

**SCHEMATIC DIAGRAMS
AND
PARTS LIST**

BK PRECISION 1590A

100 MHz QUAD-TRACE OSCILLOSCOPE

PARTS LIST

SCHEMATIC SYMBOL	DESCRIPTION	DYNASCAN PART NUMBER
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**MAIN CHASSIS
(Y70-1461-61)**

RESISTORS

Unlisted resistors are $\pm 5\%$, 1/6 or 1/4 W. See schematic diagram for value.

VR1, 2	Dual 1 k Ω Potentiometer, CH 1/CH 3 or CH 2/CH 4 POSITION Control	008-482-9-001
VR3, 4	Part of VERTICAL ATTENUATOR UNIT, CH 1 or CH 2 VARIABLE Controls	
VR5	Dual 5 k Ω Potentiometer with rotary switch, TRACE SEP/HOLDOFF Control	008-406-9-003
VR6	Dual 5 k Ω Potentiometer with push/pull switch, HORIZONTAL POSITION Control	008-406-9-002
VR7	1 k Ω Potentiometer, DELAY TIME MULT Control	008-406-9-004

CAPACITORS

C1, 2	0.047 μ F $\pm 10\%$, 630 V, Metal Film	033-042-9-003
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INDICATORS

D1	LED, Red, CH 1 UNCAL Indicator	158-039-9-001
D2	LED, Green, CH 1 X5 GAIN Indicator	158-039-9-002
D3	LED, Red, CH 2 UNCAL Indicator	158-039-9-001
D4	LED, Green, CH 2 X5 GAIN Indicator	158-039-9-002
D5, 6	LED, Green, A TRIG'D, B TRIG'D Indicator	158-039-9-002
D7	LED, Red, A SWEEP UNCAL Indicator	158-039-9-001
D8	LED, Red, POWER Indicator	400-072-9-001

SWITCHES

S1 - 19	Pushbutton Switch Vertical MODE, HORIZ MODE, TRIG MODE, 20 MHz BW, CH 2 INV (19 used)	088-069-9-002
S20	Pushbutton Switch BEAM FIND	088-069-9-003
S21, 22	Part of VERTICAL ATTENUATOR UNIT	
S23, 24	Lever Switch, CH 1 or CH 2 INPUT COUPLING SWITCH	080-015-9-001
S25	Rotary Switch, B ENDS A Control, Part of VR5	
S26	Push Switch, PULL X10 MAG Control, Part of VR6	
S27, 28	Rotary Switch, CAL Control, Part of VERTICAL ATTENUATOR UNIT	083-301-9-001

MISCELLANEOUS

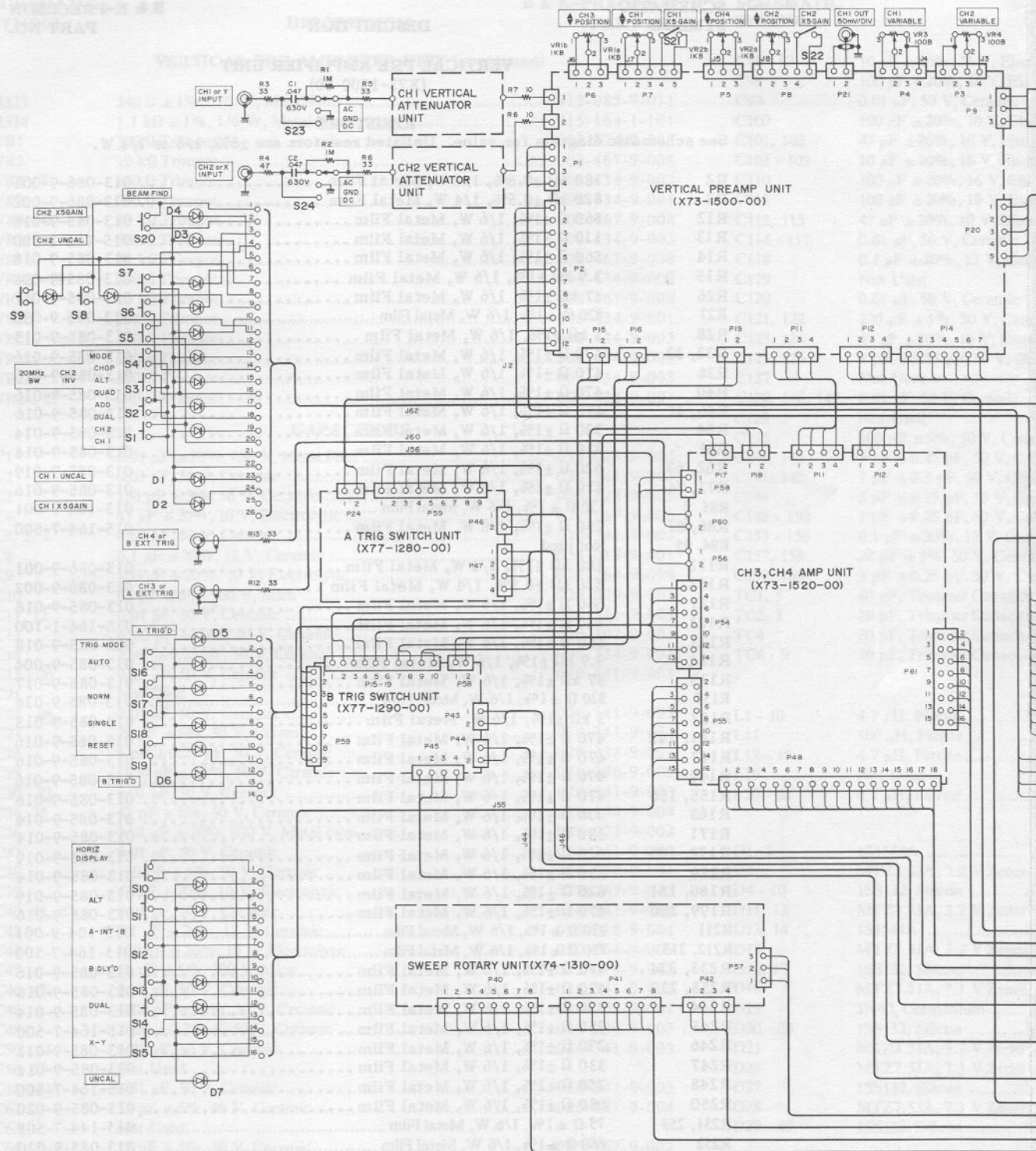
ELECTRICAL PARTS

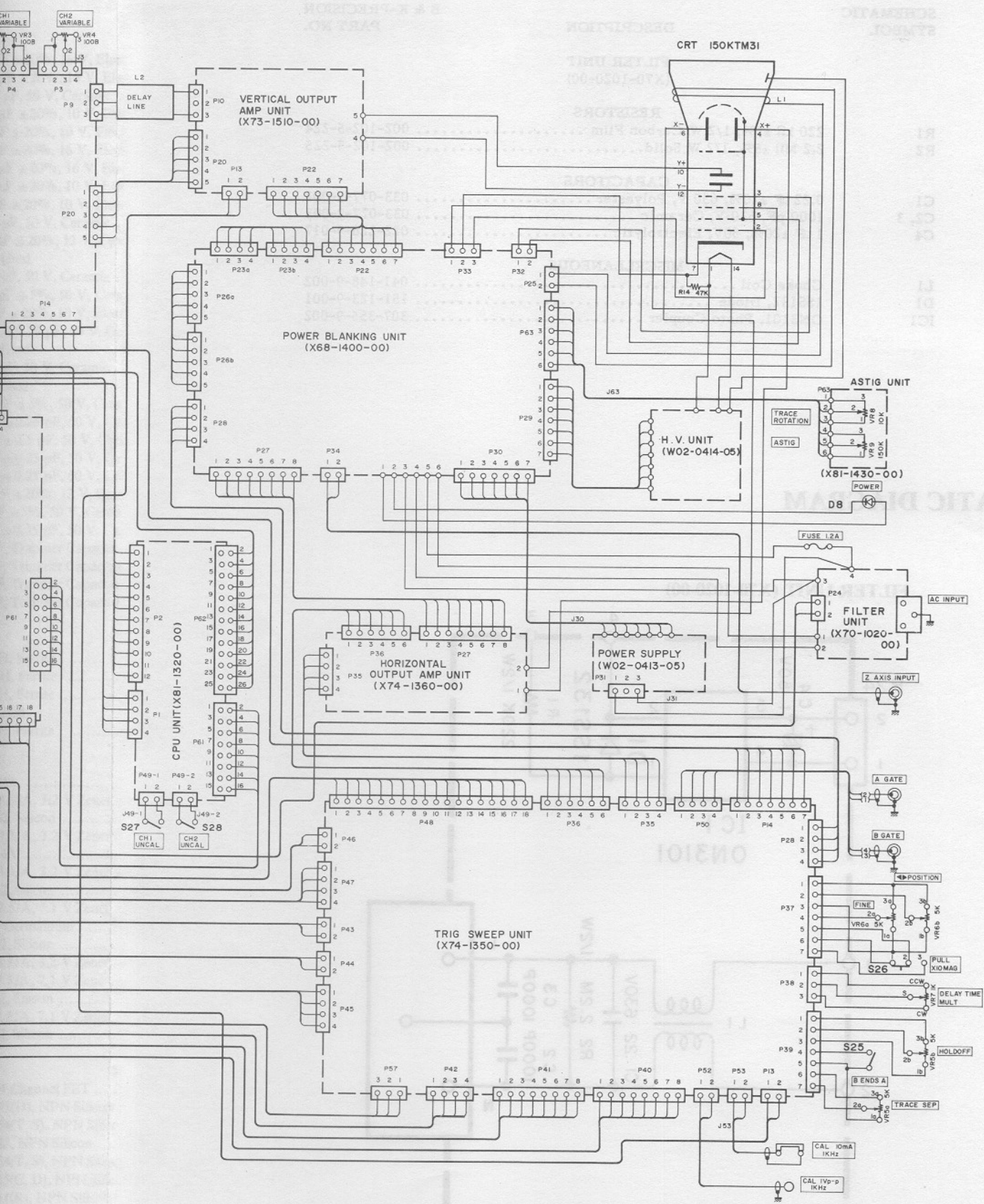
CRT	150KTM31 Cathode Ray Tube	230-027-9-001
	CRT Socket	749-088-9-001

**COMPOSITE
499-309-9-001**

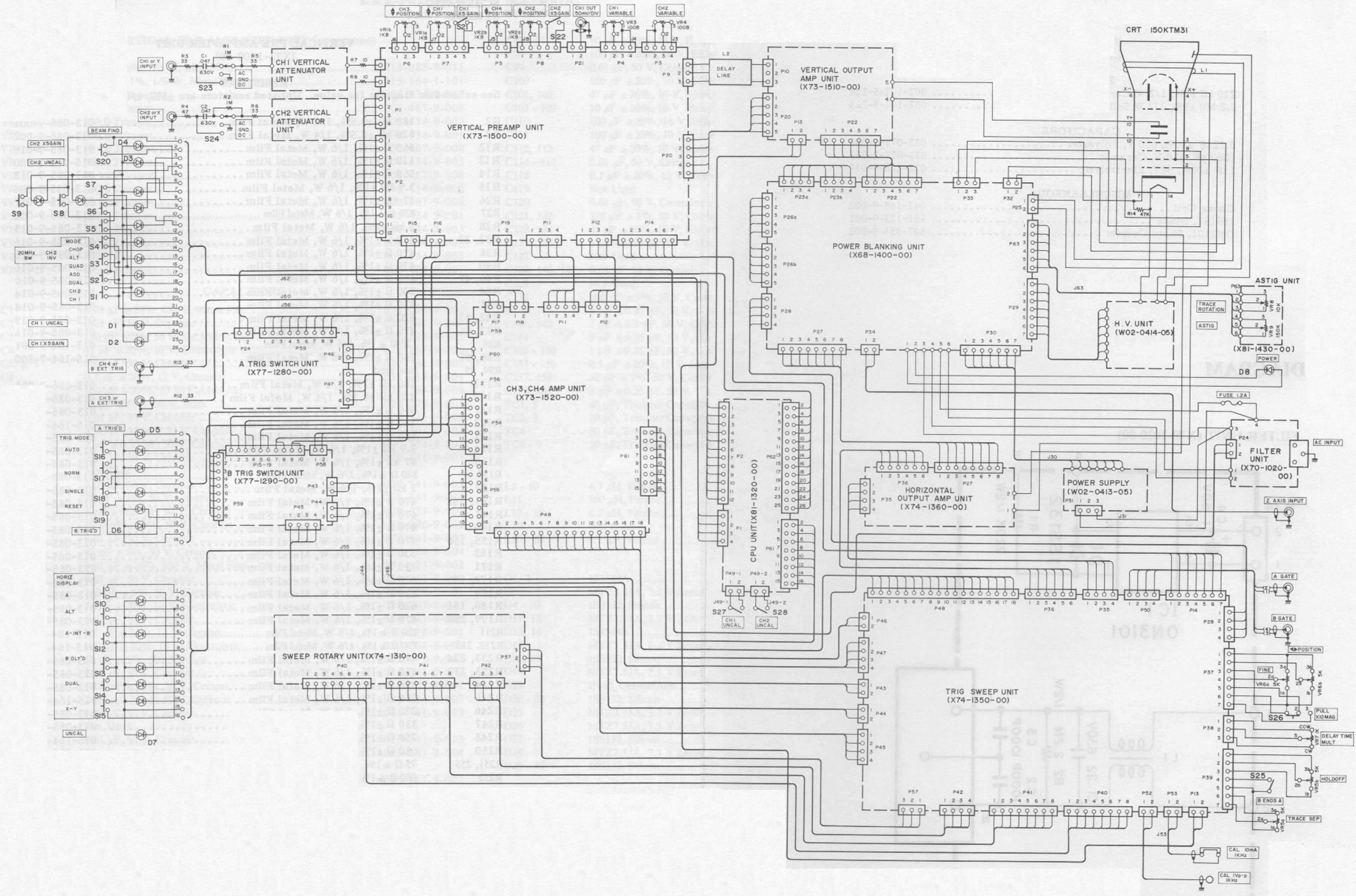
SCHMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.
L1	Y Alignment Coil	041-148-9-001
L2	Delay Line	040-006-9-001
	BNC Receptacle, CH 1 OUT, SWEEP OUT, etc.	773-090-9-001
	Fuse, 1.2 A.....	191-017-9-001
	Fuse Holder	742-029-9-001
	CAL Terminal	345-059-9-001
	GND Terminal	345-065-9-001
	CURRENT Terminal.....	345-066-9-001
	UL-CSA Power Cord.....	420-030-9-001
	Insulator (for blanking).....	342-082-9-004
	Insulator (for battery).....	342-116-9-001
	Switching Power Supply (W02-0413-05), Field repair not recommended, return entire unit for exchange.....	157-028-9-001
	High Voltage Block (W02-0414-05)	157-028-9-002
	Lithium Battery, 3V, 0.2 AH	213-008-9-001
MECHANICAL PARTS		
	Case	272-170-9-001
	Rear Panel	262-054-9-001
	Sub Panel (Front Panel)	254-083-9-001
	Sub Panel (Front Panel)	254-084-9-001
	Decorative Panel (Front Panel Overlay)	260-374-9-001
	Decorative Panel (Front Panel Overlay)	260-375-9-001
	Decorative Panel (Front Panel Overlay)	260-376-9-001
	Filter, Blue (for CRT).....	380-493-9-001
	Scale for CRT	380-493-9-002
	Extension Shaft	763-194-9-001
	Rubber Foot	381-100-9-001
	Rubber Foot/Cord Wrap.....	380-338-9-006
	Handle.....	746-048-9-001
	Gear, for Handle	251-506-9-001
	Ring, for Handle	251-507-9-001
	Spring, for Handle	767-131-9-001
	Knob, POWER, FOCUS.....	751-288-9-001
	Knob, VARIABLE (3 used)	751-288-9-002
	Knob, VOLTS/DIV (3 used)	751-288-9-003
	Knob, B INTENSITY, LEVEL, etc. (7 used)	751-288-9-004
	Knob, A INTENSITY, SLOPE, etc. (7 used)	751-288-9-005
	Knob, A SWEEP TIME.....	751-288-9-006
	Knob, B SWEEP TIME.....	751-288-9-007
	Knob, Lever (6 used)	751-288-9-008
	Knob, Pushbutton	751-260-9-003
	Instruction Manual	480-420-9-001
ASTIG UNIT (X81-1430-00)		
VR8	10 kΩ Potentiometer, TRACE ROTATION Control	008-482-9-004
VR9	150 kΩ Potentiometer, ASTIG Control.....	008-482-9-005

SCHEMATIC DIAGRAM





SCHEMATIC DIAGRAM



SCHEMATIC SYMBOL

DESCRIPTION

B & K-PRECISION PART NO.

FILTER UNIT (X70-1020-00)

RESISTORS

R1	220 k Ω \pm 5%, 1/2 W Carbon Film	002-102-5-224
R2	2.2 M Ω \pm 5%, 1/2 W Solid.....	002-102-5-225

CAPACITORS

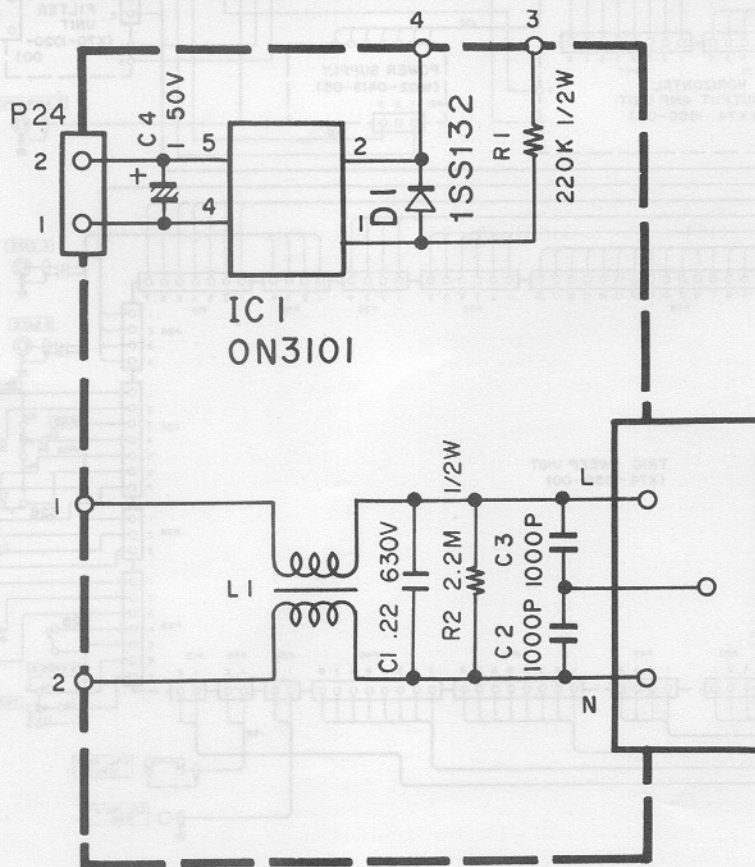
C1	0.22 μ F \pm 10%, 630 V, Polyester	033-077-9-002
C2, 3	1000 pF, 630 V, Ceramic	033-077-9-003
C4	1 μ F \pm 20%, 50V, Electrolytic	022-226-9-017

MISCELLANEOUS

L1	Choke Coil	041-148-9-002
D1	1SS132, Diode	151-123-9-001
IC1	ON3101, Photo Coupler	307-355-9-002

SCHEMATIC DIAGRAM

FILTER UNIT (X70-1020-00)



**SCHEMATIC
SYMBOL**

DESCRIPTION

**B & K-PRECISION
PART NO.**

**VERTICAL PRE AMPLIFIER UNIT
(X73-1500-00)**

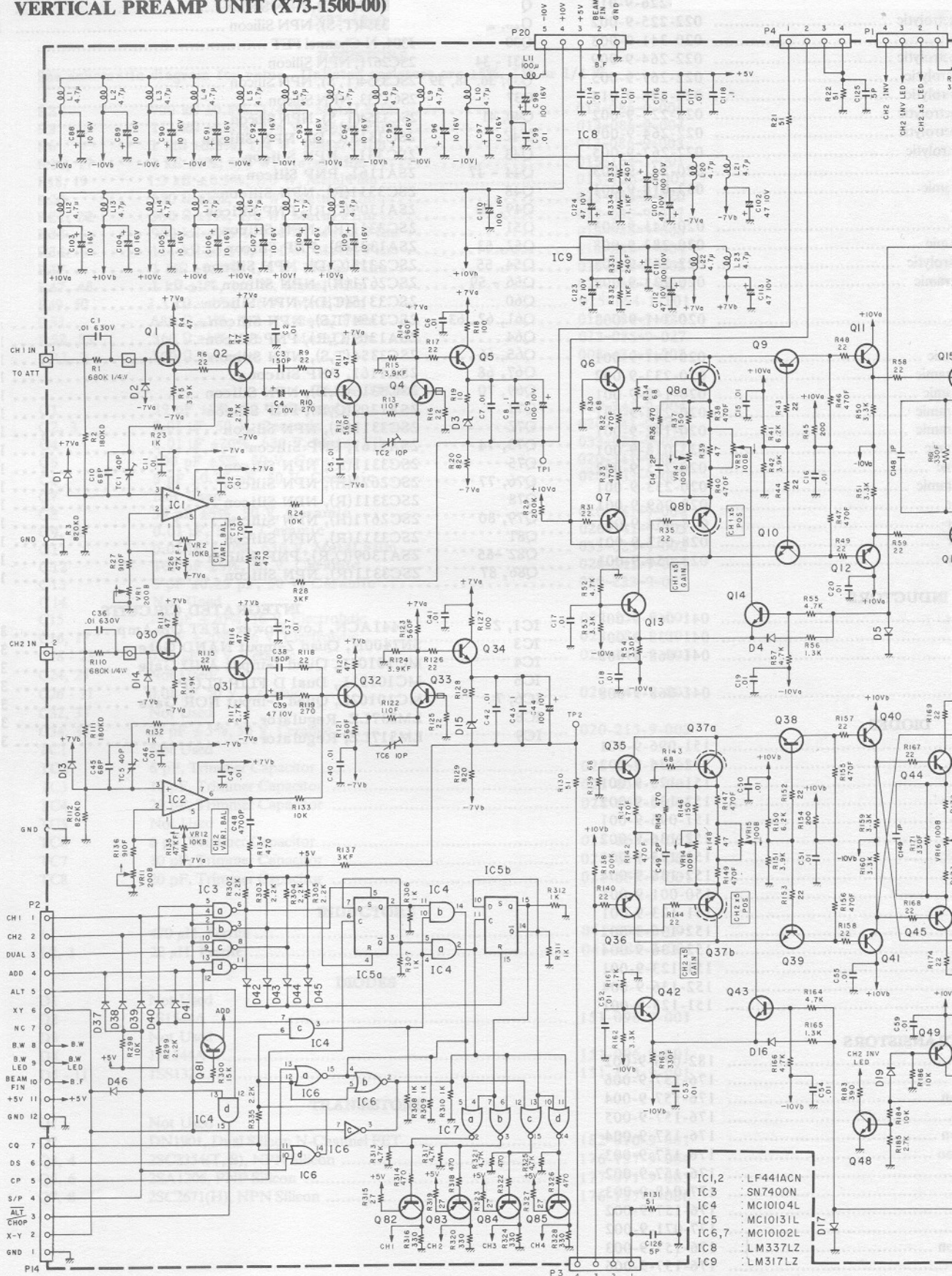
RESISTORS

See schematic diagram for value. Unlisted resistors are $\pm 5\%$, 1/6 or 1/4 W.

