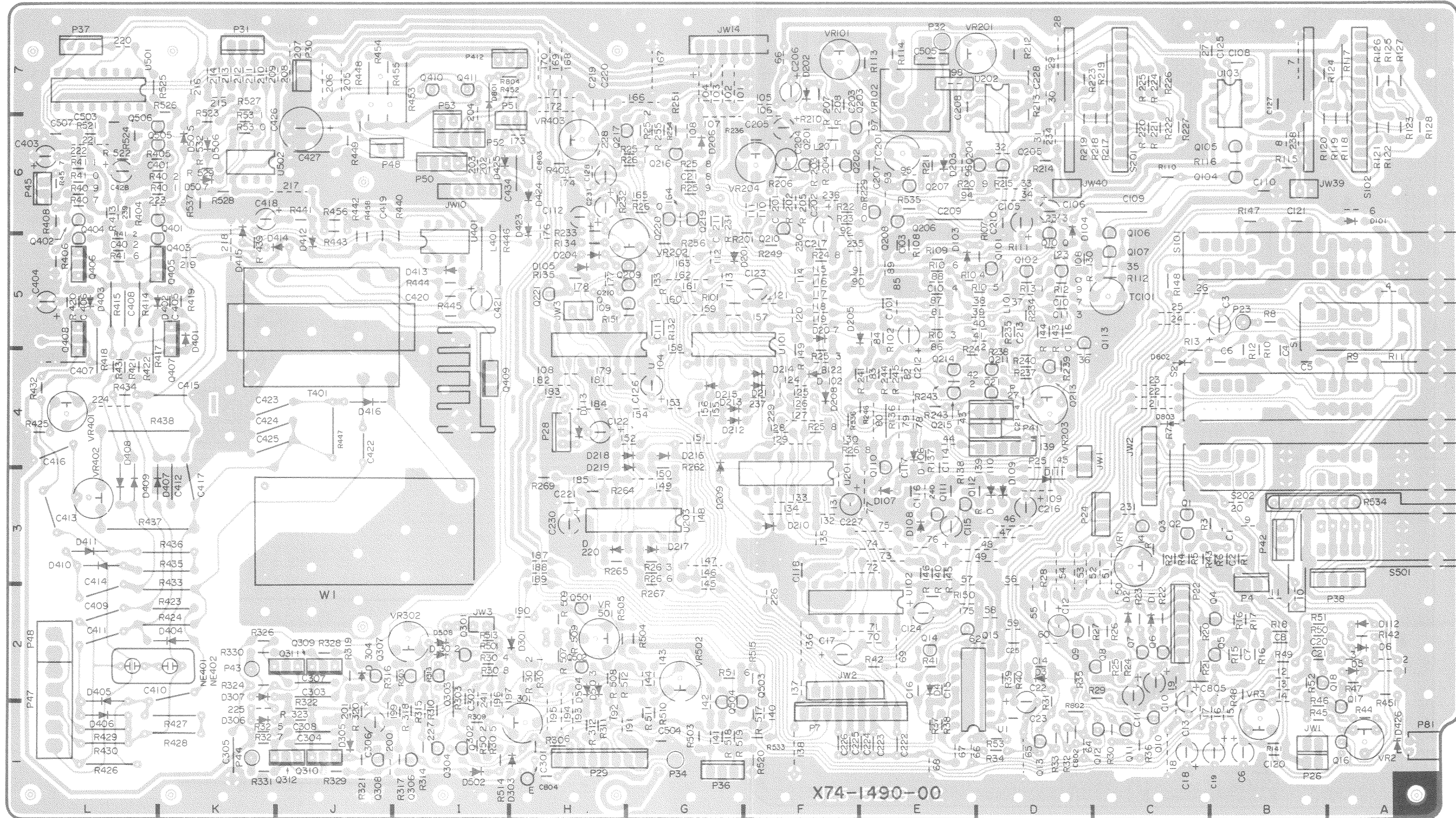


# P.C. BOARD

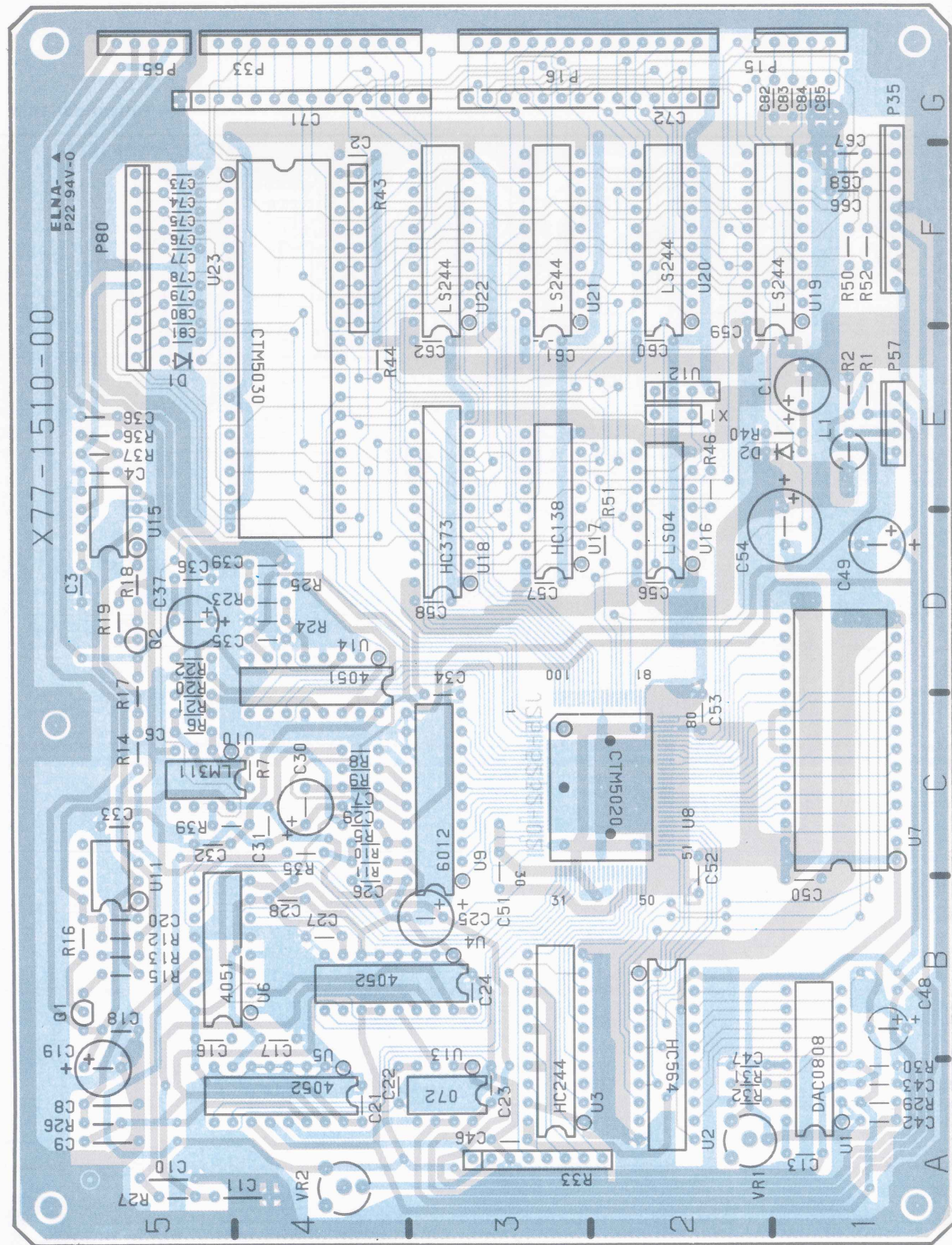
HORIZONTAL UNIT (X74-1490-01)



Pattern side view

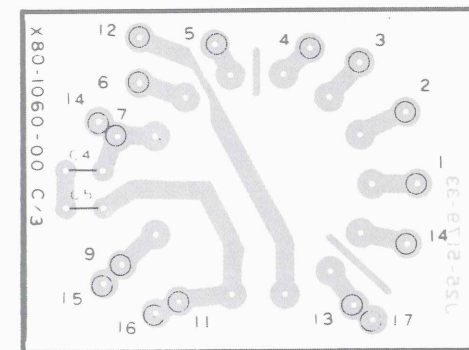
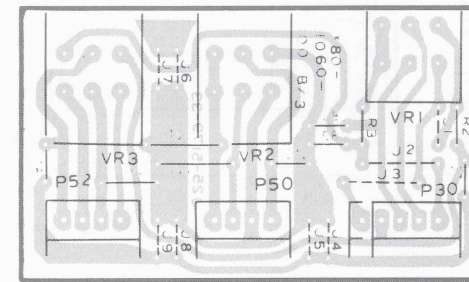
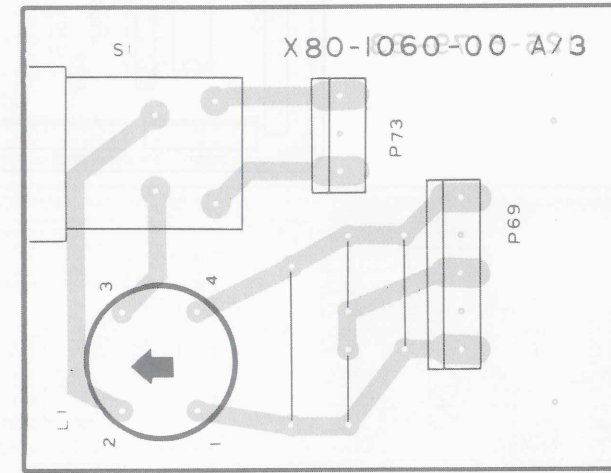


R/O UNIT (X77-1510-00)



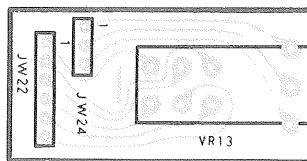
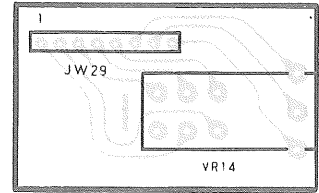
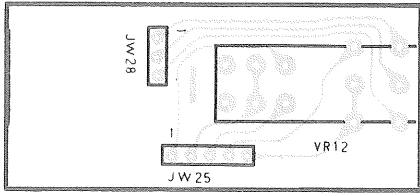
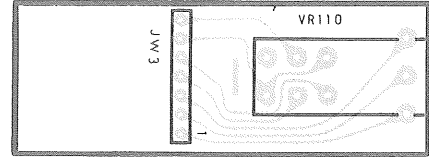
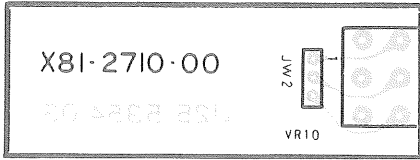
# P.C. BOARD

LINE FILTER UNIT (X80-1060-03)

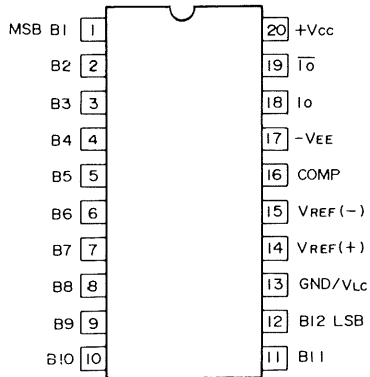


# P.C. BOARD

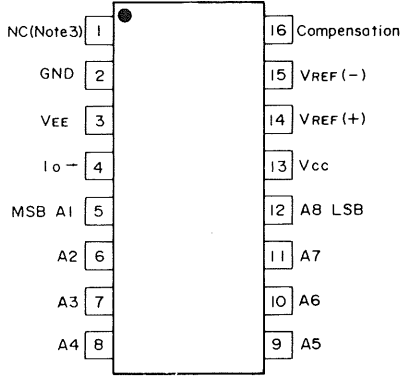
## VR UNIT (X81-2710-00)



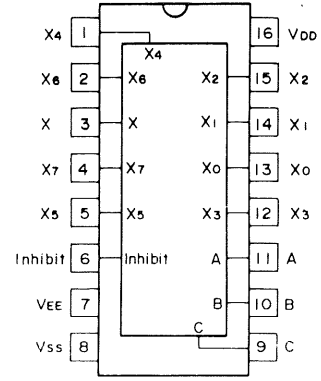
# SEMICONDUCTORS



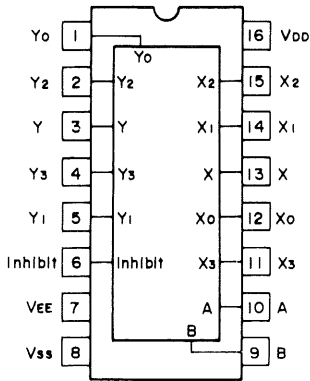
**AM6012DC**



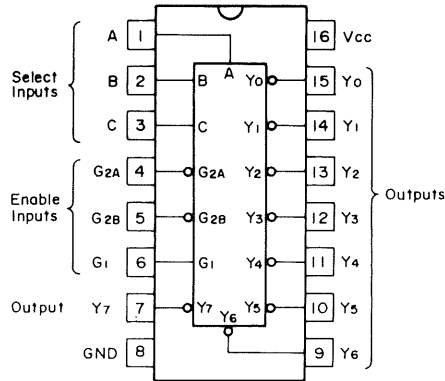
**DAC0808LCN**



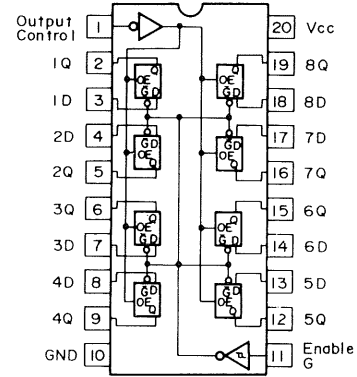
**HD14051BP**



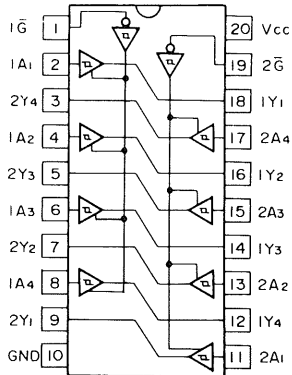
**HD14052BP**



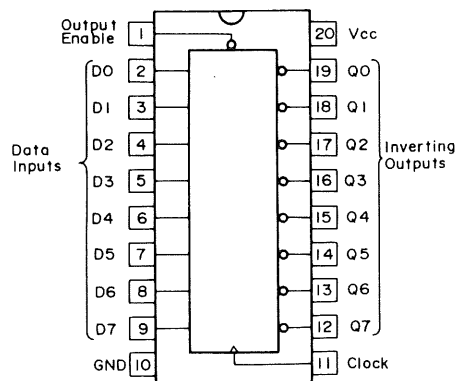
**HD74HC138AP**



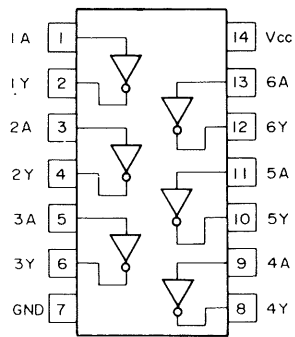
**HD74HC373AP**



**SN74LS244N  
HD74HC244AP**



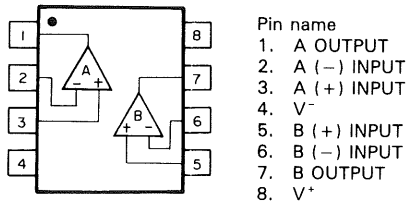
**HD74HC564AP**



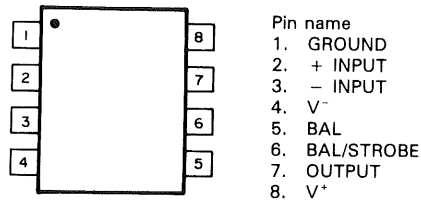
**SN74LS04N**



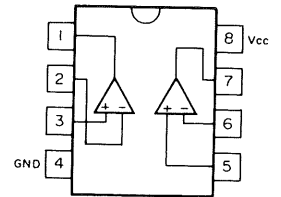
# SEMICONDUCTORS



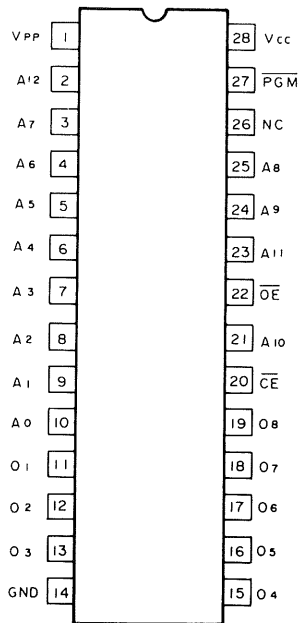
**NJM072BD**



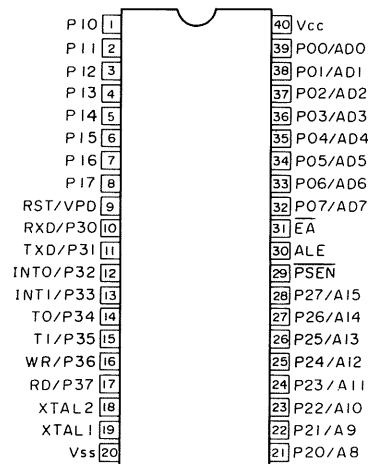
**NJM311D**



**NJM4558D**

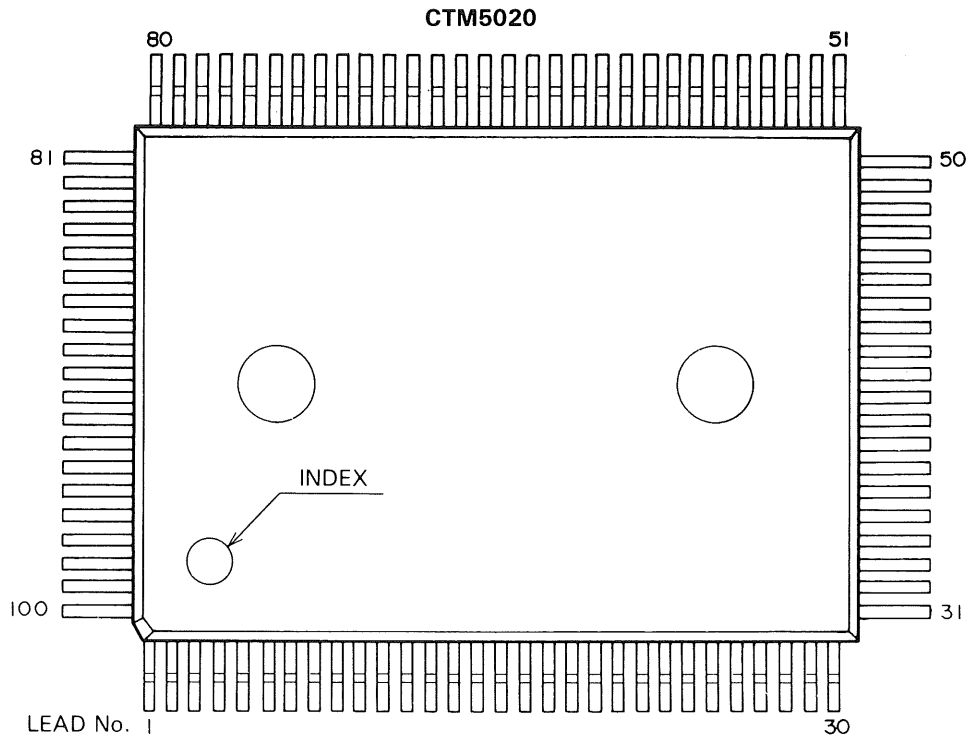


**MBM27C64 \* T**



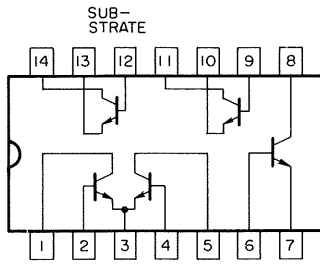
**CTM5040**

# SEMICONDUCTORS

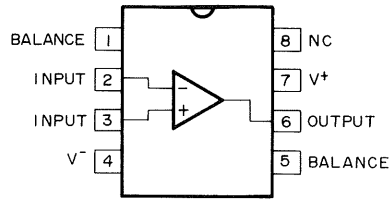


Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name	Pin No.	Pin Name
1	CONT	26	TSD0	51	GETD	76	DD3
2	A13	27	TSD1	52	CA0	77	SING
3	VDD	28	VDD	53	VDD	78	VDD
4	A14	29	TSD2	54	CA4	79	R10M
5	A15	30	AX2	55	CA3	80	10M
6	INT0	31	AX1	56	CA2	81	HLDF
7	VX3	32	AX0	57	CA1	82	SGA
8	VX2	33	AX3	58	CD3	83	ROSP
9	VX1	34	HS2	59	CD2	84	ROD
10	VX0	35	HS1	60	CD4	85	HLDL
11	DA0	36	TDIO	61	CD1	86	ROUB
12	DA1	37	TWE	62	CD5	87	ROB
13	DA2	38	TCK1	63	DC4	88	ROQ
14	DA3	39	TST1	64	CD7	89	ROED
15	VSS	40	VSS	65	VSS	90	VSS
16	DA4	41	TST2	66	DC3	91	D7
17	DA5	42	TADD	67	DC2	92	D5
18	DA6	43	TCK2	68	CD6	93	D3
19	DA7	44	VS2	69	DC1	94	D1
20	DA8	45	VS1	70	DC0	95	ALE
21	DA9	46	VA0	71	CD0	96	D6
22	ROR	47	VA4	72	DD7	97	D4
23	ROA	48	VA3	73	DD6	98	D2
24	LEVX	49	VA2	74	DD5	99	D0
25	TCL	50	VA1	75	DD4	100	WR

