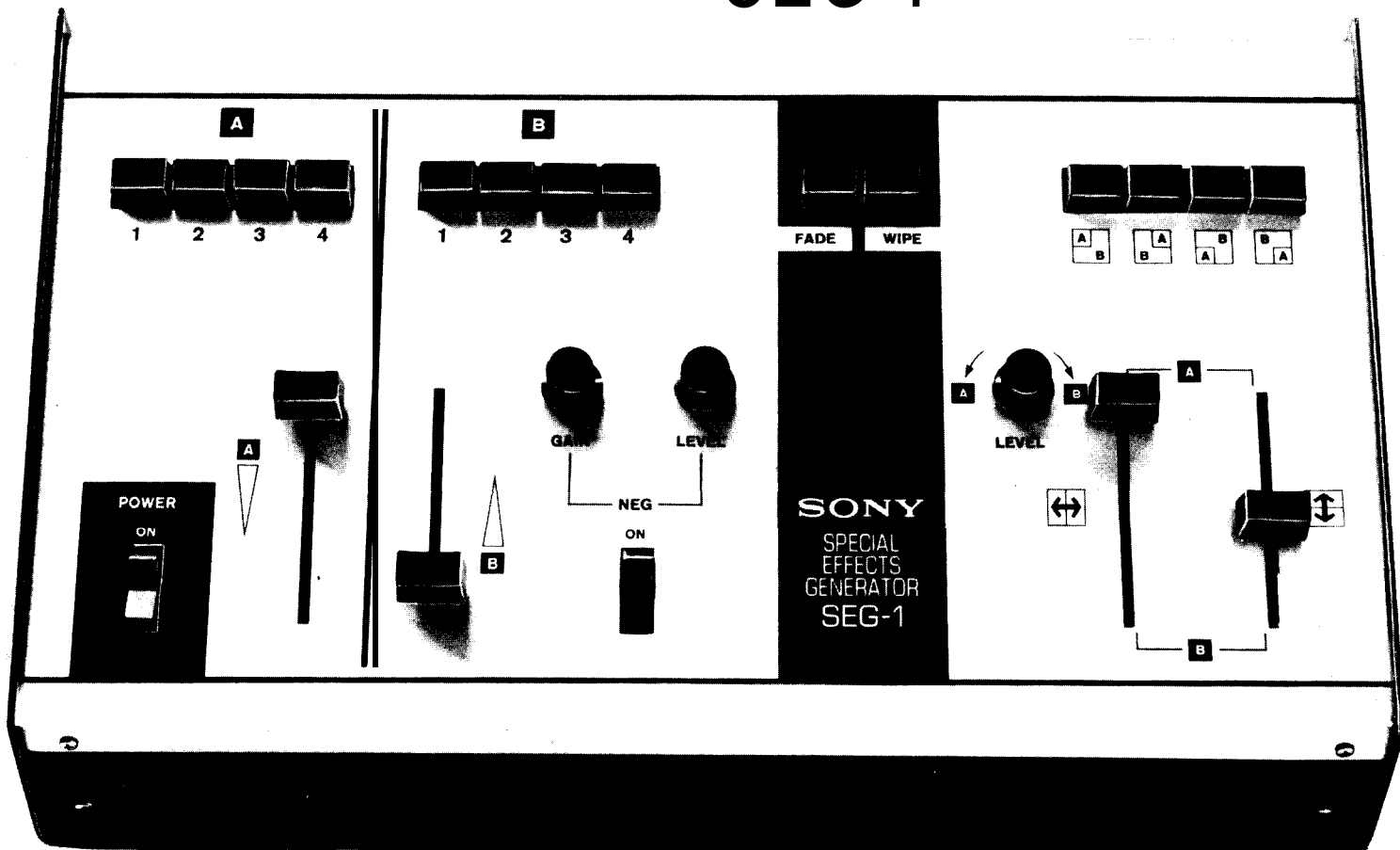


# SPECIAL-EFFECTS GENERATOR SEG-1



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# GENERAL DESCRIPTION

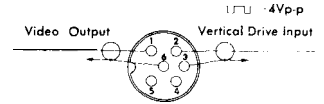
External sync:

Accepts vertical and horizontal sync from CV-Series Videocorders or vertical sync (-4V p-p) from an external 2:1 EIA sync generator. See pin connections below.

## INTRODUCTION

SONY Model SEG-1 is a special-effects generator with facilities for switching, fading, superimposing, and wiping two video signals. Inputs accept up to four SONY video cameras and provisions are included to monitor the output of each camera. One channel may be inverted, if desired, to yield a negative picture. In addition, an internal sync generator supplies 2:1 interlace sync, or sync may be supplied from an external source.

The SEG-1 may be used with any SONY video camera, monitor, and/or Videocorder. Refer to the Owner's Instruction Manual for the complete operating procedure.



Power requirements:

117V, 60Hz 3-wire parallel ground plug

Power consumption:

7 watts

Dimensions:

5 1/4" H x 15 1/2" W x 10" D

Weight:

8 1/2 lb.

## TECHNICAL SPECIFICATIONS

- Camera video inputs: 1.0 -1.4V p-p, sync neg., 75Ω impedance. Input 1 must be supplied with composite video.
- Number of camera inputs: 4, Hirschmann 6 Pin receptacle
- Monitor video outputs: 1.0 -1.4V p-p, (dependent upon input), sync negative, 75Ω impedance
- Number of monitor outputs: 4, SO-239 UHF receptacle
- Number of line outputs: 2, 1-Hirschmann 6 Pin receptacle  
1 -SO -239UHF receptacle
- Internal sync: 2:1 interlace when SYNC SELECT switch is set to INT.