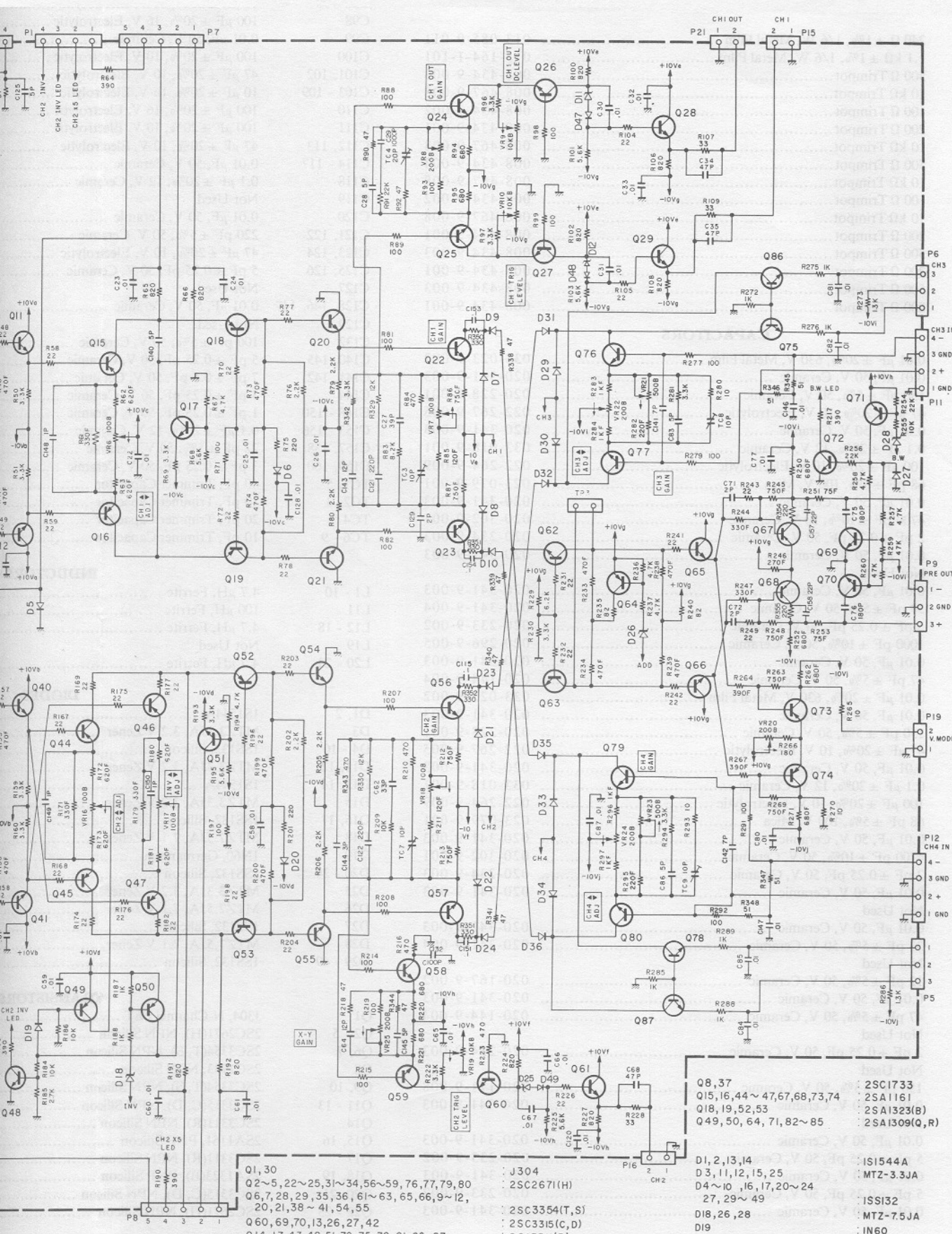
R2	180 k Ω $\pm 0.5\%$, 1/4 W, Metal Film	013-086-9-001
R3	820 k Ω $\pm 0.5\%$, 1/4 W, Metal Film	013-086-9-002
R12	560 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-018
R13	110 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-100
R14	560 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-018
R15	3.9 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-004
R26	47 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-017
R27	820 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-036
R28	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R32, 33	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R38	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R40	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R46, 47	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R54	330 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-014
R61	330 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-014
R62, 63	620 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-019
R73, 74	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R85	120 Ω $\pm 1\%$, 1/6 W, Metal Film	013-104-9-001
R86, 87	750 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-7-500
R94, 95	Not used	
R111	180 k Ω $\pm 1\%$, 1/4 W, Metal Film	013-086-9-001
R112	820 k Ω $\pm 0.5\%$, 1/4 W, Metal Film	013-086-9-002
R121	560 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-018
R122	110 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-100
R123	560 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-018
R124	3.9 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-004
R135	47 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-017
R136	820 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-036
R137	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R141, 142	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R147	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R149	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R155, 156	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R163	330 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-014
R171	330 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-014
R172, 173	620 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-019
R179	330 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-014
R180, 181	620 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-019
R199, 200	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R211	120 Ω $\pm 1\%$, 1/6 W, Metal Film	013-104-9-001
R212, 213	750 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-7-500
R233, 234	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R238, 239	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R244	330 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-014
R245	750 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-7-500
R246	270 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-012
R247	330 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-014
R248	750 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-7-500
R250	680 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-020
R251, 253	75 Ω $\pm 1\%$, 1/6 W, Metal Film	015-144-7-508
R252	680 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-020
R262	680 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-020
R263	750 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-7-500
R264	390 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-015
R267	390 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-015
R269	750 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-7-500
R271	680 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-020
R282, 295	220 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-002
R283, 284	1 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-001
R296, 297	1 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-001
R331	240 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-011
R332	1.1 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-101

SCHEMATIC DIAGRAM

VERTICAL PREAMP UNIT (X73-1500-00)



- IC1,2 : LF441ACN
- IC3 : SN7400N
- IC4 : MC10104L
- IC5 : MC10131L
- IC6,7 : MC10102L
- IC8 : LM337LZ
- IC9 : LM317LZ



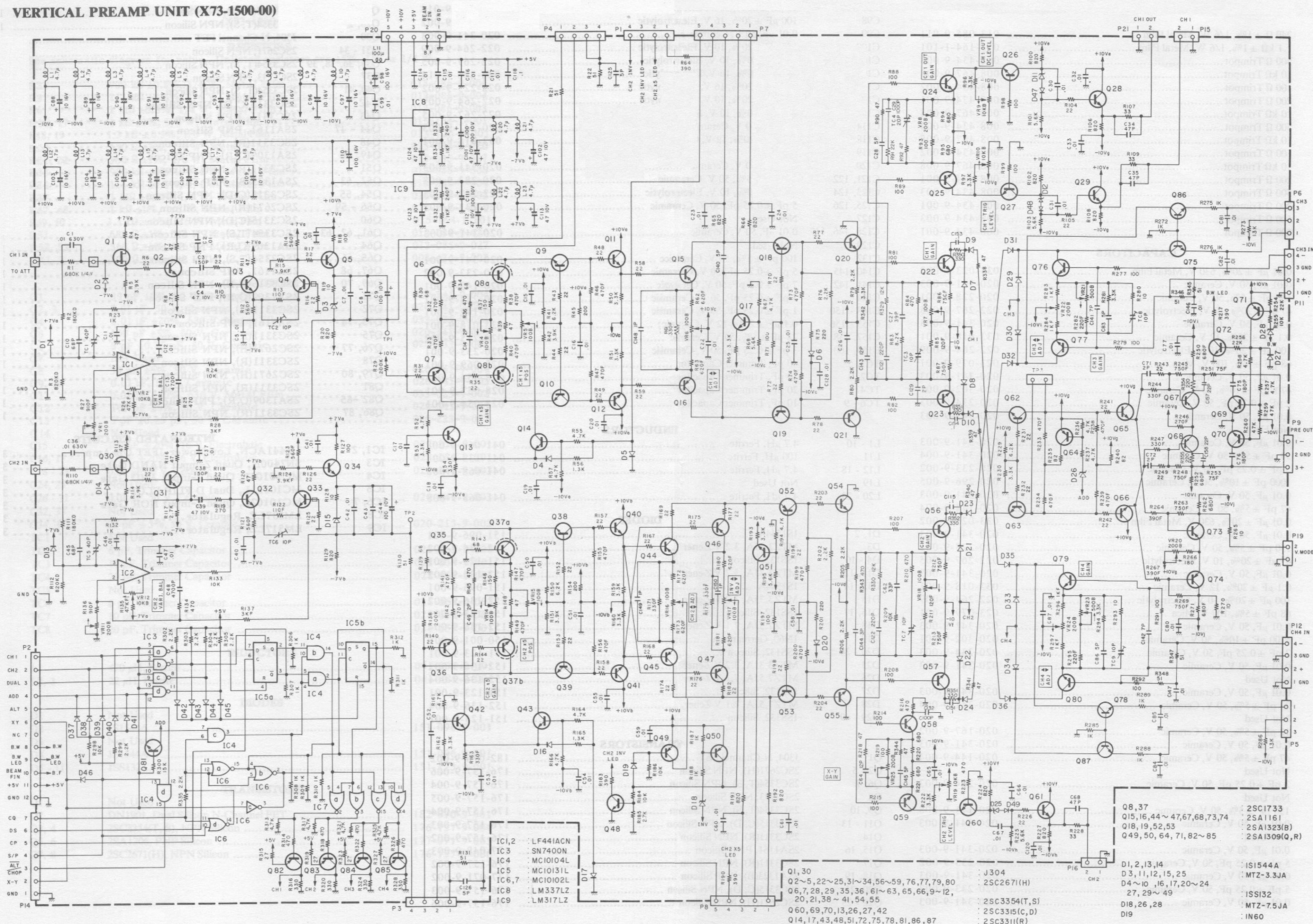
- Q1, 30 : J304
- Q2~5, 22~25, 31~34, 56~59, 76, 77, 79, 80 : 2SC2671(H)
- Q6, 7, 28, 29, 35, 36, 61~63, 65, 66, 9~12, 20, 21, 38~41, 54, 55 : 2SC3354(T,S)
- Q60, 69, 70, 13, 26, 27, 42 : 2SC3315(C,D)
- Q14, 17, 43, 48, 51, 72, 75, 78, 81, 86, 87 : 2SC3311(R)

- Q8, 37 : 2SC1733
- Q15, 16, 44~47, 67, 68, 73, 74 : 2SA1161
- Q18, 19, 52, 53 : 2SA1323(B)
- Q49, 50, 64, 71, 82~85 : 2SA1309(Q,R)

- D1, 2, 13, 14 : 1S1544A
- D3, 11, 12, 15, 25 : MTZ-3.3JA
- D4~10, 16, 17, 20~24 : 1SS132
- 27, 29~49 : MTZ-7.5JA
- D18, 26, 28 : 1N60
- D19 : 1N60

SCHEMATIC DIAGRAM

VERTICAL PREAMP UNIT (X73-1500-00)



SCHEMATIC SYMBOL

SCHEMATIC SYMBOL

DESCRIPTION

B & K-PRECISION PART NO.

SCHEMATIC SYMBOL

DESCRIPTION

VERTICAL PRE AMPLIFIER UNIT (continued)

R333	240 Ω ± 1%, 1/6 W, Metal Film	013-085-9-011
R334	1.1 kΩ ± 1%, 1/6 W, Metal Film	015-164-1-101
VR1	500 Ω Trimpot	008-434-9-003
VR2	10 kΩ Trimpot	008-467-9-008
VR4 - 7	100 Ω Trimpot	008-434-9-002
VR8	200 Ω Trimpot	008-434-9-001
VR9, 10	10 kΩ Trimpot	008-467-9-008
VR11	500 Ω Trimpot	008-434-9-003
VR12	10 kΩ Trimpot	008-467-9-008
VR14 - 18	100 Ω Trimpot	008-434-9-002
VR19	10 kΩ Trimpot	008-467-9-008
VR20	200 Ω Trimpot	008-434-9-001
VR21	500 Ω Trimpot	008-434-9-003
VR22	200 Ω Trimpot	008-434-9-001
VR23	500 Ω Trimpot	008-434-9-003
VR24, 25	200 Ω Trimpot	008-434-9-001

CAPACITORS

C1	0.01 μF ± 20%, 630 V, Metal Film	033-023-9-002
C2	0.01 μF, 50 V, Ceramic	020-341-9-003
C3	150 pF ± 5%, 50 V, Ceramic	020-228-9-001
C4	47 μF ± 20%, 10 V, Electrolytic	022-267-9-005
C5, 6, 7	0.01 μF, 50 V, Ceramic	020-341-9-003
C8	0.1 μF ± 20%, 12 V, Ceramic	033-018-9-001
C9	100 μF ± 20%, 10 V, Electrolytic	022-264-9-009
C10	68 pF ± 5%, 100 V, Mica	023-079-9-001
C11, 12	0.01 μF, 50 V, Ceramic	020-341-9-003
C13	4700 pF ± 10%, 50 V, Ceramic	020-302-9-001
C14	2 pF ± 0.25 pF, 50 V, Ceramic	020-234-9-003
C15 - 20	0.01 μF, 50 V, Ceramic	020-341-9-003
C21	Not Used	
C22 - 26	0.01 μF, 50 V, Ceramic	020-341-9-003
C27	39 pF ± 5%, 50 V, Ceramic	020-341-9-004
C28	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002
C29	1000 pF ± 10%, 50 V, Ceramic	020-296-9-005
C30 - 33	0.01 μF, 50 V, Ceramic	020-341-9-003
C34, 35	47 pF ± 5%, 50 V, Ceramic	020-144-9-004
C36	0.01 μF ± 20%, 630 V, Metal Film	033-023-9-002
C37	0.01 μF, 50 V, Ceramic	020-341-9-003
C38	150 pF ± 5%, 50 V, Ceramic	020-228-9-001
C39	47 μF ± 20%, 10 V, Electrolytic	022-267-9-005
C40, 41, 42	0.01 μF, 50 V, Ceramic	020-341-9-003
C43	0.1 μF ± 20%, 12 V, Ceramic	033-018-9-001
C44	100 μF ± 20%, 10 V, Electrolytic	022-264-9-009
C45	68 pF ± 5%, 100 V, Mica	023-079-9-001
C46, 47	0.01 μF, 50 V, Ceramic	020-341-9-003
C48	4700 pF ± 10%, 50 V, Ceramic	020-302-9-001
C49	2 pF ± 0.25 pF, 50 V, Ceramic	020-234-9-003
C50 - 55	0.01 μF, 50 V, Ceramic	020-341-9-003
C56, 57	Not Used	
C58 - 61	0.01 μF, 50 V, Ceramic	020-341-9-003
C62	33 pF ± 5%, 50 V, Ceramic	020-341-9-004
C63	Not Used	
C64	12 pF ± 5%, 50 V, Ceramic	020-167-9-002
C65, 66, 67	0.01 μF, 50 V, Ceramic	020-341-9-003
C68	47 pF ± 5%, 50 V, Ceramic	020-144-9-004
C69, 70	Not Used	
C71, 72	2 pF ± 0.25 pF, 50 V, Ceramic	020-234-9-003
C73, 74	Not Used	
C75, 76	150 pF ± 5%, 50 V, Ceramic	020-171-9-008
C77	0.01 μF, 50 V, Ceramic	020-341-9-003
C78, 79	Not Used	
C80, 81, 82	0.01 μF, 50 V, Ceramic	020-341-9-003
C83	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002
C84, 85	0.01 μF, 50 V, Ceramic	020-341-9-003
C86	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002
C87	0.01 μF, 50 V, Ceramic	020-341-9-003

C88 - 97	10 μF ± 20%, 16 V, Electrolytic
C98	100 μF ± 20%, 16 V, Electrolytic
C99	0.01 μF, 50 V, Ceramic
C100	100 μF ± 20%, 10 V, Electrolytic
C101, 102	47 μF ± 20%, 10 V, Electrolytic
C103 - 109	10 μF ± 20%, 16 V, Electrolytic
C110	100 μF ± 20%, 16 V, Electrolytic
C111	100 μF ± 20%, 10 V, Electrolytic
C112, 113	47 μF ± 20%, 10 V, Electrolytic
C114 - 117	0.01 μF, 50 V, Ceramic
C118	0.1 μF ± 20%, 12 V, Ceramic
C119	Not Used
C120	0.01 μF, 50 V, Ceramic
C121, 122	220 pF ± 5%, 50 V, Ceramic
C123, 124	47 μF ± 20%, 10 V, Electrolytic
C125, 126	5 pF ± 0.25 pF, 50 V, Ceramic
C127	Not Used
C128, 146, 147	0.01 μF, 50 V, Ceramic
C129	Not Used
C132	100 pF ± 5%, 50 V, Ceramic
C140, 145	5 pF ± 0.25 pF, 50 V, Ceramic
C141, 142	7 pF ± 0.5 pF, 50 V, Ceramic
C144	3 pF ± 0.25 pF, 50 V, Ceramic
C148 - 150	1 pF ± 0.25 pF, 50 V, Ceramic
C153 - 156	0.1 μF ± 20%, 12 V, Ceramic
C157, 158	22 pF ± 5%, 50 V, Ceramic
C159, 160	3 pF ± 0.25 pF, 50 V, Ceramic
TC1, 5	40 pF, Trimmer Capacitor
TC2, 3	10 pF, Trimmer Capacitor
TC4	20 pF, Trimmer Capacitor
TC6 - 9	10 pF, Trimmer Capacitor

INDUCTOR

L1 - 10	4.7 μH, Ferrite
L11	100 μH, Ferrite
L12 - 18	4.7 μH, Ferrite
L19	Not Used
L20 - 23	4.7 μH, Ferrite

DIODES

D1, 2	1S1544A
D3	MTZ3.3JA, 3.2 V Zener
D4 - 10	1SS132, Silicon
D11, 12	MTZ3.3JA, 3.2 V Zener
D13, 14	1S1544A
D15	MTZ3.3JA, 3.2 V Zener
D16, 17	1SS132, Silicon
D18	MTZ7.5JA, 7.1 V Zener
D19	1N60, Germanium
D20 - 24	1SS132, Silicon
D25	MTZ3.3JA, 3.2 V Zener
D26	MTZ7.5JA, 7.1 V Zener
D27	1SS132, Silicon
D28	MTZ7.5JA, 7.1 V Zener
D29 - 49	1SS132, Silicon

TRANSISTOR

Q1	J304, N-Channel FET
Q2 - 5	2SC2671(H), NPN Silicon
Q6, 7	2SC3354(T, S), NPN Silicon
Q8	2SC1733, NPN Silicon
Q9, 10	2SC3354(T, S), NPN Silicon
Q11 - 13	2SC3315(C, D), NPN Silicon
Q14	2SC3311(R), NPN Silicon
Q15, 16	2SA1161, PNP Silicon
Q17	2SC3311(R), NPN Silicon
Q18, 19	2SA1323(B), PNP Silicon
Q20, 21	2SC3315(C, D), NPN Silicon
Q22 - 25	2SC2671(H), NPN Silicon

DESCRIPTION	B & K-PRECISION PART NO.	SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.
Electrolytic	022-226-9-014	Q26, 27	2SC3315(C, D), NPN Silicon	176-157-9-003
Electrolytic	022-225-9-002	Q28, 29	2SC3354(T, S), NPN Silicon	176-157-9-004
	020-341-9-003	Q30	J304, N-Channel FET	182-076-9-002
Electrolytic	022-264-9-009	Q31 - 34	2SC2671, NPN Silicon	176-157-9-006
Electrolytic	022-267-9-005	Q35, 36, 38, 39	2SC3354(T, S), NPN Silicon	176-157-9-004
Electrolytic	022-226-9-014	Q37	2SC1733, NPN Silicon	176-157-9-005
Electrolytic	022-225-9-002	Q40, 41	2SC3354(T, S), NPN Silicon	176-157-9-004
Electrolytic	022-264-9-009	Q42	2SC3315(C,D), NPN Silicon	176-157-9-003
Electrolytic	022-267-9-005	Q43	2SC3311, NPN Silicon	176-157-9-002
	020-341-9-003	Q44 - 47	2SA1161, PNP Silicon	177-048-9-003
Ceramic	033-018-9-001	Q48	2SC3311(R), NPN Silicon	176-157-9-002
		Q49, 50	2SA1309(Q,R), PNP Silicon	177-071-9-001
	020-341-9-003	Q51	2SC3311(R), NPN Silicon	176-157-9-002
Ceramic	020-283-9-008	Q52, 53	2SA1323(B), PNP Silicon	177-071-9-002
Electrolytic	022-267-9-005	Q54, 55	2SC3315(C,D), NPN Silicon	176-157-9-003
Ceramic	020-233-9-002	Q56 - 59	2SC2671(H), NPN Silicon	176-157-9-006
		Q60	2SC3315(C,D), NPN Silicon	176-157-9-003
	020-341-9-003	Q61, 62, 63	2SC3354(T,S), NPN Silicon	176-157-9-004
		Q64	2SA1309(Q,R), PNP Silicon	177-071-9-001
Ceramic	020-341-9-001	Q65, 66	2SC3354(T,S), NPN Silicon	176-157-9-004
Ceramic	020-233-9-002	Q67, 68	2SA1161, PNP Silicon	177-048-9-003
Ceramic	020-149-9-001	Q69, 70	2SC3315(C,D), NPN Silicon	176-157-9-003
Ceramic	020-233-9-001	Q71	2SA1309(Q,R), PNP Silicon	177-071-9-001
Ceramic	020-142-9-001	Q72	2SC3311(R), NPN Silicon	176-157-9-002
Ceramic	033-018-9-001	Q73, 74	2SA1161, PNP Silicon	177-048-9-003
Ceramic	020-215-9-002	Q75	2SC3311(R), NPN Silicon	176-157-9-002
Ceramic	020-233-9-001	Q76, 77	2SC2671(H), NPN Silicon	176-157-9-006
Resistor	028-069-9-001	Q78	2SC3311(R), NPN Silicon	176-157-9-002
Resistor	028-054-9-001	Q79, 80	2SC2671(H), NPN Silicon	176-157-9-006
Resistor	028-057-9-001	Q81	2SC3311(R), NPN Silicon	176-157-9-002
Resistor	028-054-9-001	Q82 -85	2SA1309(Q,R), PNP Silicon	177-071-9-001
		Q86, 87	2SC3311(R), NPN Silicon	176-157-9-002

INDUCTORS	PART NO.
	041-068-9-008
	041-133-9-004
	041-068-9-008
	041-068-9-008

DIODES	PART NO.
	151-096-9-001
	152-136-9-002
	151-123-9-001
	152-136-9-002
	151-096-9-001
	152-136-9-002
	151-123-9-001
	152-136-9-004
	150-001-9-005
	151-123-9-001
	152-136-9-002
	152-136-9-004
	151-123-9-001
	152-136-9-004
	151-123-9-001

TRANSISTORS	PART NO.
	182-076-9-002
	176-157-9-006
on	176-157-9-004
	176-157-9-005
on	176-157-9-004
on	176-157-9-003
	176-157-9-002
	177-048-9-003
	176-157-9-002
	177-071-9-002
on	176-157-9-003
	176-157-9-006

INTEGRATED CIRCUITS	PART NO.	
IC1, 2	LF441ACN, Low Power JFET Op-Amp	307-355-9-003
IC3	SN7400N, Quad 2-input NAND Gate	307-106-9-004
IC4	MC10104L, Quad 2-input AND Gate	307-309-9-004
IC5	MC10131L, Dual D FLIP FLOP	307-309-9-005
IC6, 7	MC10102L, Quad 2-input NOR Gate	307-301-9-001
IC8	LM337LZ, Regulator	307-355-9-005
IC9	LM317LZ, Regulator	307-355-9-004

SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.	SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.	SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.
VERTICAL PRE AMPLIFIER UNIT (continued)								
R333	240 Ω ± 1%, 1/6 W, Metal Film	013-085-9-011	C88 - 97	10 μF ± 20%, 16 V, Electrolytic	022-226-9-014	Q26, 27	2SC3315(C, D), NPN Silicon	176-157-9-003
R334	1.1 kΩ ± 1%, 1/6 W, Metal Film	015-164-1-101	C98	100 μF ± 20%, 16 V, Electrolytic	022-225-9-002	Q28, 29	2SC3354(T, S), NPN Silicon	176-157-9-004
VR1	500 Ω Trimpot	008-434-9-003	C99	0.01 μF, 50 V, Ceramic	020-341-9-003	Q30	J304, N-Channel FET	182-076-9-002
VR2	10 kΩ Trimpot	008-467-9-008	C100	100 μF ± 20%, 10 V, Electrolytic	022-264-9-009	Q31 - 34	2SC2671, NPN Silicon	176-157-9-006
VR4 - 7	100 Ω Trimpot	008-434-9-002	C101, 102	47 μF ± 20%, 10 V, Electrolytic	022-267-9-005	Q35, 36, 38, 39	2SC3354(T, S), NPN Silicon	176-157-9-004
VR8	200 Ω Trimpot	008-434-9-001	C103 - 109	10 μF ± 20%, 16 V, Electrolytic	022-226-9-014	Q37	2SC1733, NPN Silicon	176-157-9-005
VR9, 10	10 kΩ Trimpot	008-467-9-008	C110	100 μF ± 20%, 16 V, Electrolytic	022-225-9-002	Q40, 41	2SC3354(T, S), NPN Silicon	176-157-9-004
VR11	500 Ω Trimpot	008-434-9-003	C111	100 μF ± 20%, 10 V, Electrolytic	022-264-9-009	Q42	2SC3315(C, D), NPN Silicon	176-157-9-003
VR12	10 kΩ Trimpot	008-467-9-008	C112, 113	47 μF ± 20%, 10 V, Electrolytic	022-267-9-005	Q43	2SC3311, NPN Silicon	176-157-9-002
VR14 - 18	100 Ω Trimpot	008-434-9-002	C114 - 117	0.01 μF, 50 V, Ceramic	020-341-9-003	Q44 - 47	2SA1161, PNP Silicon	177-048-9-003
VR19	10 kΩ Trimpot	008-467-9-008	C118	0.1 μF ± 20%, 12 V, Ceramic	033-018-9-001	Q48	2SC3311(R), NPN Silicon	176-157-9-002
VR20	200 Ω Trimpot	008-434-9-001	C119	Not Used		Q49, 50	2SA1309(Q,R), PNP Silicon	177-071-9-001
VR21	500 Ω Trimpot	008-434-9-003	C120	0.01 μF, 50 V, Ceramic	020-341-9-003	Q51	2SC3311(R), NPN Silicon	176-157-9-002
VR22	200 Ω Trimpot	008-434-9-001	C121, 122	220 pF ± 5%, 50 V, Ceramic	020-283-9-008	Q52, 53	2SA1323(B), PNP Silicon	177-071-9-002
VR23	500 Ω Trimpot	008-434-9-003	C123, 124	47 μF ± 20%, 10 V, Electrolytic	022-267-9-005	Q54, 55	2SC3315(C, D), NPN Silicon	176-157-9-003
VR24, 25	200 Ω Trimpot	008-434-9-001	C125, 126	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002	Q56 - 59	2SC2671(H), NPN Silicon	176-157-9-006
CAPACITORS			C127	Not Used		Q60	2SC3315(C, D), NPN Silicon	176-157-9-003
C1	0.01 μF ± 20%, 630 V, Metal Film	033-023-9-002	C128, 146, 147	0.01 μF, 50 V, Ceramic	020-341-9-003	Q61, 62, 63	2SC3354(T, S), NPN Silicon	176-157-9-004
C2	0.01 μF, 50 V, Ceramic	020-341-9-003	C129	Not Used		Q64	2SA1309(Q,R), PNP Silicon	177-071-9-001
C3	150 pF ± 5%, 50 V, Ceramic	020-228-9-001	C132	100 pF ± 5%, 50 V, Ceramic	020-341-9-001	Q65, 66	2SC3354(T, S), NPN Silicon	176-157-9-004
C4	47 μF ± 20%, 10 V, Electrolytic	022-267-9-005	C140, 145	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002	Q67, 68	2SA1161, PNP Silicon	177-048-9-003
C5, 6, 7	0.01 μF, 50 V, Ceramic	020-341-9-003	C141, 142	7 pF ± 0.5 pF, 50 V, Ceramic	020-149-9-001	Q69, 70	2SC3315(C, D), NPN Silicon	176-157-9-003
C8	0.1 μF ± 20%, 12 V, Ceramic	033-018-9-001	C144	3 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-001	Q71	2SA1309(Q,R), PNP Silicon	177-071-9-001
C9	100 μF ± 20%, 10 V, Electrolytic	022-264-9-009	C148 - 150	1 pF ± 0.25 pF, 50 V, Ceramic	020-142-9-001	Q72	2SC3311(R), NPN Silicon	176-157-9-002
C10	68 pF ± 5%, 100 V, Mica	023-079-9-001	C153 - 156	0.1 μF ± 20%, 12 V, Ceramic	033-018-9-001	Q73, 74	2SA1161, PNP Silicon	177-048-9-003
C11, 12	0.01 μF, 50 V, Ceramic	020-341-9-003	C157, 158	22 pF ± 5%, 50 V, Ceramic	020-215-9-002	Q75	2SC3311(R), NPN Silicon	176-157-9-002
C13	4700 pF ± 10%, 50 V, Ceramic	020-302-9-001	C159, 160	3 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-001	Q76, 77	2SC2671(H), NPN Silicon	176-157-9-006
C14	2 pF ± 0.25 pF, 50 V, Ceramic	020-234-9-003	TC1, 5	40 pF, Trimmer Capacitor	028-069-9-001	Q78	2SC3311(R), NPN Silicon	176-157-9-002
C15 - 20	0.01 μF, 50 V, Ceramic	020-341-9-003	TC2, 3	10 pF, Trimmer Capacitor	028-054-9-001	Q79, 80	2SC2671(H), NPN Silicon	176-157-9-006
C21	Not Used		TC4	20 pF, Trimmer Capacitor	028-057-9-001	Q81	2SC3311(R), NPN Silicon	176-157-9-002
C22 - 26	0.01 μF, 50 V, Ceramic	020-341-9-003	TC6 - 9	10 pF, Trimmer Capacitor	028-054-9-001	Q82 - 85	2SA1309(Q,R), PNP Silicon	177-071-9-001
C27	39 pF ± 5%, 50 V, Ceramic	020-341-9-004	INDUCTORS			Q86, 87	2SC3311(R), NPN Silicon	176-157-9-002
C28	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002	L1 - 10	4.7 μH, Ferrite	041-068-9-008	INTEGRATED CIRCUITS		
C29	1000 pF ± 10%, 50 V, Ceramic	020-296-9-005	L11	100 μH, Ferrite	041-133-9-004	IC1, 2	LF441ACN, Low Power JFET Op-Amp	307-355-9-003
C30 - 33	0.01 μF, 50 V, Ceramic	020-341-9-003	L12 - 18	4.7 μH, Ferrite	041-068-9-008	IC3	SN7400N, Quad 2-input NAND Gate	307-106-9-004
C34, 35	47 pF ± 5%, 50 V, Ceramic	020-144-9-004	L19	Not Used		IC4	MC10104L, Quad 2-input AND Gate	307-309-9-004
C36	0.01 μF ± 20%, 630 V, Metal Film	033-023-9-002	L20 - 23	4.7 μH, Ferrite	041-068-9-008	IC5	MC10131L, Dual D FLIP FLOP	307-309-9-005
C37	0.01 μF, 50 V, Ceramic	020-341-9-003	DIODES			IC6, 7	MC10102L, Quad 2-input NOR Gate	307-301-9-001
C38	150 pF ± 5%, 50 V, Ceramic	020-228-9-001	D1, 2	1S1544A	151-096-9-001	IC8	LM337LZ, Regulator	307-355-9-005
C39	47 μF ± 20%, 10 V, Electrolytic	022-267-9-005	D3	MTZ3.3JA, 3.2 V Zener	152-136-9-002	IC9	LM317LZ, Regulator	307-355-9-004
C40, 41, 42	0.01 μF, 50 V, Ceramic	020-341-9-003	D4 - 10	1SS132, Silicon	151-123-9-001			
C43	0.1 μF ± 20%, 12 V, Ceramic	033-018-9-001	D11, 12	MTZ3.3JA, 3.2 V Zener	152-136-9-002			
C44	100 μF ± 20%, 10 V, Electrolytic	022-264-9-009	D13, 14	1S1544A	151-096-9-001			
C45	68 pF ± 5%, 100 V, Mica	023-079-9-001	D15	MTZ3.3JA, 3.2 V Zener	152-136-9-002			
C46, 47	0.01 μF, 50 V, Ceramic	020-341-9-003	D16, 17	1SS132, Silicon	151-123-9-001			
C48	4700 pF ± 10%, 50 V, Ceramic	020-302-9-001	D18	MTZ7.5JA, 7.1 V Zener	152-136-9-004			
C49	2 pF ± 0.25 pF, 50 V, Ceramic	020-234-9-003	D19	1N60, Germanium	150-001-9-005			
C50 - 55	0.01 μF, 50 V, Ceramic	020-341-9-003	D20 - 24	1SS132, Silicon	151-123-9-001			
C56, 57	Not Used		D25	MTZ3.3JA, 3.2 V Zener	152-136-9-002			
C58 - 61	0.01 μF, 50 V, Ceramic	020-341-9-003	D26	MTZ7.5JA, 7.1 V Zener	152-136-9-004			
C62	33 pF ± 5%, 50 V, Ceramic	020-341-9-004	D27	1SS132, Silicon	151-123-9-001			
C63	Not Used		D28	MTZ7.5JA, 7.1 V Zener	152-136-9-004			
C64	12 pF ± 5%, 50 V, Ceramic	020-167-9-002	D29 - 49	1SS132, Silicon	151-123-9-001			
C65, 66, 67	0.01 μF, 50 V, Ceramic	020-341-9-003	TRANSISTORS					
C68	47 pF ± 5%, 50 V, Ceramic	020-144-9-004	Q1	J304, N-Channel FET	182-076-9-002			
C69, 70	Not Used		Q2 - 5	2SC2671(H), NPN Silicon	176-157-9-006			
C71, 72	2 pF ± 0.25 pF, 50 V, Ceramic	020-234-9-003	Q6, 7	2SC3354(T, S), NPN Silicon	176-157-9-004			
C73, 74	Not Used		Q8	2SC1733, NPN Silicon	176-157-9-005			
C75, 76	150 pF ± 5%, 50 V, Ceramic	020-171-9-008	Q9, 10	2SC3354(T, S), NPN Silicon	176-157-9-004			
C77	0.01 μF, 50 V, Ceramic	020-341-9-003	Q11 - 13	2SC3315(C, D), NPN Silicon	176-157-9-003			
C78, 79	Not Used		Q14	2SC3311(R), NPN Silicon	176-157-9-002			
C80, 81, 82	0.01 μF, 50 V, Ceramic	020-341-9-003	Q15, 16	2SA1161, PNP Silicon	177-048-9-003			
C83	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002	Q17	2SC3311(R), NPN Silicon	176-157-9-002			
C84, 85	0.01 μF, 50 V, Ceramic	020-341-9-003	Q18, 19	2SA1323(B), PNP Silicon	177-071-9-002			
C86	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002	Q20, 21	2SC3315(C, D), NPN Silicon	176-157-9-003			
C87	0.01 μF, 50 V, Ceramic	020-341-9-003	Q22 - 25	2SC2671(H), NPN Silicon	176-157-9-006			