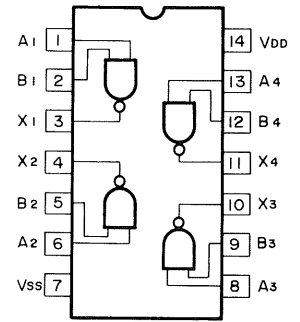
# SEMICONDUCTORS



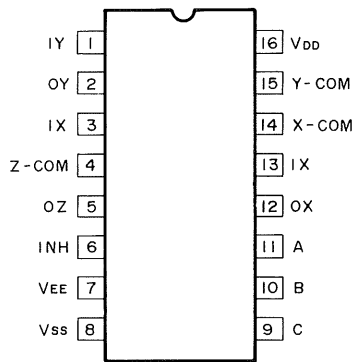
CA3086



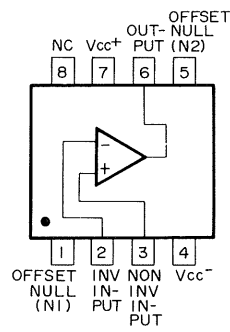
LF411CN



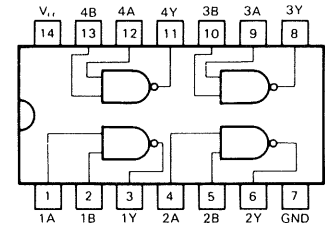
TC4011BP



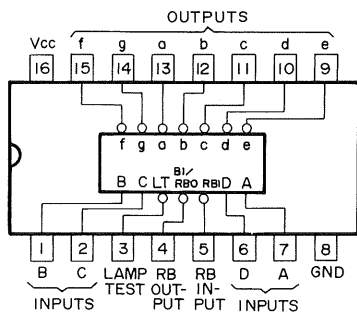
TC4053BP



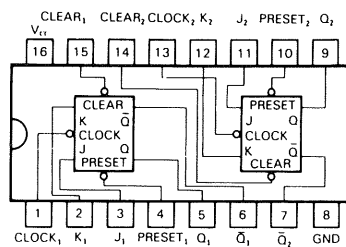
TL081CP



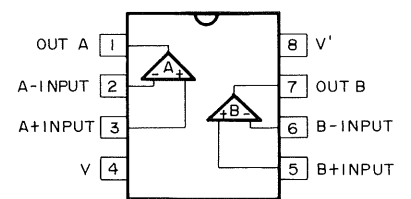
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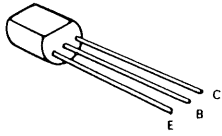


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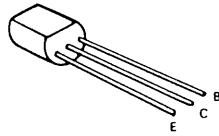


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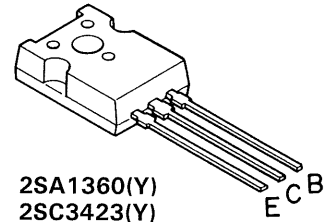
# SEMICONDUCTORS



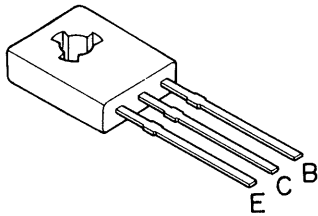
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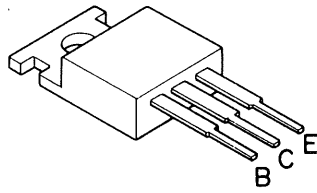
2SA838(B)  
2SA844(D)  
2SA1005(K)  
2SA1015(Y)  
2SC945(Q)  
2SC1843(E)  
2SC1907



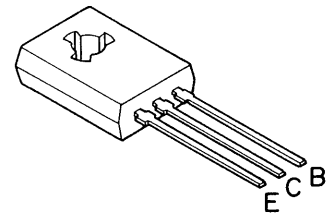
2SA1360(Y)  
2SC3423(Y)



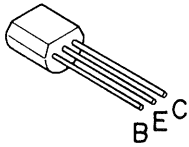
2SB648A(C)  
2SD668A(C)



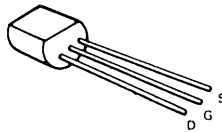
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2SB861(C)  
2SD880(Y)



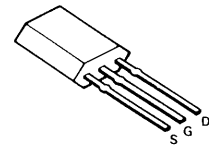
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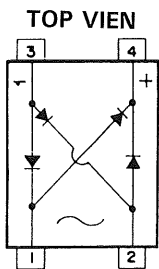
2SC2570A



2SK117(BL)  
2SK170(V)



2SK304(E)



1G4B42



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**KENWOOD CORPORATION**  
17-5, 2-chome, Shibuya, Shibuya-ku, Tokyo 150, Japan

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B51-1074-00 (T)

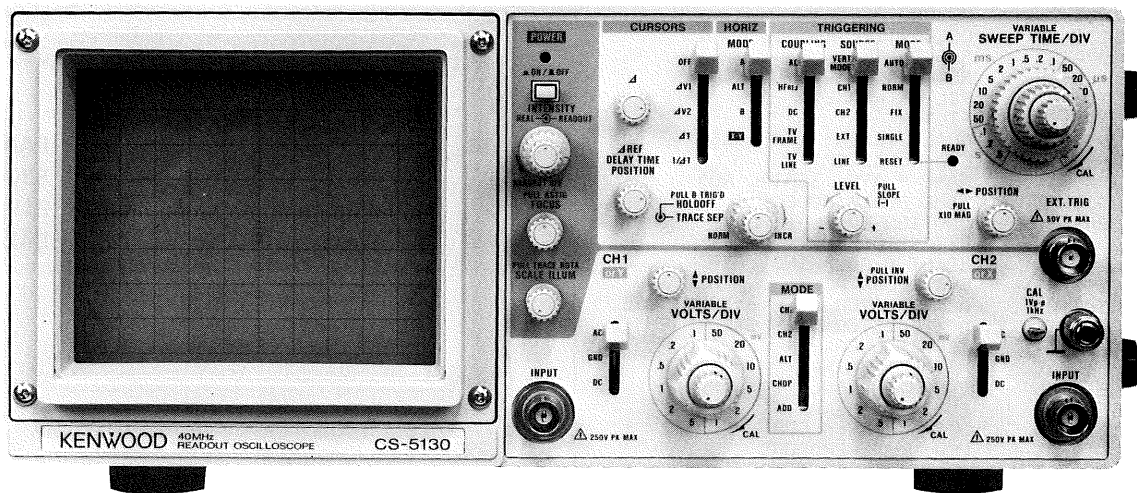
**PARTS LIST, DISASSEMBLY  
SCHEMATIC DIAGRAM  
P.C. BOARD  
ADJUSTMENT LOCATIONS**

**KENWOOD**

**CS-5130**

**40 MHz Readout Oscilloscope**

**Serial No. 9100001 ~**



# PARTS LIST

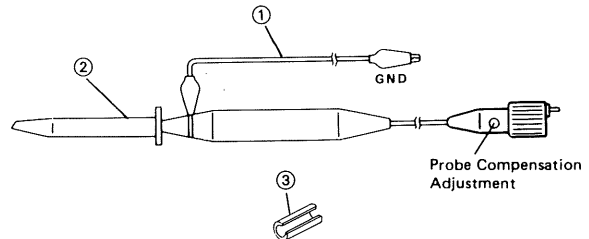
## CS-5130 UNIT

### Y70-1620-00

REF.NO	PARTS NO	NAME & DESCRIPTION
	B30-0952-05	LAMP (T4.2 8V 0.15A)
	B41-0710-04	CAUTION LABEL (HIGH VOLTAGE)
	B50-7666-10	INSTRUCTION MANUAL (JAPANESE)
	B50-7669-20	INSTRUCTION MANUAL (ENGLISH)
	E31-0564-05	WIRE ASS'Y (CRT SHIELD)
	E31-2861-05	WIRE ASS'Y (INLET-FILTER P69)
	E31-5501-05	WIRE ASS'Y (CH1 BNC)
	E31-5502-05	WIRE ASS'Y (CH1 OUT)
	E31-5506-05	WIRE ASS'Y (CH2 BNC)
	E31-5509-05	WIRE ASS'Y (CAL)
	E31-5511-05	WIRE ASS'Y
	E31-5516-05	WIRE ASS'Y (EXT. TRIG)
	E31-5519-05	WIRE ASS'Y (READY LED)
	E31-5526-05	WIRE ASS'Y (Z AXIS)
	E31-5537-05	WIRE ASS'Y (CURSOR VR)
	E31-5549-05	WIRE ASS'Y
	F05-1023-05	FUSE (6X30MM) 1A
	F05-5013-05	FUSE (6X30MM) 0.5A
	F05-5016-05	FUSE (5X20MM) 0.5AT
	H01-5888-04	CARTON BOX
	H10-2828-12	FOAMED STYRENE PAD (FRONT)
	H10-2829-12	FOAMED STYRENE PAD (REAR)
	H20-1727-04	VINYL COVER
	H25-0029-04	POLYETHYLENE BAG (FUSE)
	J61-0408-05	WIRE WRAPPING BAND
	W03-2307-05	R/O PROBE (PC-33)
	X81-2710-00	VR UNIT
C1	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
C2	CC45CH1H101J	CAP. CERAMIC 100P 5% 50V
R1	RD14BB2E220J	RES. CARBON 22 5% 1/4W
R2	RD14BB2E220J	RES. CARBON 22 5% 1/4W
1	A01-1154-22	CASE (BOTTOM)
2	A01-1193-02	CASE (TOP)
3	A13-0914-02	FRAME (L)
4	A13-0917-02	FRAME (R. LOWER)
5	A13-0922-12	FRAME (CENTER)
6	A13-0923-02	FRAME (R. UPPER)
7	A20-2822-21	MOLDED PANEL
8	A21-1137-03	DECORATIVE PANEL
9	A22-0870-02	SUB PANEL
10	A23-1682-02	REAR PANEL
11	B07-0716-03	FILTER FRAME
12	B19-0749-04	FILTER
13	B30-0951-25	SCALE ILLUMI LAMP ASS'Y
14	B30-0957-05	LED (LN322GPT)
15	B40-2765-04	NAME PLATE (SERIAL NO)
16	B40-2910-03	NAME PLATE (MODEL)
17	B41-0803-04	CAUTION LABEL
18	D21-0915-04	EXTENSION SHAFT
19	D22-0501-04	JOINT & COUPLING
20	E04-0259-05	BNC RECEPTACLE
21A	E18-0365-05	AC SELECTOR WITH 6X30MM FUSE
21B	E18-0366-15	AC SELECTOR WITH 5X20MM FUSE
22	E21-0660-04	TERMINAL.CAL
23	E21-0667-05	METAL TERMINAL
24	E23-0513-05	EARTH LUG, BNC
25	E23-0552-04	EARTH TERMINAL
26A	E30-1818-05	JIS POWER CORD
26B	E30-1819-05	CEE POWER CORD
26C	E30-1820-05	UL/CSA POWER CORD
26D	E30-1821-05	SAA POWER CORD
26E	E30-1644-15	BS POWER CORD
27	F09-0512-04	EDGING
28	F11-1206-03	CRT SHIELD
29	F15-0733-04	FELT (CRT SHIELD)
30	F20-0658-04	INSULATED SHEET
31	F20-0667-04	INSULATED SHEET
32	F20-0685-14	INSULATED SHEET
33	G01-0909-04	COIL SPRING (CAL SHIELD)
34	J02-0089-05	RUBBER FOOT
35	J02-0512-05	FOOT (SMALL)
36	J02-0515-04	TILT STAND
37	J10-0418-12	BEZEL
38	J19-1651-04	BLACKET
39	J19-1652-04	BLACKET FOR P.C.B.
40	J19-1653-13	HOLDER FOR CRT
41	J19-1654-14	HOLDER FOR LED
42	J21-2573-04	HOLDER FOR LEG
43	J21-4594-13	BRACKET FOR CRT
44	J30-0621-04	SPACER

REF.NO	PARTS NO	NAME & DESCRIPTION
45	J61-0516-05	SUPPORT
46	J42-0533-04	BUSHING (FREE)
47	J59-0403-05	NYLON RIVET (ILLUMI)
48	J61-0509-05	WIRE WRAPPING BAND
49	K01-0409-05	HANDLE
50	K21-0892-03	KNOB (VOLTS/DIV)
51	K21-0895-03	KNOB (A SWEEP)
52	K21-0896-03	KNOB (B SWEEP)
53	K21-0897-14	KNOB
54	K21-0899-04	KNOB
55	K23-0808-03	KNOB (10 USED)
56	K23-0809-03	KNOB
57	K27-0537-04	KNOB (FOR LEVER SWITCH)
58	K27-0538-04	KNOB (FOR PUSH SWITCH)
59	L01-9746-05	POWER TRANSFORMER
60	L39-0526-15	ROTATION COIL
61	L76-0114-05	DELAY LINE
62	N15-1040-41	WASHER
63	N16-0040-41	SPRING WASHER
64	N30-4006-41	SCREW, PAN HD M4X6
65	R29-1501-05	V.R. 1KB
66	E04-0260-05	BNC RECEPTACLE (READOUT)
67	W01-0503-04	REAR RUBBER FOOT/CORD WRAP
68	X73-1790-01	VERTICAL UNIT
69	X74-1490-01	HORIZONTAL UNIT
70	X77-1510-00	READOUT UNIT
71	X80-1060-03	LINE FILTER UNIT
72	150VTM31	CRT

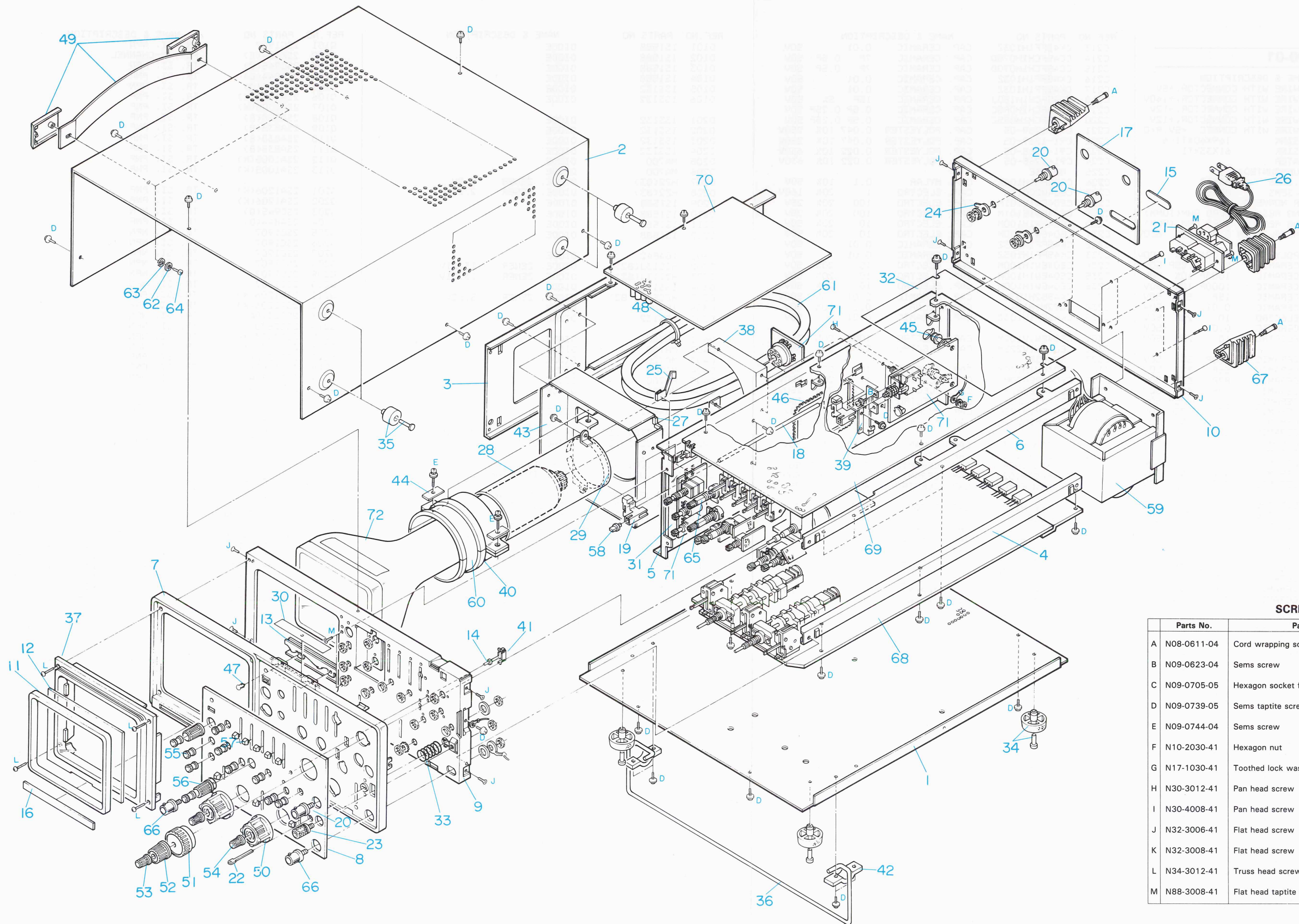
### MODEL PC-33 (LOW CAPACITY PROBE)



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



## SCREWS

Parts No.	Parts Name	Figure
A N08-0611-04	Cord wrapping screw	
B N09-0623-04	Sems screw (M3 × 8)	
C N09-0705-05	Hexagon socket flat head screw (M4 × 8)	
D N09-0739-05	Sems taptite screw (3 × 8)	
E N09-0744-04	Sems screw (M3 × 12)	
F N10-2030-41	Hexagon nut	
G N17-1030-41	Toothed lock washer	
H N30-3012-41	Pan head screw (M3 × 12)	
I N30-4008-41	Pan head screw (M4 × 8)	
J N32-3006-41	Flat head screw (M3 × 6)	
K N32-3008-41	Flat head screw (M3 × 8)	
L N34-3012-41	Truss head screw (M3 × 12)	
M N88-3008-41	Flat head taptite screw (3 × 8)	

# PARTS LIST

## VERTICAL UNIT

### X73-1790-01

REF. NO	PARTS NO	NAME & DESCRIPTION	QTY	UNIT
	E31-5544-05	LEAD WIRE WITH CONNECTOR, +5V		
	E31-5545-05	LEAD WIRE WITH CONNECTOR, +140V		
	E31-5546-05	LEAD WIRE WITH CONNECTOR, -12V		
	E31-5547-05	LEAD WIRE WITH CONNECTOR, +12V		
	E31-5548-05	LEAD WIRE WITH CONNNECT, +5V, R/O		
	F01-0863-03	HEAT SINK 169X60XT1.6		
	F01-0864-04	HEAT SINK 61X33XT1		
	F20-0516-05	INSULATOR		
	J25-5258-02	PCB (UNMOUNTED)		
	N09-0626-04	SCREW, SEMS M3X10		
	N09-0742-04	SCREW, SEMS M3X8		
	N19-0191-05	WASHER NONMETAL		
	R92-0150-05	JUMPING RES. ZERO OHM (10MM)		
	R92-1061-05	JUMPING RES. ZERO OHM (5MM)		
C001	C91-0501-05	CAP. METAL FILM 0.047 10% 630V		
C004	C91-1270-05	CAP. POLYESTER 0.001 10% 400V		
C005	CC45FCH1H020C	CAP. CERAMIC 2P 0.25P 50V		
C006	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V		
C007	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V		
C008	CC45FCH1H150J	CAP. CERAMIC 15P 5% 50V		
C009	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C010	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C011	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C012	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C015	CC45FSL1H151J	CAP. CERAMIC 150P 5% 50V		
C016	CC45FCH1H560J	CAP. CERAMIC 56P 5% 50V		
C017	CC45FCH1H820J	CAP. CERAMIC 82P 5% 50V		
C018	CC45FCH1H820J	CAP. CERAMIC 82P 5% 50V		
C019	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V		
C020	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V		
C021	CC45FCH1H101J	CAP. CERAMIC 100P 5% 50V		
C022	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C023	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C024	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V		
C025	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C026	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V		
C027	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C028	NO USE			
C029	CE04BW1E330M	CAP. ELECTRO 33 20% 25V		
C030	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C031	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V		
C101	C91-0501-05	CAP. METAL FILM 0.047 10% 630V		
C104	C91-1270-05	CAP. POLYESTER 0.001 10% 400V		
C105	CC45FCH1H020C	CAP. CERAMIC 2P 0.25P 50V		
C106	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V		
C107	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V		
C108	CC45FCH1H150J	CAP. CERAMIC 15P 5% 50V		
C109	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C110	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C111	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C112	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C115	CC45FSL1H151J	CAP. CERAMIC 150P 5% 50V		
C116	CC45FCH1H560J	CAP. CERAMIC 56P 5% 50V		
C117	CC45FCH1H820J	CAP. CERAMIC 82P 5% 50V		
C118	CC45FCH1H820J	CAP. CERAMIC 82P 5% 50V		
C119	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V		
C120	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V		
C121	CC45FCH1H101J	CAP. CERAMIC 100P 5% 50V		
C122	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C123	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C124	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C125	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C126	CC45FCH1H470J	CAP. CERAMIC 47P 5% 50V		
C127	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C128	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V		
C129	CC45FCH1H270J	CAP. CERAMIC 27P 5% 50V		
C205	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C206	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C207	CC45FSL1H681J	CAP. CERAMIC 680P 5% 50V		
C208	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C209	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C210	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C211	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C212	NO USE			