## CIRCUIT DESCRIPTION

### VIDEO INPUT

Figure 1 shows the block diagram of the SEG-1. Up to four cameras, either 4 CV-Series or 4 DXC-Series can be driven through Hirschmann connectors. To develop the sync pulse in the SEG-1, Camera #1 must always be connected with composite video signals, while either composite -- or non-composite -- video signal is acceptable through Camera #2, #3 and #4. Each camera output can be monitored through four (4) source-terminated SO-239 UHF receptacles.

Any combination of input selector switches is accepted.

Video signals are balanced between A- and B-channel by potentiometer VRI. If the output video

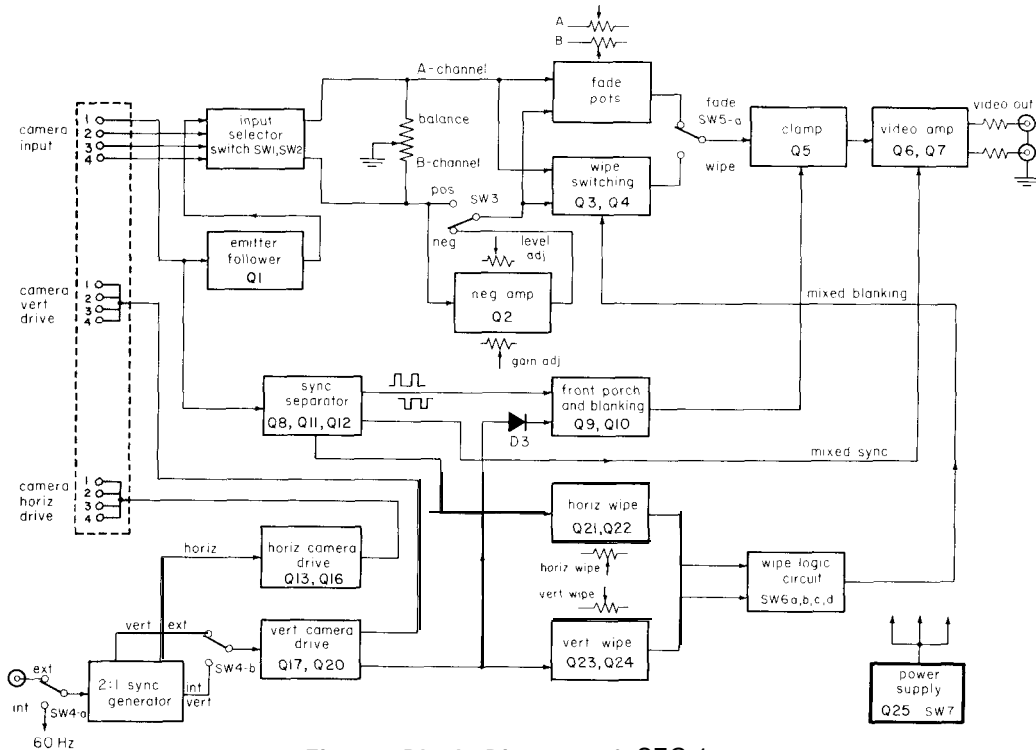


Fig. 1. Block Diagram of SEG-1

levels of A- and B-channel cameras are very different, the camera lens f-stop should be readjusted.

## VIDEO INVERTER

To produce a negative picture, an inverting one-stage amplifier, Q2, is employed in channel B. Gain and level adjustments are accomplished by VR2 and VR3 respectively. Either a negative or a positive picture can be obtained on channel B by means of SW-3.

## DISSOLVE

The two selected signals are independently attenuated by dissolve potentiometers VR4 and VR5, mixed by R24 and R25 and, with SW5-a in the FADE position, presented to the video amplifier.

## WIPES

When mode switch SW5-a is set to WIPE, analog gates Q3 and Q4 switch rapidly between the two selected channels in accordance with the logic signals on their bases. The switched video signals are mixed by R27 and R28. Logic signals are arranged so that whenever one transistor is turned on (turning off its video signal), the other is turned off. This guarantees that one channel or the other feeds the monitor at all times.

## WIPE LOGIC

The logic signals that control these transistors are derived from the horizontal and vertical sync pulses. Each horizontal pulse triggers a one-shot multivibrator (Q21/Q22) whose on time is determined by the setting of the horizontal wipe pot VR6. At one extreme, a transition between channels is produced at the left side of the screen. At the other pot extreme, a long (60- $\mu$ s) pulse is produced that delays the transition until the right side of the screen.

Vertical wipe pot VR7 does a similar job at a slower (0-16 ms.) rate: Vertical one-shot Q23/Q24, produces variable width pulses, triggered by the vertical pulse, for horizontal direction wipes. By using in combination independently adjustable pots VR6 (horizontal wipe) and VR7 (vertical wipe) and wipe selector switch, SW-6, it is possible to obtain four corner wipes, as well as vertical and horizontal wipes. The variable-duration pulses produced

by the two wipe one-shots are manipulated by resistor-transistor-logic (RTL) inverters IC-1, RTL NOR gate IC-2 and switches SW-6 to arrange the vertical, horizontal and corner wipes.