**CHANNEL 3 AND 4 AMPLIFIER UNIT
(X73-1520-00)**

RESISTORS

See schematic diagram for value. Unlisted resistors are $\pm 5\%$, 1/6 or 1/4 W.

R2	900 k Ω $\pm 0.5\%$, 1/4 W, Metal Film	013-086-9-005
R3	111 k Ω $\pm 0.5\%$, 1/4 W, Metal Film	013-086-9-004
R6	1 M Ω $\pm 0.5\%$, 1/4 W, Metal Film	013-086-9-003
R16, 17	1 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-001
R18, 19	1.3 k Ω $\pm 0.5\%$, 1/6 W, Metal Film	013-126-9-001
R20	680 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-020
R21, 22	360 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-027
R33	900 k Ω $\pm 0.5\%$, 1/4 W, Metal Film	013-086-9-005
R34	111 k Ω $\pm 0.5\%$, 1/4 W, Metal Film	013-086-9-004
R37	1 M Ω $\pm 0.5\%$, 1/4 W, Metal Film	013-086-9-003
R47, 48	1 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-001
R49, 50	1.3 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-101
R51	680 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-020
R52, 53	360 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-027
VR1, 2	100 Ω Trimpot	008-434-9-002

CAPACITORS

C1	39 pF $\pm 5\%$, 50 V, Ceramic	020-341-9-004
C2, 3	0.01 μ F, 50 V, Ceramic	020-341-9-003
C4	0.01 μ F $\pm 20\%$, 630 V, Metal Film	033-023-9-002
C5	100 pF $\pm 5\%$, 50 V, Ceramic	020-341-9-005
C6	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002
C7	Not Used	
C8	39 pF $\pm 5\%$, 50 V, Ceramic	020-341-9-004
C9, 10	0.01 μ F, 50 V, Ceramic	020-341-9-003
C11	0.01 μ F $\pm 20\%$, 630 V, Metal Film	033-023-9-002
C12	100 pF $\pm 5\%$, 50 V, Ceramic	020-341-9-005
C13	5 pF ± 0.25 pF, 50 V, Ceramic	020-233-9-002
C14	Not Used	
C15	100 μ F $\pm 20\%$, 16 V, Electrolytic	022-225-9-001
C16, 17	47 μ F $\pm 20\%$, 16 V, Electrolytic	022-281-9-001
C18 - 23	0.01 μ F 50 V, Ceramic	020-341-9-003
C24, 25	Not Used	
C26 - 31	0.01 μ F, 50 V, Ceramic	020-341-9-003
C32, 33	Not Used	
C34, 35	22 pF $\pm 5\%$, 50 V, Ceramic	020-215-9-002
TC1	Not Used	
TC2	6 pF, Trimmer Capacitor	028-065-9-003
TC3	10 pF, Trimmer Capacitor	028-054-9-001
TC4	20 pF, Trimmer Capacitor	028-057-9-001
TC5	Not Used	
TC6	6 pF, Trimmer Capacitor	028-065-9-003
TC7	10 pF, Trimmer Capacitor	028-054-9-001
TC8	20 pF, Trimmer Capacitor	028-057-9-001

INDUCTORS

L1	470 μ H, Ferrite	041-071-9-001
L2, 3	22 μ H, Ferrite	041-089-9-001

DIODES

D1	Not Used	
D2	1S1544A	151-096-9-001
D3	Not Used	
D4	1S1544A	151-096-9-001
D5 - 11	1SS132	151-123-9-001

TRANSISTORS

Q1	Not Used	
Q2	DN1901, Dual Silicon N-Channel FET	182-070-9-001
Q3, 4	2SC3354(T, S), NPN Silicon	176-157-9-004
Q5, 6	2SA1206, PNP Silicon	177-071-9-003
Q7, 8	2SC2671(H), NPN Silicon	176-157-9-006

SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.
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CHANNEL 3 AND 4 AMPLIFIER UNIT (continued)

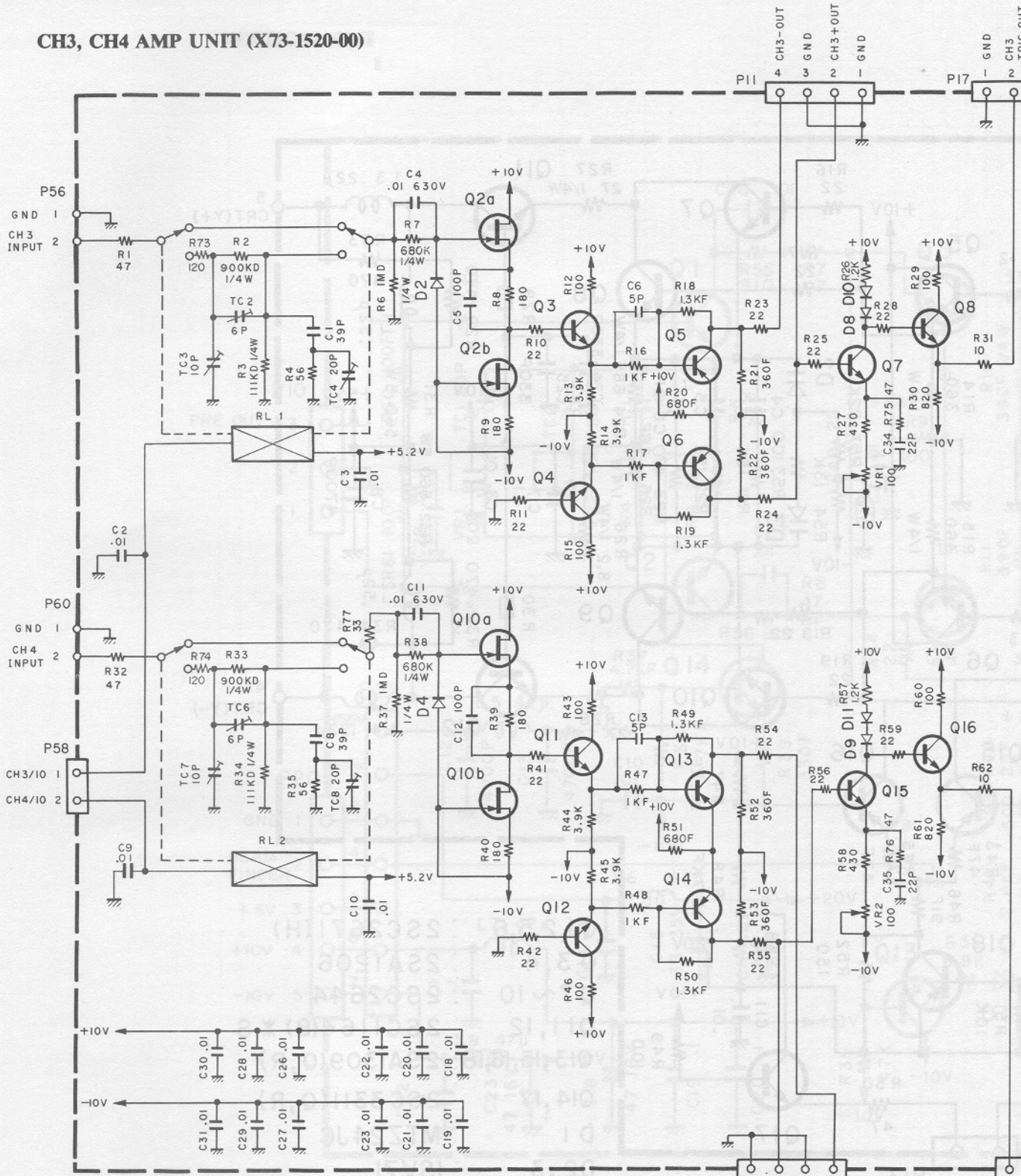
Q9	Not Used	
Q10	DN1901, Dual Silicon N-Channel FET	182-070-9-001
Q11, 12	2SC3354(T,S), NPN Silicon.....	176-157-9-004
Q13, 14	2SA1206, PNP Silicon.....	177-071-9-003
Q15, 16	2SC2671(H), NPN Silicon	176-157-9-006

RELAYS

RL1, 2	DPDT Relay.....	441-041-9-001
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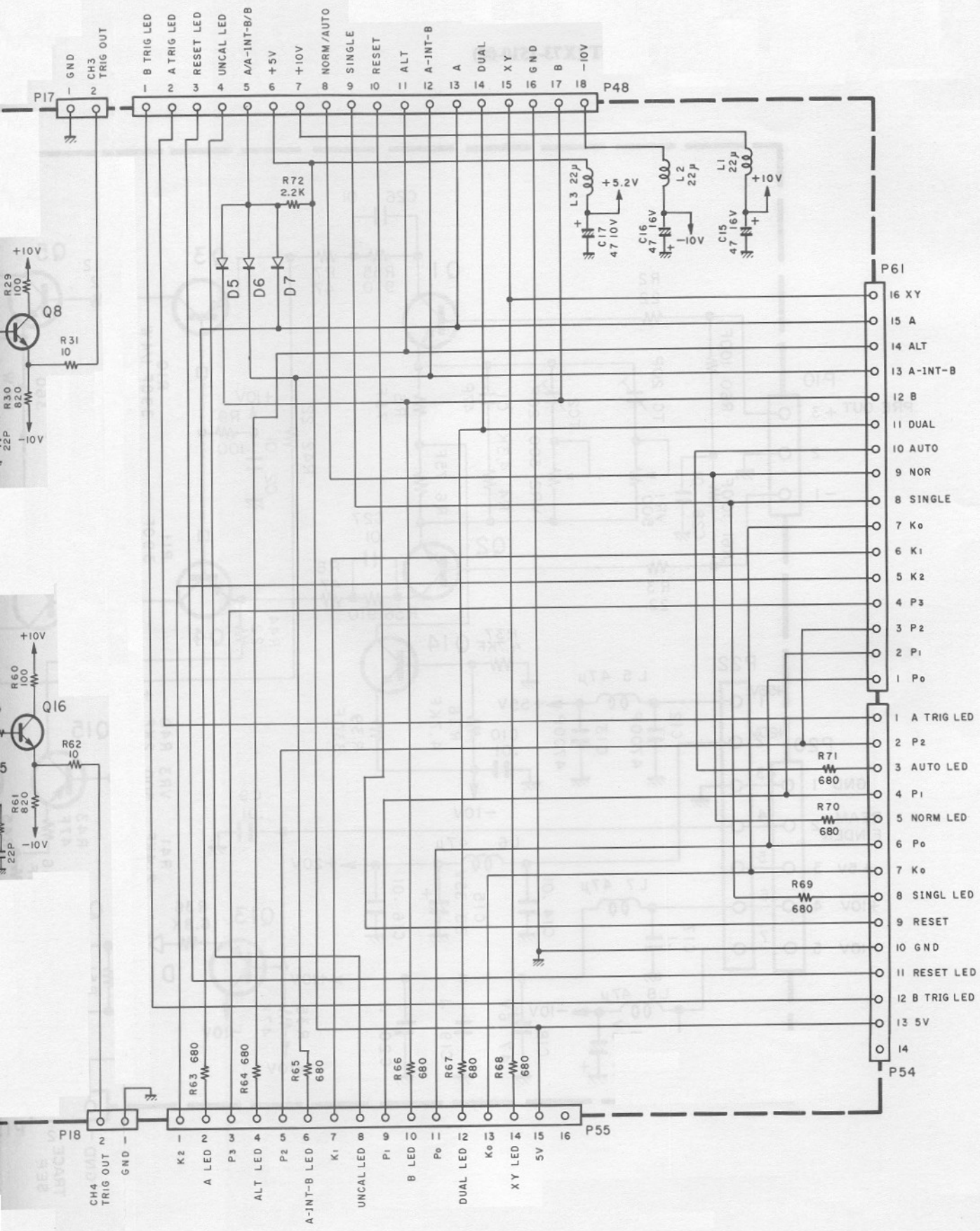
SCHEMATIC DIAGRAM

CH3, CH4 AMP UNIT (X73-1520-00)



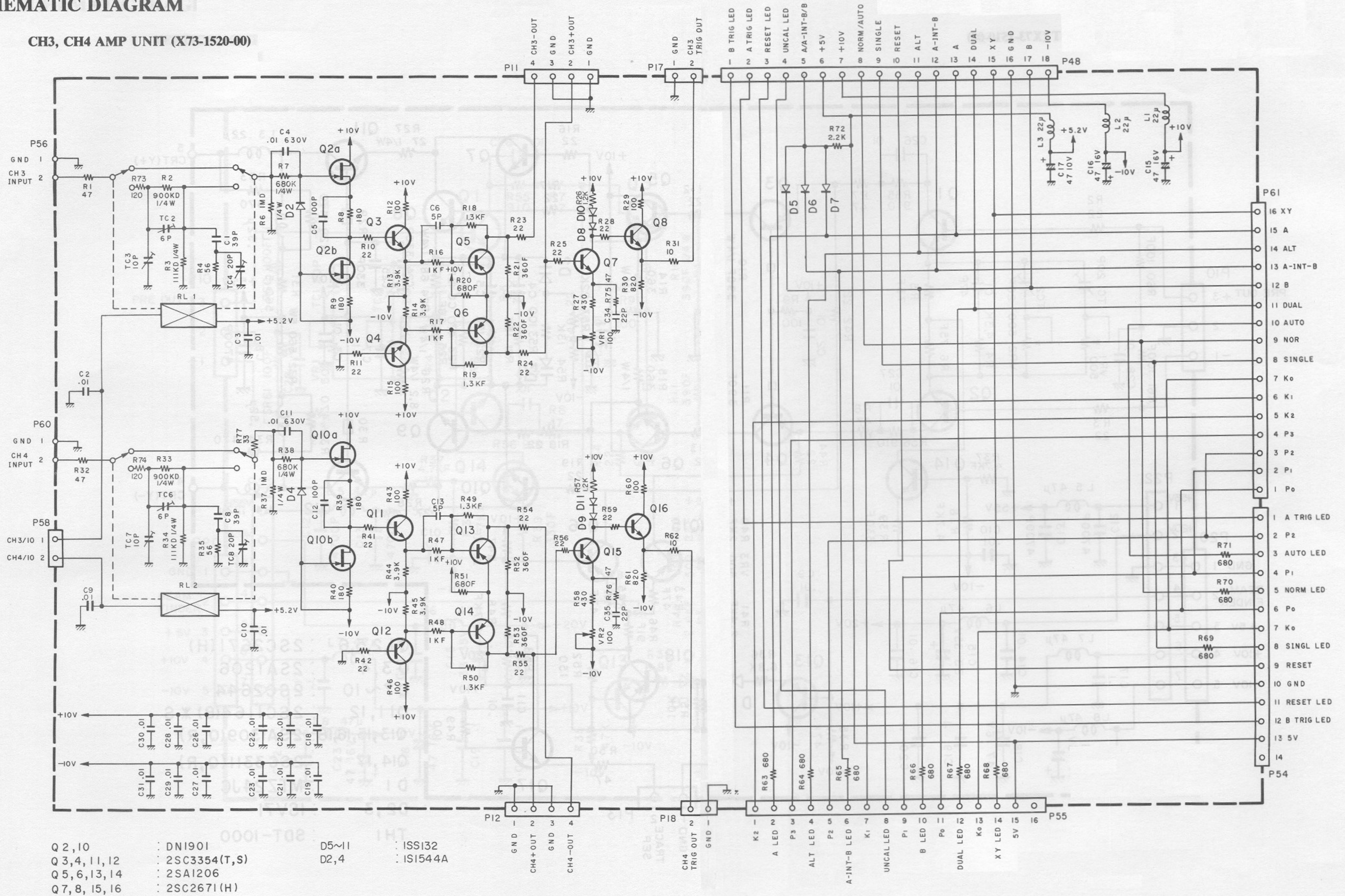
Q 2, 10 : DN1901
 Q 3, 4, 11, 12 : 2SC3354(T,S)
 Q 5, 6, 13, 14 : 2SA1206
 Q 7, 8, 15, 16 : 2SC2671(H)

D5~11 : ISS132
 D2, 4 : ISI544A



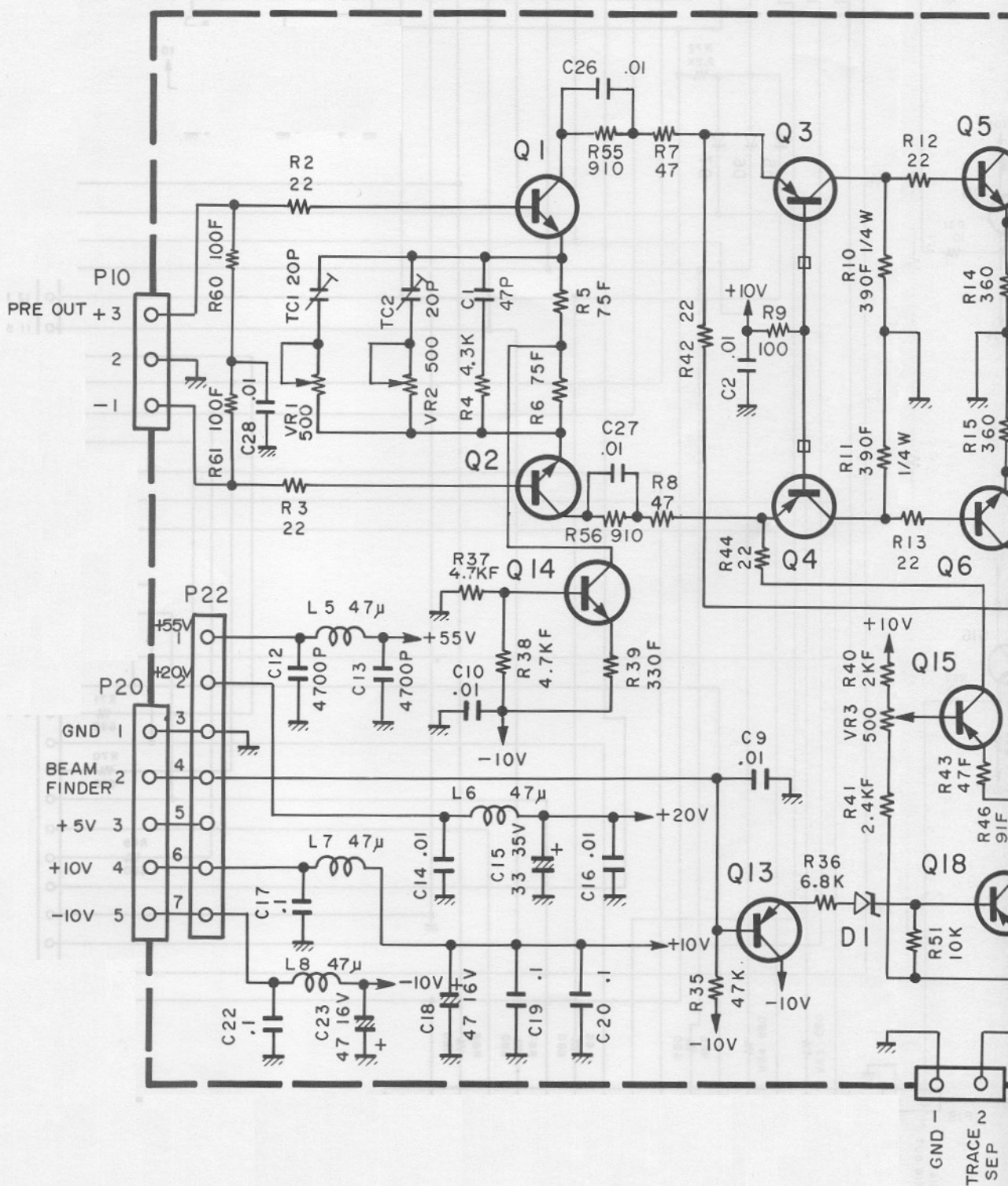
SCHEMATIC DIAGRAM

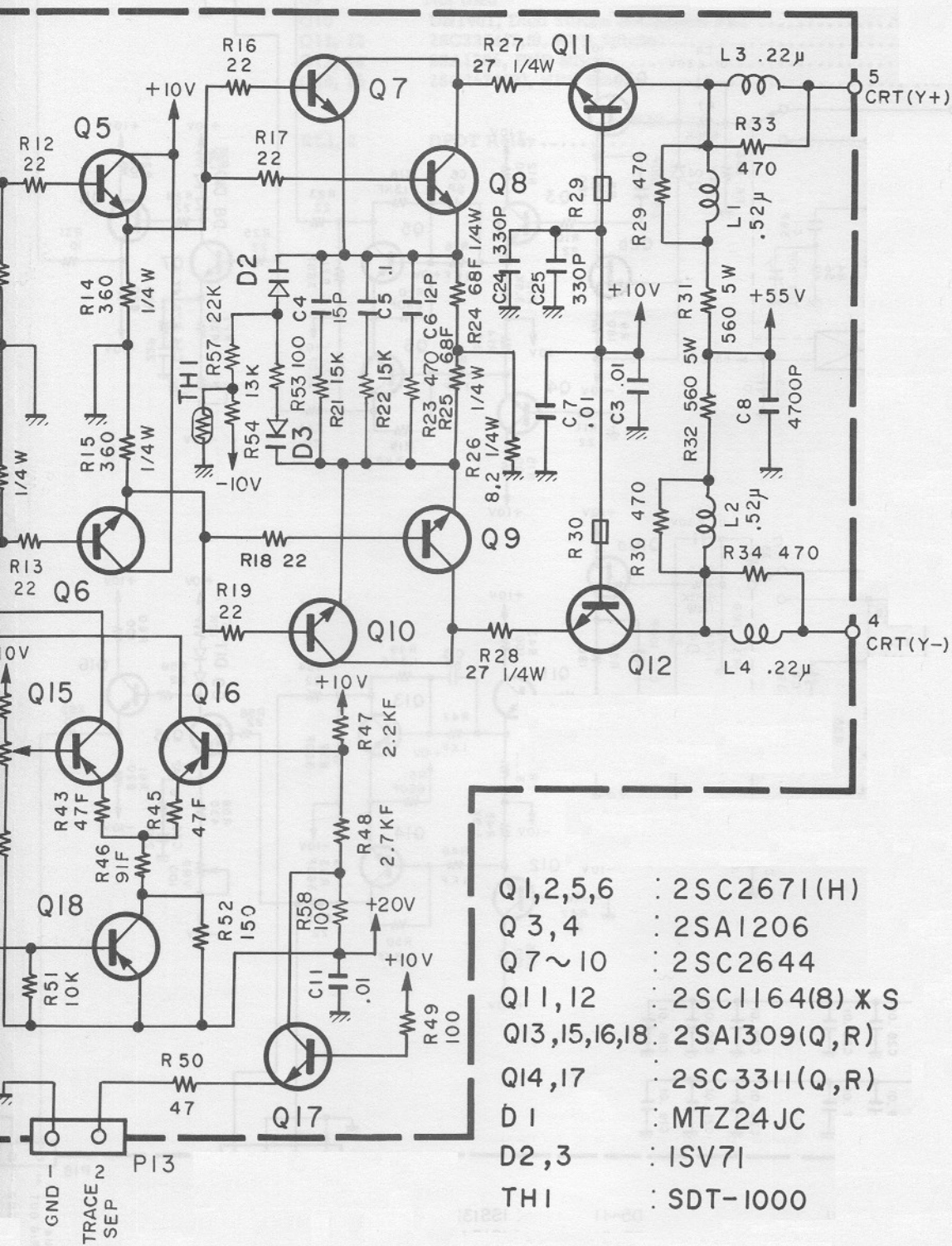
CH3, CH4 AMP UNIT (X73-1520-00)