REF. NO	PARTS NO	NAME & DESCRIPTION	QTY	UNIT
C213	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C214	CC45FCH1H070D	CAP. CERAMIC 7P 0.5P 50V		
C215	CC45FCH1H070D	CAP. CERAMIC 7P 0.5P 50V		
C216	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C217	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C218	CC45FCH1H150J	CAP. CERAMIC 15P 5% 50V		
C219	CC45FCH1HOR5C	CAP. CERAMIC 0.5P 0.25P 50V		
C220	CC45FCH1HOR5C	CAP. CERAMIC 0.5P 0.25P 50V		
C221	C91-1269-05	CAP. POLYESTER 0.047 10% 250V		
C222	C91-1269-05	CAP. POLYESTER 0.047 10% 250V		
C223	C91-1268-05	CAP. POLYESTER 0.022 10% 630V		
C224	C91-1268-05	CAP. POLYESTER 0.022 10% 630V		
C225	NO USE			
C226	CQ92FM1H104K	CAP. MYLAR 0.1 10% 50V		
C227	CE04W2C010M	CAP. ELECTRO 1 20% 160V		
C228	CE04EW1E101M	CAP. ELECTRO 100 20% 25V		
C229	CE04EW1E101M	CAP. ELECTRO 100 20% 25V		
C230	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C231	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C232	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C233	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C234	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C235	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C236	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C237	CK45B2H103K	CAP. CERAMIC 0.01 10% 500V		
C238	CQ92M1H104K	CAP. MYLAR 0.1 10% 50V		
C239	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C301	CE04EW1V102M	CAP. ELECTRO 1000 20% 35V		
C302	CE04EW1V222M	CAP. ELECTRO 2200 20% 35V		
C303	NO USE			
C304	CE04EW1H100M	CAP. ELECTRO 10 20% 50V		
C305	CE04W2E470M	CAP. ELECTRO 47 20% 250V		
C306	CE04W2E2R2M	CAP. ELECTRO 2.2 20% 250V		
C307	CE04W2C010M	CAP. ELECTRO 1 20% 160V		
C308	CQ92FM1H223K	CAP. MYLAR 0.022 10% 50V		
C309	CQ92FM1H223K	CAP. MYLAR 0.022 10% 50V		
C351	CQ92FM1H103J	CAP. MYLAR 0.01 5% 50V		
C352	CQ92FM1H103J	CAP. MYLAR 0.01 5% 50V		
C353	CC45FCH1H050C	CAP. CERAMIC 5P 0.25P 50V		
C354	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V		
C355	CE04EW1E470M	CAP. ELECTRO 47 20% 25V		
C402	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V		
C403	NO USE			
C404	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C405	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C406	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C407	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C408	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C409	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C410	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C411	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C412	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C413	CK45FF1H103Z	CAP. CERAMIC 0.01 50V		
C451	CE04EW1C222M	CAP. ELECTRO 2200 20% 16V		
C452	CE04EW1E470M	CAP. ELECTRO 47 20% 25V		
C801	CC45CH1H680J	CAP. CERAMIC 68P 5% 50V		
C802	CQ92M1H102K	CAP. MYLAR 1000P 10% 50V		
C803	CQ92M1H103K	CAP. MYLAR 0.01 10% 50V		
C901	CK45F1H103Z	CAP. CERAMIC 0.01 50V		
C902	CK45F1H103Z	CAP. CERAMIC 0.01 50V		
C903	CQ92M1H104K	CAP. MYLAR 0.1 10% 50V		
C904	CQ92M1H104K	CAP. MYLAR 0.1 10% 50V		
C905	CK45F1H103Z	CAP. CERAMIC 0.01 50V		
C906	CQ92M1H103K	CAP. MYLAR 0.01 10% 50V		
D001	1S1588	DIODE		
D002	1S1588	DIODE		
D003	1S1588	DIODE		
D004	1S1588	DIODE		
D005	1SS132	DIODE		
D006	1SS132	DIODE		
D007	1SS132	DIODE		

REF. NO	PARTS NO	NAME & DESCRIPTION	QTY	UNIT
D101	1S1588	DIODE		
D102	1S1588	DIODE		
D103	1S1588	DIODE		
D104	1S1588	DIODE		
D105	1SS132	DIODE		
D106	1SS132	DIODE		
D201	1SS132	DIODE		
D202	1SS132	DIODE		
D203	1SS132	DIODE		
D204	1SS132	DIODE		
D205	MA700	DIODE		
D206	MA700	DIODE		
D207	H22(B3)	DIODE, ZENER 2.2V		
D208	H22(B3)	DIODE, ZENER 2.2V		
D209	1S1588	DIODE		
D210	1S1588	DIODE		
D211	1S1588	DIODE		
D212	1S1588	DIODE		
D301	1G4B42	DIODE		
D302	HZS13J(B2)	DIODE, ZENER 13.21V		
D303	HZS13J(B2)	DIODE, ZENER 13.21V		
D304	1SS132	DIODE		
D305	HZS5.6J(B2)	DIODE, ZENER 5.62V		
D306	1G4B42	DIODE		
D307	1SS132	DIODE		
D401	MA700	DIODE		
D402	MA700	DIODE		
D403	MA700	DIODE		
D404	MA700	DIODE		
D405	MA700	DIODE		
D406	MA700	DIODE		
D451	1G4B42	DIODE		
L201	L40-2282-13	AXIAL COIL 0.22UH		
L202	L40-2282-13	AXIAL COIL 0.22UH		
L401	L40-1001-13	FERRI INDUCTOR 10UH		
L402	L40-1001-13	FERRI INDUCTOR 10UH		
P001	E40-0273-05	PIN CONNECTOR 2P		
P002	E40-0373-05	PIN CONNECTOR 3P		
P003	E40-0773-05	PIN CONNECTOR 7P		
P004	E40-0273-05	PIN CONNECTOR 2P		
P005	E40-0373-05	PIN CONNECTOR 3P		
P006	E40-0373-05	PIN CONNECTOR 3P		
P007	E40-0973-05	PIN CONNECTOR 9P		
P008	E23-0401-05	PIN TERMINAL		
P009	E23-0401-05	PIN TERMINAL		
P010	E40-0273-05	PIN CONNECTOR 2P		
P011	E40-7031-05	PIN CONNECTOR 5P		
P012	E40-0373-05	PIN CONNECTOR 3P		
P013	E40-0273-05	PIN CONNECTOR 2P		
P014	E40-0673-05	PIN CONNECTOR 6P		
P015	E40-0473-05	PIN CONNECTOR 4P		
P016	E40-0673-05	PIN CONNECTOR 6P		
P017	E40-0773-05	PIN CONNECTOR 7P		
P018	E40-0273-05	PIN CONNECTOR 2P		
P019	E40-0273-05	PIN CONNECTOR 2P		
P020	E40-7041-05	PIN CONNECTOR 2P		
P021	E40-0273-05	PIN CONNECTOR 2P		
P035	E40-0373-05	PIN CONNECTOR 3P		
P057	E40-0473-05	PIN CONNECTOR 4P		
Q001	2SC1907	TR. SI, NPN		

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION	QTY	UNIT	REF.NO	PARTS NO	NAME & DESCRIPTION	QTY	UNIT		
R053	RD148B2C121J	RES. CARBON	120	5%	1/6W	R173	RD148B2C221J	RES. CARBON	220	5%	1/6W
R054	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W	R174	RD148B2C221J	RES. CARBON	220	5%	1/6W
R055	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W	R201	RD148B2C221J	RES. CARBON	220	5%	1/6W
R056	RD148B2C181J	RES. CARBON	180	5%	1/6W	R202	RD148B2C221J	RES. CARBON	220	5%	1/6W
R057	RD148B2C181J	RES. CARBON	180	5%	1/6W	R203	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W
R058	RD148B2C101J	RES. CARBON	100	5%	1/6W	R204	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W
R059	RD148B2C622J	RES. CARBON	6.2K	5%	1/6W	R205	RD148B2C682J	RES. CARBON	6.8K	5%	1/6W
R060	RD148B2C622J	RES. CARBON	6.2K	5%	1/6W	R206	RD148B2C682J	RES. CARBON	6.8K	5%	1/6W
R061	RD148B2C470J	RES. CARBON	47	5%	1/6W	R207	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W
R062	RD148B2C470J	RES. CARBON	47	5%	1/6W	R208	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W
R063	RD148B2C221J	RES. CARBON	220	5%	1/6W	R209	RD148B2C820J	RES. CARBON	82	5%	1/6W
R064	RD148B2C561J	RES. CARBON	560	5%	1/6W	R210	RD148B2C820J	RES. CARBON	82	5%	1/6W
R065	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W	R211	RD148B2C681J	RES. CARBON	680	5%	1/6W
R066	RD148B2C682J	RES. CARBON	6.8K	5%	1/6W	R212	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R067	RD148B2C151J	RES. CARBON	150	5%	1/6W	R213	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R068	RD148B2C151J	RES. CARBON	150	5%	1/6W	R214	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R069	RD148B2C820J	RES. CARBON	82	5%	1/6W	R215	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R070	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W	R216	R90-0645-05	RES. NETWORK	4X10K	5%	
R071	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W	R217	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R072	RD148B2C221J	RES. CARBON	220	5%	1/6W	R218	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R073	RD148B2C472J	RES. CARBON	4.7K	5%	1/6W	R219	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R074	RD148B2C102J	RES. CARBON	1K	5%	1/6W	R220	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R075	RD148B2C101J	RES. CARBON	100	5%	1/6W	R221	RN14BK2C91R0F	RES. METAL FILM	91.0	1%	1/6W
R076	RD148B2C152J	RES. CARBON	1.5K	5%	1/6W	R222	RN14BK2C91R0F	RES. METAL FILM	91.0	1%	1/6W
R077	RD148B2C100J	RES. CARBON	10	5%	1/6W	R223	RD148B2C470J	RES. CARBON	47	5%	1/6W
R078	RD148B2C390J	RES. CARBON	39	5%	1/6W	R224	RD148B2C470J	RES. CARBON	47	5%	1/6W
R101	RD148B2C220J	RES. CARBON	22	5%	1/6W	R225	RD148B2C201J	RES. CARBON	200	5%	1/6W
R112	RN14BK2E1004F	RES. METAL FILM	1M	1%	1/4W	R226	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R113	RD148B2E824J	RES. CARBON	820K	5%	1/4W	R227	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R114	RD148B2E102J	RES. CARBON	1K	5%	1/4W	R228	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W
R115	RD148B2C102J	RES. CARBON	1K	5%	1/6W	R229	RD148B2C104J	RES. CARBON	100K	5%	1/6W
R116	RD148B2C101J	RES. CARBON	100	5%	1/6W	R230	RD148B2C104J	RES. CARBON	100K	5%	1/6W
R117	RD148B2C681J	RES. CARBON	680	5%	1/6W	R231	RD148B2C470J	RES. CARBON	47	5%	1/6W
R118	RD148B2C392J	RES. CARBON	3.9K	5%	1/6W	R232	RD148B2C470J	RES. CARBON	47	5%	1/6W
R119	RD148B2C822J	RES. CARBON	8.2K	5%	1/6W	R233	RD148B2C562J	RES. CARBON	5.6K	5%	1/6W
R120	RD148B2C562J	RES. CARBON	5.6K	5%	1/6W	R234	RD148B2C682J	RES. CARBON	6.8K	5%	1/6W
R121	NO USE					R235	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R122	RD148B2C391J	RES. CARBON	390	5%	1/6W	R236	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R123	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W	R237	RD148B2C470J	RES. CARBON	47	5%	1/6W
R124	RD148B2C100J	RES. CARBON	10	5%	1/6W	R238	RD148B2C470J	RES. CARBON	47	5%	1/6W
R125	RD148B2C100J	RES. CARBON	10	5%	1/6W	R239	RD148B2C152J	RES. CARBON	1.5K	5%	1/6W
R133	RD148B2C121J	RES. CARBON	120	5%	1/6W	R240	RD148B2C152J	RES. CARBON	1.5K	5%	1/6W
R134	RD148B2C121J	RES. CARBON	120	5%	1/6W	R241	RD148B2C202J	RES. CARBON	2K	5%	1/6W
R135	RD148B2C681J	RES. CARBON	680	5%	1/6W	R242	RD148B2C202J	RES. CARBON	2K	5%	1/6W
R136	RD148B2C562J	RES. CARBON	5.6K	5%	1/6W	R243	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R137	RD148B2C562J	RES. CARBON	5.6K	5%	1/6W	R244	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R138	RD148B2C101J	RES. CARBON	100	5%	1/6W	R245	RD148B2C220J	RES. CARBON	22	5%	1/6W
R139	RD148B2C473J	RES. CARBON	47K	5%	1/6W	R246	RD148B2C220J	RES. CARBON	22	5%	1/6W
R140	RD148B2C477J	RES. CARBON	4.7	5%	1/6W	R249	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R141	RD148B2C270J	RES. CARBON	27	5%	1/6W	R250	RD148B2C220J	RES. CARBON	22	5%	1/6W
R142	RD148B2C270J	RES. CARBON	27	5%	1/6W	R251	RD148B2C220J	RES. CARBON	22	5%	1/6W
R143	RD148B2C473J	RES. CARBON	47K	5%	1/6W	R252	RS14GB3A333J	RES. METAL FILM	33K	5%	1W
R144	RN14BK2C56R0F	RES. METAL FILM	56.0	1%	1/6W	R253	RS14GB3A333J	RES. METAL FILM	33K	5%	1W
R145	RN14BK2C56R0F	RES. METAL FILM	56.0	1%	1/6W	R254	RD148B2C820J	RES. CARBON	82	5%	1/6W
R146	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W	R255	RD148B2C820J	RES. CARBON	82	5%	1/6W
R147	RN14BK2C4700F	RES. METAL FILM	470	1%	1/6W	R256	RD14DB2H473J	RES. CARBON	47K	5%	1/2W
R148	RD148B2C271J	RES. CARBON	270	5%	1/6W	R257	RD14DB2H473J	RES. CARBON	47K	5%	1/2W
R149	RN14BK2C6800F	RES. METAL FILM	680	1%	1/6W	R258	RD148B2C477J	RES. CARBON	4.7	5%	1/6W
R150	RN14BK2C6800F	RES. METAL FILM	680	1%	1/6W	R259	RD148B2C477J	RES. CARBON	4.7	5%	1/6W
R151	RD148B2C220J	RES. CARBON	22	5%	1/6W	R260	RD148B2C511J	RES. CARBON	510	5%	1/6W
R152	RD148B2C220J	RES. CARBON	22	5%	1/6W	R261	RD148B2C511J	RES. CARBON	510	5%	1/6W
R153	RD148B2C121J	RES. CARBON	120	5%	1/6W	R262	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W
R154	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W	R263	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W
R155	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W	R264	RD148B2C477J	RES. CARBON	4.7	5%	1/6W
R156	RD148B2C181J	RES. CARBON	180	5%	1/6W	R265	RD148B2C477J	RES. CARBON	4.7	5%	1/6W
R157	RD148B2C181J	RES. CARBON	180	5%	1/6W	R266	RD148B2C331J	RES. CARBON	330	5%	1/6W
R158	RD148B2C101J	RES. CARBON	100	5%	1/6W	R267	RD148B2C100J	RES. CARBON	10	5%	1/6W
R159	RD148B2C622J	RES. CARBON	6.2K	5%	1/6W	R268	RD148B2C100J	RES. CARBON	10	5%	1/6W
R160	RD148B2C622J	RES. CARBON	6.2K	5%	1/6W	R269	RD148B2C100J	RES. CARBON	10	5%	1/6W
R161	RD148B2C470J	RES. CARBON	47	5%	1/6W	R270	RD148B2C100J	RES. CARBON	10	5%	1/6W
R162	RD148B2C470J	RES. CARBON	47	5%	1/6W	R271	RD148B2C100J	RES. CARBON	10	5%	1/6W
R163	RD148B2C470J	RES. CARBON	47	5%	1/6W	R272	RD148B2C100J	RES. CARBON	10	5%	1/6W
R164	RD148B2C470J	RES. CARBON	47	5%	1/6W	R273	RD148B2C100J	RES. CARBON	10	5%	1/6W
R165	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W	R274	RD148B2C100J	RES. CARBON	10	5%	1/6W
R166	RD148B2C221J	RES. CARBON	220	5%	1/6W	R275	RD148B2C100J	RES. CARBON	10	5%	1/6W
R167	RD148B2C221J	RES. CARBON	220	5%	1/6W	R301	RD14DB2H2R2J	RES. CARBON	2.2	5%	1/2W
R168	RD148B2C151J	RES. CARBON	150	5%	1/6W	R302	RD148B2C101J	RES. CARBON	100	5%	1/6W
R169	RD148B2C151J	RES. CARBON	150	5%	1/6W	R303	RS14GB3A101J	RES. METAL FILM	100	5%	1W
R170	RD148B2C820J	RES. CARBON	82	5%	1/6W	R304	RN14BK2C1202F	RES. METAL FILM	12K	1%	1/6W
R171	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W	R305	RN14BK2C1202F	RES. METAL FILM	12K	1%	1/6W
R172	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W						

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION
R306	RS14GB3A1R0J	RES. METAL FILM 1 5% 1W
R307	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R308	RS14GB3A101J	RES. METAL FILM 100 5% 1W
R309	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R310	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R311	RD14BB2C562J	RES. CARBON 5.6K 5% 1/6W
R312	RS14GB3A330J	RES. METAL FILM 33 5% 1W
R313	RD14BB2C151J	RES. CARBON 150 5% 1/6W
R314	RN14BK2C3901F	RES. METAL FILM 3.9K 1% 1/6W
R315	RN14BK2C9101F	RES. METAL FILM 9.1K 1% 1/6W
R316	RS14GB3D272J	RES. METAL FILM 2.7K 5% 2W
R317	RS14GB3D272J	RES. METAL FILM 2.7K 5% 2W
R318	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R319	RD14BB2C101J	RES. CARBON 100 5% 1/6W
R320	RD14BB2C221J	RES. CARBON 220 5% 1/6W
R321	RN14BK2C1203F	RES. METAL FILM 120K 1% 1/6W
R322	RN14BK2C1002F	RES. METAL FILM 10K 1% 1/6W
R323	RD14BB2C561J	RES. CARBON 560 5% 1/6W
R324	RD14BB2E225J	RES. CARBON 2.2M 5% 1/4W
R325	RD14BB2E225J	RES. CARBON 2.2M 5% 1/4W
R351	RD14BB2C154J	RES. CARBON 150K 5% 1/6W
R352	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R353	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R354	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R355	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R356	RD14BB2C224J	RES. CARBON 220K 5% 1/6W
R357	RD14BB2C474J	RES. CARBON 470K 5% 1/6W
R358	RD14BB2C474J	RES. CARBON 470K 5% 1/6W
R359	RD14BB2C471J	RES. CARBON 470 5% 1/6W
R360	RN14BK2C1102F	RES. METAL FILM 11K 1% 1/6W
R361	RN14BK2C7500F	RES. METAL FILM 750 1% 1/6W
R362	NO USE	
R363	RD14BB2C100J	RES. CARBON 10 5% 1/6W
R405	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R406	RD14BB2C332J	RES. CARBON 3.3K 5% 1/6W
R407	RD14BB2C102J	RES. CARBON 1K 5% 1/6W
R408	NO USE	
R409	RN14BK2C1201F	RES. METAL FILM 1.2K 1% 1/6W
R410	RN14BK2C1201F	RES. METAL FILM 1.2K 1% 1/6W
R411	RN14BK2C1151F	RES. METAL FILM 1.15K 1% 1/6W
R412	RD14BB2C111J	RES. CARBON 110 5% 1/6W
R413	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R414	RD14BB2C912J	RES. CARBON 9.1K 5% 1/6W
R415	RD14BB2C751J	RES. CARBON 750 5% 1/6W
R416	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R417	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R418	RN14BK2C8201F	RES. METAL FILM 8.2K 1% 1/6W
R419	RN14BK2C2201F	RES. METAL FILM 2.2K 1% 1/6W
R420	RN14BK2C8200F	RES. METAL FILM 820 1% 1/6W
R421	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R422	RD14BB2C103J	RES. CARBON 10K 5% 1/6W
R423	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R424	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R425	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R426	RD14BB2C472J	RES. CARBON 4.7K 5% 1/6W
R427	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R428	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R429	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R430	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R431	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R432	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R433	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R434	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R435	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R436	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R437	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R438	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R439	RD14BB2C104J	RES. CARBON 100K 5% 1/6W
R801	RD14BB2C2R2J	RES. CARBON 2.2 5% 1/6W
R802	RD14BB2C752J	RES. CARBON 7.5K 5% 1/6W
R803	RD14BB2C134J	RES. CARBON 130K 5% 1/6W
R804	RD14BB2C154J	RES. CARBON 150K 5% 1/6W
R901	RD14BB2C132J	RES. CARBON 1.3K 5% 1/6W
R902	RD14BB2C163J	RES. CARBON 16K 5% 1/6W
R903	RD14BB2C271J	RES. CARBON 270 5% 1/6W