## CLAMPING

The video signal selected by mode switch SW-5 is clamped to ground during blanking time by Q5. The horizontal blanking pulse includes front and back porch, while the vertical blanking pulse has only a back porch.

The horizontal blanking pulse is developed from Camera #1 and is a composite video signal. Sync separator Q8 produces mixed sync, which is a positive going 6 volt pulse. By means of a one-shot multivibrator (Q9/Q10), a 60- $\mu$ s delayed pulse occurs about 2  $\mu$ s in front of the sync pulse to form the front porch.

The sync pulses are delayed by C16 to form the horizontal back porch. The horizontal front porch, mixed sync, horizontal back porch and the vertical blanking pulse are added with diodes D1 -D3 to give mixed blanking. This signal is sent to clamping transistor, Q5.

## VIDEO AMPLIFIER

A two-stage feedback amplifier (Q6/Q7) is employed as the final stage. This gives low output impedance to drive two 75-ohm lines. Mixed sync from Camera #1 is inserted at the output of the video amplifier.

## CAMERA DRIVE

Two modes of camera drive, external and internal, are available. In the SEG-1, a two-to-one interlace sync generator is installed which is phase locked to either incoming vertical pulses (through a Hirschmann male receptacle) or to internal 60 Hz line frequency.

After the sync generator, both the horizontal and the vertical pulses are shaped by Q13 -Q16 and Q17 -Q20 respectively. These pulse-shaping amplifiers can drive a 19 (75  $\div$  4) ohm load with a 4-volt negative-going pulse.

Due to the phase difference of horizontal driving pulses, a combination of DXC-Series and CVC-Series cameras is not recommended.

# TRANSISTOR VOLTAGE CHART

## SIGNAL PROCESSING BOARD

TRANSISTOR	B	C	E	LOCATION *
Q1	2.80	7.60	2.30	c-4
Q2	6.90	0.28	7.60	E-3
Q3	0	0.05	0	F-2
Q4	0	0.05	0	F-2
Q5	0.16	0.75	0	H-2
Q6	2.10	7.0	1.65	J-2
Q7	7.20	1.20	8.0	J-2
Q8	6.20	0.45	6.0	c-5
Q9	0.08	5.0	0	c-5
Q10	6.70	0.73	6.0	E-5
Q11	0.01	5.50	0	F-4
Q12	5.50	6.10	4.8	G-4
Q13	0.65	0.45	0	C-6
Q14	6.60	6.80	7.1	C-6
Q15	6.80	0.82	7.1	D-6
Q16	0.32	6.40	0	E-6
Q17	0.10	6.10	0	C-8
Q18	0.63	0.28	0	C-8
Q19	0.08	6.40	0	D-7
Q20	6.40	6.80	5.90	E-7
Q21	0.08	2.40	0	G-6
Q22	7.10	4.20	7.50	G-5
Q23	0.06	2.05	0	G-8
Q24	7.0	3.50	7.60	G-8
Q25	8.0	11.0	7.60	L-4

All voltages above measured with a 20,000 ohms-per-volt VOM.

## SYNC GENERATOR BOARD

TRANSISTOR	B	C	E	LOCATION*
Q1	-0.66	0.58	0	B-2
Q2	0.66	0.55	0	c-2
Q3	0	0.58	0.55	D-2
Q4 (FET)	5.30 <sup>a</sup>	0.58 <sup>b</sup>	1.75 <sup>c</sup>	D-2
Q5 (UJT)	0.30 <sup>d</sup>	4.80 <sup>e</sup>	3.00 <sup>f</sup>	E-2

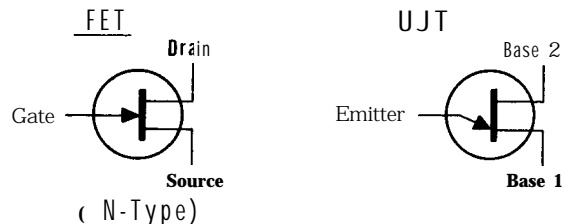
All voltages above measured with a VTVM.

### SEG-1 CONTROL SETTINGS:

- Channel A Level Control = Maximum (upper position)
- Channel B Level Control = Maximum (lower position)
- LEVEL Control = Center
- FADE -WIPE Selector = Fade
- SYNC SELECT Switch = INT

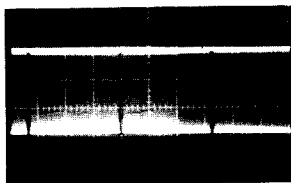
### NOTES:

FET	UJT
a Gate	d Base 1
b Drain	e Base 2
c Source	f Emitter

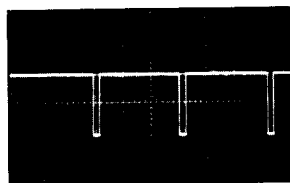


\*Refers to Schematic Diagram Coordinates

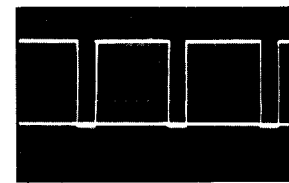
# TEST POINTS AND WAVEFORMS, SIGNAL PROCESSING BOARD



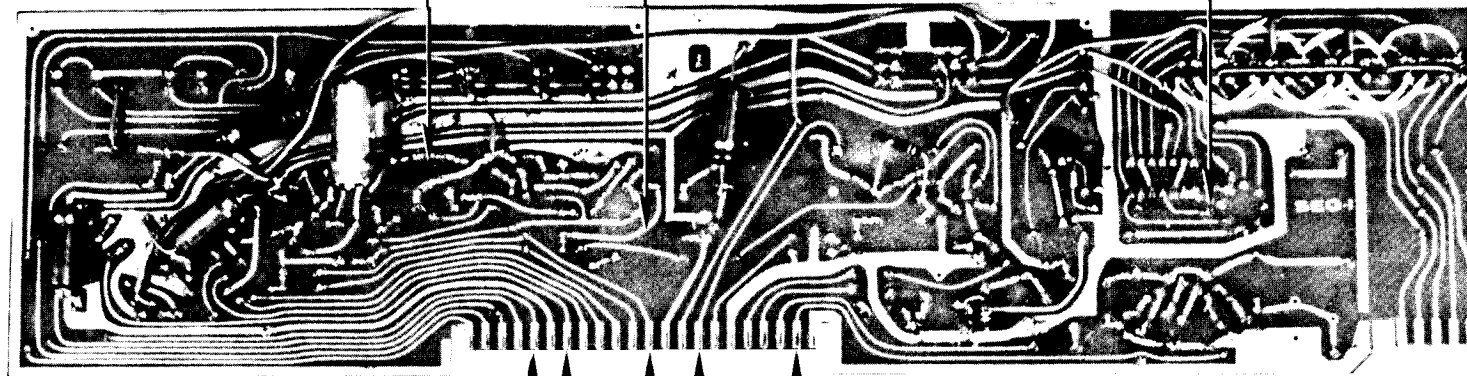
TP-6, V=0.05 V/div, H=5 m sec



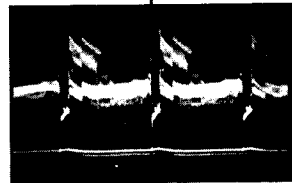
TP-7, V=0.2 V/div, H=20  $\mu$  sec



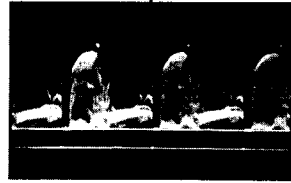
TP-8, V=0.05 V/div, H=5 msec



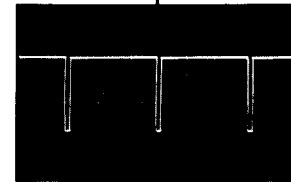
TP-5, V=0.02 V/div, H=5 m sec



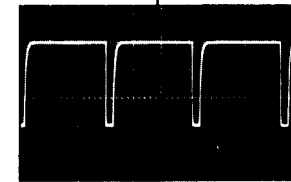
TP-4, V=0.02 V/div, H=5 m sec



TP-9, V=0.05 V/div, H=5 m sec



TP-3, V=0.2V/div, H=5 m sec

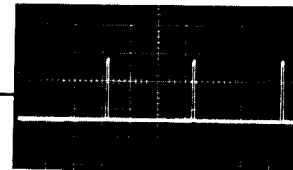
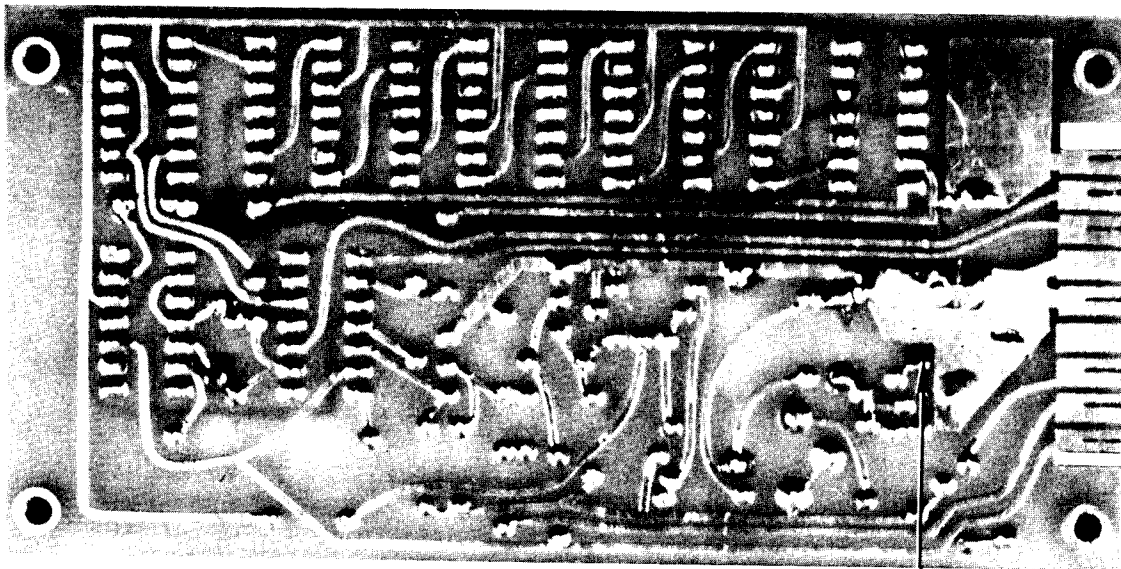


TP-2, V=0.2 V/div, H=20  $\mu$  sec

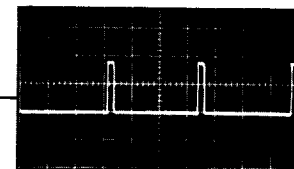
**Note:**

Amplitude settings given are actual scope settings using a 10:1 probe.