SCHEMATIC DIAGRAM

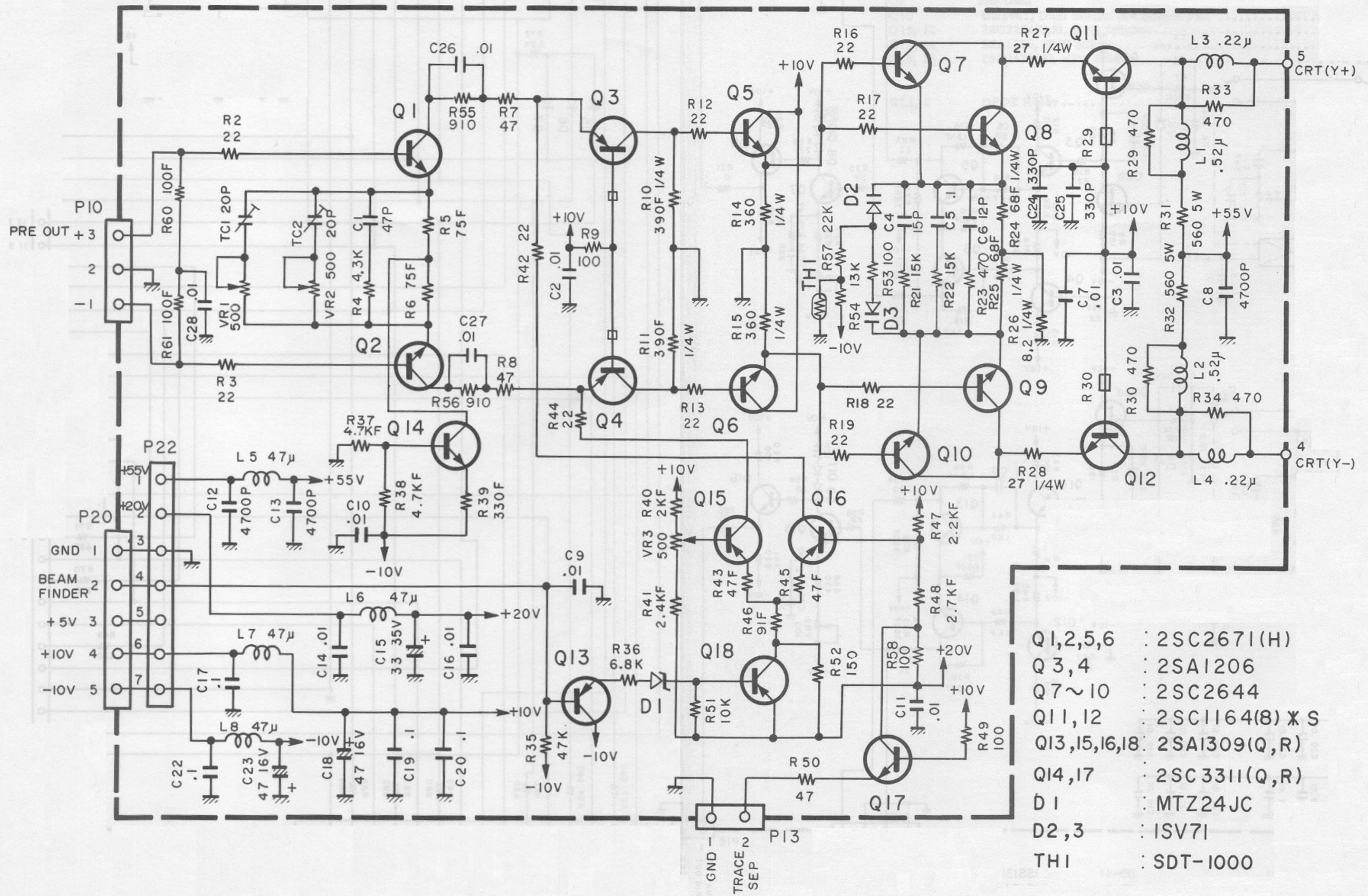
VERTICAL OUTPUT AMP UNIT (X73-1510-00)





SCHEMATIC DIAGRAM

VERTICAL OUTPUT AMP UNIT (X73-1510-00)



- Q1,2,5,6 : 2SC2671(H)
- Q3,4 : 2SA1206
- Q7~10 : 2SC2644
- Q11,12 : 2SC1164(8) X S
- Q13,15,16,18 : 2SA1309(Q,R)
- Q14,17 : 2SC3311(Q,R)
- D1 : MTZ24JC
- D2,3 : ISV71
- TH1 : SDT-1000

VERTICAL OUTPUT AMPLIFIER UNIT
(X73-1510-00)

RESISTORS

See schematic diagram for value. Unlisted resistors are $\pm 5\%$, 1/6 or 1/4 W.

R5, 6	75.0 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-7-508
R10, 11	390 Ω $\pm 1\%$, 1/4 W, Metal Film	013-076-9-001
R24, 25	68.0 Ω $\pm 1\%$, 1/4 W, Metal Film	013-034-9-028
R31,32	560 Ω $\pm 5\%$, 5 W, Metal Film	011-005-5-561
R37, 38	4.7 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-025
R39	330 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-014
R40	2 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-2-001
R41	2.4 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-022
R43	47.0 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-024
R45	47.0 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-024
R46	91.0 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-026
R47	2.2 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-003
R48	2.7 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-023
VR1, 2, 3	500 Ω Trimpot	008-467-9-005

CAPACITORS

C1	47 pF $\pm 5\%$, 50 V, Ceramic	020-149-9-006
C2, 3	0.01 μ F, 50 V, Ceramic	020-341-9-003
C4	15 pF $\pm 5\%$, 50 V, Ceramic	020-171-9-002
C5	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C6	12 pF $\pm 5\%$, 50 V, Ceramic	020-167-9-002
C7	0.01 μ F, 50 V, Ceramic	020-341-9-003
C8	4700 pF $\pm 10\%$, 500 V, Ceramic	020-302-9-003
C9, 10, 11	0.01 μ F, 50 V, Ceramic	020-341-9-003
C12, 13	4700 pF $\pm 10\%$, 500 V, Ceramic	020-302-9-003
C14	0.01 μ F, 50 V, Ceramic	020-341-9-003
C15	33 μ F $\pm 20\%$, 35 V, Electrolytic	022-267-9-006
C16	0.01 μ F, 50 V, Ceramic	020-341-9-003
C17	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C18	47 μ F $\pm 20\%$, 16 V, Electrolytic	022-281-9-001
C19, 20	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C21	Not Used	
C22	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C23	47 μ F $\pm 20\%$, 16 V, Electrolytic	022-281-9-001
C24, 25	330 pF $\pm 5\%$, 50 V, Ceramic	020-158-9-004
C26, 27	0.01 μ F, 50 V, Ceramic	020-341-9-003
TC1, 2	20 pF, Trimmer Capacitor	028-065-9-004

INDUCTORS

L1, 2	Choke Coil	041-148-9-003
L3, 4	0.22 μ H, Ferrite	041-133-9-009
L5 - 8	47 μ H, Ferrite	041-143-9-002

DIODES

D1	MTZ24JC, 24 V Zener	152-136-9-005
D2, 3	1SV71	151-097-9-002

TRANSISTORS

Q1, 2	2SC2671(H), NPN Silicon	176-157-9-006
Q3, 4	2SA1206, PNP Silicon	177-071-9-003
Q5, 6	2SC2671(H), NPN Silicon	176-157-9-006
Q7 - 10	2SC2644, NPN Silicon	176-114-9-008
Q11, 12	2SC1164, NPN Silicon	176-114-9-007
Q13	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q14	2SC3311(Q,R), NPN Silicon	176-157-9-007
Q15, 16	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q17	2SC3311(Q,R), NPN Silicon	176-157-9-007
Q18	2SA1309(Q,R), PNP Silicon	177-071-9-001

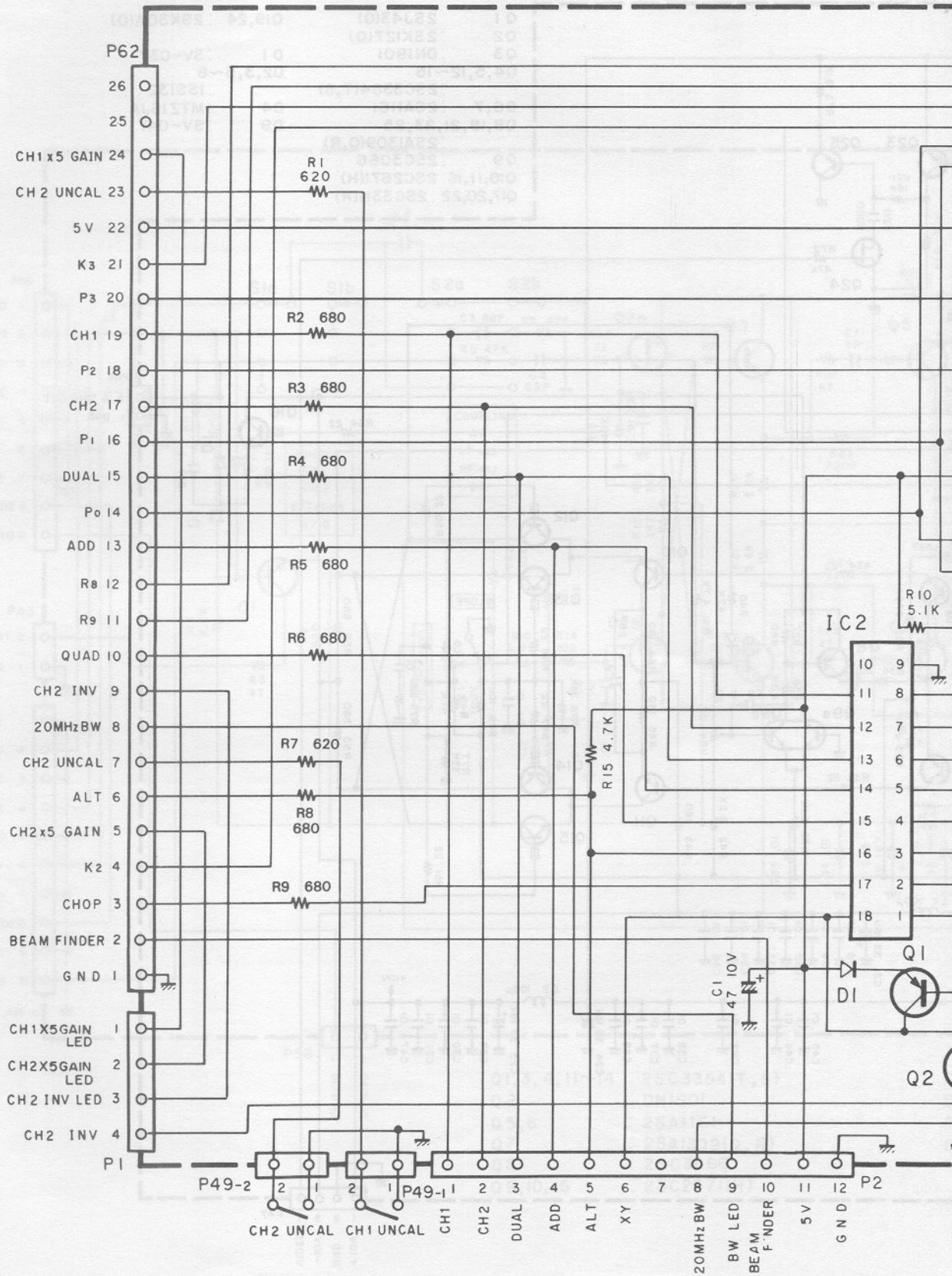
MISCELLANEOUS

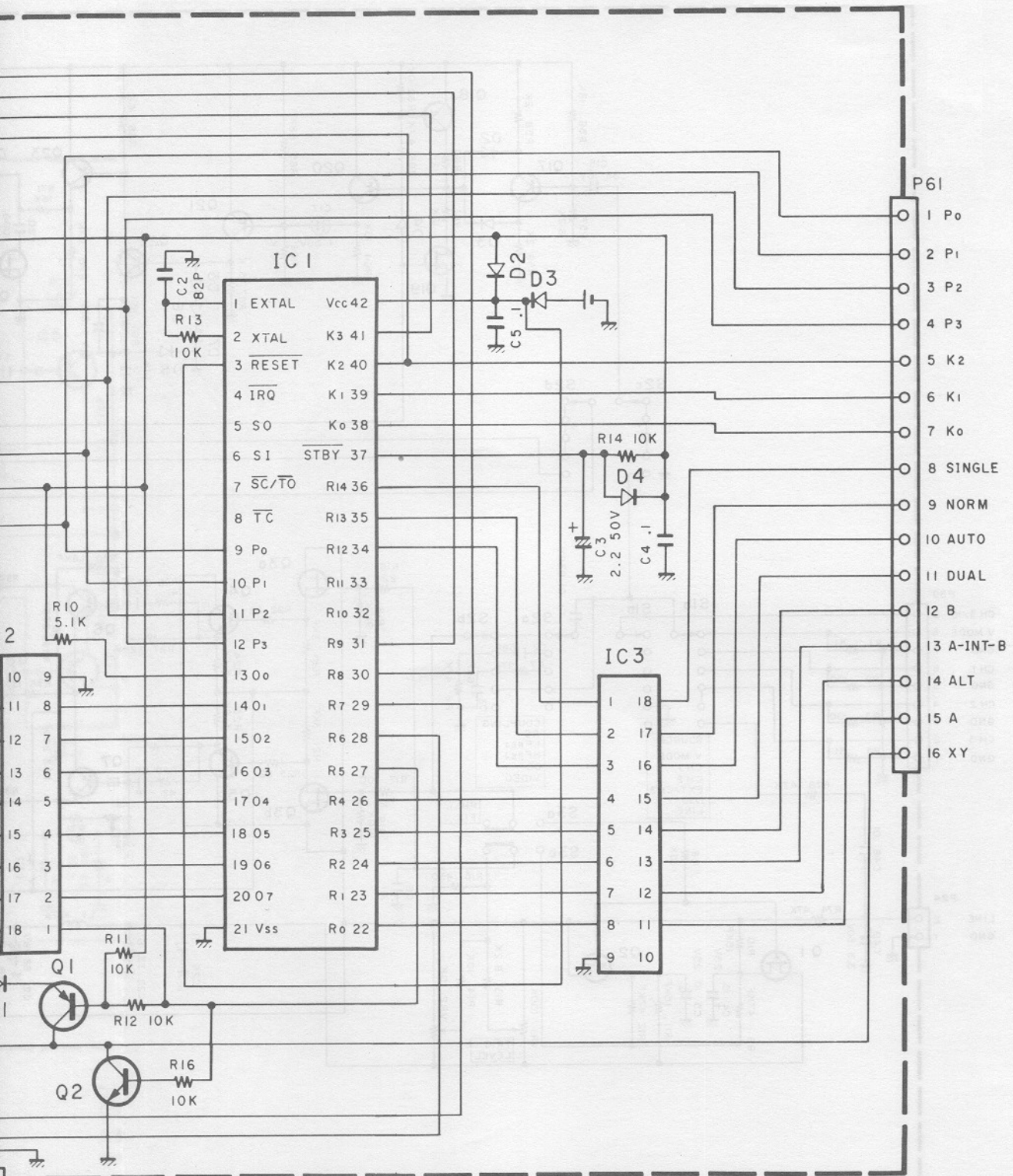
TH1	SDT1000, Thermistor	005-003-9-002
	Bead Core	040-004-9-002

Schematic Symbol	Description	B & K-Precision Part No.
CPU UNIT (X81-1320-00)		
RESISTORS		
See schematic diagram for value. Resistors are $\pm 5\%$, 1/6 W.		
CAPACITORS		
C1	47 μF $\pm 20\%$, 10 V, Electrolytic	022-267-9-005
C2	82 pF $\pm 5\%$, 50 V, Ceramic	020-250-9-002
C3	2.2 μF $\pm 20\%$, 50 V, Electrolytic	022-281-9-004
C4, 5	0.1 μF $\pm 20\%$, 12 V, Ceramic	033-018-9-001
DIODES		
D1, 2, 3, 4	1SS132	151-123-9-001
TRANSISTORS		
Q1	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q2	2SC3311(R), NPN Silicon	176-157-9-002
INTEGRATED CIRCUITS		
IC1	MTM5010, 4-Bit Microcomputer	307-355-9-013
IC2, 3	AN90B20, Transistor Array	307-355-9-012

SCHEMATIC DIAGRAM

CPU UNIT (X81-1320-00)



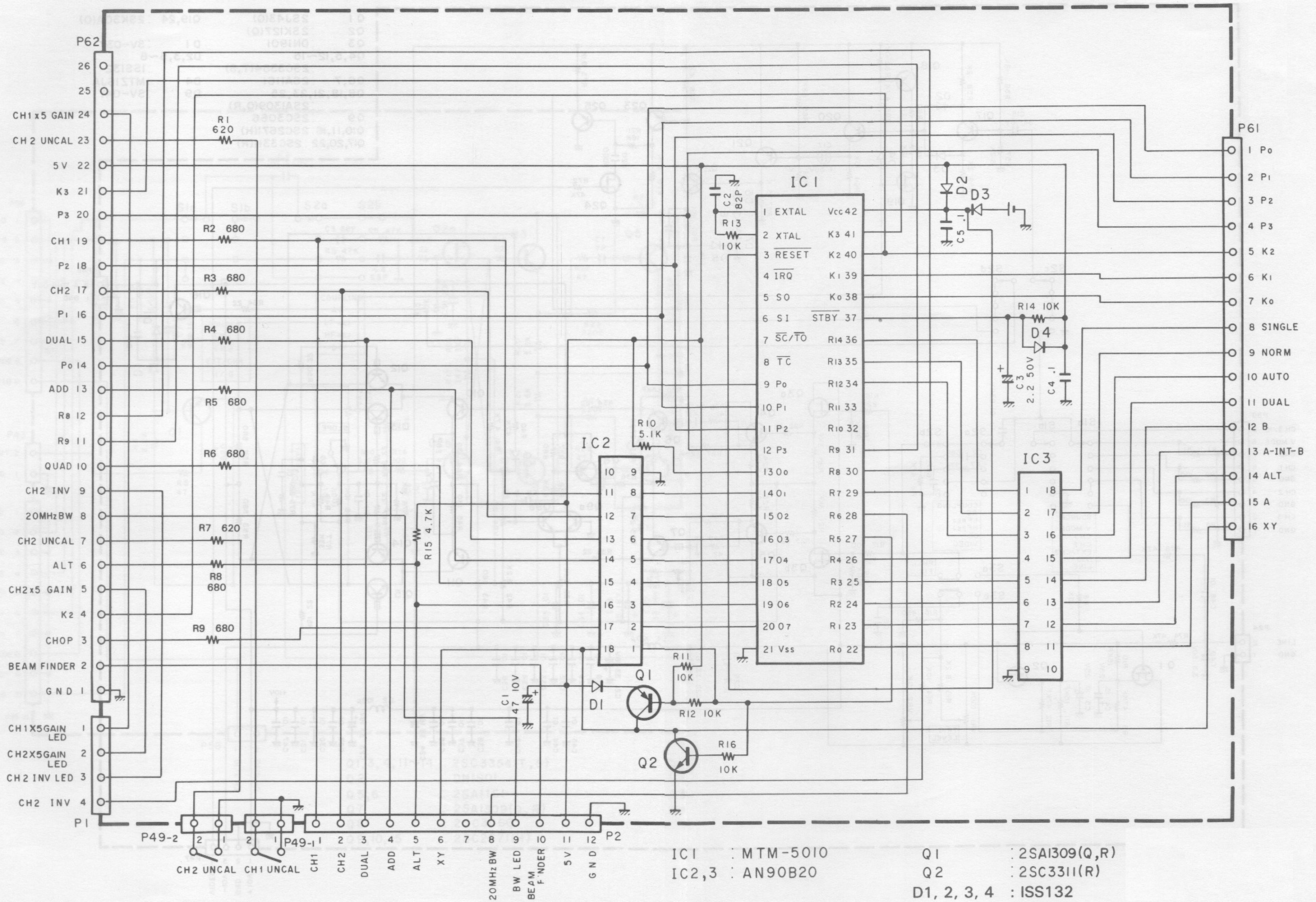


IC1 : MTM-5010
 IC2,3 : AN90B20

Q1 : 2SA1309(Q,R)
 Q2 : 2SC3311(R)
 D1, 2, 3, 4 : ISS132

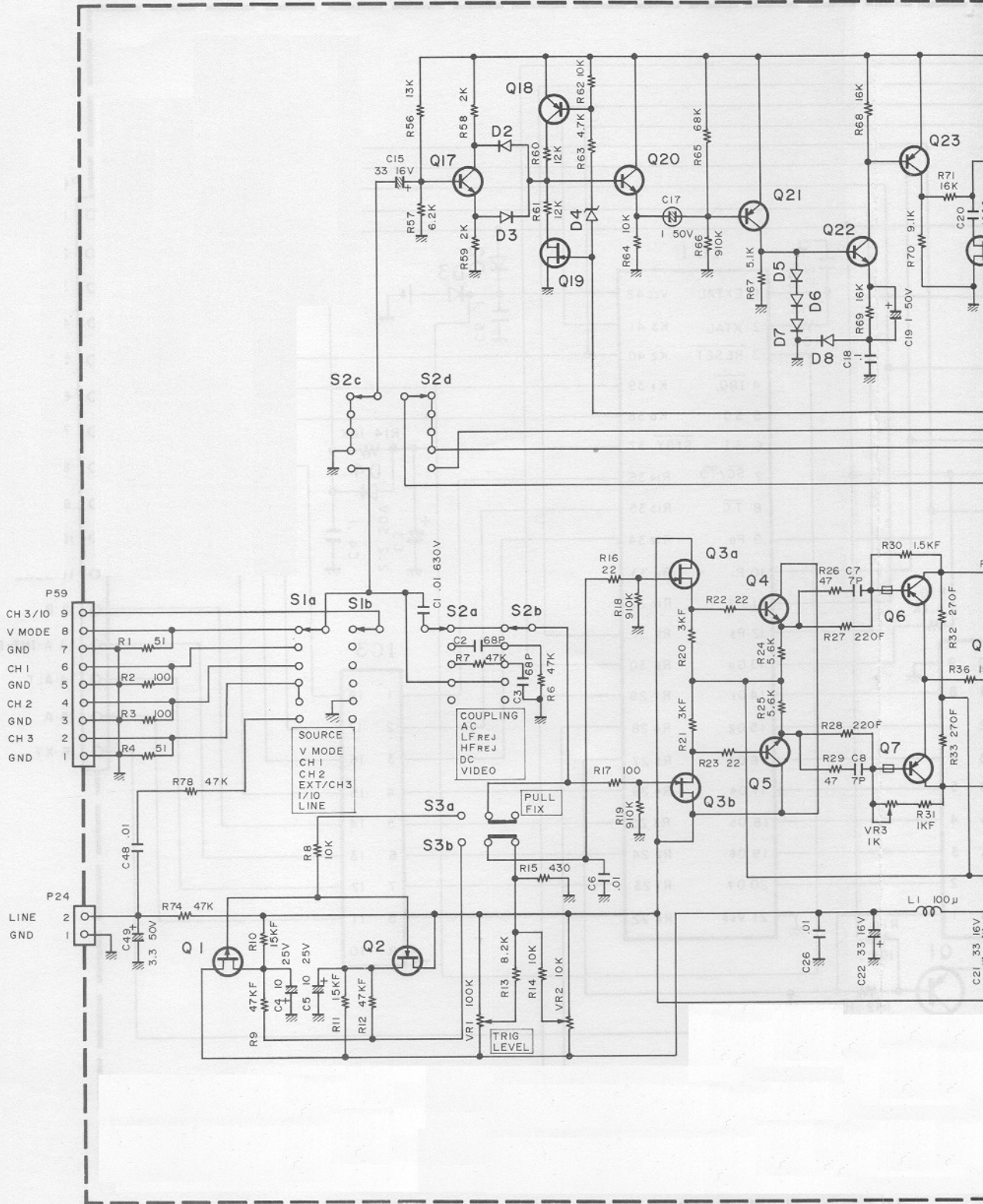
SCHEMATIC DIAGRAM

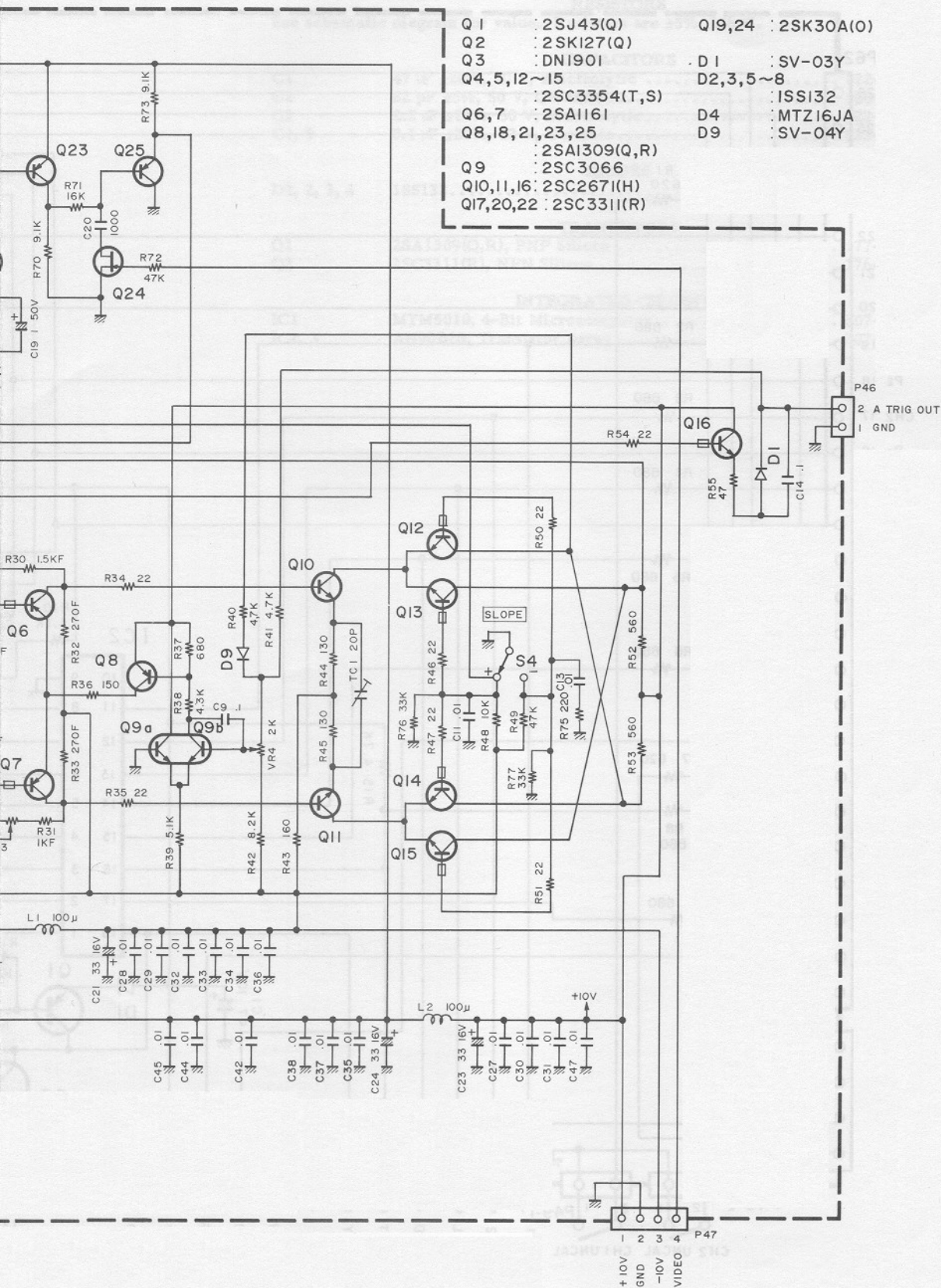
CPU UNIT (X81-1320-00)