REF.NO	PARTS NO	NAME & DESCRIPTION
S102	S02-4510-05	ROTARY SWITCH
S201	S32-4008-05	LEVER SWITCH 4-5
TC005	C05-0455-05	CAP. TRIMMER 30PF
TC006	C05-0456-05	CAP. TRIMMER 50PF
TC105	C05-0455-05	CAP. TRIMMER 30PF
TC106	C05-0456-05	CAP. TRIMMER 50PF
TC201	C05-0454-05	CAP. TRIMMER 20PF
TC202	C05-0454-05	CAP. TRIMMER 20PF
TC203	C05-0455-05	CAP. TRIMMER 30PF
TC901	C05-0474-05	CAP. TRIMMER 10P
TH021	112-251-2	THERMISTOR
TH121	112-251-2	THERMISTOR
U001	LF411CN	IC, DUAL JFET INPUT OP AMP
U002	CA3086	IC, NPN TRANSISTOR ARRAY
U101	LF411CN	IC, DUAL JFET INPUT OP AMP
U102	CA3086	IC, NPN TRANSISTOR ARRAY
U201	SN74LS47N	IC, DECODER/DRIVER
U202	SN74LS00N	IC, QUAD 2-INPUT NAND GATE
U203	SN74LS00N	IC, QUAD 2-INPUT NAND GATE
U204	SN74LS112AN	IC, DUAL JK-FF
U205	SN74LS00N	IC, QUAD 2-INPUT NAND GATE
U301	UPC4558C	IC, OP AMP
U302	UPC4558C	IC, OP AMP
U351	TC4011BP	IC, QUAD 2-INPUT NAND GATE
U451	TA78005AP	IC, 3-TERMINAL REGULATOR
VR001	R12-3550-05	RES. SEMI FIXED 20K B
VR002	R12-0577-05	RES. SEMI FIXED 500 B
VR003	R12-3550-05	RES. SEMI FIXED 20K B
VR004	R12-0575-05	RES. SEMI FIXED 100 B
VR005	NO USE	
VR006	R12-3550-05	RES. SEMI FIXED 20K B
VR007	R12-0577-05	RES. SEMI FIXED 500 B
VR008	R12-0577-05	RES. SEMI FIXED 500 B
VR009	R12-1545-05	RES. SEMI FIXED 1K B
VR010	NO USE	
VR011	R12-1545-05	RES. SEMI FIXED 1K B
VR101	R12-3550-05	RES. SEMI FIXED 20K B
VR102	R12-0577-05	RES. SEMI FIXED 500 B
VR103	R12-3550-05	RES. SEMI FIXED 20K B
VR104	R12-0575-05	RES. SEMI FIXED 100 B
VR105	NO USE	
VR106	R12-3550-05	RES. SEMI FIXED 20K B
VR107	R12-0577-05	RES. SEMI FIXED 500 B
VR108	R12-0577-05	RES. SEMI FIXED 500 B
VR109	R12-1545-05	RES. SEMI FIXED 1K B
VR110	NO USE	
VR111	R12-1545-05	RES. SEMI FIXED 1K B
VR201	R12-0577-05	RES. SEMI FIXED 500 B
VR202	R12-0576-05	RES. SEMI FIXED 200 B
VR203	R12-0577-05	RES. SEMI FIXED 500 B
VR204	R12-0576-05	RES. SEMI FIXED 200 B
VR205	R12-1546-05	RES. SEMI FIXED 2K B
VR301	R12-1545-05	RES. SEMI FIXED 1K B
VR351	R12-0577-05	RES. SEMI FIXED 500 B
VR401	R12-1545-05	RES. SEMI FIXED 1K B
VR402	R12-1545-05	RES. SEMI FIXED 1K B

S001	S32-2012-05	LEVER SWITCH 2-3
S002	S02-4510-05	ROTARY SWITCH
S101	S32-2012-05	LEVER SWITCH 2-3

# PARTS LIST

## HORIZONTAL UNIT

X74-1490-01

REF.NO	PARTS NO	NAME & DESCRIPTION			
	E31-2948-05	ANODE CAP			
	E31-5510-15	LEAD WIRE WITH CONNECTOR,P14			
	E31-5514-15	LEAD WIRE WITH CONNECTOR,P10			
	E31-5531-05	LEAD WIRE WITH CONNECTOR,P49			
	E31-5533-15	LEAD WIRE WITH CONNECTOR,P39			
	F01-0867-05	HEAT SINK			
	F11-1208-13	SHIELD CASE			
	F15-0727-04	HOLDER (NEON LAMP)			
	F20-0516-05	INSULATOR			
	F20-0675-04	INSULATED SHEET			
	J25-5259-02	PCB (UNMOUNTED)			
	J25-5264-04	PCB (UNMOUNTED) 58X22			
	J25-5268-04	PCB (UNMOUNTED) 86X46			
	J42-0538-04	BUSHING			
	J61-0501-05	BOARD SUPPORT			
	N19-0191-05	WASHER NONMETAL			
	R30-3006-41	SCREW, PAN HD M3X6			
	R92-0150-05	JUMPING RES. ZERO OHM(10MM)			
	R92-1061-05	JUMPING RES. ZERO OHM (5MM)			
C002	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C003	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C004	CQ92FM1H223K	CAP. MYLAR	0.022	10%	50V
C005	CC45FCH1H221J	CAP. CERAMIC	220P	5%	50V
C006	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V
C007	CC45SCH1H101J	CAP. CERAMIC	100P	5%	50V
C008	CC45FSL1H271J	CAP. CERAMIC	270P	5%	50V
C009	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C010	CE04EW1E470M	CAP. ELECTRO	47	20%	25V
C011	CE04EW1E470M	CAP. ELECTRO	47	20%	25V
C012	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C013	CS15E1V010M	CAP. TANTALUM	1	20%	35V
C014	CC45FCH1H030C	CAP. CERAMIC	3P	0.25P	50V
C015	CQ92FM1H103K	CAP. MYLAR	0.01	10%	50V
C016	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V
C017	CE04EW1E470M	CAP. ELECTRO	47	20%	25V
C018	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C019	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C020	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C021	CC45FCH1H101J	CAP. CERAMIC	100P	5%	50V
C022	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C023	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C101	CC45FSL1H561J	CAP. CERAMIC	560P	5%	50V
C102	NO USE				
C103	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C104	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C105	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C106	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C107	CC45FCH1H820J	CAP. CERAMIC	82P	5%	50V
C108	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C109	C91-0574-05	CAP. MYLAR	1	5%	100V
C110	NO USE				
C111	CC45FCH1H050C	CAP. CERAMIC	5P	0.25P	50V
C112	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C113	CC45FCH1H221J	CAP. CERAMIC	220P	5%	50V
C114	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C115	CE04EW1E470M	CAP. ELECTRO	47	20%	25V
C116	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C117	CQ92FM1H473K	CAP. MYLAR	0.047	10%	50V
C118	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P	50V
C119	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V
C120	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C121	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
C122	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C123	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C124	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C125	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C126	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C127	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C128	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C201	CC45FSL1H561J	CAP. CERAMIC	560P	5%	50V
C202	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C203	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V
C204	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C205	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C206	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C207	CC45FCH1H820J	CAP. CERAMIC	82P	5%	50V
C208	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C209	C91-0574-05	CAP. MYLAR	1	5%	100V

REF.NO	PARTS NO	NAME & DESCRIPTION			
C210	NO USE				
C211	CC45FCH1H050C	CAP. CERAMIC	5P	0.25P	50V
C212	CE04EW1E101M	CAP. ELECTRO	100	20%	25V
C213	CC45FCH1H050C	CAP. CERAMIC	5P	0.25P	50V
C214	CC45FCH1H100D	CAP. CERAMIC	10P	0.5P	50V
C215	NO USE				
C216	CE04BW1E100M	CAP. ELECTRO	10	20%	25V
C217	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V
C218	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C219	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C220	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C221	CC45FCH1H151J	CAP. CERAMIC	150P	5%	50V
C222	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C223	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C224	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C225	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C226	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C227	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C228	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C229	NO USE				
C230	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C231	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C301	CC45FCH1H820J	CAP. CERAMIC	82P	5%	50V
C302	CC45FSL1H471J	CAP. CERAMIC	470P	5%	50V
C303	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C304	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C305	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C306	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C307	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C308	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C401	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C402	CC45FCH1H221J	CAP. CERAMIC	220P	5%	50V
C403	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C404	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C405	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C406	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C407	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C408	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C409	C91-1266-05	CAP. CERAMIC	1000P		6KV
C410	C91-1266-05	CAP. CERAMIC	1000P		6KV
C411	C91-1266-05	CAP. CERAMIC	1000P		6KV
C412	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C413	C91-1266-05	CAP. CERAMIC	1000P		6KV
C414	C91-1266-05	CAP. CERAMIC	1000P		6KV
C415	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C416	C91-1267-05	CAP. CERAMIC	4700P		3KV
C417	C91-1267-05	CAP. CERAMIC	4700P		3KV
C418	CS15E1V010M	CAP. TANTALUM	1	20%	35V
C419	CK45FB1H222K	CAP. CERAMIC	2200P	10%	50V
C420	CQ92FM1H223K	CAP. MYLAR	0.022	10%	50V
C421	CE04EW1H220M	CAP. ELECTRO	22	20%	50V
C422	C91-1264-05	CAP. CERAMIC	22P		3KV
C423	C91-1267-05	CAP. CERAMIC	4700P		3KV
C424	C91-1267-05	CAP. CERAMIC	4700P		3KV
C425	C91-1267-05	CAP. CERAMIC	4700P		3KV
C426	CE04W2C100M	CAP. ELECTRO	10	20%	160V
C427	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C434	CK45B2H103K	CAP. CERAMIC	0.01	10%	500V
C503	CC45FSL1H331J	CAP. CERAMIC	330P	5%	50V
C504	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C505	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C506	NO USE				
C507	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C601	C91-1266-05	CAP. CERAMIC	1000P		6KV
C602	C91-1266-05	CAP. CERAMIC	1000P		6KV
C603	C91-1266-05	CAP. CERAMIC	1000P		6KV
C604	C91-1266-05	CAP. CERAMIC	1000P		6KV
C605	C91-1266-05	CAP. CERAMIC	1000P		6KV
C606	C91-1266-05	CAP. CERAMIC	1000P		6KV
C701	CE04EW1H100M	CAP. ELECTRO	10	20%	50V
C702	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C703	CK45FF1H103Z	CAP. CERAMIC	0.01		50V
C801	CE04EW1C102M	CAP. ELECTRO	1000	20%	16V
C802	CC45SCH1H101J	CAP. CERAMIC	100P	5%	50V
C901	CK45F1H103Z	CAP. CERAMIC	0.01		50V
C902	CQ92FM1H104K	CAP. MYLAR	0.1	10%	50V

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION
D001	1SS132	DIODE
D002	1SS132	DIODE
D003	1SS86	DIODE
D004	1SS132	DIODE
D005	1S1588	DIODE
D006	1SS132	DIODE
D101	1SS132	DIODE
D102	1SS132	DIODE
D103	1S1588	DIODE
D104	1S1588	DIODE
D105	1SS132	DIODE
D106	1SS132	DIODE
D107	1SS132	DIODE
D108	1SS132	DIODE
D109	1SS132	DIODE
D110	1SS132	DIODE
D111	1SS132	DIODE
D112	1SS132	DIODE
D113	HZS6.8J(B2)	DIODE, ZENER 6.79V
D201	1S1588	DIODE
D202	1S1588	DIODE
D203	1S1588	DIODE
D204	1SS132	DIODE
D205	1SS132	DIODE
D206	1SS132	DIODE
D207	1SS132	DIODE
D208	1SS132	DIODE
D209	1SS132	DIODE
D210	1SS132	DIODE
D211	1S1588	DIODE
D212	1SS132	DIODE
D213	1SS132	DIODE
D214	1S1588	DIODE
D215	1SS132	DIODE
D216	1SS132	DIODE
D217	1SS132	DIODE
D218	1S1588	DIODE
D219	1SS132	DIODE
D220	1SS132	DIODE
D301	1S1588	DIODE
D302	MA700	DIODE
D303	MA700	DIODE
D304	1SS86	DIODE
D305	1S1588	DIODE
D306	1S1588	DIODE
D307	1SS83	DIODE
D401	1SS132	DIODE
D402	HZ2(B3)	DIODE, ZENER 2.2V
D403	HZ2(B3)	DIODE, ZENER 2.2V
D404	1SS83	DIODE
D405	1SS83	DIODE
D406	1SS83	DIODE
D407	1SS83	DIODE
D408	1SS83	DIODE
D409	1SS83	DIODE
D410	1SS83	DIODE
D411	1SS83	DIODE
D412	1SS132	DIODE
D413	HZS5.6J(B2)	DIODE, ZENER 5.62V
D414	1SS132	DIODE
D415	1SS132	DIODE
D416	Y10GA	DIODE
D423	HZ36L(2)	DIODE, ZENER 36V
D424	HZ36L(2)	DIODE, ZENER 36V
D425	HZ36L(2)	DIODE, ZENER 36V
D426	B30-0957-05	LED (LN322GPT)
D502	MA700	DIODE
D503	MA700	DIODE
D503	1SS132	DIODE
D504	1SS132	DIODE
D505	1SS132	DIODE
D506	1SS132	DIODE
D507	1SS132	DIODE
D508	NO USE	

REF.NO	PARTS NO	NAME & DESCRIPTION
D509	1S1588	DIODE
D510	MA700	DIODE
D511	MA700	DIODE
D512	1S1588	DIODE
D601	Y10GA	DIODE
D602	Y10GA	DIODE
D603	Y10GA	DIODE
D604	Y10GA	DIODE
D605	Y10GA	DIODE
D606	Y10GA	DIODE
D901	RD30E(B3)	DIODE, ZENER 29.09V
D902	1SS132	DIODE
D903	1SS132	DIODE
JW001	E31-5539-05	LEAD WIRE WITH CONNECTOR
JW002	E31-5540-05	LEAD WIRE WITH CONNECTOR
JW003	E31-5541-05	LEAD WIRE WITH CONNECTOR
L101	L40-2292-02	FERRI INDUCTOR 2.2UH 20%
L201	L40-2292-02	FERRI INDUCTOR 2.2UH 20%
L401	L40-1011-13	FERRI INDUCTOR 100UH 10%
NE401	NE-2B	NEON LAMP
NE402	NE-2B	NEON LAMP
P004	E40-0273-05	PIN CONNECTOR 2P
P007	E40-0973-05	PIN CONNECTOR 9P
P021	E40-0273-05	PIN CONNECTOR 2P
P022	E40-0673-05	PIN CONNECTOR 6P
P023	E23-0401-05	PIN TERMINAL
P024	E40-0373-05	PIN CONNECTOR 3P
P025	E40-0573-05	PIN CONNECTOR 5P
P026	E40-0273-05	PIN CONNECTOR 2P
P027	NO USE	
P028	E40-0373-05	PIN CONNECTOR 3P
P029	E40-0873-05	PIN CONNECTOR 8P
P030	E40-0273-05	PIN CONNECTOR 2P
P031	E40-0373-05	PIN CONNECTOR 3P
P032	E23-0401-05	PIN TERMINAL
P033	E40-0573-05	PIN CONNECTOR 5P
P034	E23-0401-05	PIN TERMINAL
P035	NO USE	
P036	E40-0373-05	PIN CONNECTOR 3P
P037	E40-0373-05	PIN CONNECTOR 3P
P038	E40-0473-05	PIN CONNECTOR 4P
P039	E40-0473-05	PIN CONNECTOR 4P
P040	NO USE	
P041	E40-0273-05	PIN CONNECTOR 2P
P042	E40-0373-05	PIN CONNECTOR 3P
P043	E23-0401-05	PIN TERMINAL
P044	E23-0401-05	PIN TERMINAL
P045	E40-0273-05	PIN CONNECTOR 2P
P046	E40-7033-05	PIN CONNECTOR 2P
P047	E40-7032-05	PIN CONNECTOR 5P
P048	E40-0273-05	PIN CONNECTOR 2P
P049	E40-0473-05	PIN CONNECTOR 4P
P050	E40-0473-05	PIN CONNECTOR 4P
P051	E40-0273-05	PIN CONNECTOR 2P
P052	E40-0473-05	PIN CONNECTOR 4P
P053	E40-0273-05	PIN CONNECTOR 2P
P080	E40-0673-05	PIN CONNECTOR 6P
P081	E40-0216-05	PIN CONNECTOR 2P
Q001	2SA1005(K)	TR. SI, PNP
Q002	2SA1005(K)	TR. SI, PNP
Q003	2SK304(E)	FET, N-CHANNEL
Q004	2SC1907	TR. SI, NPN
Q005	2SC1907	TR. SI, NPN
Q006	2SA844(D)	TR. SI, PNP
Q007	2SA844(D)	TR. SI, PNP
Q008	2SA844(D)	TR. SI, PNP
Q009	2SA844(D)	TR. SI, PNP
Q010	2SK117(BL)	FET, N-CHANNEL
Q011	2SA838(B)	TR. SI, PNP
Q012	2SA1015(Y)	TR. SI, PNP
Q013	2SC1907	TR. SI, NPN
Q014	2SA844(D)	TR. SI, PNP
Q015	2SC1907	TR. SI, NPN
Q016	2SC945(Q)	TR. SI, NPN

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION	REF.NO	PARTS NO	NAME & DESCRIPTION
Q017	2SC945(Q)	TR. SI. NPN	R009	RD148B2C103J	RES. CARBON 10K 5% 1/6W
Q018	2SA844(D)	TR. SI. PNP	R010	RD148B2C473J	RES. CARBON 47K 5% 1/6W
Q101	2SA844(D)	TR. SI. PNP	R011	RN148K2E1004F	RES. METAL FILM 1M 1% 1/4W
Q102	2SA844(D)	TR. SI. PNP	R012	RD148B2C103J	RES. CARBON 10K 5% 1/6W
Q103	2SA844(D)	TR. SI. PNP	R013	RD148B2C330J	RES. CARBON 33 5% 1/6W
Q104	2SA838(B)	TR. SI. PNP	R014	RD148B2C152J	RES. CARBON 1.5K 5% 1/6W
Q105	2SC1843(E)	TR. SI. NPN	R015	RD148B2C151J	RES. CARBON 150 5% 1/6W
Q106	2SK117(BL)	FET, N-CHANNEL	R016	RD148B2C392J	RES. CARBON 3.9K 5% 1/6W
Q107	2SK170(V)	FET, N-CHANNEL	R017	RD148B2C392J	RES. CARBON 3.9K 5% 1/6W
Q108	2SA844(D)	TR. SI. PNP	R018	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W
Q109	2SA844(D)	TR. SI. PNP	R019	RD148B2C102J	RES. CARBON 1K 5% 1/6W
Q110	2SC945(Q)	TR. SI. NPN	R020	RD148B2C681J	RES. CARBON 680 5% 1/6W
Q111	2SC945(Q)	TR. SI. NPN	R021	RD148B2C681J	RES. CARBON 680 5% 1/6W
Q112	2SC945(Q)	TR. SI. NPN	R022	RD148B2C681J	RES. CARBON 680 5% 1/6W
Q113	2SC945(Q)	TR. SI. NPN	R023	RD148B2C681J	RES. CARBON 680 5% 1/6W
Q201	2SA844(D)	TR. SI. PNP	R024	RD148B2C104J	RES. CARBON 100K 5% 1/6W
Q202	2SA844(D)	TR. SI. PNP	R025	RD148B2C104J	RES. CARBON 100K 5% 1/6W
Q203	2SA844(D)	TR. SI. PNP	R026	RD148B2C103J	RES. CARBON 10K 5% 1/6W
Q204	2SA838(B)	TR. SI. PNP	R027	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W
Q205	2SC1843(E)	TR. SI. NPN	R028	RD148B2C223J	RES. CARBON 22K 5% 1/6W
Q206	2SK117(BL)	FET, N-CHANNEL	R029	RD148B2C474J	RES. CARBON 470K 5% 1/6W
Q207	2SK170(V)	FET, N-CHANNEL	R030	RD148B2C474J	RES. CARBON 470K 5% 1/6W
Q208	2SA844(D)	TR. SI. PNP	R031	RD148B2C301J	RES. CARBON 300 5% 1/6W
Q209	2SA844(D)	TR. SI. PNP	R032	RD148B2C910J	RES. CARBON 91 5% 1/6W
Q210	2SA1015(Y)	TR. SI. PNP	R033	RD148B2C271J	RES. CARBON 270 5% 1/6W
Q211	2SK170(V)	FET, N-CHANNEL	R034	RD148B2C201J	RES. CARBON 200 5% 1/6W
Q212	2SK170(V)	FET, N-CHANNEL	R035	RD148B2C102J	RES. CARBON 1K 5% 1/6W
Q213	2SC945(Q)	TR. SI. NPN	R036	RD148B2C103J	RES. CARBON 10K 5% 1/6W
Q214	2SA844(D)	TR. SI. PNP	R037	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W
Q215	2SA844(D)	TR. SI. PNP	R038	RD148B2C202J	RES. CARBON 2K 5% 1/6W
Q216	2SC945(Q)	TR. SI. NPN	R039	RD148B2C474J	RES. CARBON 470K 5% 1/6W
Q217	2SC945(Q)	TR. SI. NPN	R040	RD148B2C473J	RES. CARBON 47K 5% 1/6W
Q218	2SC945(Q)	TR. SI. NPN	R041	RD148B2C331J	RES. CARBON 330 5% 1/6W
Q219	2SA1005(K)	TR. SI. PNP	R042	RD148B2C220J	RES. CARBON 22 5% 1/6W
Q220	2SA1005(K)	TR. SI. PNP	R043	RD148B2C561J	RES. CARBON 560 5% 1/6W
Q221	2SC945(Q)	TR. SI. NPN	R044	RD148B2C391J	RES. CARBON 390 5% 1/6W
Q301	2SC945(Q)	TR. SI. NPN	R045	RD148B2C272J	RES. CARBON 2.7K 5% 1/6W
Q302	2SC945(Q)	TR. SI. NPN	R046	RD148B2C272J	RES. CARBON 2.7K 5% 1/6W
Q303	2SA1015(Y)	TR. SI. PNP	R047	RD148B2C102J	RES. CARBON 1K 5% 1/6W
Q304	2SA1015(Y)	TR. SI. PNP	R048	RD148B2C681J	RES. CARBON 680 5% 1/6W
Q305	2SC1907	TR. SI. NPN	R049	RD148B2C123J	RES. CARBON 12K 5% 1/6W
Q306	2SC1907	TR. SI. NPN	R050	RD148B2C152J	RES. CARBON 1.5K 5% 1/6W
Q307	2SC1907	TR. SI. NPN	R051	RD148B2C332J	RES. CARBON 3.3K 5% 1/6W
Q308	2SA838(B)	TR. SI. PNP	R052	RD148B2C223J	RES. CARBON 22K 5% 1/6W
Q309	2SD668A(C)	TR. SI. NPN	R053	RD148B2C100J	RES. CARBON 10 5% 1/6W
Q310	2SD668A(C)	TR. SI. NPN	R101	RD148B2C473J	RES. CARBON 47K 5% 1/6W
Q311	2SB648A(C)	TR. SI. PNP	R102	RD148B2C151J	RES. CARBON 150 5% 1/6W
Q312	2SB648A(C)	TR. SI. PNP	R103	RD148B2C181J	RES. CARBON 180 5% 1/6W
Q401	2SA1005(K)	TR. SI. PNP	R104	RD148B2C470J	RES. CARBON 47 5% 1/6W
Q402	2SA1005(K)	TR. SI. PNP	R105	RD148B2C470J	RES. CARBON 47 5% 1/6W
Q403	2SC1907	TR. SI. NPN	R106	RD148B2C152J	RES. CARBON 1.5K 5% 1/6W
Q404	2SC1907	TR. SI. NPN	R107	RD148B2C102J	RES. CARBON 1K 5% 1/6W
Q405	2SD668A(C)	TR. SI. NPN	R108	RD148B2C101J	RES. CARBON 100 5% 1/6W
Q406	2SD668A(C)	TR. SI. NPN	R109	RD148B2C102J	RES. CARBON 1K 5% 1/6W
Q407	2SD668A(C)	TR. SI. NPN	R110	RD148B2C223J	RES. CARBON 22K 5% 1/6W
Q408	2SD668A(C)	TR. SI. NPN	R111	RD148B2C331J	RES. CARBON 330 5% 1/6W
Q409	2SD880(Y)	TR. SI. NPN	R112	RD148B2C330J	RES. CARBON 33 5% 1/6W
Q410	2SC945(Q)	TR. SI. NPN	R113	RD148B2C153J	RES. CARBON 15K 5% 1/6W
Q411	2SA1015(Y)	TR. SI. PNP	R114	RD148B2C472J	RES. CARBON 4.7K 5% 1/6W
Q412	2SC1846(R)	TR. SI. NPN	R115	RD148B2C333J	RES. CARBON 33K 5% 1/6W
Q413	2SC1846(R)	TR. SI. NPN	R116	RD148B2C103J	RES. CARBON 10K 5% 1/6W
Q501	2SC1907	TR. SI. NPN	R117	RN148K2E3004F	RES. METAL FILM 3M 1% 1/4W
Q502	2SC1907	TR. SI. NPN	R118	RN148K2C1004F	RES. METAL FILM 1M 1% 1/6W
Q503	2SA1005(K)	TR. SI. PNP	R119	RN148K2C5003F	RES. METAL FILM 500K 1% 1/6W
Q504	2SA1005(K)	TR. SI. PNP	R120	RN148K2C3003F	RES. METAL FILM 300K 1% 1/6W
Q505	2SA1005(K)	TR. SI. PNP	R121	RN148K2C1003F	RES. METAL FILM 100K 1% 1/6W
Q506	2SC945(Q)	TR. SI. NPN	R122	RN148K2C5002F	RES. METAL FILM 50K 1% 1/6W
R001	RD148B2C220J	RES. CARBON 22 5% 1/6W	R123	RN148K2C3002F	RES. METAL FILM 30K 1% 1/6W
R002	RD148B2C102J	RES. CARBON 1K 5% 1/6W	R124	RN148K2C1002F	RES. METAL FILM 10K 1% 1/6W
R003	RN148K2C1001F	RES. METAL FILM 1K 1% 1/6W	R125	RN148K2C5001F	RES. METAL FILM 5K 1% 1/6W
R004	RD148B2C681J	RES. CARBON 680 5% 1/6W	R126	RN148K2C3001F	RES. METAL FILM 3K 1% 1/6W
R005	RD148B2C912J	RES. CARBON 9.1K 5% 1/6W	R127	RN148K2C1001F	RES. METAL FILM 1K 1% 1/6W
R006	RD148B2C302J	RES. CARBON 3K 5% 1/6W	R128	RN148K2C1001F	RES. METAL FILM 1K 1% 1/6W
R007	RD148B2E220J	RES. CARBON 22 5% 1/4W	R129	RD148B2C392J	RES. CARBON 3.9K 5% 1/6W
R008	RD148B2C560J	RES. CARBON 56 5% 1/6W	R130	RD148B2C183J	RES. CARBON 18K 5% 1/6W
			R131	RD148B2C121J	RES. CARBON 120 5% 1/6W
			R132	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W
			R133	RD148B2C222J	RES. CARBON 2.2K 5% 1/6W
			R134	RD148B2C103J	RES. CARBON 10K 5% 1/6W
			R135	RD148B2C101J	RES. CARBON 100 5% 1/6W
			R136	RD148B2C223J	RES. CARBON 22K 5% 1/6W
			R137	RD148B2C561J	RES. CARBON 560 5% 1/6W
			R138	RD148B2C103J	RES. CARBON 10K 5% 1/6W