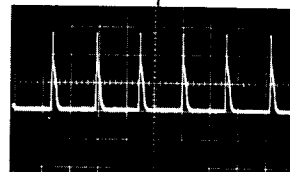
# TEST POINTS AND WAVEFORMS, SYNC GENERATOR BOARD



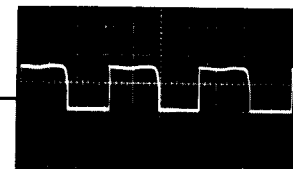
TP-13,  $V=0.1$  V/div,  $H=20$   $\mu$  sec



TP-14,  $V=0.1$  V/div,  $H=5$  m sec



TP-11,  $V=0.05$  V/div,  $H=20$   $\mu$  sec



TP-12,  $V=0.1$  V/div,  $H=5$  m sec

## Note:

Amplitude settings given are actual scope settings using a 10:1 probe.

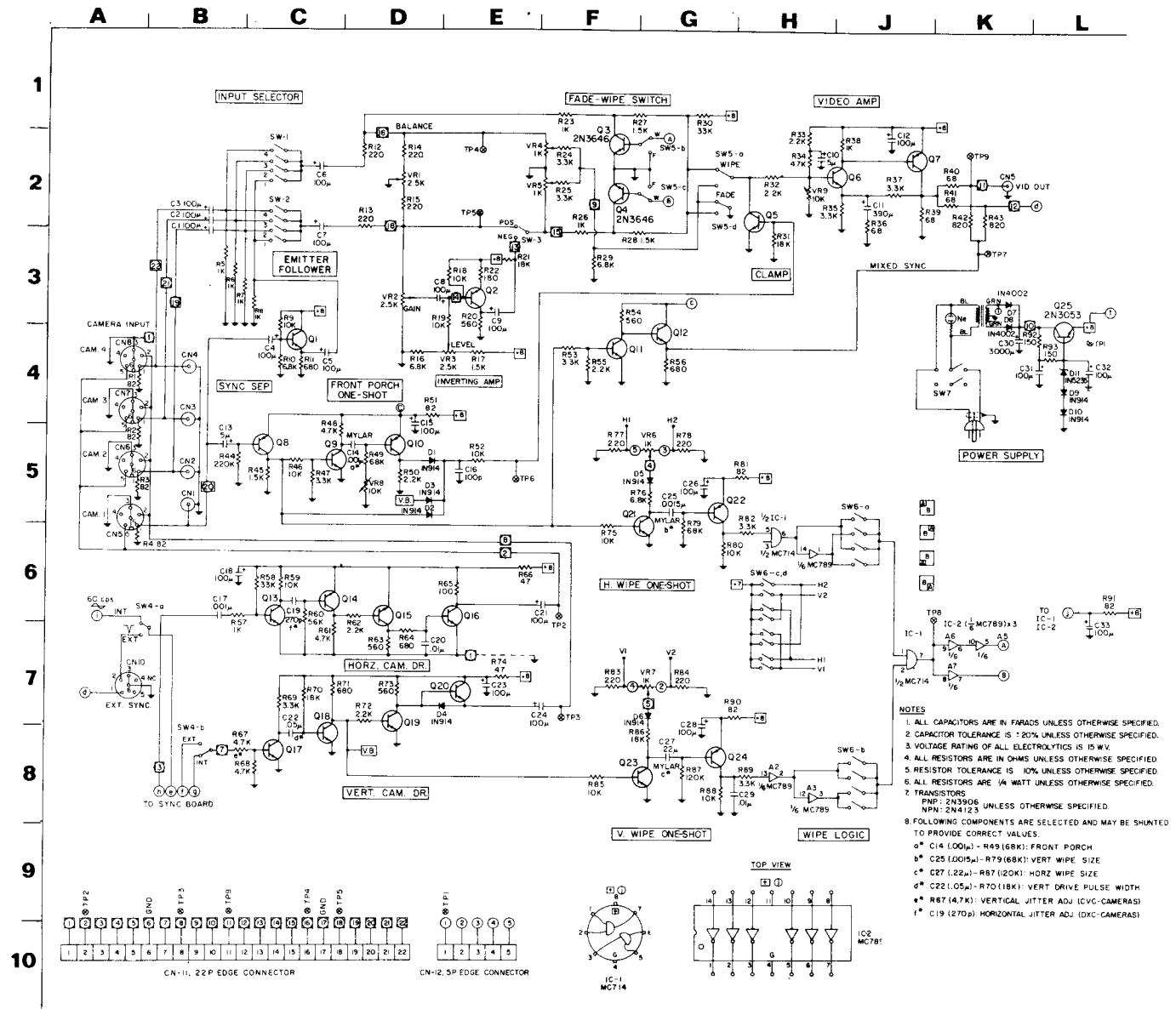
**TRANSISTOR AND TEST POINT LOCATION**

**Schematic Diagram, Signal Processing Board**

Transistor	Location
Q1	C-4
Q2	E-3
Q3	F-2
Q4	F-2
Q5	H-2
Q6	J-2
Q7	J-2
Q8	C-5
Q9	C-5
Q10	E-5
Q11	F-4
Q12	G-4
Q13	C-6
Q14	C-6
Q15	D-6
Q16	E-6
Q17	C-8
Q18	C-8
Q19	D-7
Q20	E-7
Q21	G-6
Q22	G-5
Q23	G-8
Q24	G-8
Q25	L-4