SCHEMATIC DIAGRAM

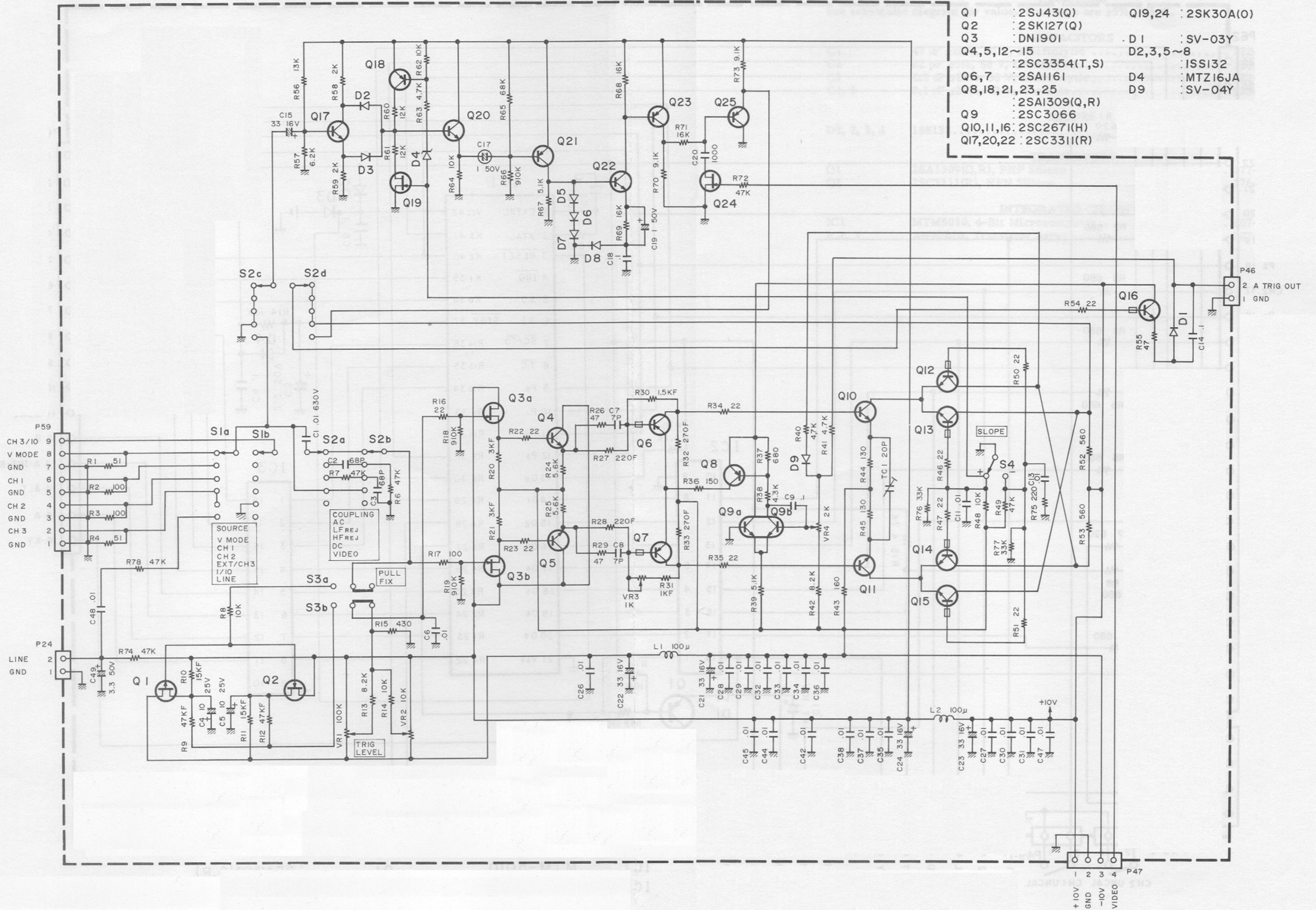
A TRIG SWITCH UNIT (X77-1280-00)





SCHEMATIC DIAGRAM

A TRIG SWITCH UNIT (X77-1280-00)



**SCHEMATIC
SYMBOL**

DESCRIPTION

**B & K-PRECISION
PART NO.**

**A TRIGGER SWITCH UNIT
(X77-1280-00)**

RESISTORS

See schematic diagram for value. Unlisted resistors are $\pm 5\%$, 1/6 W.

R9	47 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-017
R10, 11	15 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-502
R12	47 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-017
R20, 21	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R27, 28	220 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-002
R32, 33	270 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-012
R30	1.5 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-501
R31	1 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-001
VR1	100 k Ω Potentiometer, TRIG LEVEL Control	008-482-9-002
VR2	10 k Ω Trimpot	008-434-9-007
VR3	1 k Ω Trimpot	008-434-9-005
VR4	2 k Ω Trimpot	008-470-9-003

CAPACITORS

C1	0.01 μ F $\pm 20\%$, 630 V, Metal Film	033-023-9-002
C2, 3	68 pF $\pm 5\%$, 50 V, Ceramic	020-215-9-008
C4, 5	10 μ F $\pm 20\%$, 25 V, Electrolytic	022-281-9-003
C6	0.01 μ F, 50 V, Ceramic	020-341-9-003
C7, 8	7 pF ± 0.5 pF, 50 V, Ceramic	020-149-9-001
C9	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C10	Not Used	
C11	0.01 μ F, 50 V, Ceramic	020-341-9-003
C12	Not Used	
C13	0.01 μ F, 50 V, Ceramic	020-341-9-003
C14	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C15	33 μ F $\pm 20\%$, 16 V, Electrolytic	022-226-9-008
C16	Not Used	
C17	1 μ F $\pm 20\%$, 50 V, Electrolytic	022-167-9-001
C18	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C19	1 μ F $\pm 20\%$, 50 V, Electrolytic	022-226-9-017
C20	1000 pF $\pm 10\%$, 50 V, Ceramic	020-249-9-001
C21 - 24	33 μ F $\pm 20\%$, 16 V, Electrolytic	022-226-9-008
C25	Not Used	
C26 - 38	0.01 μ F, 50 V, Ceramic	020-341-9-003
C39, 40, 41	Not Used	
C42	0.01 μ F, 50 V, Ceramic	020-341-9-003
C43	Not Used	
C44, 45	0.01 μ F, 50 V, Ceramic	020-341-9-003
C46	Not Used	
C47, 48	0.01 μ F, 50 V, Ceramic	020-341-9-003
C49	3.3 μ F $\pm 20\%$, 50 V, Electrolytic	022-226-9-009
TC1	20 pF Trimmer Capacitor	028-065-9-001

INDUCTORS

L1, 2	100 μ H, Ferrite	041-124-9-001
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DIODES

D1	SV03Y	153-022-9-001
D2, 3	1SS132	151-123-9-001
D4	MTZ16JA, 15 V Zener	152-134-9-002
D5 - 8	1SS132	151-123-9-001
D9	SV04Y	153-026-9-001

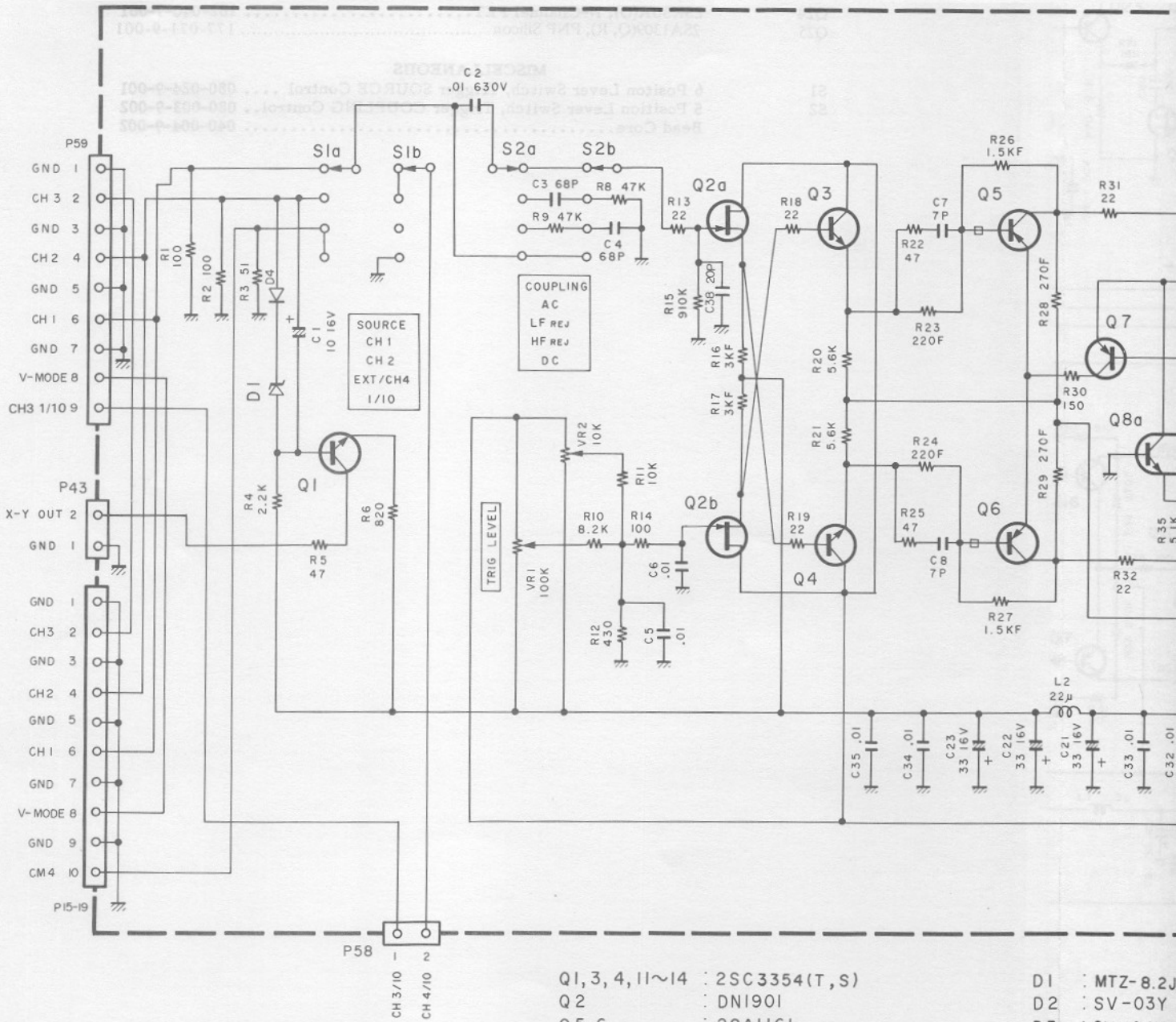
TRANSISTORS

Q1	2SJ43(Q), P-Channel FET	182-064-9-003
Q2	2SK301(Q), FET	182-092-9-001
Q3	DN1901, Dual Silicon N-Channel FET	182-070-9-001
Q4, 5	2SC3354(T,S), NPN Silicon	176-157-9-004
Q6, 7	2SA1161, PNP Silicon	177-048-9-003
Q8	2SA1309(Q,R), PNP Silicon	177-071-9-001

SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.
Q9	2SC3066, NPN Silicon.....	176-157-9-008
Q10, 11	2SC2671(H), NPN Silicon	176-157-9-006
Q12 - 15	2SC3354(T,S), NPN Silicon.....	176-157-9-004
Q16	2SC2671(H), NPN Silicon	176-157-9-006
Q17	2SC3311(R), NPN Silicon	176-157-9-002
Q18	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q19	2SK30A(O), N-Channel FET.....	182-040-9-001
Q20	2SC3311(R), NPN Silicon	176-157-9-002
Q21	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q22	2SC3311(R), NPN Silicon	176-157-9-002
Q23	2SA1309(Q, R), PNP Silicon	177-071-9-001
Q24	2SK30A(O), N-Channel FET.....	182-040-9-001
Q25	2SA1309(Q, R), PNP Silicon	177-071-9-001
MISCELLANEOUS		
S1	6 Position Lever Switch, Trigger SOURCE Control	080-024-9-001
S2	5 Position Lever Switch, Trigger COUPLING Control..	080-003-9-002
	Bead Core.....	040-004-9-002

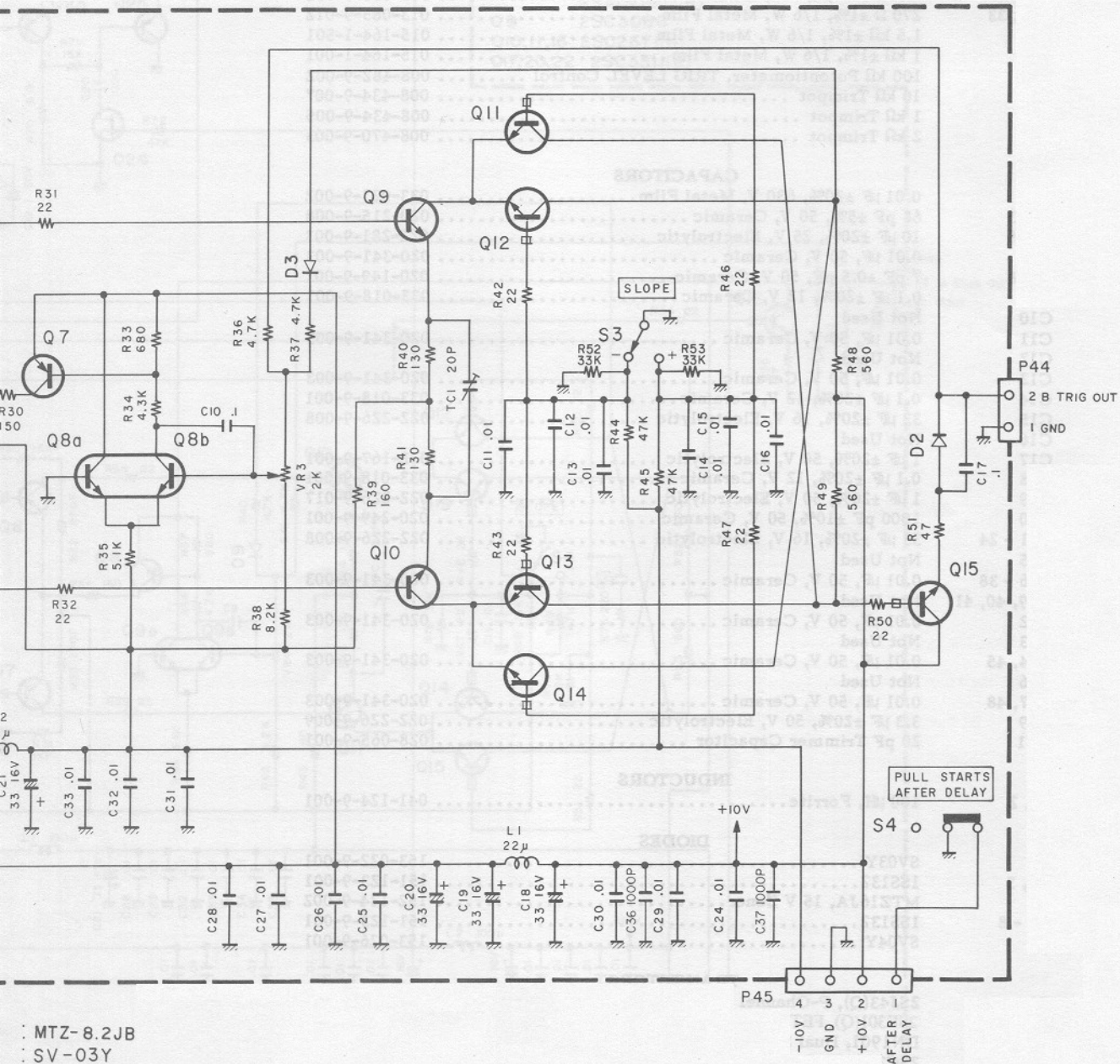
SCHEMATIC DIAGRAM

B TRIG SWITCH UNIT (X77-1290-00)



- Q1, 3, 4, 11~14 : 2SC3354(T, S)
- Q2 : DNI901
- Q5, 6 : 2SA1161
- Q7 : 2SA1309(Q, R)
- Q8 : 2SC3066
- Q9, 10, 15 : 2SC2671(H)

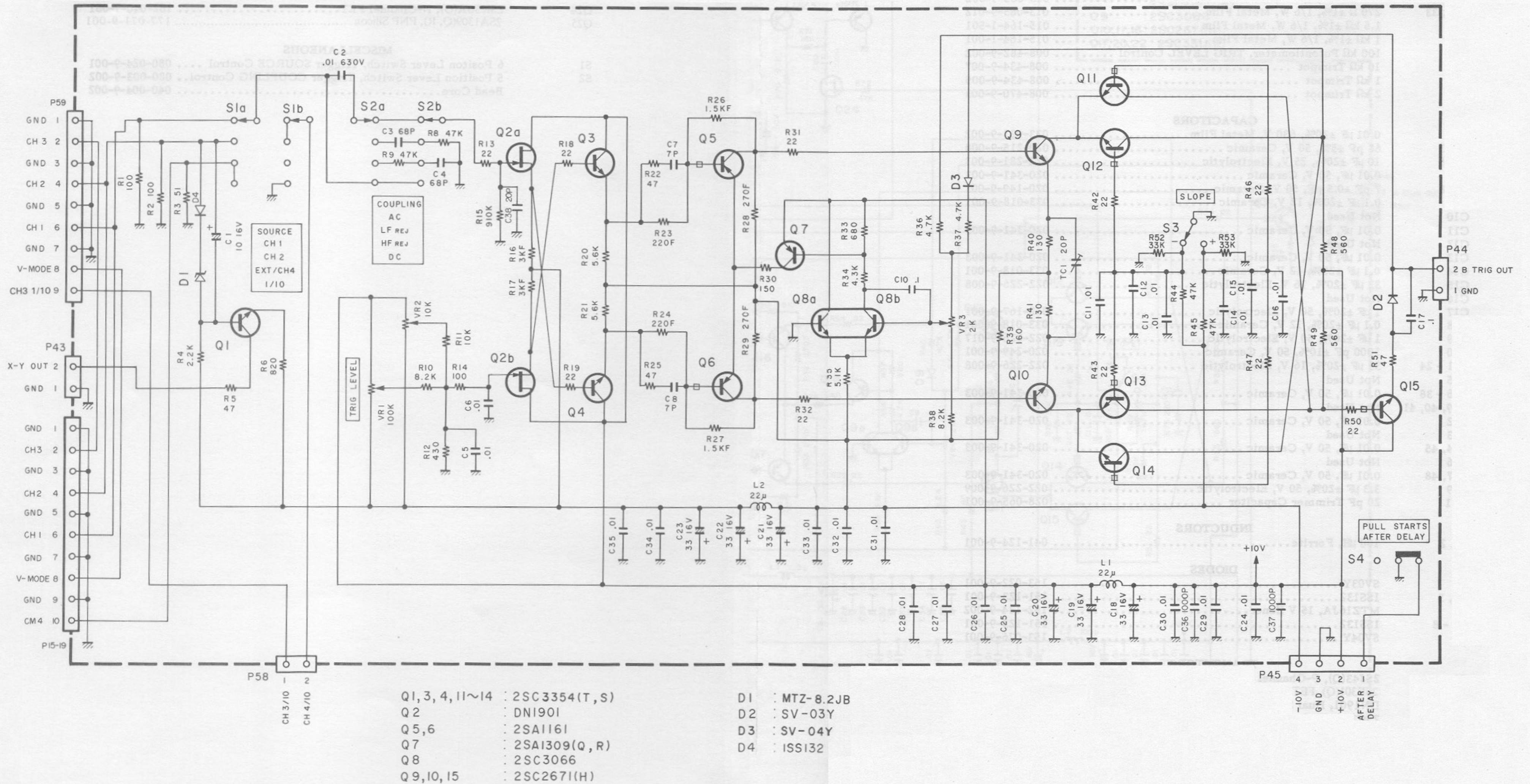
- D1 : MTZ-8.2V
- D2 : SV-03Y
- D3 : SV-04Y
- D4 : ISS132



- : MTZ-8.2JB
- : SV-03Y
- : SV-04Y
- : ISS132

SCHEMATIC DIAGRAM

B TRIG SWITCH UNIT (X77-1290-00)



**SCHEMATIC
SYMBOL**

DESCRIPTION

**B & K-PRECISION
PART NO.**

**B TRIGGER SWITCH UNIT
(X77-1290-00)**

RESISTORS

See schematic diagram for value. Unlisted resistors are $\pm 5\%$, 1/6 W.

R16, 17	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R23, 24	220 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-002
R26, 27	1.5 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-501
R28, 29	270 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-012
VR1	100 k Ω Potentiometer, TRIG LEVEL Control	008-482-9-003
VR2	10 k Ω Trimpot	008-434-9-007
VR3	2 k Ω Trimpot	008-470-9-003

CAPACITORS

C1	10 μ F $\pm 20\%$, 16 V, Electrolytic	022-226-9-014
C2	0.01 μ F $\pm 20\%$, 630 V, Metal Film	033-023-9-002
C3, 4	68 pF $\pm 5\%$, 50 V, Ceramic	020-215-9-008
C5, 6	0.01 μ F, 50 V, Ceramic	020-341-9-003
C7, 8	7 pF ± 0.5 pF, 50 V, Ceramic	020-337-9-004
C9	Not Used	
C10	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C11 - 16	0.01 μ F, 50 V, Ceramic	020-341-9-003
C17	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C18 - 23	33 μ F $\pm 20\%$, 16 V, Electrolytic	022-226-9-008
C24 - 35	0.01 μ F, 50 V, Ceramic	020-341-9-003
C36, 37	1000 pF $\pm 10\%$, 50 V, Ceramic	020-249-9-001
C38	20 pF $\pm 5\%$, 50 V, Ceramic	020-330-9-002
TC1	20 pF, Trimmer Capacitor	028-065-9-004

INDUCTORS

L1, 2	22 μ H, Ferrite	041-089-9-001
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DIODES

D1	MTZ7.5JC, 7.5 V Zener	152-134-9-001
D2	SV03Y	153-022-9-001
D3	SV04Y	153-026-9-001
D4	ISS132, Silicon	151-123-9-001

TRANSISTORS

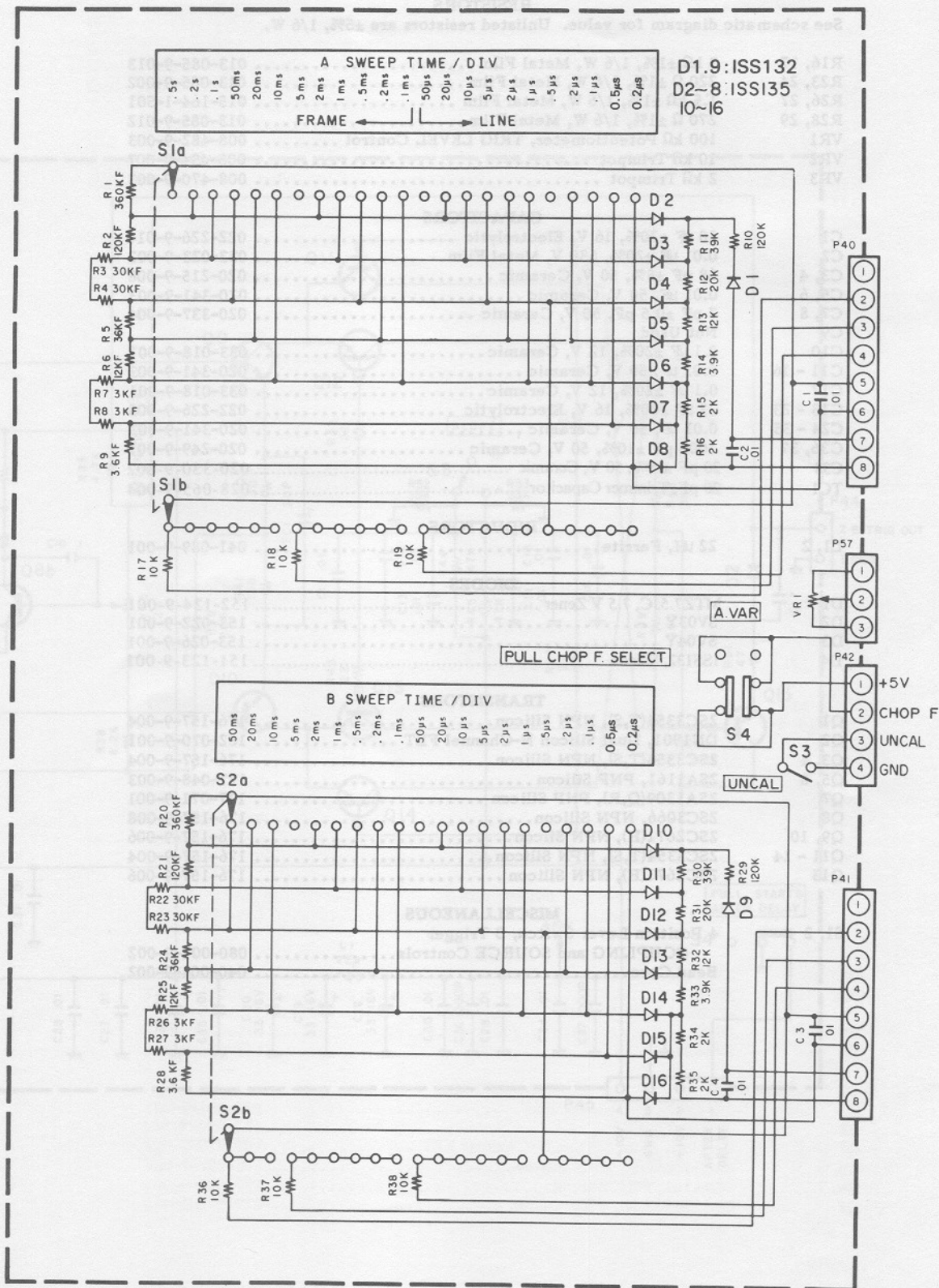
Q1	2SC3354(T,S), NPN Silicon	176-157-9-004
Q2	DN1901, Dual Silicon N-Channel FET	182-070-9-001
Q3, 4	2SC3354(T,S), NPN Silicon	176-157-9-004
Q5, 6	2SA1161, PNP Silicon	177-048-9-003
Q7	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q8	2SC3066, NPN Silicon	176-157-9-008
Q9, 10	2SC2671(H), NPN Silicon	176-157-9-006
Q11 - 14	2SC3354(T,S), NPN Silicon	176-157-9-004
Q15	2SC2671(H), NPN Silicon	176-157-9-006

MISCELLANEOUS

S1, 2	4 Position Lever Switch, B Trigger COUPLING and SOURCE Controls	080-004-9-002
	Bead Core	040-004-9-002

SCHEMATIC DIAGRAM

SWEEP ROTARY UNIT (X74-1310-00)



**SCHEMATIC
SYMBOL**

DESCRIPTION

**B & K-PRECISION
PART NO. PART NO.**

**SWEEP ROTARY UNIT
(X74-1310-00)**

RESISTORS

See schematic diagram for value. Unlisted resistors are $\pm 5\%$, 1/6 W.