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION			
R139	RD148B2C821J	RES. CARBON	820	5%	1/6W
R140	RD148B2C222J	RES. CARBON	2.2K	5%	1/6W
R141	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R142	RD148B2C221J	RES. CARBON	220	5%	1/6W
R143	RN148K2C2002F	RES. METAL FILM	20K	1%	1/6W
R144	RN148K2C3302F	RES. METAL FILM	33K	1%	1/6W
R145	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R146	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R147	RD148B2C682J	RES. CARBON	6.8K	5%	1/6W
R148	RD148B2C392J	RES. CARBON	3.9K	5%	1/6W
R149	RD148B2C220J	RES. CARBON	22	5%	1/6W
R150	RD148B2C100J	RES. CARBON	10	5%	1/6W
R151	RD148B2C100J	RES. CARBON	10	5%	1/6W
R201	RD148B2C151J	RES. CARBON	150	5%	1/6W
R202	RD148B2C181J	RES. CARBON	180	5%	1/6W
R203	RD148B2C470J	RES. CARBON	47	5%	1/6W
R204	RD148B2C470J	RES. CARBON	47	5%	1/6W
R205	RD148B2C152J	RES. CARBON	1.5K	5%	1/6W
R206	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R207	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R208	RD148B2C101J	RES. CARBON	100	5%	1/6W
R209	RD148B2C223J	RES. CARBON	22K	5%	1/6W
R210	RD148B2C331J	RES. CARBON	330	5%	1/6W
R211	RD148B2C330J	RES. CARBON	33	5%	1/6W
R212	RD148B2C183J	RES. CARBON	18K	5%	1/6W
R213	RD148B2C183J	RES. CARBON	18K	5%	1/6W
R214	RD148B2C333J	RES. CARBON	33K	5%	1/6W
R215	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R216	RN148K2E3004F	RES. METAL FILM	3M	1%	1/4W
R217	RN148K2C1004F	RES. METAL FILM	1M	1%	1/6W
R218	RN148K2C5003F	RES. METAL FILM	500K	1%	1/6W
R219	RN148K2C3003F	RES. METAL FILM	300K	1%	1/6W
R220	RN148K2C1003F	RES. METAL FILM	100K	1%	1/6W
R221	RN148K2C5002F	RES. METAL FILM	50K	1%	1/6W
R222	RN148K2C3002F	RES. METAL FILM	30K	1%	1/6W
R223	RN148K2C1002F	RES. METAL FILM	10K	1%	1/6W
R224	RN148K2C5001F	RES. METAL FILM	5K	1%	1/6W
R225	RN148K2C3001F	RES. METAL FILM	3K	1%	1/6W
R226	RN148K2C1001F	RES. METAL FILM	1K	1%	1/6W
R227	RN148K2C1001F	RES. METAL FILM	1K	1%	1/6W
R228	RD148B2C392J	RES. CARBON	3.9K	5%	1/6W
R229	RD148B2C183J	RES. CARBON	18K	5%	1/6W
R230	RD148B2C121J	RES. CARBON	120	5%	1/6W
R231	RD148B2C222J	RES. CARBON	2.2K	5%	1/6W
R232	RD148B2C182J	RES. CARBON	1.8K	5%	1/6W
R233	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R234	RD148B2C471J	RES. CARBON	470	5%	1/6W
R235	RD148B2C153J	RES. CARBON	15K	5%	1/6W
R236	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R237	RD148B2C152J	RES. CARBON	1.5K	5%	1/6W
R238	RD148B2C242J	RES. CARBON	2.4K	5%	1/6W
R239	RD148B2C472J	RES. CARBON	4.7K	5%	1/6W
R240	RD148B2C822J	RES. CARBON	8.2K	5%	1/6W
R241	RD148B2C561J	RES. CARBON	560	5%	1/6W
R242	RD148B2C563J	RES. CARBON	56K	5%	1/6W
R243	RD148B2C222J	RES. CARBON	2.2K	5%	1/6W
R244	RD148B2C221J	RES. CARBON	220	5%	1/6W
R245	RD148B2C561J	RES. CARBON	560	5%	1/6W
R248	RN148K2C2002F	RES. METAL FILM	20K	1%	1/6W
R249	RN148K2C3302F	RES. METAL FILM	33K	1%	1/6W
R250	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R251	RD148B2C561J	RES. CARBON	560	5%	1/6W
R252	RD148B2C471J	RES. CARBON	470	5%	1/6W
R253	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R254	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R255	RD148B2C223J	RES. CARBON	22K	5%	1/6W
R256	RD148B2C333J	RES. CARBON	33K	5%	1/6W
R257	RD148B2C562J	RES. CARBON	5.6K	5%	1/6W
R258	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W
R259	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R260	RD148B2C472J	RES. CARBON	4.7K	5%	1/6W
R261	RD148B2C392J	RES. CARBON	3.9K	5%	1/6W
R262	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R263	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R264	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R265	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R266	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R267	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W
R268	RD148B2C100J	RES. CARBON	10	5%	1/6W
R269	RD148B2C100J	RES. CARBON	10	5%	1/6W

REF.NO	PARTS NO	NAME & DESCRIPTION			
R301	RD148B2C471J	RES. CARBON	470	5%	1/6W
R302	RD148B2C392J	RES. CARBON	3.9K	5%	1/6W
R303	RN148K2E1501F	RES. METAL FILM	1.5K	1%	1/4W
R304	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W
R305	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W
R306	RD148B2C682J	RES. CARBON	6.8K	5%	1/6W
R307	RD148B2C471J	RES. CARBON	470	5%	1/6W
R308	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R309	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R310	RN148K2E47ROF	RES. METAL FILM	47.0	1%	1/4W
R311	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W
R312	RD148B2C122J	RES. CARBON	1.2K	5%	1/6W
R313	RN148K2C1001F	RES. METAL FILM	1K	1%	1/6W
R314	RN148K2C1001F	RES. METAL FILM	1K	1%	1/6W
R315	RN148K2C7500F	RES. METAL FILM	750	1%	1/6W
R316	RD148B2C331J	RES. CARBON	330	5%	1/6W
R317	RD148B2C331J	RES. CARBON	330	5%	1/6W
R318	RD148B2C123J	RES. CARBON	12K	5%	1/6W
R319	RD148B2C222J	RES. CARBON	2.2K	5%	1/6W
R320	RD148B2C222J	RES. CARBON	2.2K	5%	1/6W
R321	RD148B2C393J	RES. CARBON	39K	5%	1/6W
R322	RD148B2C104J	RES. CARBON	100K	5%	1/6W
R323	RD148B2C104J	RES. CARBON	100K	5%	1/6W
R324	RD148B2C152J	RES. CARBON	1.5K	5%	1/6W
R325	RD148B2C152J	RES. CARBON	1.5K	5%	1/6W
R326	RD148B2C331J	RES. CARBON	330	5%	1/6W
R327	RD148B2C331J	RES. CARBON	330	5%	1/6W
R328	RN148K2C1003F	RES. METAL FILM	100K	1%	1/6W
R329	RN148K2C1003F	RES. METAL FILM	100K	1%	1/6W
R330	RD148B2C470J	RES. CARBON	47	5%	1/6W
R331	RD148B2C470J	RES. CARBON	47	5%	1/6W
R401	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W
R402	RD148B2C561J	RES. CARBON	560	5%	1/6W
R403	RD148B2C101J	RES. CARBON	100	5%	1/6W
R404	RD148B2C123J	RES. CARBON	12K	5%	1/6W
R405	RD148B2C101J	RES. CARBON	100	5%	1/6W
R406	RD148B2C221J	RES. CARBON	220	5%	1/6W
R407	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W
R408	RD148B2C331J	RES. CARBON	330	5%	1/6W
R409	RD148B2C472J	RES. CARBON	4.7K	5%	1/6W
R410	RD148B2C472J	RES. CARBON	4.7K	5%	1/6W
R411	RD148B2C473J	RES. CARBON	47K	5%	1/6W
R412	RD148B2C331J	RES. CARBON	330	5%	1/6W
R413	RD148B2C472J	RES. CARBON	4.7K	5%	1/6W
R414	RD148B2H473J	RES. CARBON	47K	5%	1/2W
R415	RD148B2H473J	RES. CARBON	47K	5%	1/2W
R416	RD148B2C222J	RES. CARBON	2.2K	5%	1/6W
R417	RD148B2H473J	RES. CARBON	47K	5%	1/2W
R418	RD148B2H473J	RES. CARBON	47K	5%	1/2W
R419	RD148B2C681J	RES. CARBON	680	5%	1/6W
R420	RD148B2C681J	RES. CARBON	680	5%	1/6W
R421	RD148B2C101J	RES. CARBON	100	5%	1/6W
R422	RD148B2C101J	RES. CARBON	100	5%	1/6W
R423	RD148B2C332J	RES. CARBON	3.3K	5%	1/4W
R424	R92-1057-05	RES. METAL FILM	2.2M	5%	1/2W
R425	RD148B2C823J	RES. CARBON	82K	5%	1/6W
R426	R92-1057-05	RES. METAL FILM	2.2M	5%	1/2W
R427	R92-1007-05	RES. CARBON	10M	5%	1/2W
R428	R92-1007-05	RES. CARBON	10M	5%	1/2W
R429	RD148B2E102J	RES. CARBON	1K	5%	1/4W
R430	RD148B2E102J	RES. CARBON	1K	5%	1/4W
R431	RD148B2C101J	RES. CARBON	100	5%	1/6W
R432	RD148B2C101J	RES. CARBON	100	5%	1/6W
R433	R92-1057-05	RES. METAL FILM	2.2M	5%	1/2W
R434	RD148B2C103J	RES. CARBON	10K	5%	1/6W
R435	R92-1007-05	RES. CARBON	10M	5%	1/2W
R436	R92-1007-05	RES. CARBON	10M	5%	1/2W
R437	R92-1418-05	RES. METAL	6.8M	1%	1W
R438	R92-1419-05	RES. METAL FILM	10M	1%	1W
R439	RD148B2C471J	RES. CARBON	470	5%	1/6W
R440	RN148K2C1103F	RES. METAL FILM	110K	1%	1/6W
R441	RD148B2C472J	RES. CARBON	4.7K	5%	1/6W
R442	RN148K2C8201F	RES. METAL FILM	8.2K	1%	1/6W
R443	RN148K2C1202F	RES. METAL FILM	12K	1%	1/6W
R444	RD148B2C102J	RES. CARBON	1K	5%	1/6W
R445	RD148B2C332J	RES. CARBON	3.3K	5%	1/6W
R446	RS148B3A1R0J	RES. METAL FILM	1	5%	1W
R447	RD148B2H223J	RES. CARBON	22K	5%	1/2W
R448	RD148B2C104J	RES. CARBON	100K	5%	1/6W
R449	RD148B2C473J	RES. CARBON	47K	5%	1/6W
R450	NO USE				
R451	RD148B2C681J	RES. CARBON	680	5%	1/6W
R452	RD148B2C470J	RES. CARBON	47	5%	1/6W



# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION			
R453	RS14GB3A102J	RES. METAL FILM 1K	5%	1W	
R454	RS14GB3A750J	RES. METAL FILM 75	5%	1W	
R455	RS14GB3A750J	RES. METAL FILM 75	5%	1W	
R456	RD14BB2C304J	RES. CARBON 300K	5%	1/6W	
R457	RD14BB2C682J	RES. CARBON 6.8K	5%	1/6W	
R501	RD14BB2C104J	RES. CARBON 100K	5%	1/6W	
R502	RD14BB2C104J	RES. CARBON 100K	5%	1/6W	
R503	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R504	RD14BB2C332J	RES. CARBON 3.3K	5%	1/6W	
R505	RD14BB2C102J	RES. CARBON 1K	5%	1/6W	
R506	RN14BK2C3301F	RES. METAL FILM 3.3K	1%	1/6W	
R507	RN14BK2C3301F	RES. METAL FILM 3.3K	1%	1/6W	
R508	RD14BB2C122J	RES. CARBON 1.2K	5%	1/6W	
R509	RD14BB2C561J	RES. CARBON 560	5%	1/6W	
R510	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R511	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R512	RD14BB2C751J	RES. CARBON 750	5%	1/6W	
R515	RN14BK2C8201F	RES. METAL FILM 8.2K	1%	1/6W	
R516	RN14BK2C2201F	RES. METAL FILM 2.2K	1%	1/6W	
R517	RN14BK2C8200F	RES. METAL FILM 820	1%	1/6W	
R518	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W	
R519	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R520	RD14BB2C104J	RES. CARBON 100K	5%	1/6W	
R521	RN14BK2C1002F	RES. METAL FILM 10K	1%	1/6W	
R522	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W	
R523	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W	
R524	RD14BB2C101J	RES. CARBON 100	5%	1/6W	
R525	RD14BB2C222J	RES. CARBON 2.2K	5%	1/6W	
R526	RD14BB2C102J	RES. CARBON 1K	5%	1/6W	
R527	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R528	RD14BB2C303J	RES. CARBON 30K	5%	1/6W	
R529	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R530	RD14BB2C474J	RES. CARBON 470K	5%	1/6W	
R531	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W	
R532	RD14BB2C472J	RES. CARBON 4.7K	5%	1/6W	
R533	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R534	R90-0665-05				
R535	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R536	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R537	RD14BB2C103J	RES. CARBON 10K	5%	1/6W	
R601	R92-1007-05	RES. CARBON 10M	5%	1/2W	
R701	R90-0664-05	RES. NETWORK 10K	X10		
R702	R90-0664-05	RES. NETWORK 10K	X10		
R801	RD14BB2C151J	RES. CARBON 150	5%	1/6W	
R802	RD14BB2C120J	RES. CARBON 12	5%	1/6W	
R901	RD14BB2C561J	RES. CARBON 560	5%	1/6W	
R902	RD14BB2C163J	RES. CARBON 16K	5%	1/6W	
S001	S33-2501-05	LEVER SWITCH 2-5			
S002	S32-4008-05	LEVER SWITCH 4-5			
S101	S33-4503-05	LEVER SWITCH 4-5 (H.MODE)			
S102	S29-4502-05	ROTARY SWITCH (SWEEP TIME)			
S202	S32-4009-05	LEVER SWITCH 4-4			
S501	S33-2501-05	LEVER SWITCH 2-5			
T401	L19-0421-05	CONVERTOR TRANSFORMER			
TC101	C05-0454-05	CAP. TRIMMER 20PF			
TC201	C05-0454-05	CAP. TRIMMER 20PF			
U001	SN74LS00N	IC. QUAD 2-INPUT NAND GATE			
U101	SN74LS00N	IC. QUAD 2-INPUT NAND GATE			
U102	SN74LS112AN	IC. DUAL JK-FF			
U103	TL081CP	IC. BI-FET O.P AMP			
U104	TC4053BP	IC. 2-CH ANALOG MULTIPLEXER			
U201	SN74LS112AN	IC. DUAL JK-FF			
U202	TL081CP	IC. BI-FET O.P AMP			
U203	SN74LS112AN	IC. DUAL JK-FF			
U401	LF13741N	IC. MONOLITHIC JFET INPUT OP			
U501	TC74HC123AP				
U502	NJM4558D	IC. DUAL OP AMP			

REF.NO	PARTS NO	NAME & DESCRIPTION			
U701	DTM-5020	IC. GATE ARRAY			
U702	DTM-5020	IC. GATE ARRAY			
VR001	R12-2522-05	RES. SEMI FIXED 5K	B		
VR002	R12-0575-05	RES. SEMI FIXED 100	B		
VR003	R12-0577-05	RES. SEMI FIXED 500	B		
VR101	R12-3549-05	RES. SEMI FIXED 10K	B		
VR102	R06-3502-05	V.R. 10K	B		
VR201	R12-3549-05	RES. SEMI FIXED 10K	B		
VR202	R12-1545-05	RES. SEMI FIXED 1K	B		
VR203	R12-0577-05	RES. SEMI FIXED 500	B		
VR204	R12-3549-05	RES. SEMI FIXED 10K	B		
VR301	R12-1546-05	RES. SEMI FIXED 2K	B		
VR302	R12-0575-05	RES. SEMI FIXED 100	B		
VR401	R12-4516-05	RES. SEMI FIXED 50K	B		
VR402	R12-8501-05	RES. SEMI FIXED 2.2M	B		
VR403	R12-3549-05	RES. SEMI FIXED 10K	B		
VR501	R12-0577-05	RES. SEMI FIXED 500	B		
VR502	R12-1545-05	RES. SEMI FIXED 1K	B		