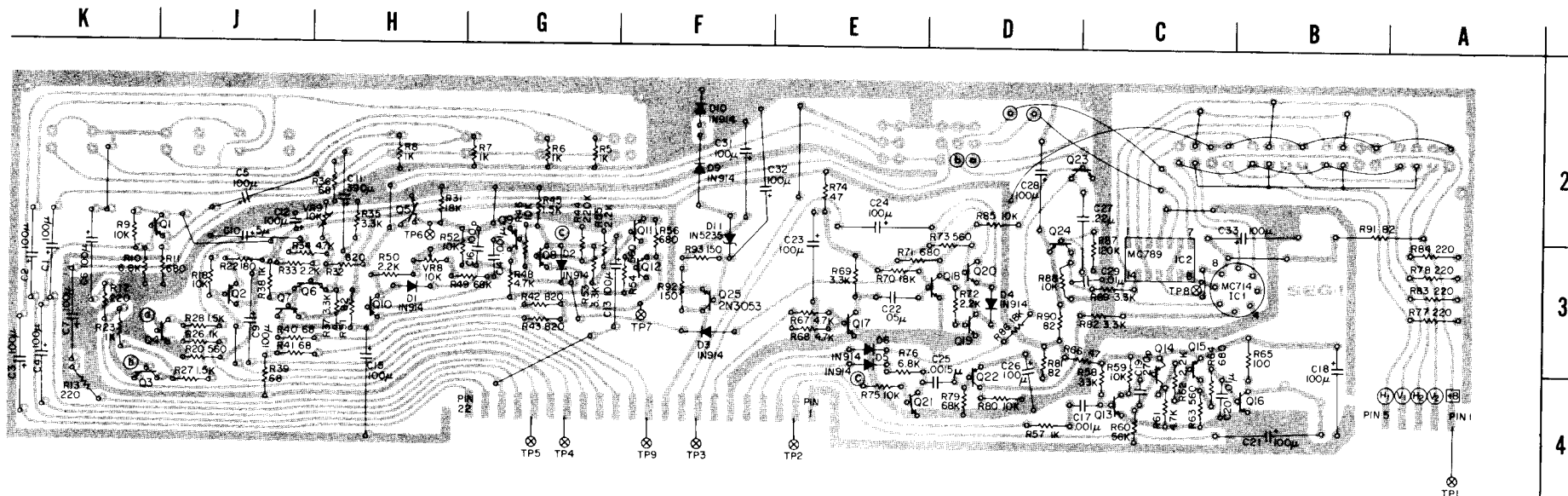
Test Point	Location
TP-1	L-4
TP-2	F-6
TP-3	F-7
TP-4	E-2
TP-5	E-2
TP-6	E-5
TP-7	K-3
TP-8	K-6
TP-9	K-2



- NOTES**
1. ALL CAPACITORS ARE IN FARADS UNLESS OTHERWISE SPECIFIED.
  2. CAPACITOR TOLERANCE IS: 20% UNLESS OTHERWISE SPECIFIED.
  3. VOLTAGE RATING OF ALL ELECTROLYTICS IS 15 W.V.
  4. ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
  5. RESISTOR TOLERANCE IS 10% UNLESS OTHERWISE SPECIFIED.
  6. ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED.
  7. TRANSISTORS  
PNP: 2N3906  
NPN: 2N4123 UNLESS OTHERWISE SPECIFIED.
  8. FOLLOWING COMPONENTS ARE SELECTED AND MAY BE SHUNTED TO PROVIDE CORRECT VALUES:  
 \* C14 (100μ)-R79 (68K): FRONT PORCH  
 \* C25 (100μ)-R79 (68K): VERT WIPE SIZE  
 \* C2 (22μ)-R71 (20K): HORZ WIPE SIZE  
 \* C22 (1.05μ)-R70 (18K): VERT DRIVE PULSE WIDTH  
 \* R67 (4.7K): VERTICAL JITTER ADJ (ICV-CAMERAS)  
 \* C19 (270p): HORIZONTAL JITTER ADJ (IXC-CAMERAS)



# PRINTED CIRCUIT, SIGNAL PROCESSING BOARD



**TRANSISTOR AND TEST POINT LOCATION**

Transistor	Location	Transistor	Location	Test Point	Location
Q1	K-2	Q14	C-4	TP-1	A-4
Q2	J-3	Q15	C-4	TP-2	E-4
Q3	K-3	Q16	B-4	TP-3	F-4
Q4	J-3	Q17	E-3	TP-4	G-4
Q5	H-2	Q18	D-3	TP-5	G-4
Q6	J-3	Q19	D-3	TP-6	H-2
Q7	J-3	Q20	D-3	TP-7	F-3
Q8	G-3	Q21	E-4	TP-8	C-3
Q9	G-3	Q22	D-4	TP-9	F-4
Q10	H-3	Q23	C-2		
Q11	F-2	Q24	D-3		
Q12	F-3	Q25	F-3		
Q13	C-4				