R1	360 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-113-9-003
R2	120 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-103-9-002
R3, 4	30 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-103-9-005
R5	36 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-103-9-006
R6	12 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-028
R7, 8	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R9	3.6 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-113-9-002
R20	360 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-113-9-003
R21	120 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-103-9-002
R22, 23	30 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-103-9-005
R24	36 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-103-9-006
R25	12 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-028
R26, 27	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R28	3.6 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-113-9-002

CAPACITORS

C1, 2, 3, 4	0.01 μ F $\pm 10\%$, 50 V, Ceramic	020-296-9-001
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DIODES

D1	1SS132	151-123-9-001
D2 - 8	1SS135	151-118-9-001
D9	1SS132	151-123-9-001
D10 - 16	1SS135	151-118-9-001

SWITCHES

S1/2/3/4	Rotary Switch, SWEEP TIME/DIV control	083-289-9-001
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**SCHEMATIC
SYMBOL**

DESCRIPTION

**B & K-PRECISION
PART NO.**

**TRIGGER SWEEP UNIT
(X74-1350-00)**

RESISTORS

See schematic diagram for value. Unlisted resistors are $\pm 5\%$, 1/6 W.

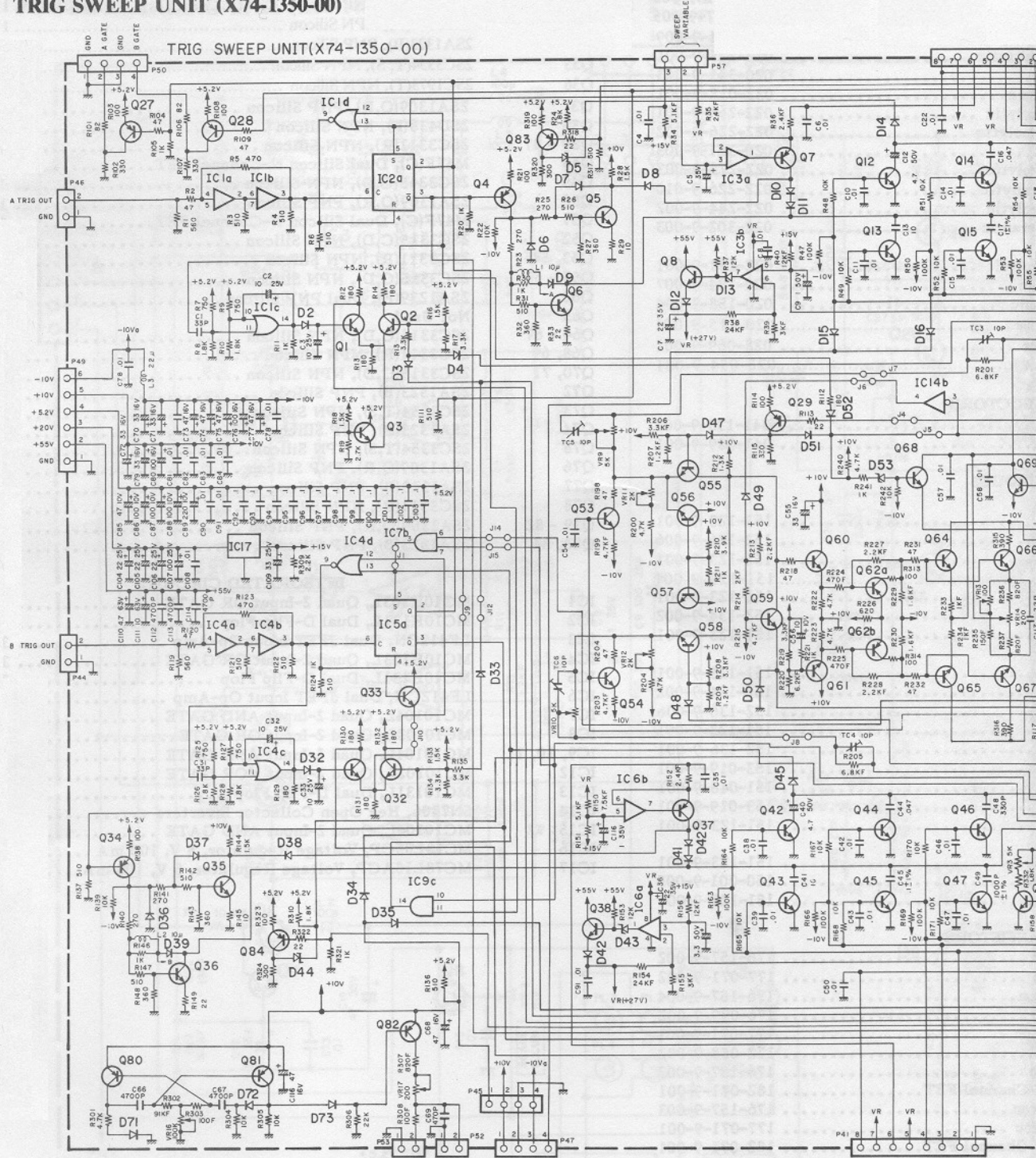
R34	5.1 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-005
R35, 36	2.4 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-022
R38	24 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-030
R39	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R40	12 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-028
R41	1.5 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-501
R43	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R45	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R91	510 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-033
R92, 93	4.7 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-025
R150	7.5 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-7-501
R151	5.1 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-005
R152	2.4 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-022
R154	24 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-030
R155	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R156	12 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-028
R157	1.5 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-501
R159	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R161	3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-013
R199	4.7 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-025
R201	6.8 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-035
R203	4.7 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-025
R205	6.8 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-035
R206	3.3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-032
R207	1.2 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-001
R208	3.3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-032
R209	1.2 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-001
R213	2.2 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-003
R214	2 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-2-001
R215	4.7 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-025
R219	3.3 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-032
R220	6.2 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-034
R224, 225	470 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-016
R227, 228	2.2 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-003
R229, 230	1.6 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-029
R233, 234	1 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-001
R235	150 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-500
R236, 237	820 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-036
R302	91 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-037
R303	100 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-003
R307	820 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-036
R308	100 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-9-000
VR1	5 k Ω Trimpot	008-467-9-013
VR2	2 k Ω Trimpot	008-434-9-011
VR3	5 k Ω Trimpot	008-434-9-013
VR4	2 k Ω Trimpot	008-434-9-011
VR5	200 Ω Trimpot	008-434-9-001
VR6	1 k Ω Trimpot	008-434-9-012
VR7, 8	1 k Ω Trimpot	008-434-9-012
VR9, 10	5 k Ω Trimpot	008-434-9-013
VR11, 12	2 k Ω Trimpot	008-434-9-011
VR13	100 Ω Trimpot	008-434-9-002
VR14	500 Ω Trimpot	008-434-9-003
VR15	10 k Ω Trimpot	008-467-9-008
VR16	100 k Ω Trimpot	008-467-9-006
VR17	200 Ω Trimpot	008-434-9-001

CAPACITORS

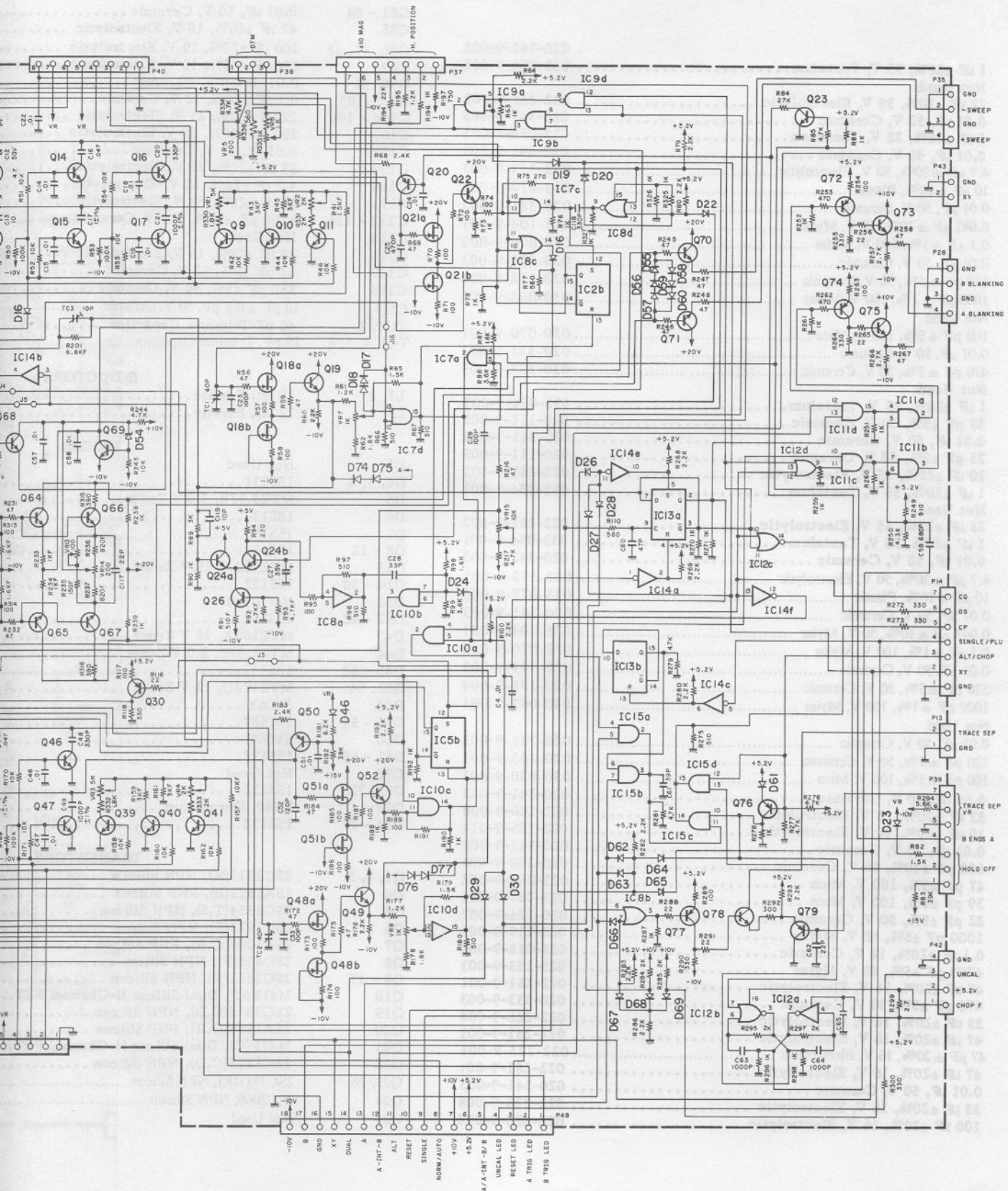
C1	33 pF $\pm 5\%$, 50 V, Ceramic	020-111-9-005
C2, 3	10 μ F $\pm 20\%$, 25 V, Electrolytic	022-281-9-003

SCHEMATIC DIAGRAM

TRIG SWEEP UNIT (X74-1350-00)

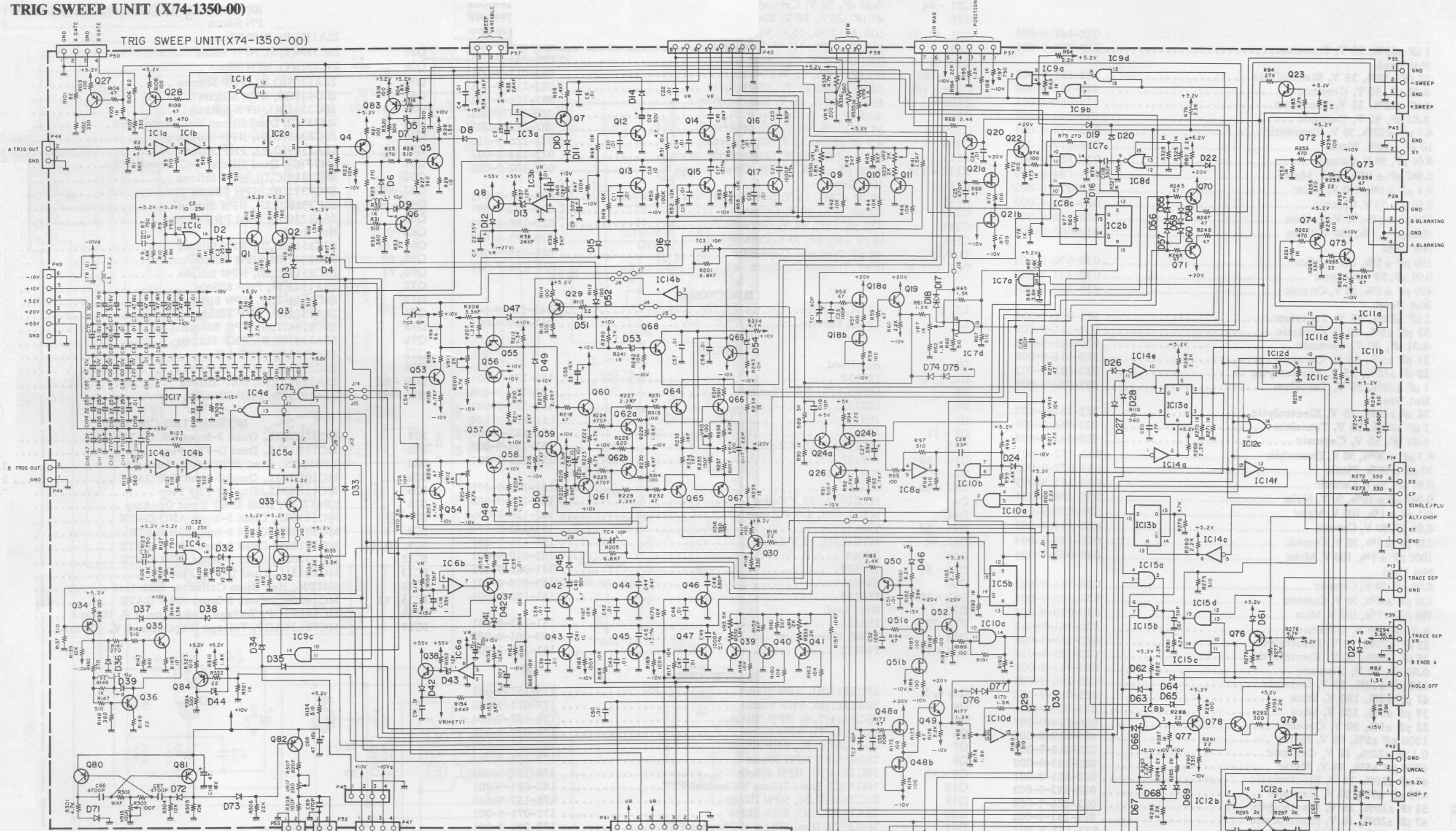


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|--------------------------------------|-----------------|---------------|--------------|----------------------------|-------------|
| Q4, 27-30, 34, 72, 74, 77, 83, 84 | : 2SA1323(B) | IC17 | : MC78L15ACP | D7, 9, 12, 37, 39, 42 | : 1SS132 |
| Q7, 20, 37, 50, 76, 79-82 | : 2SA1309(I, R) | IC3, 6 | : LF412CN | D1-4, 6, 8, 10, 11, 14-22, | |
| Q6, 36 | : 2SC1973(T) | IC12 | : MC10102L | 23-36, 38, 40, 41, | |
| Q9, 22, 49, 52, 55-61, 64-66, 70, 71 | : 2SC3315(C, D) | IC8 | : MC10103L | 45-52 | |
| Q5, 35, 73, 75 | : 2SC3354(T, S) | IC7, 9-11, 15 | : MC1014L | 61-69, 71, 72, 74-77 | |
| Q8, 38 | : 2SD438(F) | IC13 | : MC1013L | D5, 44 | : MTZ-3.0JB |
| Q1-3, 9-17, 23-26, 31-33, 39-47 | : 2SC3311(R) | IC14 | : SN7405N | D70 | : MTZ-10JC |
| 53, 54, 68, 69, 78 | | IC1, 4 | : MC101H03L | D53, 54 | : MTZ-12JC |
| Q18, 21, 48, 51 | : M47F(C) | IC2, 5 | : MC101H13L | D13, 43 | : MTZ-15JC |
| Q62 | : 2SA1239 | | | D55, 60 | : SV06Y |
| Q24 | : 2SC3066 | | | D73 | : IN60 |
| | | | | D56-59 | : IS1587 |



SCHEMATIC DIAGRAM

TRIG SWEEP UNIT (X74-1350-00)



- | | | | |
|---------------------------------------|-----------------|----------------------------|--------------------|
| Q4, 27-30, 34, 72, 74, 77, 83, 84 | : 2SA1323(B) | D7, 9, 12, 37, 39, 42 | : 1SS132 |
| Q7, 20, 37, 50, 76, 79-82 | : 2SAI309(I, R) | D1-4, 6, 8, 10, 11, 14-22, | 23-36, 38, 40, 41, |
| Q6, 36 | : 2SC1973(T) | 45-52 | |
| Q19, 22, 49, 52, 55-61, 64-66, 70, 71 | : 2SC3315(C, D) | 61-69, 71, 72, 74-77 | |
| Q5, 35, 73, 75 | : 2SC3354(T, S) | D5, 44 | : MTZ-3.0JB |
| Q8, 38 | : 2SD438(F) | D70 | : MTZ-10JC |
| Q1-3, 9-17, 23-26, 31-33, 39-47 | : 2SC3311(R) | D53, 54 | : MTZ-12JC |
| 53, 54, 68, 69, 78 | | D13, 43 | : MTZ-15JC |
| Q18, 21, 48, 51 | : M47F(C) | D55, 60 | : SV06Y |
| Q62 | : 2SAI239 | D73 | : IN60 |
| Q24 | : 2SC3066 | D56-59 | : 1S1587 |
| IC17 | : MC78L15ACP | | |
| IC3, 6 | : LF412CN | | |
| IC12 | : MC10102L | | |
| IC8 | : MC10103L | | |
| IC7, 9-11, 15 | : MC1014L | | |
| IC13 | : MC10131L | | |
| IC14 | : SN7405N | | |
| IC1, 4 | : MC10103L | | |
| IC2, 5 | : MC10131L | | |

SCHEMATIC SYMBOL

DESCRIPTION

B & K-PRECISION PART NO.

TRIGGER SWEEP UNIT (continued)

C4	0.01 μ F, 50 V, Ceramic	020-341-9-003
C5	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C6	Not Used	
C7	22 μ F \pm 20%, 35 V, Electrolytic	022-281-9-002
C8	0.01 μ F, 50 V, Ceramic	020-341-9-003
C9	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C10, 11	0.01 μ F, 50 V, Ceramic	020-341-9-003
C12	4.7 μ F \pm 20%, 50 V, Electrolytic	022-353-9-001
C13	10 μ F \pm 10%, Plastic	033-077-9-005
C14, 15	0.01 μ F, 50 V, Ceramic	020-341-9-003
C16	0.047 μ F \pm 10%, 50 V, Mylar	025-104-9-001
C17	0.1 μ F \pm 1%, 100 V, Mylar	030-070-9-002
C18, 19	0.01 μ F, 50 V, Ceramic	020-341-9-003
C20	330 pF \pm 5%, 50 V, Ceramic	020-158-9-004
C21	1000 pF \pm 1%, 100 V, Mylar	030-062-9-001
C22	Not Used	
C23	100 pF \pm 5%, 100 V, Mica	030-070-9-001
C24	0.01 μ F, 50 V, Ceramic	020-341-9-003
C25	470 pF \pm 5%, 50 V, Ceramic	020-233-9-003
C26	Not Used	
C27	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C28, 29	33 pF \pm 5%, 50 V, Ceramic	020-111-9-005
C30	0.01 μ F, 50 V, Ceramic	020-341-9-003
C31	33 pF \pm 5%, 50 V, Ceramic	020-111-9-005
C32, 33	10 μ F \pm 20%, 25 V, Electrolytic	022-281-9-003
C34	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C35	Not Used	
C36	22 μ F \pm 20%, 35 V, Electrolytic	022-281-9-002
C37	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C38, 39	0.01 μ F, 50 V, Ceramic	020-341-9-003
C40	4.7 μ F \pm 20%, 50 V, Electrolytic	022-353-9-001
C41	10 μ F \pm 10%, Plastic	033-077-9-005
C42, 43	0.01 μ F, 50 V, Ceramic	020-341-9-003
C44	0.047 μ F \pm 10%, 50 V, Mylar	025-104-9-001
C45	0.1 μ F \pm 1%, 100 V, Mylar	030-070-9-002
C46, 47	0.01 μ F, 50 V, Ceramic	020-341-9-003
C48	330 pF \pm 5%, 50 V, Ceramic	020-158-9-004
C49	1000 pF \pm 1%, 100 V, Mylar	030-062-9-001
C50	Not Used	
C51	0.01 μ F, 50 V, Ceramic	020-341-9-003
C52	120 pF \pm 5%, 50 V, Ceramic	020-103-9-001
C53	100 pF \pm 5%, 100 V, Mica	030-070-9-001
C54	0.01 μ F, 50 V, Ceramic	020-341-9-003
C55	33 μ F \pm 20%, 16 V, Electrolytic	022-226-9-008
C56	10 μ F \pm 20%, 16 V, Electrolytic	022-226-9-014
C57, 58	0.01 μ F, 50 V, Ceramic	020-341-9-003
C59	680 pF \pm 10%, 50 V, Ceramic	020-200-9-003
C60	47 pF \pm 5%, 100 V, Mica	023-056-9-002
C61	39 pF \pm 5%, 100 V, Mica	023-059-9-001
C62	22 pF \pm 5%, 50 V, Ceramic	020-124-9-007
C63, 64	1000 pF \pm 5%, 50 V, Mylar	025-219-9-001
C65	0.1 μ F \pm 20%, 12 V, Ceramic	033-018-9-001
C66, 67	4700 pF \pm 5%, 50 V, Mylar	025-153-9-003
C68	47 μ F \pm 20%, 16 V, Electrolytic	022-281-9-001
C69	470 pF \pm 5%, 50 V, Ceramic	020-233-9-003
C70, 71, 72	33 μ F \pm 20%, 16 V, Electrolytic	022-226-9-008
C73, 74, 75	47 μ F \pm 20%, 16 V, Electrolytic	022-281-9-001
C76	47 μ F \pm 20%, 16 V, Electrolytic	022-225-9-001
C77	47 μ F \pm 20%, 16 V, Electrolytic	022-281-9-001
C78	0.01 μ F, 50 V, Ceramic	020-341-9-003
C79	33 μ F \pm 20%, 16 V, Electrolytic	022-226-9-008
C80	100 μ F \pm 20%, 16 V, Electrolytic	022-225-9-002

SCHEMATIC SYMBOL

DESCRIPTION

C81 - 84	0.01 μ F, 50 V, Ceramic	.....
C85	47 μ F \pm 20%, 10 V, Electrolytic	.....
C86, 87, 88	100 μ F \pm 20%, 10 V, Electrolytic	.....
C89	220 μ F \pm 20%, 10 V, Electrolytic	.....
C90, 91	0.01 μ F, 50 V, Ceramic	.....
C92 - 103	0.1 μ F \pm 20%, 12 V, Ceramic	.....
C104 - 106	22 μ F \pm 20%, 25 V, Electrolytic	.....
C107	100 μ F \pm 20%, 25 V, Electrolytic	.....
C108	0.01 μ F, 50 V, Ceramic	.....
C109	33 μ F \pm 20%, 25 V, Electrolytic	.....
C110	4.7 μ F \pm 20%, 63 V, Electrolytic	.....
C111	10 μ F \pm 20%, 63 V, Electrolytic	.....
C112 - 114	4700 pF \pm 10%, 500 V, Ceramic	.....
C115	Not Used	
C116	47 μ F \pm 20%, 16 V, Electrolytic	.....
C117	22 pF \pm 5%, 50 V, Ceramic	.....
C118	330 pF \pm 5%, 50 V, Ceramic	.....
C119	10 pF \pm 0.5 pF, 50 V, Ceramic	.....
TC1, 2	40 pF Trimmer Capacitor	.....
TC3, 4, 5, 6	10 pF, Trimmer Capacitor	.....

INDUCTORS

L1, 2	10 μ H, Ferrite	.....
L3	22 μ H, Ferrite	.....

DIODES

D1	Not Used	
D2, 3, 4	1SS132	.....
D5	MTZ3.0JB, 3.0 V Zener	.....
D6	1SS132	.....
D7	1SS132	.....
D8 - 12	1SS132	.....
D13	MTZ16JA, 15 V Zener	.....
D14 - 30	1SS132	.....
D31	Not Used	
D32 - 42	1SS132	.....
D43	MTZ16JA, 15 V Zener	.....
D44	MTZ3.0JB, 3.0 V Zener	.....
D45 - 52	1SS132	.....
D53, 54	MTZ12JC, 12 V Zener	.....
D55	SV06Y	.....
D56 - 59	1S1587	.....
D60	SV06Y	.....
D61 - 69	1SS132	.....
D70	Not Used	
D71, 72	1SS132	.....
D73	1N60, Germanium	.....
D74 - 77	1SS132	.....