## R/O UNIT

### X77-1510-00

REF.NO	PARTS NO	NAME & DESCRIPTION			
C001	CE04EW1A470M	CAP. ELECTRO 47	20%	10V	
C002	C91-1245-05	CAP. CERAMIC 0.1		12V	
C003	C91-0769-05	CAP. AXIAL 0.01	20%	16V	
C004	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C005	NO USE				
C006	CC45FSL1H331J	CAP. CERAMIC 330P	5%	50V	
C007	CC45FCH1H680J	CAP. CERAMIC 68P	5%	50V	
C008	CF92FV1H334J	CAP. POLYESTER 0.33	5%	50V	
C009	CF92FV1H334J	CAP. POLYESTER 0.33	5%	50V	
C010	CF92FV1H334J	CAP. POLYESTER 0.33	5%	50V	
C011	CF92FV1H334J	CAP. POLYESTER 0.33	5%	50V	
C012	NO USE				
C013	CC45FCH1H101J	CAP. CERAMIC 100P	5%	50V	
C016	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C017	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C018	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C019	CE04EW1C220M	CAP. ELECTRO 22	20%	16V	
C020	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C021	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C022	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C023	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C024	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C025	CE04EW1C220M	CAP. ELECTRO 22	20%	16V	
C026	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C027	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C028	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C029	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C030	CE04EW1C220M	CAP. ELECTRO 22	20%	16V	
C031	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C032	C91-1245-05	CAP. CERAMIC 0.1		12V	
C033	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C034	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C035	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C036	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C037	CE04EW1C220M	CAP. ELECTRO 22	20%	16V	
C038	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C039	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C042	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C043	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C046	C91-1245-05	CAP. CERAMIC 0.1		12V	
C047	CK45FF1H103Z	CAP. CERAMIC 0.01		50V	
C048	CE04EW1C220M	CAP. ELECTRO 22	20%	16V	
C049	CE04EW1C220M	CAP. ELECTRO 22	20%	16V	
C050	C91-0769-05	CAP. AXIAL 0.01	20%	16V	
C051	C91-0769-05	CAP. AXIAL 0.01	20%	16V	
C052	C91-0769-05	CAP. AXIAL 0.01	20%	16V	
C053	C91-0769-05	CAP. AXIAL 0.01	20%	16V	
C054	CE04EW1A101M	CAP. ELECTRO 100	20%	10V	
C055	NO USE				
C056	C91-1245-05	CAP. CERAMIC 0.1		12V	
C057	C91-1245-05	CAP. CERAMIC 0.1		12V	

# PARTS LIST

REF.NO	PARTS NO	NAME & DESCRIPTION			
C058	C91-1245-05	CAP. CERAMIC	0.1	12V	
C059	C91-1245-05	CAP. CERAMIC	0.1	12V	
C060	C91-1245-05	CAP. CERAMIC	0.1	12V	
C061	C91-1245-05	CAP. CERAMIC	0.1	12V	
C062	C91-1245-05	CAP. CERAMIC	0.1	12V	
C066	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V
C067	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V
C068	CC45FCH1H470J	CAP. CERAMIC	47P	5%	50V
C071	C91-1249-05	CAP. NETWORK	0.01X13		
C072	C91-1249-05	CAP. NETWORK	0.01X13		
C073	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C074	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C075	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C076	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C077	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C078	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C079	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C080	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C081	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C082	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C083	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C084	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
C085	CK45FF1H103Z	CAP. CERAMIC	0.01	50V	
D001	MA700	DIODE			
D002	MA700	DIODE			
L001	L40-1011-04	FERRI INDUCTOR	100UH		
P015	E40-0473-05	PIN CONNECTOR	4P		
P016	E40-1373-05	PIN CONNECTOR	13P		
P033	E40-1173-05	PIN CONNECTOR	11P		
P034	NO USE				
P035	E40-0973-05	PIN CONNECTOR	9P		
P057	E40-0473-05	PIN CONNECTOR	4P		
P065	E40-0473-05	PIN CONNECTOR	4P		
P080	E40-1173-05	PIN CONNECTOR	11P		
Q001	2SC2785(F)	TR. SI. NPN			
Q002	2SA1175(F)	TR. SI. PNP			
R001	RD14BB2C682J	RES. CARBON	6.8K	5%	1/6W
R002	RD14BB2C512J	RES. CARBON	5.1K	5%	1/6W
R005	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R006	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R007	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R008	RD14BK2C1202F	RES. METAL FILM	12K	1%	1/6W
R009	RD14BB2C123J	RES. CARBON	12K	5%	1/6W
R010	RN14BK2C6200F	RES. METAL FILM	620	1%	1/6W
R011	RN14BK2C6200F	RES. METAL FILM	620	1%	1/6W
R012	RN14BK2C9531F	RES. METAL FILM	1.3K	1%	1/6W
R013	RN14BK2C1301F	RES. METAL FILM	9.1K	1%	1/6W
R014	RN14BK2C9101F	RES. METAL FILM	9.1K	1%	1/6W
R015	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R016	RD14BB2C331J	RES. CARBON	330	5%	1/6W
R017	RN14BK2C9101F	RES. METAL FILM	9.1K	1%	1/6W
R018	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R019	RD14BB2C331J	RES. CARBON	330	5%	1/6W
R020	RN14BK2C3602F	RES. METAL FILM	36K	1%	1/6W
R021	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W
R022	RN14BK2C7501F	RES. METAL FILM	7.5K	1%	1/6W
R023	RN14BK2C7501F	RES. METAL FILM	7.5K	1%	1/6W
R024	RN14BK2C3602F	RES. METAL FILM	36K	1%	1/6W
R025	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W
R026	RD14BB2C473J	RES. CARBON	47K	5%	1/6W
R027	RD14BB2C473J	RES. CARBON	47K	5%	1/6W
R028	NO USE				
R029	RN14BK2C1202F	RES. METAL FILM	12K	1%	1/6W
R030	RN14BK2C1101F	RES. METAL FILM	1.1K	1%	1/6W
R031	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W
R032	RD14BB2C622J	RES. CARBON	6.2K	5%	1/6W
R033	R90-0654-05	RES. NETWORK	COMPLEX, Y		
R034	NO USE				
R035	RD14BB2C5R6J	RES. CARBON	5.6	5%	1/6W
R036	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R037	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R038	NO USE				

REF.NO	PARTS NO	NAME & DESCRIPTION			
R039	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R040	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R043	R90-0653-05	RES. NETWORK	8X10K	5%	
R044	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R045	NO USE				
R046	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R050	RD14BB2C301J	RES. CARBON	300	5%	1/6W
R051	RD14BB2C301J	RES. CARBON	300	5%	1/6W
R052	RD14BB2C301J	RES. CARBON	300	5%	1/6W
U001	DAC0808LCN	IC.8-BIT D/A CONVERTER			
U002	HD74HC564AP	IC.OCTAL D FLIP-FLOP			
U003	HD74HC244AP	IC.OCTAL BUFFER			
U004	HD14052BP	IC.DUAL ANALOG MULTIPLEXER			
U005	HD14052BP	IC.DUAL ANALOG MULTIPLEXER			
U006	HD14051BP	IC.ANALOG MULTIPLEXER			
U007	MBM27C64*T	IC.CHARACTOR GENERATOR			
U008	CTM5020	IC.GATE ARRAY (R/D CONTROLLER)			
U009	AM6012DC	IC.12-BIT D/A CONVERTER			
U010	NJM311D	IC.COMPARATOR			
U011	NJM4558D	IC. DUAL OP AMP			
U012	R90-0655-05	CR NETWORK			
U013	NJM072BD	IC.JFET INPUT OP AMP			
U014	HD14051BP	IC.ANALOG MULTIPLEXER			
U015	NJM4558D	IC. DUAL OP AMP			
U016	SN74LS04N	IC.HEX INVERTER			
U017	HD74HC138AP	IC.3 TO 8 DECORDER MULTIPLEXER			
U018	HD74HC373AP	IC.OCTAL D-LATCHES			
U019	SN74LS244N	IC.OCTAL BUFFER			
U020	SN74LS244N	IC.OCTAL BUFFER			
U021	SN74LS244N	IC.OCTAL BUFFER			
U022	SN74LS244N	IC.OCTAL BUFFER			
U023	CTM5040	IC. CPU			
VR001	R12-1538-05	RES. SEMI FIXED	1KB		
VR002	R12-2520-05	RES. SEMI FIXED	5KB		
X001	L78-0107-05	CERAMIC RESONATOR	(10MHZ)		

## LINE FILTER UNIT

### X80-1060-03

REF.NO	PARTS NO	NAME & DESCRIPTION			
E01	0103-05	CRT SOCKET			
E31	5505-05	WIRE ASS'Y (+Y,-Y)			
E31	5524-05	WIRE ASS'Y (+X,-X)			
E31	5528-05	WIRE ASS'Y (P2,G2)			
E31	5532-05	WIRE ASS'Y (P1,G1,K)			
J25	5179-23	PCB (UNMOUNTED)			
R92	0150-05	JUMPING RES.	ZERO OHM(10MM)		
C001	C91-0575-05	CAP. CERAMIC	1000P	4KV	
C002	C91-0575-05	CAP. CERAMIC	1000P	4KV	
C003	C91-0551-05	CAP. POLYESTER	0.22	10%	630V
L001	L33-0808-05	CHOKE COIL			
P030	E40-0574-05	PIN CONNECTOR	5P		
P050	E40-0474-05	PIN CONNECTOR	4P		
P051	NO USE				
P052	E40-0474-05	PIN CONNECTOR	4P		
P069	E40-0530-05	PIN CONNECTOR	5P		
P073	E40-0330-05	PIN CONNECTOR	3P		
R001	RD14BY2H225J	RES. CARBON	2.2M	5%	1/2W
R002	RD14BB2C101J	RES. CARBON	100	5%	1/6W
R003	RD14BB2C101J	RES. CARBON	100	5%	1/6W
S001	S40-2524-05	PUSH SWITCH (POWER)			
VR001	R10-9508-05	V.R.(INTENSITY)	10KB/20KB		
VR002	R10-9506-05	V.R.(FOCUS/ASTIG)	200KB/100KB		
VR003	R10-9507-05	V.R.(ILLUM/ROTA)	10KB/20KB		

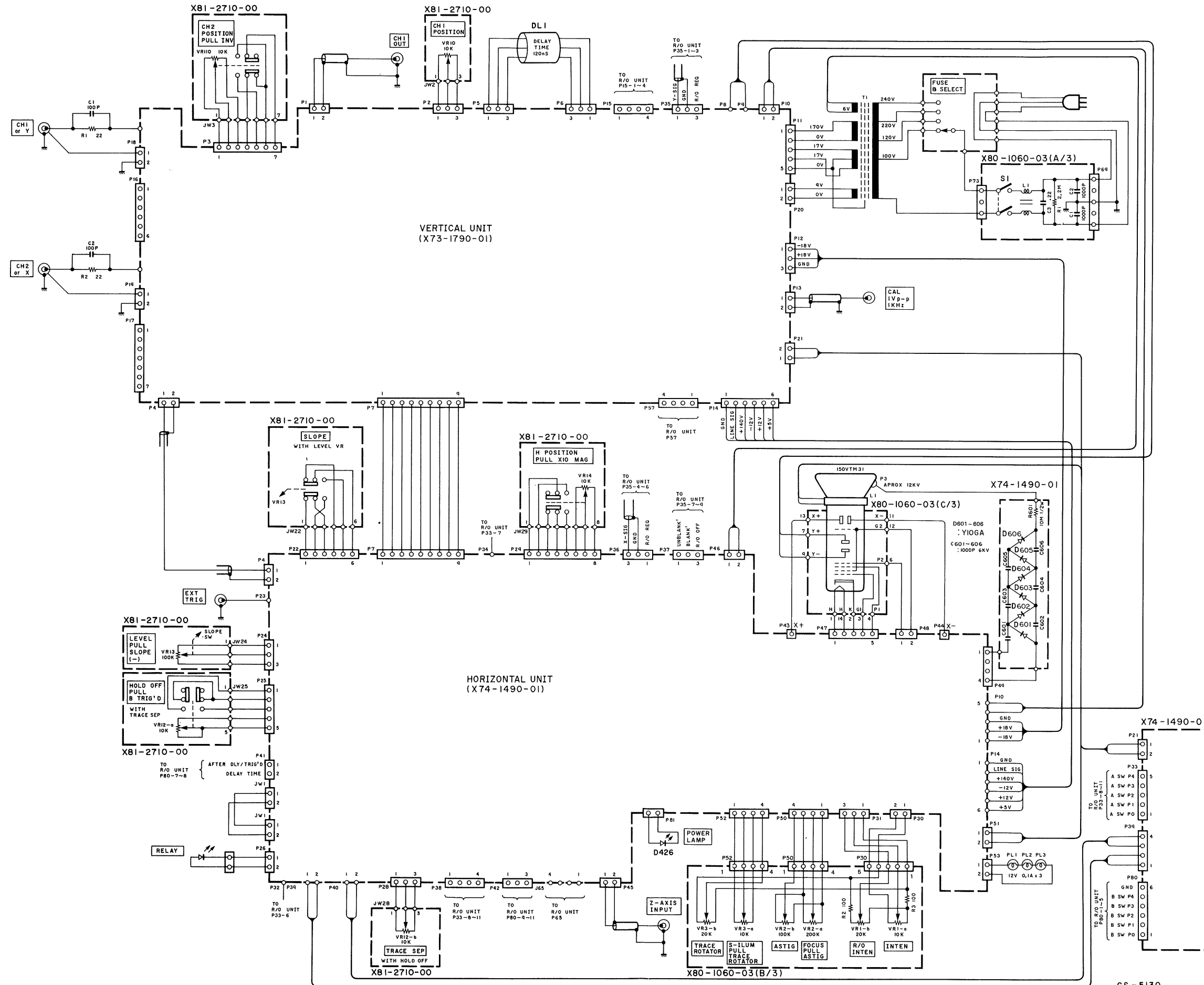
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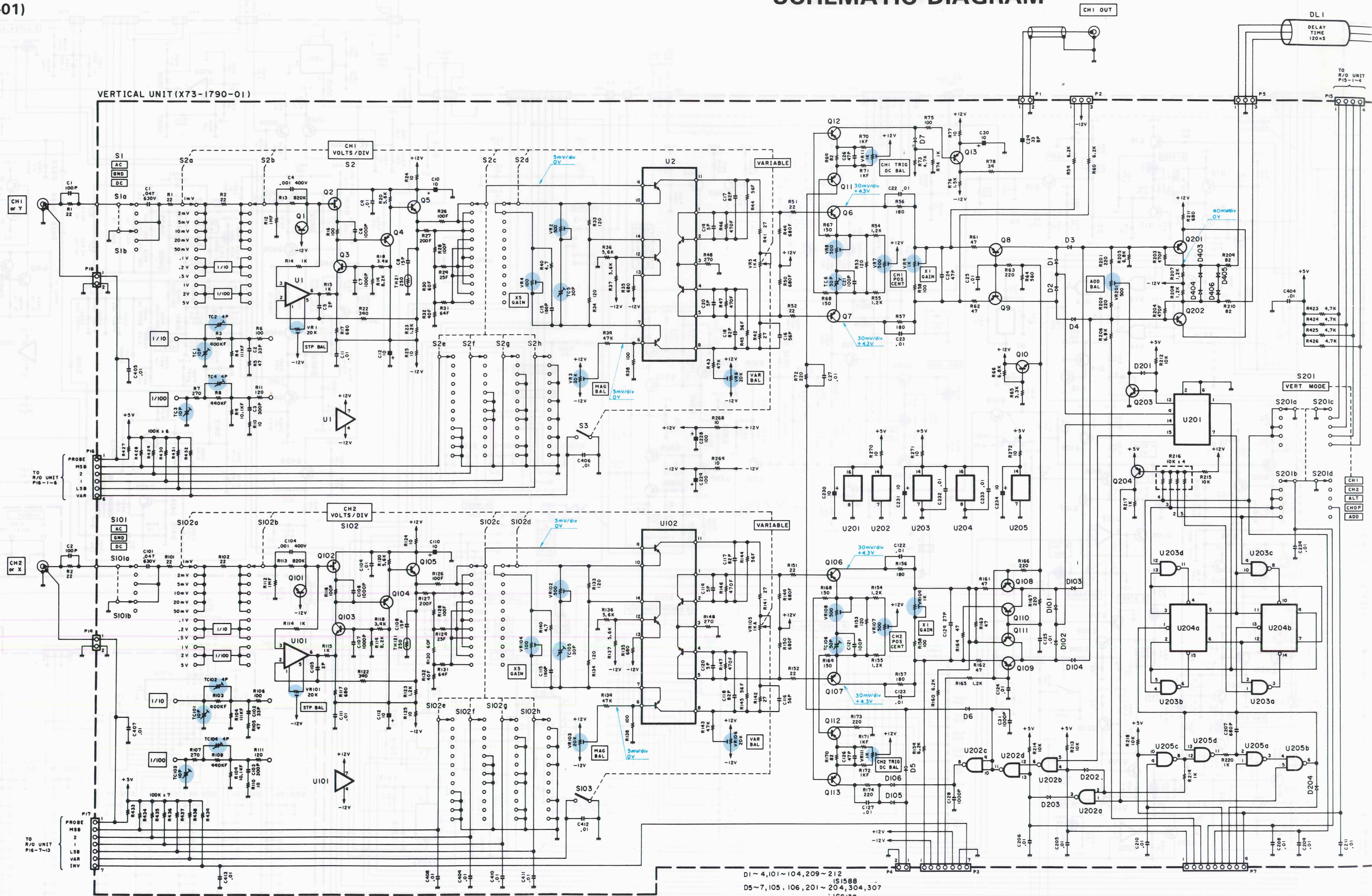
## VR UNIT

**X81-2710-00**

REF.NO	PARTS NO	NAME & DESCRIPTION
	J25-5354-03	PCB (UNMOUNTED)
JW002	E31-5503-05	LEAD WIRE WITH CONNECTOR
JW003	E31-5507-05	LEAD WIRE WITH CONNECTOR
JW022	E31-5517-05	LEAD WIRE WITH CONNECTOR
JW023	NO USE	
JW024	E31-5518-05	LEAD WIRE WITH CONNECTOR
JW025	E31-5520-05	LEAD WIRE WITH CONNECTOR
JW028	E31-5522-05	LEAD WIRE WITH CONNECTOR
JW029	E31-5523-05	LEAD WIRE WITH CONNECTOR
VR010	R01-3522-05	V.R. 2X10K B
VR011	NO USE	
VR012	R06-2505-05	V.R. 2X10K B
VR013	R01-5513-05	V.R. 100K B
VR014	R01-3523-05	V.R. 10K B
VR110	R01-3523-05	V.R. 10K B

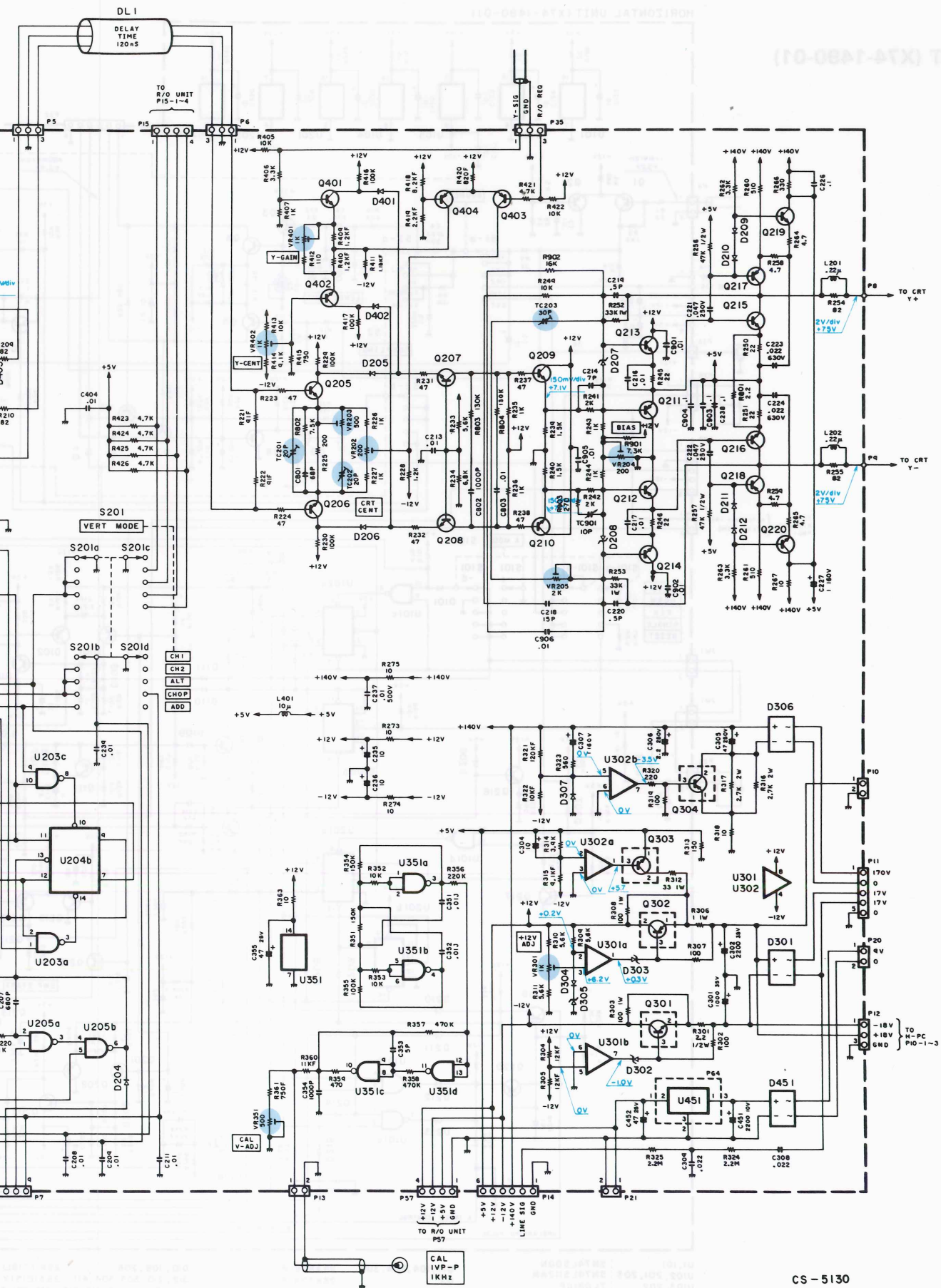
# SCHEMATIC DIAGRAM





U1, 101	: LF411CN	Q1, 13, 101, 205 ~ 210, 401, 402	: 2SC1907	Q213, 214, 219, 220	: 2SC2570A
U2, 102	: CA3086	Q2, 102	: 2SK304(E)	Q215, 216	: 2SC3423(Y)
U201	: SN74LS47N	Q3, 5, 10, 103, 105, 203	: 2SC945(O)	Q217, 218	: 2SA1360(Y)
U202, 203, 205	: SN74LS00N	Q4, 104, 204	: 2SA844(D)	Q301, 303	: 2SD880(Y)
U204	: SN74LS112AN	Q6, 7, 11, 12, 106, 107, 112, 113, 403, 404	: 2SA1005(K)	Q302	: 2SB834(Y)
U301, 302	: $\mu$ PC4558C	Q8, 9, 108 ~ 111	: 2SA838(B)	Q304	: 2SB861(C)
U351	: TC4011BP	Q201, 202, 211, 212	: 2SA1206(K)		
U451	: TA76005AP				