# Schematic Diagram, Sync Generator Board

A B C D E F G H J

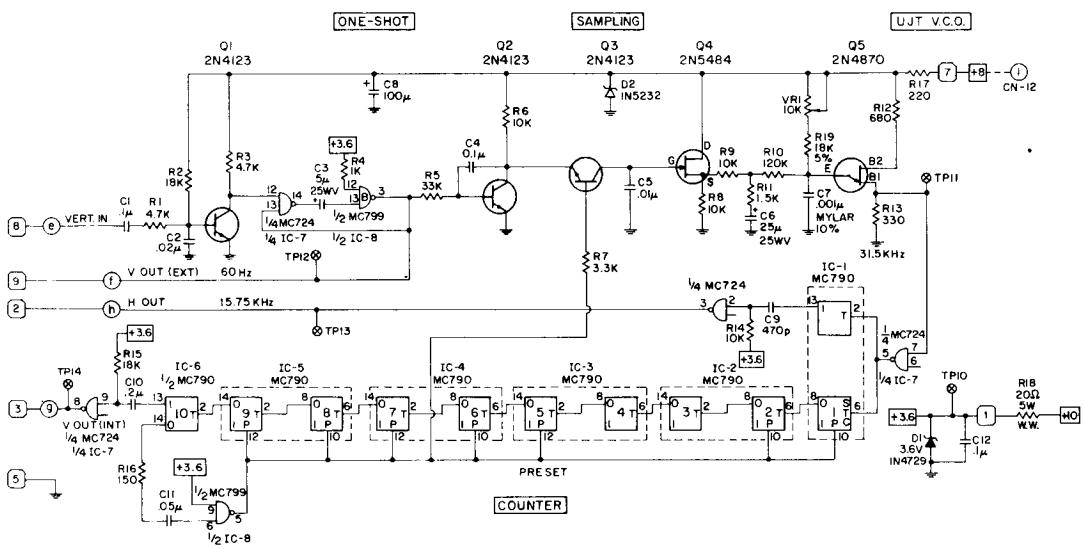
1

2

3

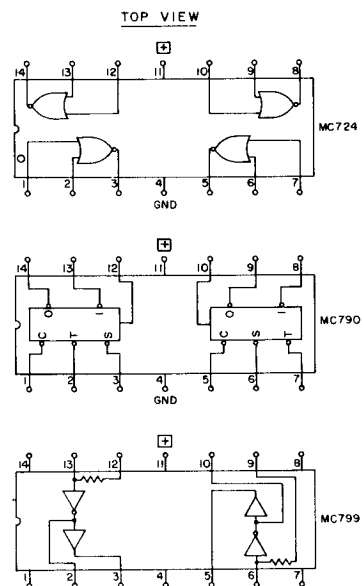
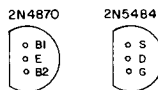
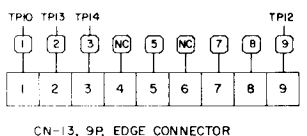
4

5



NOTES:

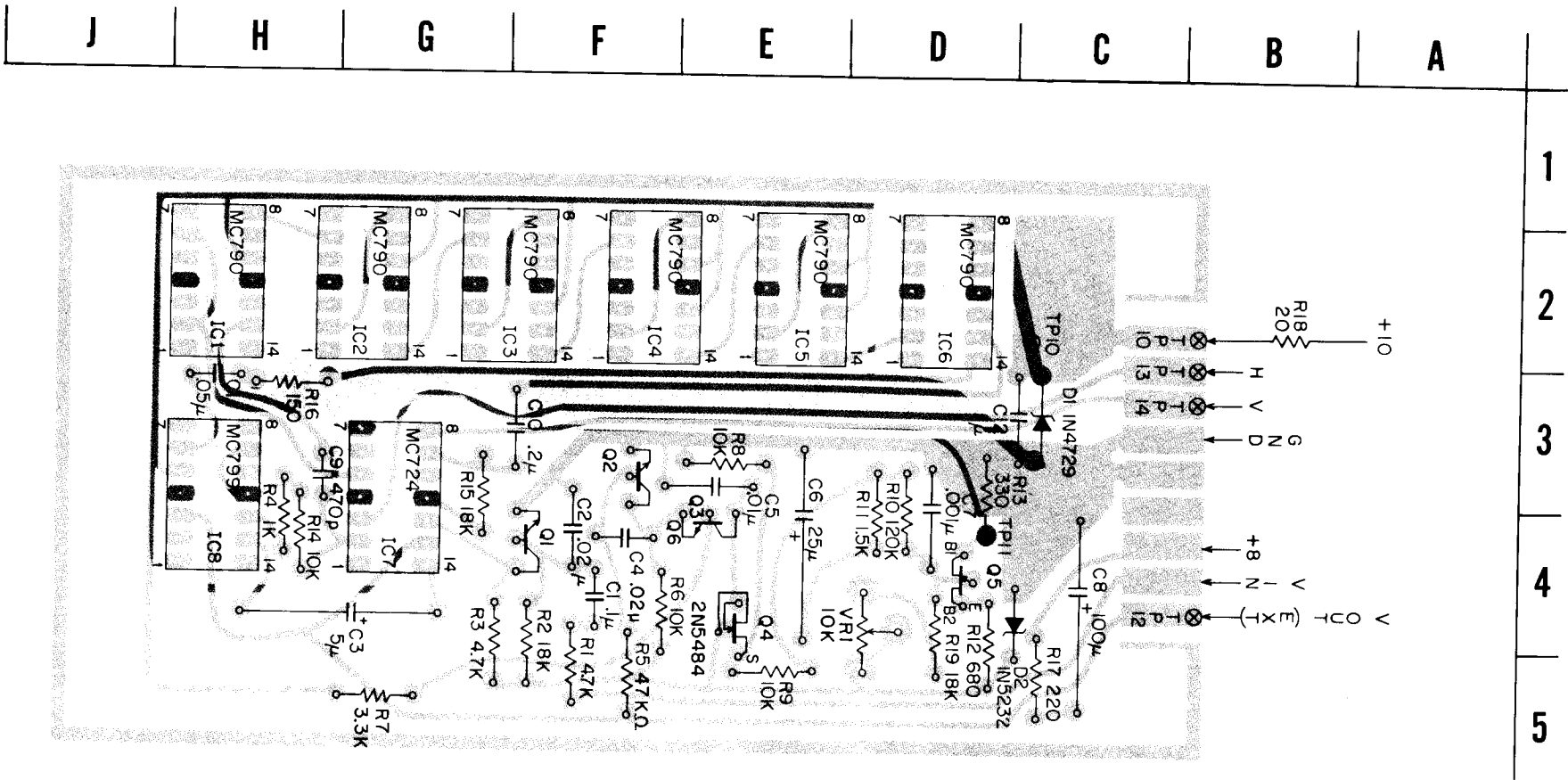
1. ALL CAPACITORS ARE IN FARADS UNLESS OTHERWISE SPECIFIED.
2. CAPACITOR TOLERANCE IS ±20% UNLESS OTHERWISE SPECIFIED.
3. ELECTROLYTICS SHOW CAPACITANCE AND VOLTAGE RATINGS.
4. ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
5. RESISTOR TOLERANCE IS ±10% UNLESS OTHERWISE SPECIFIED.
6. ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED.