TRANSISTORS

Q1, 2, 3	2SC3311(R), NPN Silicon	.....
Q4	2SA1323(B), PNP Silicon	.....
Q5	2SC3354(T,S), NPN Silicon	.....
Q6	2SC1973(T), NPN Silicon	.....
Q7	2SA1309(Q,R), PNP Silicon	.....
Q8	2SD438(F), NPN Silicon	.....
Q9 - 17	2SC3311(R), NPN Silicon	.....
Q18	M47F(C), Dual Silicon N-Channel FET	.....
Q19	2SC3315(C,D), NPN Silicon	.....
Q20	2SA1309(Q,R), PNP Silicon	.....
Q21	M47F(C), Dual Silicon N-Channel FET	.....
Q22	2SC3315(C,D), NPN Silicon	.....
Q23, 26	2SC3311(R), NPN Silicon	.....
Q24	2SC3066, NPN Silicon	.....
Q25	Not Used	

DESCRIPTION	B & K-PRECISION PART NO.	SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.
Capacitor	020-341-9-003	Q27 - 30	2SA1323(B), PNP Silicon	177-071-9-002
Electrolytic	022-267-9-005	Q31 - 33	2SC3311(R), NPN Silicon	176-157-9-002
Electrolytic	022-264-9-009	Q34	2SA1323(B), PNP Silicon	177-071-9-002
Electrolytic	022-225-9-001	Q35	2SC3354(T, S), NPN Silicon	176-157-9-004
Capacitor	020-341-9-003	Q36	2SC1973(T), NPN Silicon	176-099-9-002
Ceramic	033-018-9-001	Q37	2SA1309(Q,R), PNP Silicon	177-071-9-001
Electrolytic	022-264-9-001	Q38	2SD438(F), NPN Silicon	172-058-9-002
Electrolytic	022-226-9-002	Q39 - 47	2SC3311(R), NPN Silicon	176-157-9-002
Capacitor	020-341-9-003	Q48	M47F(C), Dual Silicon N-Channel FET	182-071-9-001
Electrolytic	022-276-9-003	Q49	2SC3315(C,D), NPN Silicon	176-157-9-003
Electrolytic	022-226-9-010	Q50	2SA1309(Q,R), PNP Silicon	177-071-9-001
Electrolytic	022-244-9-002	Q51	M47F(C), Dual Silicon N-Channel FET	182-071-9-001
Ceramic	020-302-9-003	Q52	2SC3315(C,D), NPN Silicon	176-157-9-003
Electrolytic	022-281-9-001	Q53, 54	2SC3311(R), NPN Silicon	176-157-9-002
Ceramic	020-124-9-007	Q55 - 61	2SC3315(C,D), NPN Silicon	176-157-9-003
Ceramic	020-158-9-004	Q62	2SA1239(F), Dual PNP Silicon	177-068-9-001
Ceramic	020-215-9-001	Q63	Not Used	
Resistor	028-069-9-001	Q64 - 67	2SC3315(C,D), NPN Silicon	176-157-9-003
Resistor	028-054-9-001	Q68, 69	2SC3311(R), NPN Silicon	176-157-9-002
		Q70, 71	2SC3315(C,D), NPN Silicon	176-157-9-003
		Q72	2SA1323(B), PNP Silicon	177-071-9-002
		Q73	2SC3354(T,S), NPN Silicon	176-157-9-004
		Q74	2SA1323(B), PNP Silicon	177-071-9-002
		Q75	2SC3354(T,S), NPN Silicon	176-157-9-004
		Q76	2SA1309(Q,R), PNP Silicon	177-071-9-001
		Q77	2SA1323(B), PNP Silicon	177-071-9-002
		Q78	2SC3311(R), NPN Silicon	176-157-9-002
		Q79 - 82	2SA1309(Q,R), PNP Silicon	177-071-9-001
		Q83, 84	2SA1323(B), PNP Silicon	177-071-9-002
INTEGRATED CIRCUITS				
		IC1	MC10H103L, Quad 2-Input OR GATE	307-355-9-007
		IC2	MC10H131L, Dual D-Flip Flop	307-355-9-008
		IC3	LF412CN, Dual JFET Input Op-Amp	307-355-9-006
		IC4	MC10H103L, Quad 2-Input OR GATE	307-355-9-007
		IC5	MC10H131L, Dual D-Flip Flop	307-355-9-008
		IC6	LF412CN, Dual JFET Input Op-Amp	307-355-9-006
		IC7	MC10104L, Quad 2-Input AND GATE	307-309-9-004
		IC8	MC10103L, Quad 2-Input OR GATE	307-309-9-003
		IC9, 10, 11	MC10104L, Quad 2-Input AND GATE	307-309-9-004
		IC12	MC10102L, Quad 2-Input NOR GATE	307-301-9-001
		IC13	MC10131L, Dual D-Flip Flop	307-309-9-005
		IC14	SN7406, Hex Open Collector Inverters	307-355-9-011
		IC15	MC10104L, Quad 2-Input AND GATE	307-309-9-004
		IC16	MC78L05CP, Voltage Regulator, 5 V, 100 mA	307-355-9-009
		IC17	MC78L15ACP, Voltage Regulator, 5 V, 100 mA	307-355-9-010
TRANSISTORS				
Capacitor	176-157-9-002			
Capacitor	177-071-9-002			
Capacitor	176-157-9-004			
Capacitor	176-099-9-002			
Capacitor	177-071-9-001			
Capacitor	172-058-9-002			
Capacitor	176-157-9-002			
N-Channel FET	182-071-9-001			
Capacitor	176-157-9-003			
Capacitor	177-071-9-001			
N-Channel FET	182-071-9-001			
Capacitor	176-157-9-003			
Capacitor	176-157-9-002			
Capacitor	176-157-9-008			

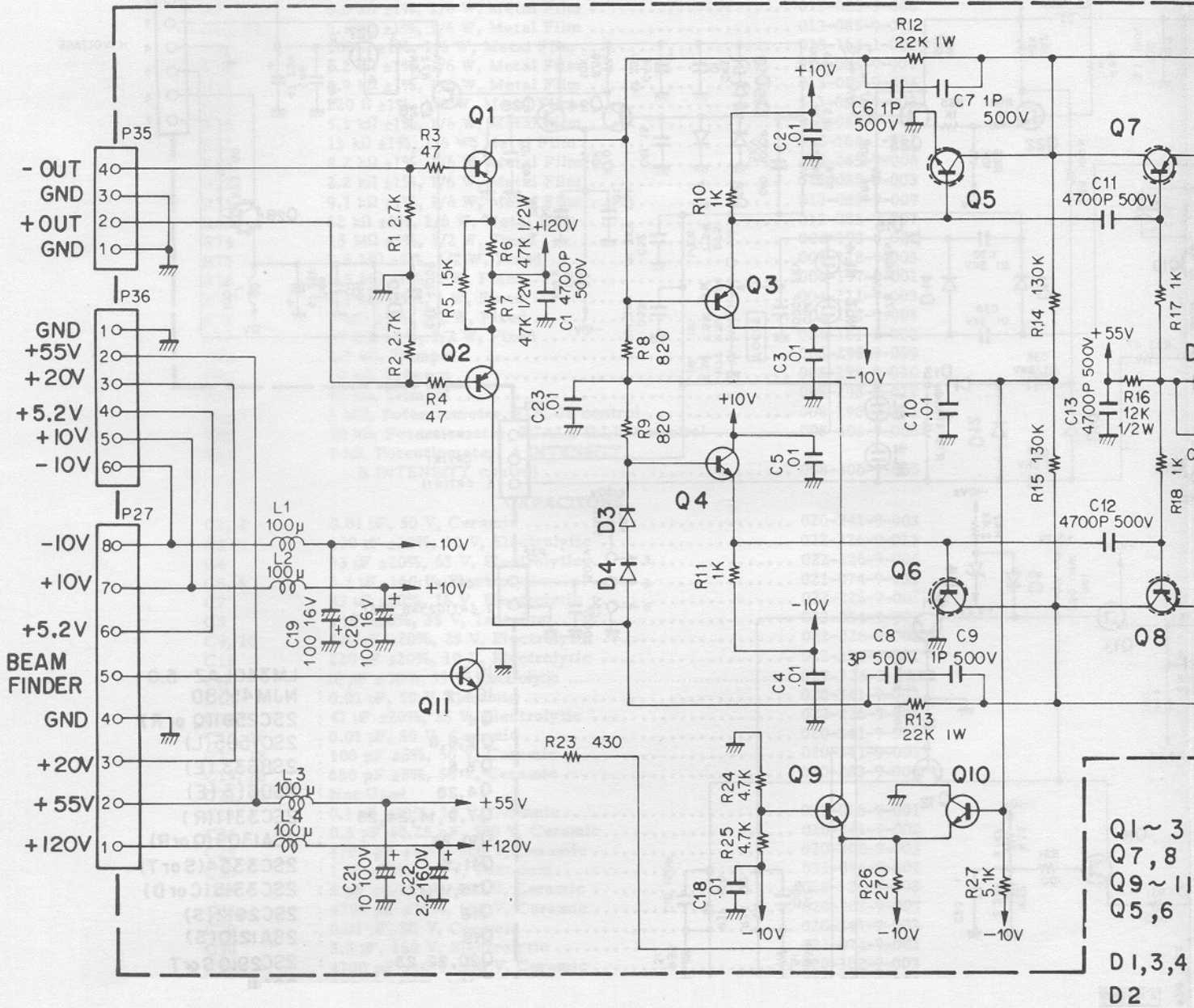
SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.
TRIGGER SWEEP UNIT (continued)		
C4	0.01 μ F, 50 V, Ceramic	020-341-9-003
C5	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C6	Not Used	
C7	22 μ F \pm 20%, 35 V, Electrolytic	022-281-9-002
C8	0.01 μ F, 50 V, Ceramic	020-341-9-003
C9	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C10, 11	0.01 μ F, 50 V, Ceramic	020-341-9-003
C12	4.7 μ F \pm 20%, 50 V, Electrolytic	022-353-9-001
C13	10 μ F \pm 10%, Plastic	033-077-9-005
C14, 15	0.01 μ F, 50 V, Ceramic	020-341-9-003
C16	0.047 μ F \pm 10%, 50 V, Mylar	025-104-9-001
C17	0.1 μ F \pm 1%, 100 V, Mylar	030-070-9-002
C18, 19	0.01 μ F, 50 V, Ceramic	020-341-9-003
C20	330 pF \pm 5%, 50 V, Ceramic	020-158-9-004
C21	1000 pF \pm 1%, 100 V, Mylar	030-062-9-001
C22	Not Used	
C23	100 pF \pm 5%, 100 V, Mica	030-070-9-001
C24	0.01 μ F, 50 V, Ceramic	020-341-9-003
C25	470 pF \pm 5%, 50 V, Ceramic	020-233-9-003
C26	Not Used	
C27	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C28, 29	33 pF \pm 5%, 50 V, Ceramic	020-111-9-005
C30	0.01 μ F, 50 V, Ceramic	020-341-9-003
C31	33 pF \pm 5%, 50 V, Ceramic	020-111-9-005
C32, 33	10 μ F \pm 20%, 25 V, Electrolytic	022-281-9-003
C34	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C35	Not Used	
C36	22 μ F \pm 20%, 35 V, Electrolytic	022-281-9-002
C37	1 μ F \pm 20%, 35 V, Tantalum	033-054-9-001
C38, 39	0.01 μ F, 50 V, Ceramic	020-341-9-003
C40	4.7 μ F \pm 20%, 50 V, Electrolytic	022-353-9-001
C41	10 μ F \pm 10%, Plastic	033-077-9-005
C42, 43	0.01 μ F, 50 V, Ceramic	020-341-9-003
C44	0.047 μ F \pm 10%, 50 V, Mylar	025-104-9-001
C45	0.1 μ F \pm 1%, 100 V, Mylar	030-070-9-002
C46, 47	0.01 μ F, 50 V, Ceramic	020-341-9-003
C48	330 pF \pm 5%, 50 V, Ceramic	020-158-9-004
C49	1000 pF \pm 1%, 100 V, Mylar	030-062-9-001
C50	Not Used	
C51	0.01 μ F, 50 V, Ceramic	020-341-9-003
C52	120 pF \pm 5%, 50 V, Ceramic	020-103-9-001
C53	100 pF \pm 5%, 100 V, Mica	030-070-9-001
C54	0.01 μ F, 50 V, Ceramic	020-341-9-003
C55	33 μ F \pm 20%, 16 V, Electrolytic	022-226-9-008
C56	10 μ F \pm 20%, 16 V, Electrolytic	022-226-9-014
C57, 58	0.01 μ F, 50 V, Ceramic	020-341-9-003
C59	680 pF \pm 10%, 50 V, Ceramic	020-200-9-003
C60	47 pF \pm 5%, 100 V, Mica	023-056-9-002
C61	39 pF \pm 5%, 100 V, Mica	023-059-9-001
C62	22 pF \pm 5%, 50 V, Ceramic	020-124-9-007
C63, 64	1000 pF \pm 5%, 50 V, Mylar	025-219-9-001
C65	0.1 μ F \pm 20%, 12 V, Ceramic	033-018-9-001
C66, 67	4700 pF \pm 5%, 50 V, Mylar	025-153-9-003
C68	47 μ F \pm 20%, 16 V, Electrolytic	022-281-9-001
C69	470 pF \pm 5%, 50 V, Ceramic	020-233-9-003
C70, 71, 72	33 μ F \pm 20%, 16 V, Electrolytic	022-226-9-008
C73, 74, 75	47 μ F \pm 20%, 16 V, Electrolytic	022-281-9-001
C76	47 μ F \pm 20%, 16 V, Electrolytic	022-225-9-001
C77	47 μ F \pm 20%, 16 V, Electrolytic	022-281-9-001
C78	0.01 μ F, 50 V, Ceramic	020-341-9-003
C79	33 μ F \pm 20%, 16 V, Electrolytic	022-226-9-008
C80	100 μ F \pm 20%, 16 V, Electrolytic	022-225-9-002

SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.
C81 - 84	0.01 μ F, 50 V, Ceramic	020-341-9-003
C85	47 μ F \pm 20%, 10 V, Electrolytic	022-267-9-005
C86, 87, 88	100 μ F \pm 20%, 10 V, Electrolytic	022-264-9-009
C89	220 μ F \pm 20%, 10 V, Electrolytic	022-225-9-001
C90, 91	0.01 μ F, 50 V, Ceramic	020-341-9-003
C92 - 103	0.1 μ F \pm 20%, 12 V, Ceramic	033-018-9-001
C104 - 106	22 μ F \pm 20%, 25 V, Electrolytic	022-264-9-001
C107	100 μ F \pm 20%, 25 V, Electrolytic	022-226-9-002
C108	0.01 μ F, 50 V, Ceramic	020-341-9-003
C109	33 μ F \pm 20%, 25 V, Electrolytic	022-276-9-003
C110	4.7 μ F \pm 20%, 63 V, Electrolytic	022-226-9-010
C111	10 μ F \pm 20%, 63 V, Electrolytic	022-244-9-002
C112 - 114	4700 pF \pm 10%, 500 V, Ceramic	020-302-9-003
C115	Not Used	
C116	47 μ F \pm 20%, 16 V, Electrolytic	022-281-9-001
C117	22 pF \pm 5%, 50 V, Ceramic	020-124-9-007
C118	330 pF \pm 5%, 50 V, Ceramic	020-158-9-004
C119	10 pF \pm 0.5 pF, 50 V, Ceramic	020-215-9-001
TC1, 2	40 pF Trimmer Capacitor	028-069-9-001
TC3, 4, 5, 6	10 pF, Trimmer Capacitor	028-054-9-001
INDUCTORS		
L1, 2	10 μ H, Ferrite	041-133-9-003
L3	22 μ H, Ferrite	041-089-9-001
DIODES		
D1	Not Used	
D2, 3, 4	1SS132	151-123-9-001
D5	MTZ3.0JB, 3.0 V Zener	152-136-9-006
D6	1SS132	151-123-9-001
D7	1SS132	151-123-9-001
D8 - 12	1SS132	151-123-9-001
D13	MTZ16JA, 15 V Zener	152-134-9-002
D14 - 30	1SS132	151-123-9-001
D31	Not Used	
D32 - 42	1SS132	151-123-9-001
D43	MTZ16JA, 15 V Zener	152-134-9-002
D44	MTZ3.0JB, 3.0 V Zener	152-136-9-006
D45 - 52	1SS132	151-123-9-001
D53, 54	MTZ12JC, 12 V Zener	152-136-9-001
D55	SV06Y	153-019-9-001
D56 - 59	1S1587	151-048-9-001
D60	SV06Y	153-019-9-001
D61 - 69	1SS132	151-123-9-001
D70	Not Used	
D71, 72	1SS132	151-123-9-001
D73	1N60, Germanium	150-001-9-005
D74 - 77	1SS132	151-123-9-001
TRANSISTORS		
Q1, 2, 3	2SC3311(R), NPN Silicon	176-157-9-002
Q4	2SA1323(B), PNP Silicon	177-071-9-002
Q5	2SC3354(T,S), NPN Silicon	176-157-9-004
Q6	2SC1973(T), NPN Silicon	176-099-9-002
Q7	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q8	2SD438(F), NPN Silicon	172-058-9-002
Q9 - 17	2SC3311(R), NPN Silicon	176-157-9-002
Q18	M47F(C), Dual Silicon N-Channel FET	182-071-9-001
Q19	2SC3315(C,D), NPN Silicon	176-157-9-003
Q20	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q21	M47F(C), Dual Silicon N-Channel FET	182-071-9-001
Q22	2SC3315(C,D), NPN Silicon	176-157-9-003
Q23, 26	2SC3311(R), NPN Silicon	176-157-9-002
Q24	2SC3066, NPN Silicon	176-157-9-008
Q25	Not Used	

SCHEMATIC SYMBOL	DESCRIPTION	B & K-PRECISION PART NO.
Q27 - 30	2SA1323(B), PNP Silicon	177-071-9-002
Q31 - 33	2SC3311(R), NPN Silicon	176-157-9-002
Q34	2SA1323(B), PNP Silicon	177-071-9-002
Q35	2SC3354(T, S), NPN Silicon	176-157-9-004
Q36	2SC1973(T), NPN Silicon	176-099-9-002
Q37	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q38	2SD438(F), NPN Silicon	172-058-9-002
Q39 - 47	2SC3311(R), NPN Silicon	176-157-9-002
Q48	M47F(C), Dual Silicon N-Channel FET	182-071-9-001
Q49	2SC3315(C,D), NPN Silicon	176-157-9-003
Q50	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q51	M47F(C), Dual Silicon N-Channel FET	182-071-9-001
Q52	2SC3315(C,D), NPN Silicon	176-157-9-003
Q53, 54	2SC3311(R), NPN Silicon	176-157-9-002
Q55 - 61	2SC3315(C,D), NPN Silicon	176-157-9-003
Q62	2SA1239(F), Dual PNP Silicon	177-068-9-001
Q63	Not Used	
Q64 - 67	2SC3315(C,D), NPN Silicon	176-157-9-003
Q68, 69	2SC3311(R), NPN Silicon	176-157-9-002
Q70, 71	2SC3315(C,D), NPN Silicon	176-157-9-003
Q72	2SA1323(B), PNP Silicon	177-071-9-002
Q73	2SC3354(T,S), NPN Silicon	176-157-9-004
Q74	2SA1323(B), PNP Silicon	177-071-9-002
Q75	2SC3354(T,S), NPN Silicon	176-157-9-004
Q76	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q77	2SA1323(B), PNP Silicon	177-071-9-002
Q78	2SC3311(R), NPN Silicon	176-157-9-002
Q79 - 82	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q83, 84	2SA1323(B), PNP Silicon	177-071-9-002
INTEGRATED CIRCUITS		
IC1	MC10H103L, Quad 2-Input OR GATE	307-355-9-007
IC2	MC10H131L, Dual D-Flip Flop	307-355-9-008
IC3	LF412CN, Dual JFET Input Op-Amp	307-355-9-006
IC4	MC10H103L, Quad 2-Input OR GATE	307-355-9-007
IC5	MC10H131L, Dual D-Flip Flop	307-355-9-008
IC6	LF412CN, Dual JFET Input Op-Amp	307-355-9-006
IC7	MC10104L, Quad 2-Input AND GATE	307-309-9-004
IC8	MC10103L, Quad 2-Input OR GATE	307-309-9-003
IC9, 10, 11	MC10104L, Quad 2-Input AND GATE	307-309-9-004
IC12	MC10102L, Quad 2-Input NOR GATE	307-301-9-001
IC13	MC10131L, Dual D-Flip Flop	307-309-9-005
IC14	SN7406, Hex Open Collector Inverters	307-355-9-011
IC15	MC10104L, Quad 2-Input AND GATE	307-309-9-004
IC16	MC78L05CP, Voltage Regulator, 5 V, 100 mA	307-355-9-009
IC17	MC78L15ACP, Voltage Regulator, 5 V, 100 mA	307-355-9-010

SCHEMATIC DIAGRAM

HORIZONTAL OUTPUT AMP UNIT (X74-1360-00)



SCHEMATIC SYMBOL

DESCRIPTION

B & K-PRECISION PART NO.

**HORIZONTAL OUTPUT AMP UNIT
(X74-1360-00)**

RESISTORS

See schematic diagram for value. Unlisted resistors are ±5%, 1/6 W.

R6, 7	47 kΩ ±5%, 1/2 W, Carbon Film.....	002-102-5-473
R12, 13	22 kΩ ±5%, 1 W, Metal Film.....	011-001-5-223
R16	12 kΩ ±5%, 1/2 W, Carbon Film.....	002-102-5-123

CAPACITORS

C1	4700 pF ± 10%, 500 V, Ceramic	020-302-9-003
C2 - 5	0.01 μF, 50 V, Ceramic	020-341-9-003
C6, 7	1 pF ± 0.25 pF, 500 V, Ceramic.....	020-326-9-002
C8	3 pF ±0.25 pF, 500 V, Ceramic	020-326-9-008
C9	1 pF ±0.25 pF, 500 V, Ceramic	020-326-9-002
C10	0.01 μF, 50 V, Ceramic	020-341-9-003
C11, 12, 13	4700 pF ± 10%, 500 V, Ceramic	020-302-9-003
C14	1 μF ±20%, 35 V, Tantalum.....	033-054-9-001
C15	0.01 μF, 50 V, Ceramic	020-341-9-003
C16	1 μF ±20%, 35 V, Tantalum.....	033-054-9-001
C17	4700 pF ± 10%, 500 V, Ceramic	020-302-9-003
C18	0.01 μF, 50 V, Ceramic	020-341-9-003
C19, 20	100 μF ± 20%, 16 V, Electrolytic.....	022-222-9-014
C21	10 μF ± 20%, 100 V, Electrolytic.....	021-069-9-002
C22	2.2 μF, 160 V, Electrolytic	021-077-9-001
C23	0.01 μF, 50 V, Ceramic	020-341-9-003
C24	Not Used	
C25	Not Used	

INDUCTORS

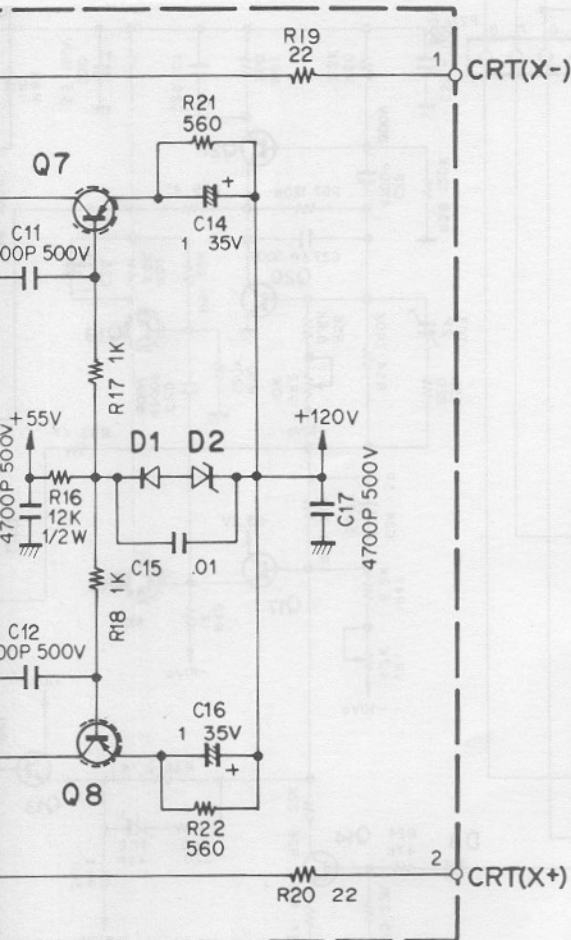
L1 - 4	100 μH, Ferrite.....	041-133-9-004
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DIODES

D1	1SS132, Silicon.....	151-123-9-001
D2	MTZ5.1JB, 5 V Zener	152-134-9-003
D3, 4	1SS132, Silicon.....	151-123-9-001

TRANSISTORS

Q1 - 3	2SA1323(B), PNP Silicon	177-071-9-002
Q4	2SC3311(R), NPN Silicon	176-157-9-002
Q5, 6	2SC2912(S), NPN Silicon	176-066-9-002
Q7, 8	2SA1210(S), PNP Silicon.....	177-014-9-002
Q9, 10, 11	2SC3311(R), NPN Silicon	176-157-9-002



- Q1 ~ 3 : 2SA1323(B)
- Q7, 8 : 2SA1210(S)
- Q9 ~ 11, 4 : 2SC3311(R)
- Q5, 6 : 2SC2912(S)
- D1, 3, 4 : 1SS132
- D2 : MTZ 5.1JB

SCHEMATIC DIAGRAM

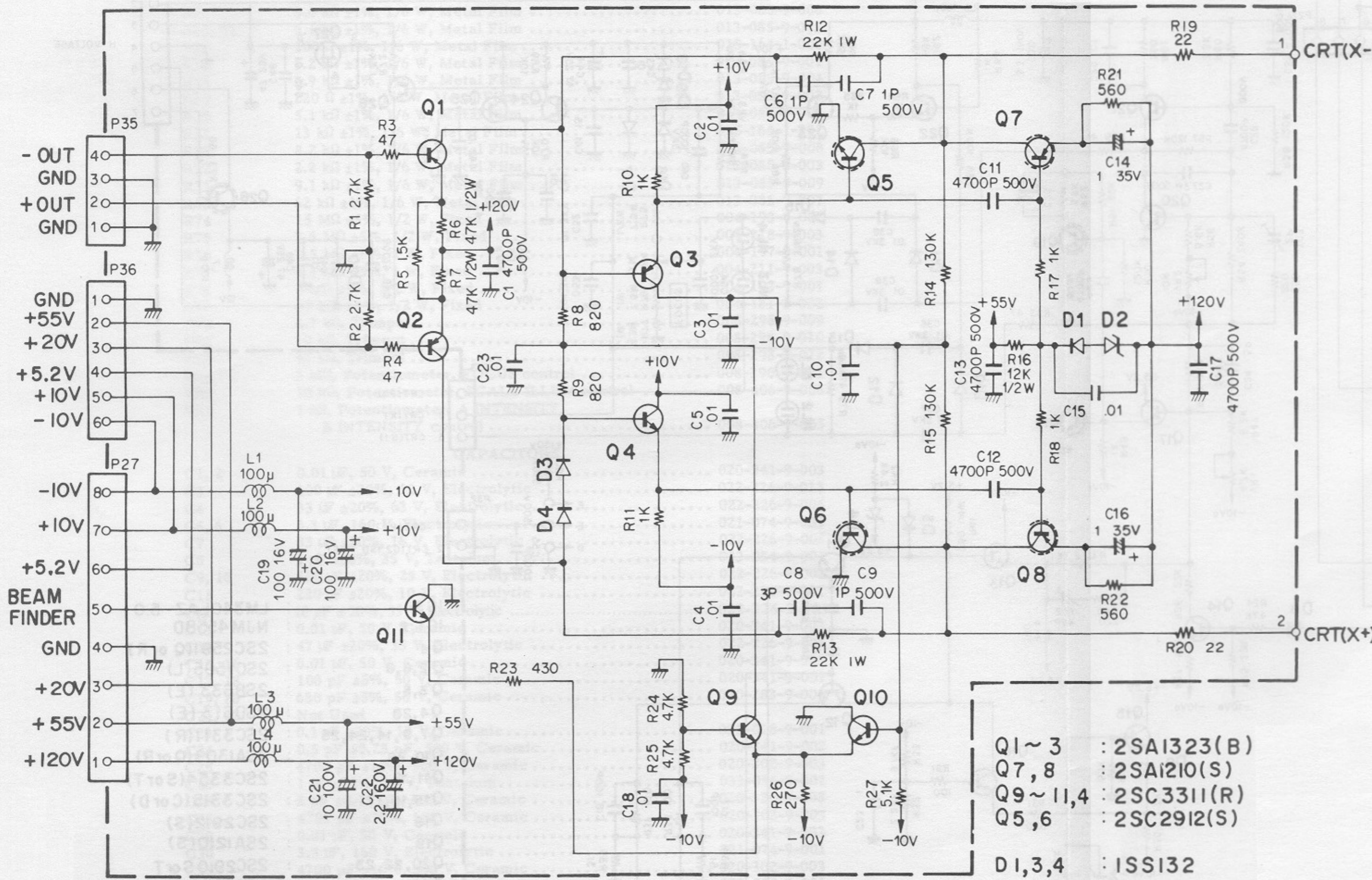
HORIZONTAL OUTPUT AMP UNIT (X74-1360-00)

SCHEMATIC SYMBOL

DESCRIPTION

B & K-PRECISION PART NO.