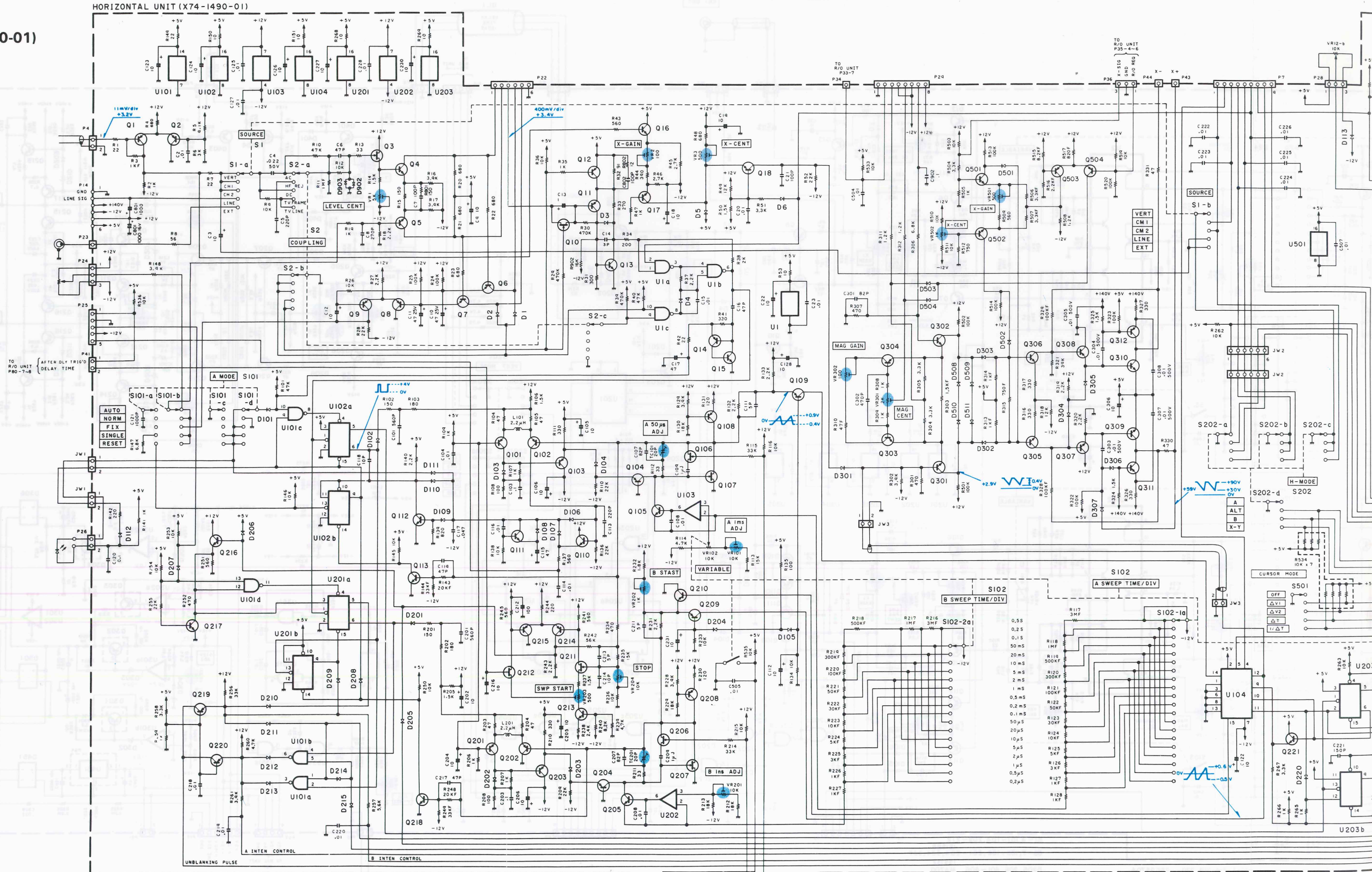
D1 ~ 4, 101 ~ 104, 209 ~ 212  
 IS1588  
 D5 ~ 7, 105, 106, 201 ~ 204, 304, 307  
 IS132  
 D205, 206, 401 ~ 406  
 MA700  
 D207, 208  
 HZ2(B3)  
 D301, 306, 451  
 IG4B42  
 D302, 303  
 HZS13J(B2)  
 D305  
 HZS5.6J(B2)



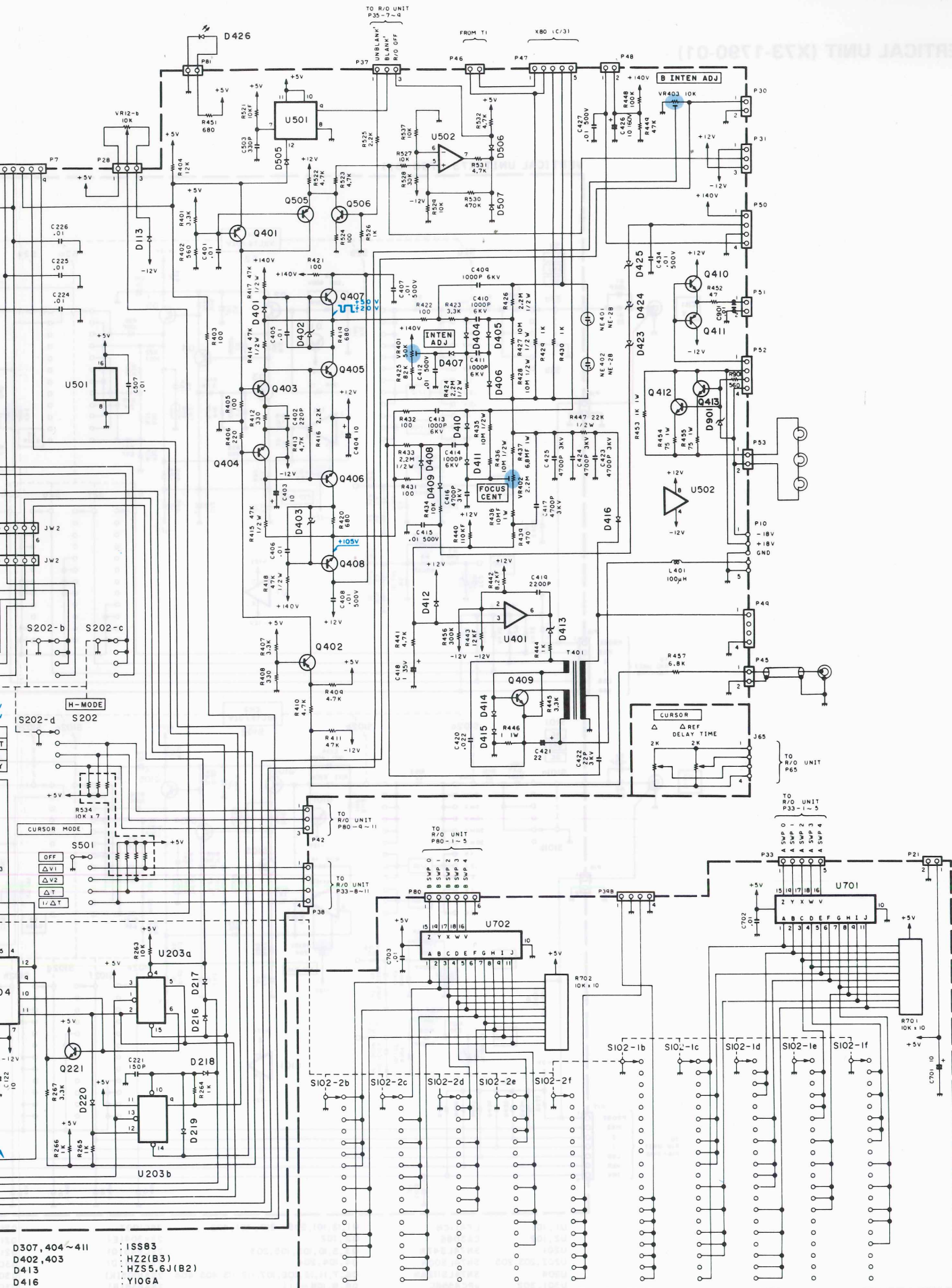
CS - 5130

# SCHEMATIC DIAGRAM

## HORIZONTAL UNIT (X74-1490-01)



- |   |   |   |  |
|---|---|---|--|
| <p>U1, 101 : SN74LS00N<br/>         U02, 201, 203 : SN74LS112AN<br/>         U03, 202 : TL081CP<br/>         U04 : TC4053BP<br/>         U401 : LF1374IN<br/>         U501 : TC74HC123AP<br/>         U502 : NJM4558D<br/>         U701, 702 : DTM-5020</p> | <p>Q11, 104, 204, 308 : 2SA838(B)<br/>         Q3 : 2SK304(E)<br/>         Q4, 5, 13, 15, 305~307, 403<br/>         404, 501, 502 : 2SC1907<br/>         Q6~9, 14, 18, 101~103, 108, 109, 201~203<br/>         208, 209, 214, 215 : 2SA844(D)<br/>         Q10, 106, 206 : 2SK117(BL)<br/>         Q12, 210, 303, 304, 411 : 2SA1015(Y)<br/>         Q16, 17, 110~113, 213, 216~218, 221, 301, 302<br/>         410, 506 : 2SC945(Q)<br/>         Q105, 205 : 2SC1843(E)<br/>         Q107, 207, 211, 212 : 2SK170(V)</p> | <p>Q1, 2, 219, 220, 401, 402<br/>         503~505 : 2SA1005(K)<br/>         Q309, 310, 405~408 : 2SD668A(C)<br/>         Q311, 312 : 2SB648A(C)<br/>         Q409 : 2SD880(Y)<br/>         Q412, 413 : 2SC1846(R)</p> | <p>D1, 2, 4~6, 101~112, 201~220<br/>         301, 305, 306, 401, 412, 414, 415<br/>         503~507, 509, 512 : 1S1588<br/>         D3, 304 : 1SS86<br/>         D113 : HZS6-BJ(B2)<br/>         D302, 303, 502, 503, 510, 511 : MA700<br/>         D307, 404~411 : 1SS83<br/>         D402, 403 : HZ2(B3)<br/>         D413 : HZS5.6(B2)<br/>         D416 : Y10GA<br/>         D423~425 : HZ36L(2)<br/>         D426 : B30-0957-C<br/>         D901 : RD30E(B3)<br/>         D902, 903 : 1SS32</p> |
|---|---|---|--|

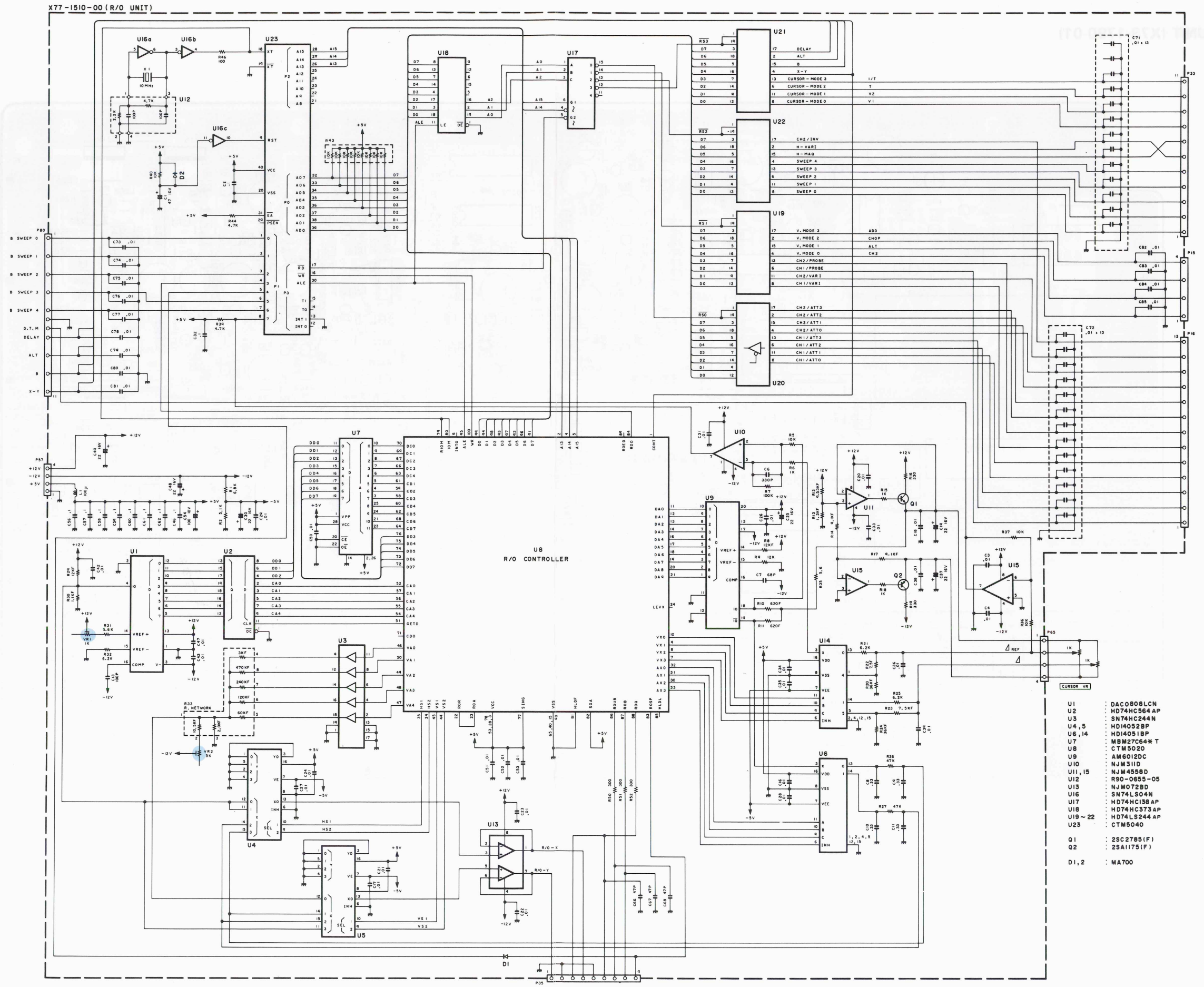


- D307, 404~411 : ISS83
- D402, 403 : HZ2(B3)
- D413 : HZ55.6J(B2)
- D416 : Y10GA
- D423~425 : HZ36L(2)
- D426 : B30-0957-05
- D901 : RD30E(B3)
- D902, 903 : ISS32



# SCHEMATIC DIAGRAM

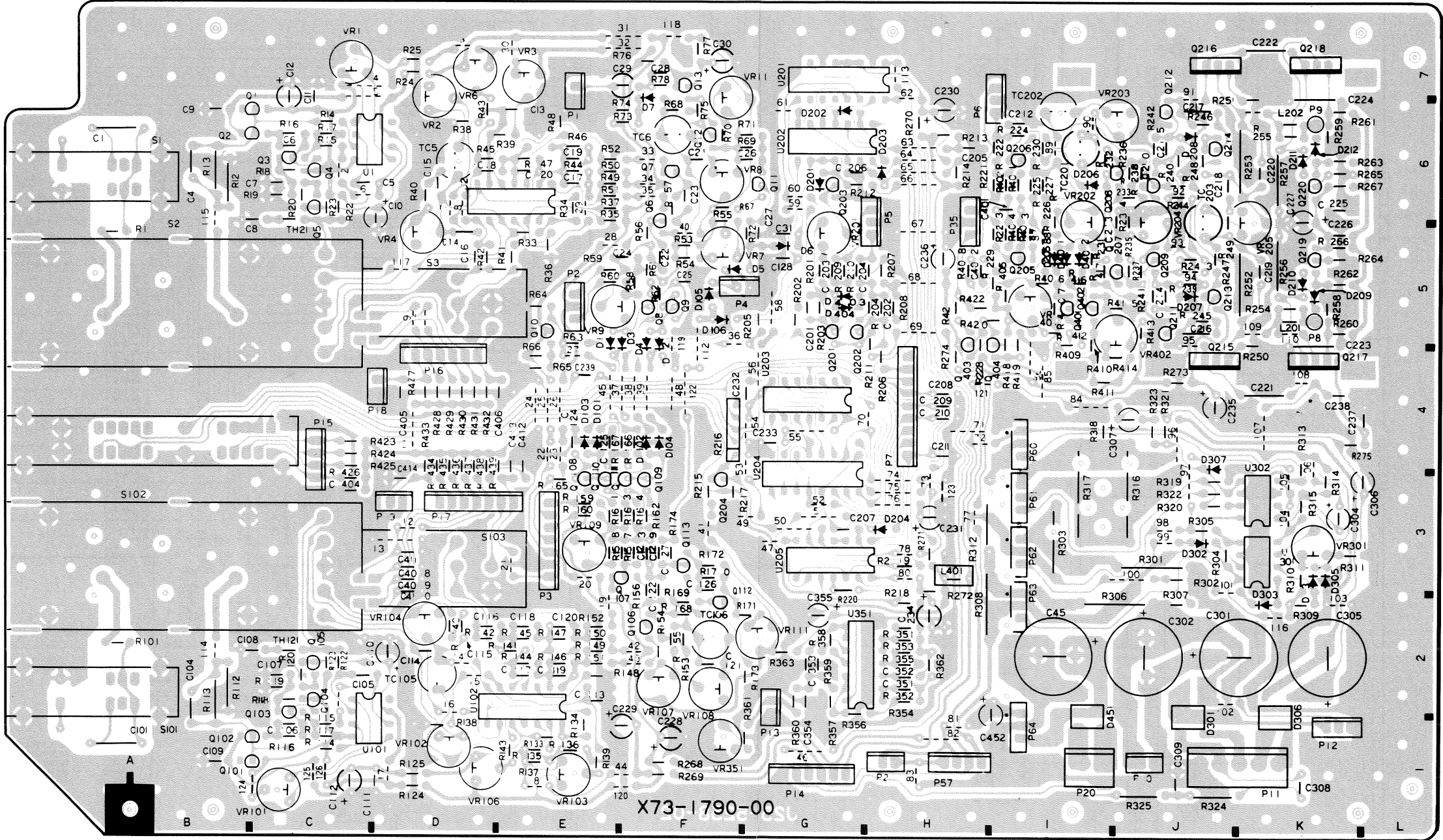
R/O UNIT (X77-1510-00)



- U1 : DAC0808LCN
- U2 : HD74HC564 AP
- U3 : SN74HC244 N
- U4, 5 : HD140528P
- U6, 14 : HD140518P
- U7 : MM427C64W T
- U8 : CTM5020
- U9 : AM6012DC
- U10 : NJM311D
- U11, 15 : NJM4558D
- U12 : R90-0655-05
- U13 : NJM0728D
- U16 : SM74LS04N
- U17 : HD74HC138 AP
- U18 : HD74HC373 AP
- U19-22 : HD74LS244 AP
- U23 : CTM5040
- Q1 : 2SC2765(F)
- Q2 : 2SA1175(F)
- D1, 2 : MA700

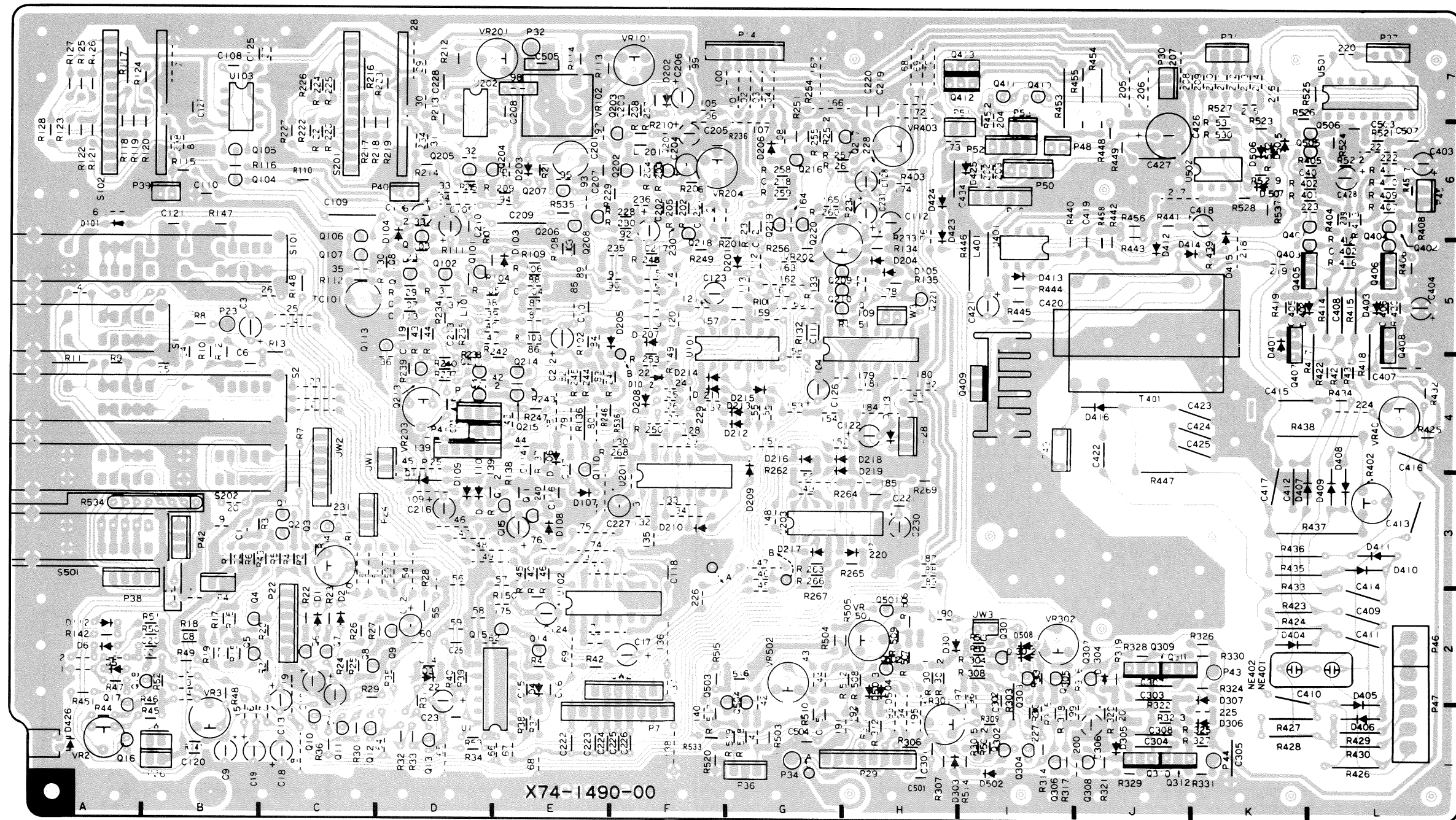
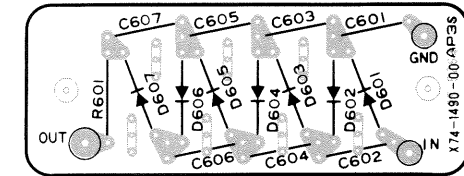
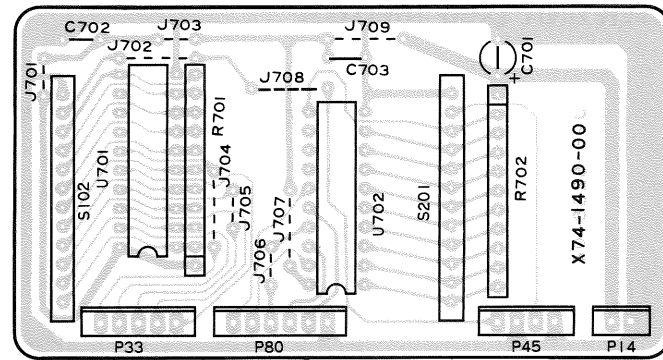
# P.C. BOARD

VERTICAL UNIT (X73-1790-01)



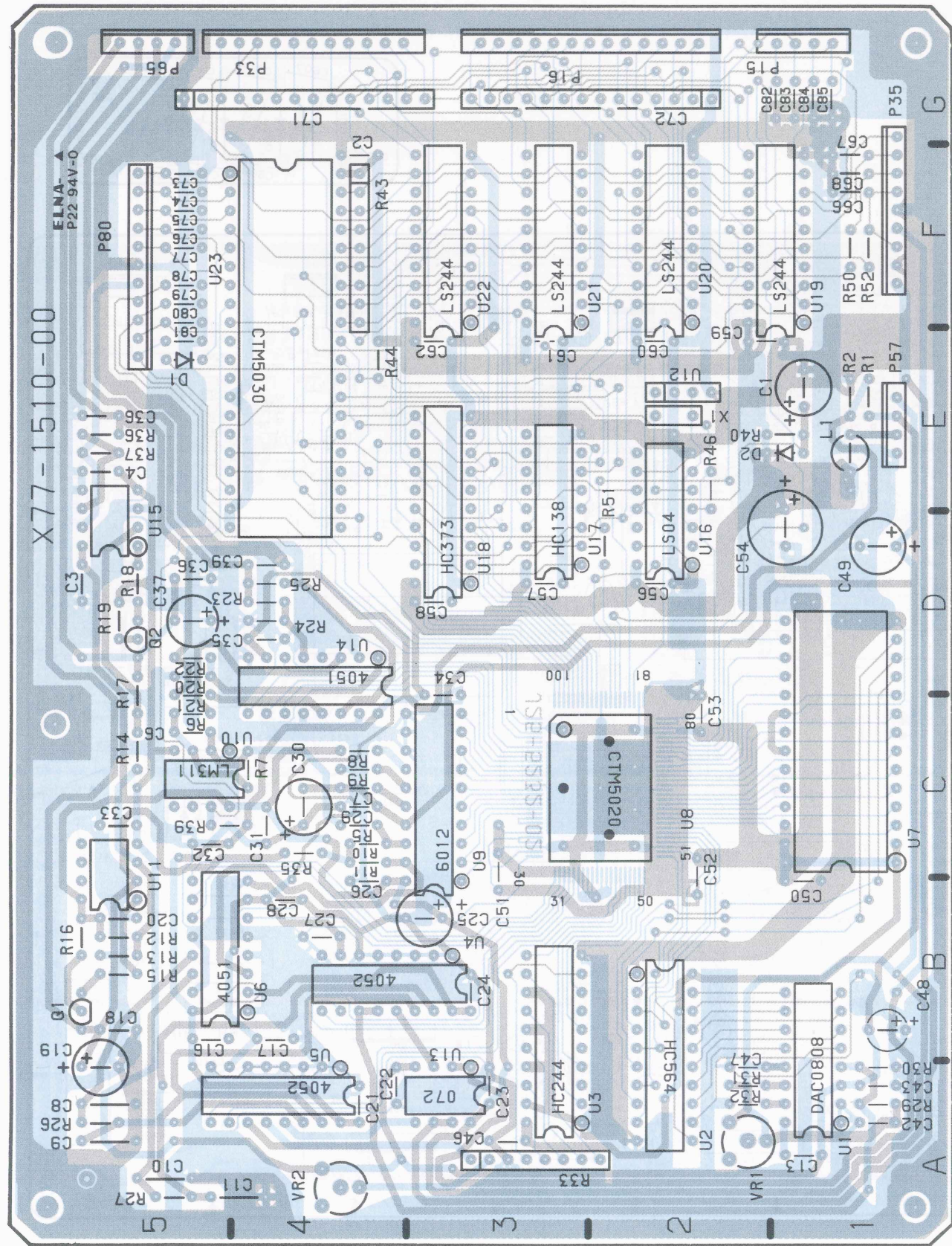
# P.C. BOARD

HORIZONTAL UNIT (X74-1490-01)

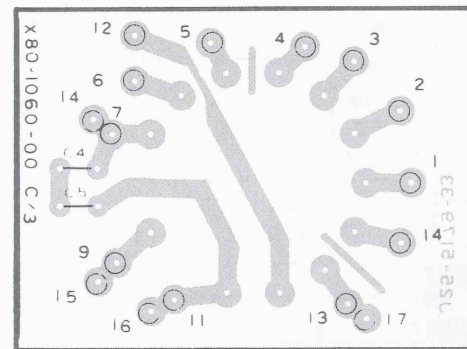
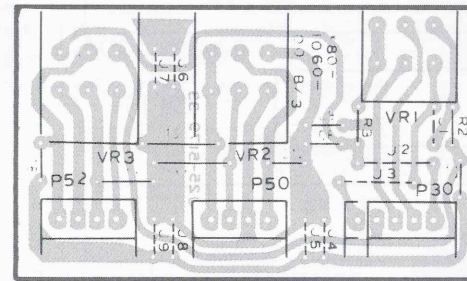
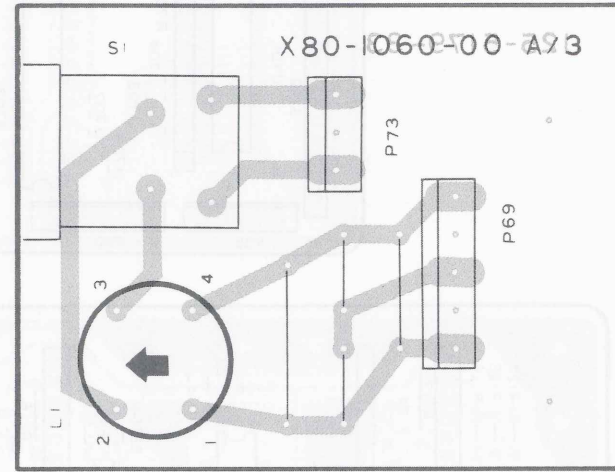


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R/O UNIT (X77-1510-00)

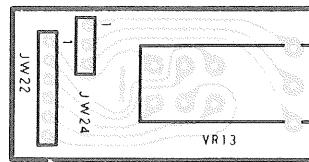
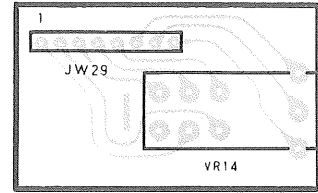
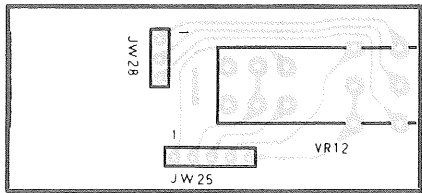
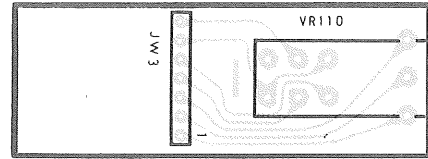
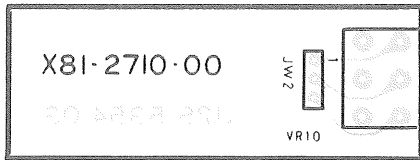


LINE FILTER UNIT (X80-1060-03)



# P.C. BOARD

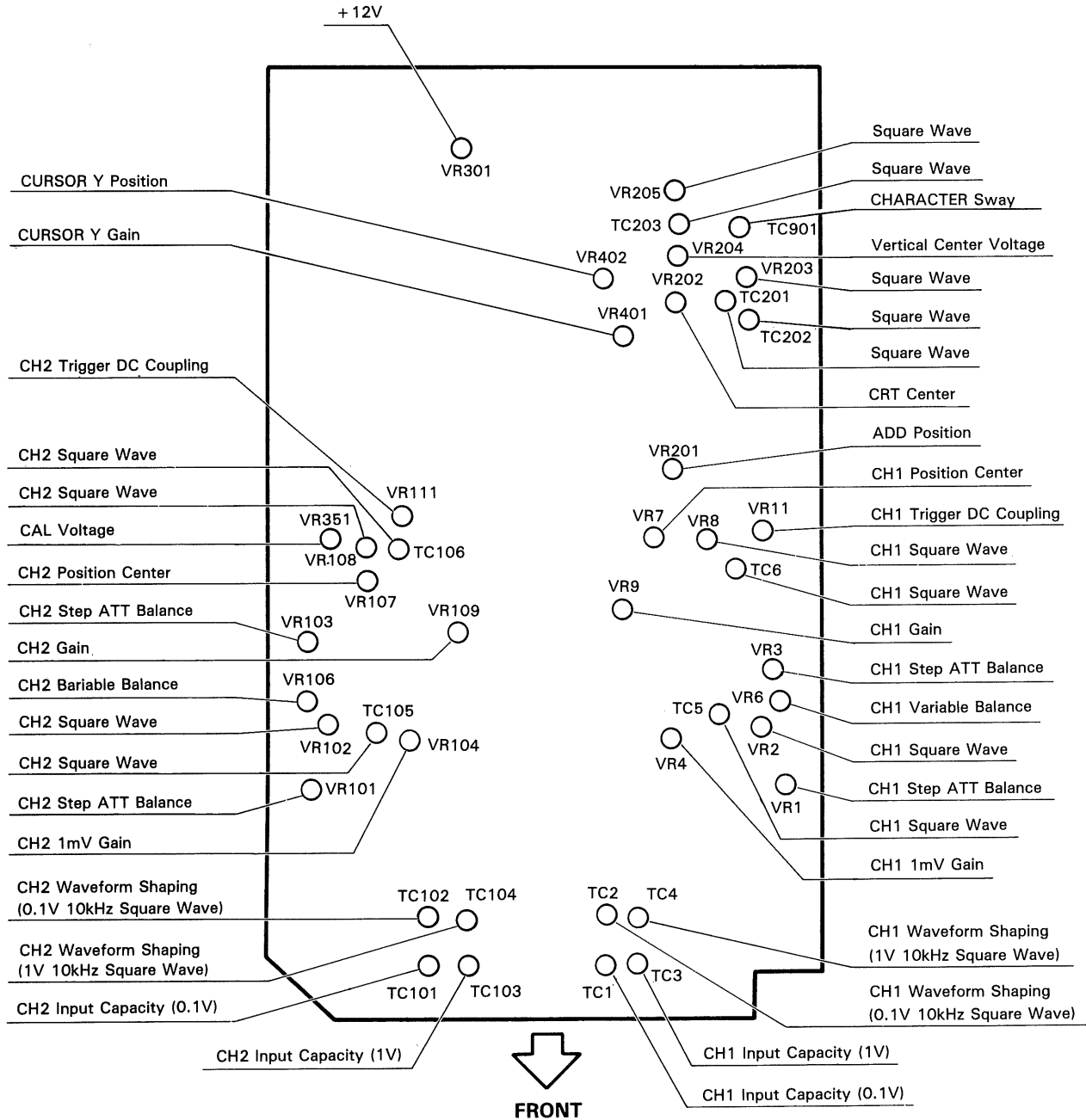
## VR UNIT (X81-2710-00)



# ADJUSTMENT LOCATIONS

VERTICAL UNIT (X73-1790-01)

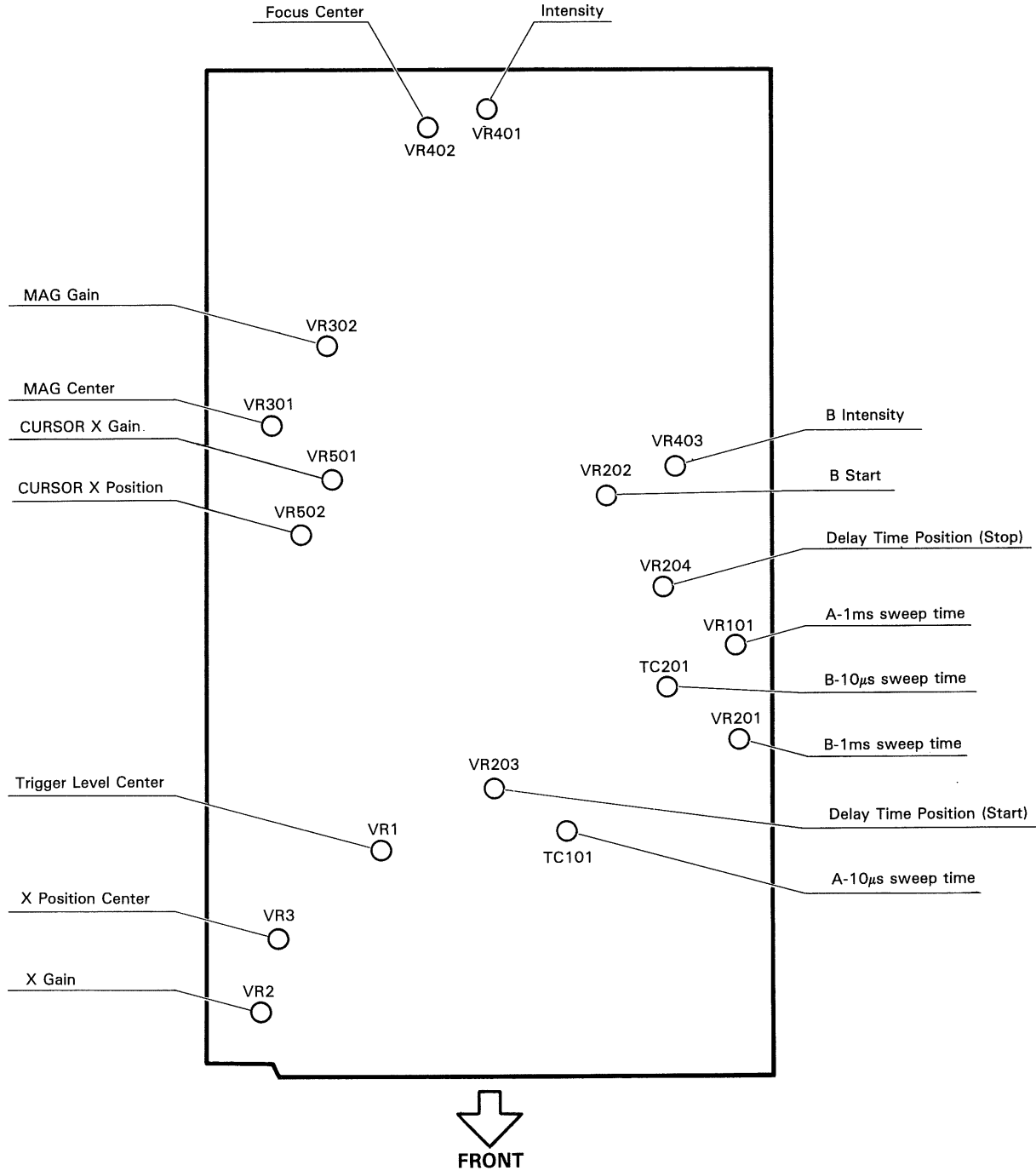
PATTERN SIDE



# ADJUSTMENT LOCATIONS

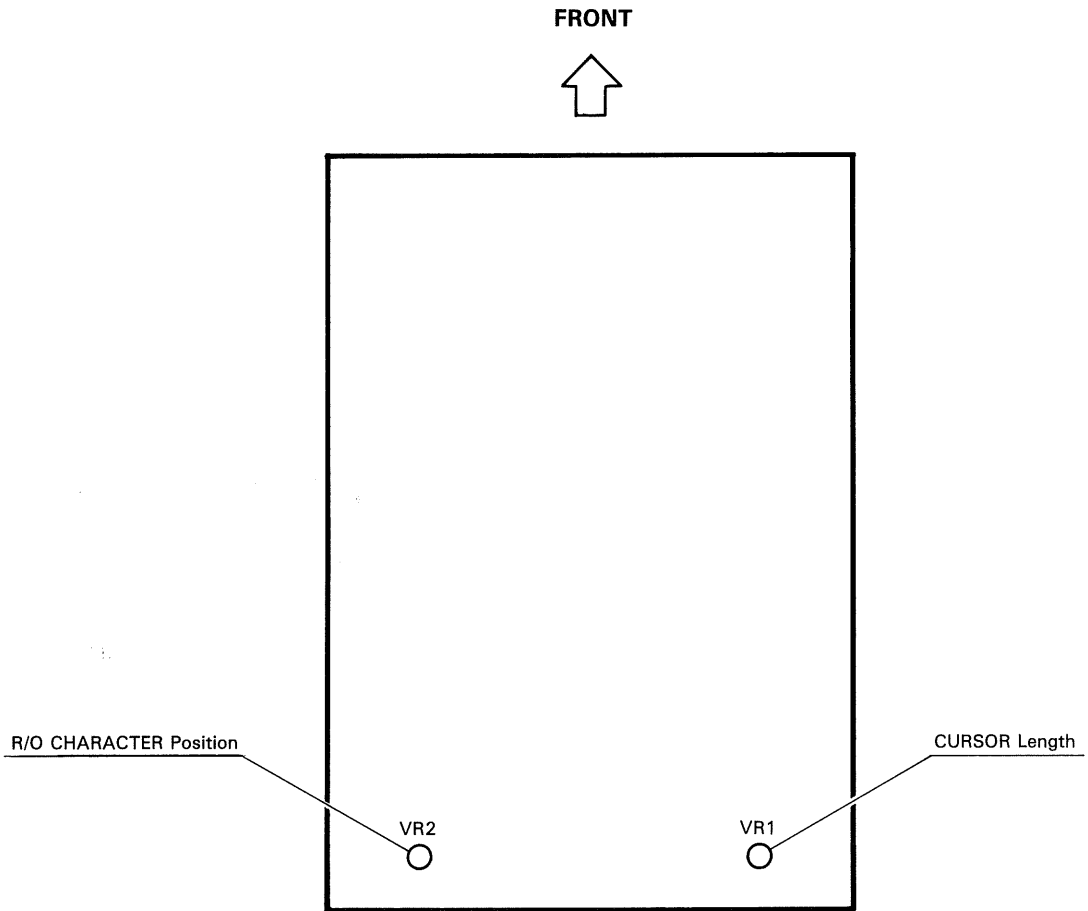
## HORIZONTAL UNIT (X74-1490-01)

PATTERN SIDE



# ADJUSTMENT LOCATIONS

R/O UNIT (X77-1510-00)



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