HORIZONTAL OUTPUT AMP UNIT (X74-1360-00)



- Q1 ~ 3 : 2SA1323(B)
- Q7, 8 : 2SA1210(S)
- Q9 ~ 11, 4 : 2SC3311(R)
- Q5, 6 : 2SC2912(S)
- D1, 3, 4 : 1SS132
- D2 : MTZ 5.1JB

RESISTORS
See schematic diagram for value. Unlisted resistors are $\pm 5\%$, 1/6 W.

RESISTOR	DESCRIPTION	PART NO.
R6, 7	47 k Ω $\pm 5\%$, 1/2 W, Carbon Film	002-102-5-473
R12, 13	22 k Ω $\pm 5\%$, 1 W, Metal Film	011-001-5-223
R16	12 k Ω $\pm 5\%$, 1/2 W, Carbon Film	002-102-5-123

CAPACITOR	DESCRIPTION	PART NO.
C1	4700 pF $\pm 10\%$, 500 V, Ceramic	020-302-9-003
C2 - 5	0.01 μ F, 50 V, Ceramic	020-341-9-003
C6, 7	1 pF ± 0.25 pF, 500 V, Ceramic	020-326-9-002
C8	3 pF ± 0.25 pF, 500 V, Ceramic	020-326-9-008
C9	1 pF ± 0.25 pF, 500 V, Ceramic	020-326-9-002
C10	0.01 μ F, 50 V, Ceramic	020-341-9-003
C11, 12, 13	4700 pF $\pm 10\%$, 500 V, Ceramic	020-302-9-003
C14	1 μ F $\pm 20\%$, 35 V, Tantalum	033-054-9-001
C15	0.01 μ F, 50 V, Ceramic	020-341-9-003
C16	1 μ F $\pm 20\%$, 35 V, Tantalum	033-054-9-001
C17	4700 pF $\pm 10\%$, 500 V, Ceramic	020-302-9-003
C18	0.01 μ F, 50 V, Ceramic	020-341-9-003
C19, 20	100 μ F $\pm 20\%$, 16 V, Electrolytic	022-222-9-014
C21	10 μ F $\pm 20\%$, 100 V, Electrolytic	021-069-9-002
C22	2.2 μ F, 160 V, Electrolytic	021-077-9-001
C23	0.01 μ F, 50 V, Ceramic	020-341-9-003
C24	Not Used	
C25	Not Used	

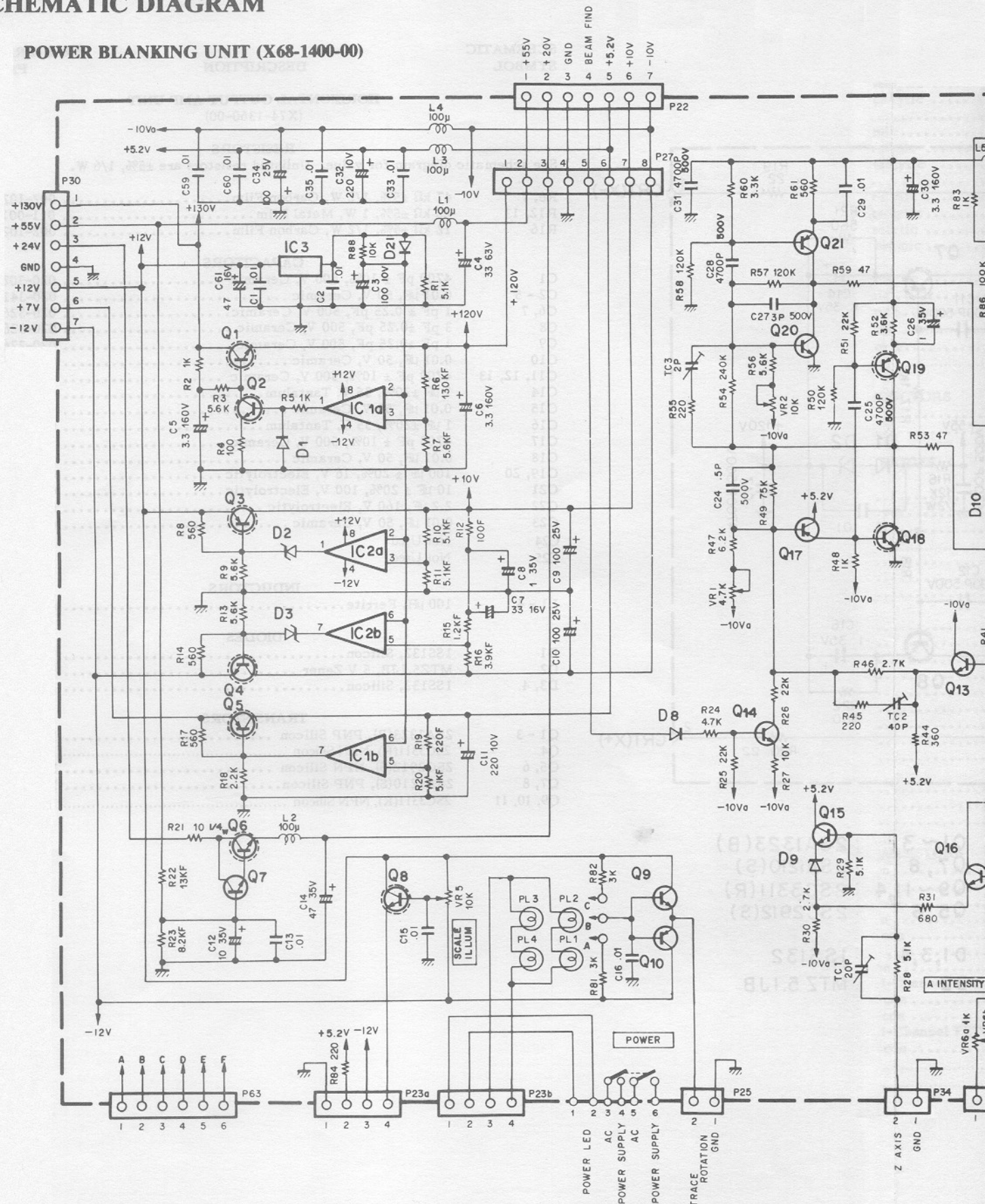
INDUCTOR	DESCRIPTION	PART NO.
L1 - 4	100 μ H, Ferrite	041-133-9-004

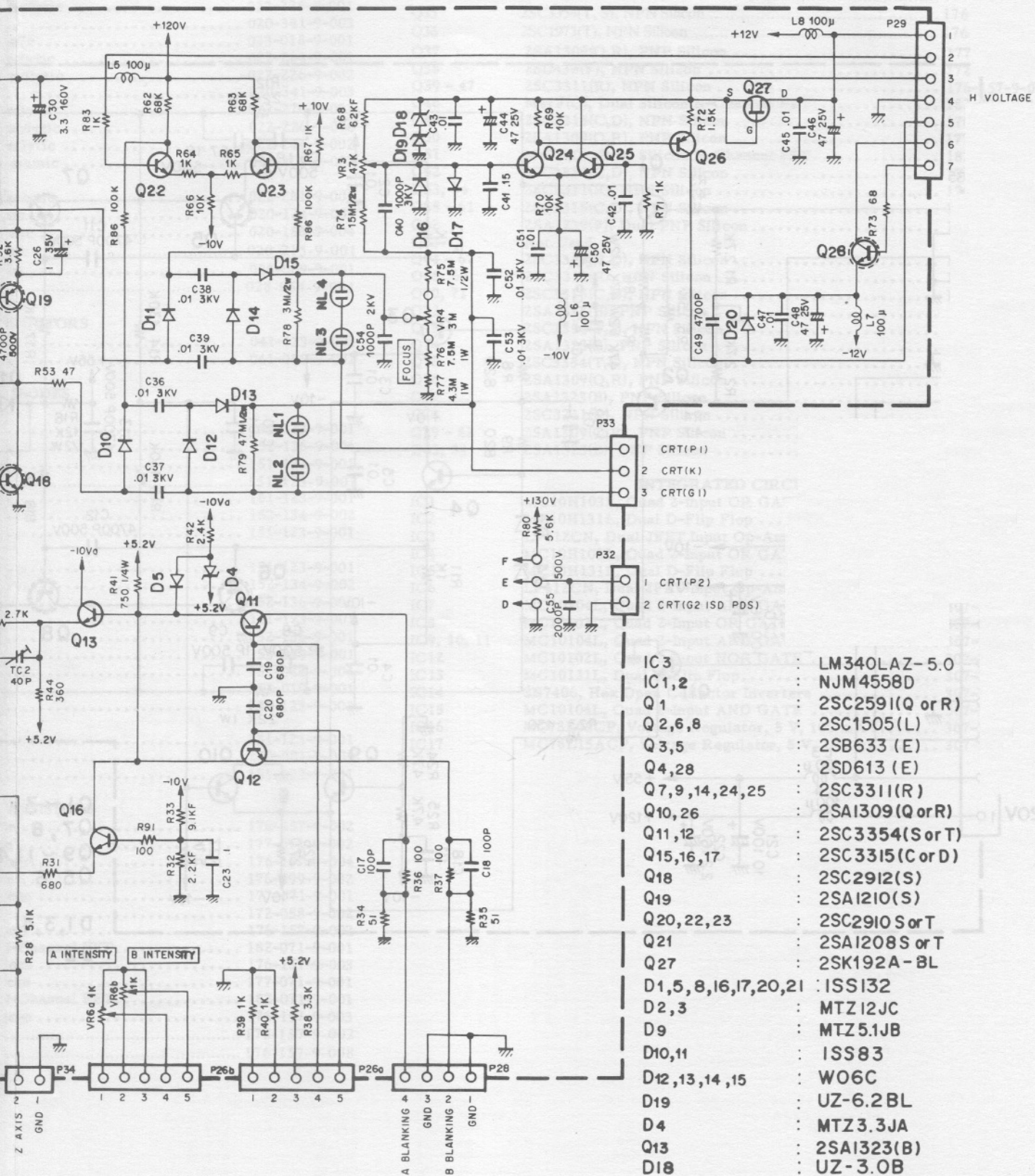
DIODES	DESCRIPTION	PART NO.
D1	1SS132, Silicon	151-123-9-001
D2	MTZ5.1JB, 5 V Zener	152-134-9-003
D3, 4	1SS132, Silicon	151-123-9-001

TRANSISTORS	DESCRIPTION	PART NO.
Q1 - 3	2SA1323(B), PNP Silicon	177-071-9-002
Q4	2SC3311(R), NPN Silicon	176-157-9-002
Q5, 6	2SC2912(S), NPN Silicon	176-066-9-002
Q7, 8	2SA1210(S), PNP Silicon	177-014-9-002
Q9, 10, 11	2SC3311(R), NPN Silicon	176-157-9-002

SCHEMATIC DIAGRAM

POWER BLANKING UNIT (X68-1400-00)

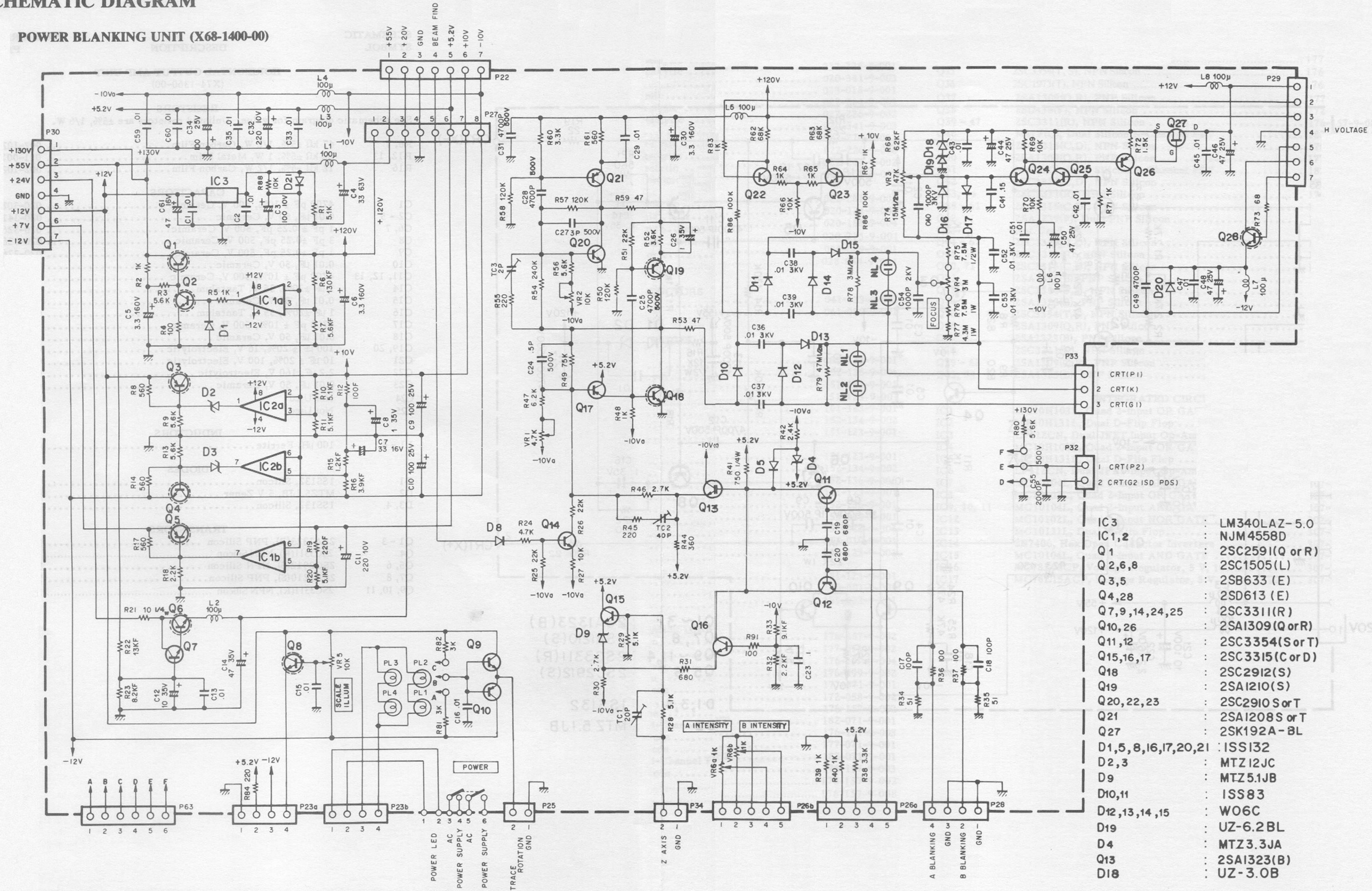




- IC 3 : LM340LAZ-5.0
- IC 1,2 : NJM 4558D
- Q 1 : 2SC2591(Q or R)
- Q 2,6,8 : 2SC1505(L)
- Q 3,5 : 2SB633 (E)
- Q 4,28 : 2SD613 (E)
- Q 7,9,14,24,25 : 2SC3311(R)
- Q 10,26 : 2SA1309(Q or R)
- Q 11,12 : 2SC3354(S or T)
- Q 15,16,17 : 2SC3315(C or D)
- Q 18 : 2SC2912(S)
- Q 19 : 2SA1210(S)
- Q 20,22,23 : 2SC2910 S or T
- Q 21 : 2SA1208 S or T
- Q 27 : 2SK192A - BL
- D 1,5,8,16,17,20,21 : ISS132
- D 2,3 : MTZ12JC
- D 9 : MTZ5.1JB
- D 10,11 : ISS83
- D 12,13,14,15 : WO6C
- D 19 : UZ-6.2BL
- D 4 : MTZ3.3JA
- Q 13 : 2SA1323(B)
- D 18 : UZ-3.0B

SCHEMATIC DIAGRAM

POWER BLANKING UNIT (X68-1400-00)



**POWER BLANKING UNIT
(X68-1400-00)**

RESISTORS

See schematic diagram for value. Unlisted resistors are $\pm 5\%$, 1/6 or 1/4 W.

R6	130 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-303
R7	5.6 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-006
R10, 11	5.1 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-005
R12	100 Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-000
R15	1.2 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-001
R16	3.9 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-004
R19	220 Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-002
R20	5.1 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-005
R22	13 k Ω $\pm 1\%$, 1/6 W, Metal Film	015-164-1-302
R23	8.2 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-008
R32	2.2 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-003
R33	9.1 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-009
R68	62 k Ω $\pm 1\%$, 1/6 W, Metal Film	013-085-9-007
R74	15 M Ω $\pm 5\%$, 1/2 W, Fixed	004-193-9-002
R75	7.5 M Ω $\pm 5\%$, 1/2 W, Fixed	004-218-9-003
R76	7.5 M Ω $\pm 5\%$, 1 W, Fixed	004-197-9-001
R77	4.3 M Ω $\pm 5\%$, 1 W, Fixed	004-211-9-003
R78	3 M Ω $\pm 5\%$, 1/2 W, Fixed	004-193-9-001
R79	47 M Ω $\pm 5\%$, 1/2 W, Fixed	004-181-9-002
VR1	4.7 k Ω , Trimpot	008-298-9-009
VR2	10 k Ω , Trimpot	008-298-9-010
VR3	47 k Ω , Trimpot	008-298-9-012
VR4	3 M Ω , Potentiometer, FOCUS control	008-390-9-001
VR5	10 k Ω , Potentiometer, SCALE ILLUM control	008-406-9-006
VR6	1 k Ω , Potentiometer, A INTENSITY, B INTENSITY control	008-406-9-005

CAPACITORS

C1, 2	0.01 μ F, 50 V, Ceramic	020-341-9-003
C3	100 μ F $\pm 20\%$, 10 V, Electrolytic	022-226-9-013
C4	33 μ F $\pm 20\%$, 63 V, Electrolytic	022-226-9-005
C5, 6	3.3 μ F, 160 V, Electrolytic	021-074-9-001
C7	33 μ F $\pm 20\%$, 16 V, Electrolytic	022-226-9-008
C8	1 μ F $\pm 20\%$, 35 V, Tantalum	033-054-9-001
C9, 10	100 μ F $\pm 20\%$, 25 V, Electrolytic	022-226-9-002
C11	220 μ F $\pm 20\%$, 10 V, Electrolytic	022-225-9-001
C12	10 μ F $\pm 20\%$, 35 V, Electrolytic	022-226-9-003
C13	0.01 μ F, 50 V, Ceramic	020-341-9-003
C14	47 μ F $\pm 20\%$, 35 V, Electrolytic	022-226-9-004
C15, 16	0.01 μ F, 50 V, Ceramic	020-341-9-003
C17, 18	100 pF $\pm 5\%$, 50 V, Ceramic	020-341-9-001
C19, 20	680 pF $\pm 5\%$, 50 V, Ceramic	020-283-9-004
C21, 22	Not Used	
C23	0.1 μ F $\pm 20\%$, 12 V, Ceramic	033-018-9-001
C24	0.5 pF ± 0.25 pF, 500 V, Ceramic	020-341-9-002
C25	4700 pF $\pm 10\%$, 500 V, Ceramic	020-302-9-003
C26	1 μ F $\pm 20\%$, 35 V, Tantalum	033-054-9-001
C27	3 pF ± 0.25 pF, 500 V, Ceramic	020-326-9-008
C28	4700 pF $\pm 10\%$, 500 V, Ceramic	020-302-9-003
C29	0.01 μ F, 50 V, Ceramic	020-341-9-003
C30	3.3 μ F, 160 V, Electrolytic	021-074-9-001
C31	4700 pF $\pm 10\%$, 500 V, Ceramic	020-302-9-003
C32	220 μ F $\pm 20\%$, 10 V, Electrolytic	022-225-9-001
C33	0.01 μ F, 50 V, Ceramic	020-341-9-003
C34	100 μ F $\pm 20\%$, 25 V, Electrolytic	022-226-9-002
C35	0.01 μ F, 50 V, Ceramic	020-341-9-003
C36 - 39	0.01 μ F ± 0.25 pF, 3 kV, Ceramic	033-077-9-001
C40	1000 pF, 3.1 kV, Ceramic	020-226-9-003
C41	0.15 μ F $\pm 10\%$, 50 V, Mylar	025-192-9-001
C42, 43	0.01 μ F, 50 V, Ceramic	020-341-9-003
C44	47 μ F $\pm 20\%$, 25 V, Electrolytic	022-226-9-001
C45	0.01 μ F, 50 V, Ceramic	020-341-9-003
C46	47 μ F $\pm 20\%$, 25 V, Electrolytic	022-226-9-001

SCHEMATIC SYMBOL

DESCRIPTION

B & K-PRECISION PART NO.

POWER BLANKING UNIT (continued)

C47	0.01 μ F, 50 V, Ceramic	020-341-9-003
C48	47 μ F \pm 20%, 25 V, Electrolytic	022-226-9-001
C49	4700 pF \pm 10%, 50 V, Mylar	025-107-9-007
C50	47 μ F \pm 20%, 25 V, Electrolytic	022-226-9-001
C51	0.01 μ F, 50 V, Ceramic	020-341-9-003
C52, 53	0.01 μ F \pm 0.25 pF, 3 kV, Ceramic	033-077-9-001
C54	1000 pF, 2 kV, Ceramic	020-226-9-002
C55	2200 pF \pm 10%, 500 V, Ceramic	020-302-9-004
C56 - 58	Not Used	
C59, 60	0.01 μ F, 50 V, Ceramic	020-341-9-003
C61	47 μ F \pm 20%, 16 V, Electrolytic	022-226-9-012
TC1	20 pF Trimmer Capacitor	028-050-9-002
TC2	40 pF Trimmer Capacitor	028-088-9-001
TC3	2 pF Trimmer Capacitor	028-079-9-001

INDUCTORS

L1 - 5	100 μ H, Ferrite.....	041-133-9-004
L6	100 μ H, Ferrite.....	041-124-9-001
L7, 8	100 μ H, Ferrite.....	041-133-9-004

DIODES

D1	1SS132, Silicon.....	151-123-9-001
D2, 3	MTZ12JC, 12 V Zener.....	152-136-9-001
D4	MTZ3.3JA, 3.2 V Zener	152-136-9-002
D5	1SS132, Silicon.....	151-123-9-001
D6, 7	Not Used	
D8	1SS132, Silicon.....	151-123-9-001
D9	MTZ5.1JB, 5 V Zener	152-134-9-003
D10, 11	1SS83, Silicon Switching.....	151-084-9-001
D12 - 15	W06C, Silicon Rectifier	151-052-9-002
D16, 17	1SS132, Silicon.....	151-123-9-001
D18	UZ3.0B, 3.0 V Zener	152-149-9-001
D19	UZ6.2BC, 6.2 V Zener.....	152-149-9-002
D20, 21	1SS132, Silicon.....	151-123-9-001

TRANSISTORS

Q1	2SC2591(Q,R), NPN Silicon	176-157-9-001
Q2	2SC1505(L), NPN Silicon	172-058-9-001
Q3	2SB633(E), PNP Silicon.....	173-010-9-001
Q4	2SD613(E), NPN Silicon	176-104-9-002
Q5	2SB633(E), PNP Silicon.....	173-010-9-001
Q6	2SC1505(L), NPN Silicon	172-058-9-001
Q7	2SC3311(R), NPN Silicon	176-157-9-002
Q8	2SC1505(L), NPN Silicon	172-058-9-001
Q9	2SC3311(R), NPN Silicon	176-157-9-002
Q10	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q11, 12	2SC3354(T,S), NPN Silicon.....	176-157-9-004
Q13	2SA1323(B), PNP Silicon	177-071-9-002
Q14	2SC3311(R), NPN Silicon	176-157-9-002
Q15, 16, 17	2SC3315(C,D), NPN Silicon	176-157-9-003
Q18	2SC2912(S), NPN Silicon	172-066-9-002
Q19	2SA1210(S), PNP Silicon.....	173-014-9-002
Q20	2SC2910(S,T), NPN Silicon.....	176-126-9-001
Q21	2SA1208(S,T), PNP Silicon.....	177-053-9-001
Q22, 23	2SC2910(S,T), NPN Silicon.....	176-126-9-001
Q24, 25	2SC3311(R), NPN Silicon	176-157-9-002
Q26	2SA1309(Q,R), PNP Silicon	177-071-9-001
Q27	2SK192A-BL, N-Channel FET	182-076-9-001
Q28	2SD613(E), NPN Silicon	176-104-9-002

INTEGRATED CIRCUITS

IC1, 2	NJM4558D, Dual Op-Amp	307-333-9-001
IC3	LM340LAZ5.0, Regulator.....	307-355-9-001

MISCELLANEOUS

NL1 - 4	Neon Lamp	401-024-9-001
PL1 - 4	Lamp	400-082-9-001
	Neon Tube Holder	253-117-9-001

PARTS ORDERING INFORMATION

There is a minimum charge for each invoice. Orders will be shipped C.O.D. unless previous open account arrangements have been made or remittance accompanies order. Advance remittance must cover handling, postage, or express charges. Specify model and serial number when ordering replacement parts.

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