## TRANSISTOR AND TEST POINT LOCATION

Transistor	Location	Test Point	Location
Q1	B-2	TP-10	F-3
Q2	C-2	TP-11	F-2
Q3	D-2	TP-12	B-2
Q4	D-2	TP-13	B-2
Q5	E-2	TP-14	A-3

# PRINTED CIRCUIT, SYNC GENERATOR BOARD



**TRANSISTOR AND TEST POINT LOCATION**

Transistor	Location	Test Point	Location
Q1	F-4	TP-10	B-2
Q2	F-3	TP-11	D-4
Q3	E-4	TP-12	B-4
Q4	E-4	TP-13	B-3
Q5	D-4	TP-14	B-3

# PARTS LIST

## MECHANICAL PARTS

No.	Description	'ty.
	Screw, Pan Head (+) #4-40 x 1/4	4
	Clear Mylar Washer #4	4
	<b>Front Panel</b>	1
	Switch Mounting Bracket	1
	Screw, Pan Head (+) #6-32x 3/8	8
	Clear Mylar Washers #4	8
	Speed Nut, Tinnerman #C8936-632	4
	Speed Nut, Tinnerman #C-7795-440-1	12
	<b>Pal Nut, Reg. Type #4-40</b>	4
	Screw, Flat Head (+) #4-40 x 3/4	4
	Speed Nut, Tinnerman #C-8022-632-27	4
	PalNut #4-40	12
	Rubber Bumper #4076	4
	Bottom Assembly,	1
	Top Cover Assembly	1
	Knobs for Pushbutton Switch	14
	Knobs for Slide Switch	4
	Knobs for Rotating Pots	3
	Standoff	8

## ASSEMBLED PARTS

Part Number	Description
AS-SEG-1-1	Signal Processing Board, with components and switchbracket
AS-SEG-1-2	Sync Generator Board, with components.

## SIGNAL PROCESSING BOARD

### RESISTORS

All resistors are 1/4 watt, 10% unless otherwise noted.

Symbol	Part No.	Description
R1	R82-1/4-10C	820hms
R2	'	'
R3	'	'
R4	'	'
R5	R1K-1/4-10C	1k
R6	'	'
R7	'	'
R8	'	'
R9	R10K-1/4-10C	10k
R10	R6.8K-1/4-10C	6.8 k
R11	R680-1/4-10C	680
R12	R220-1/4-10C	220
R13	'	'
R14	'	'
R15	'	'
R16	R6.8K-1/4-10C	6.8 k

Symbol	Part No.	Description
R17	R1.5K-1/4-10C	1.5 k
R18	R10K-1/4-10C	10k
R19	'	'
R20	R560-1/4-10C	560
R21	R18K-1/4-10C	18 k
R22	R180-1/4-10C	180
R23	R1K-1/4-10C	1k
R24	R3.3K-1/4-10C	3.3 k
R25	'	'
R26	R1K-1/4-10C	1k
R27	R1.5K-1/4-10C	1.5 k
R28	'	'
R29	R6.8K-1/4-10C	6.8 k
R30	R33K-1/4-10C	33 k
R31	R18K-1/4-10C	18 k
R32	R2.2K-1/4-10C	2.2 k
R33	'	'
R34	R4.7K-1/4-10C	4.7 k
R35	R3.3K-1/4-10C	3.3 k
R36	R68-1/4-10C	68
R37	R3.3K-1/4-10C	3.3 k
R38	R1K-1/4-10C	1k
R39	R68-1/4-10C	68
R40	'	'
R41	"	"
R42	R820-1/4-10C	820
R43	'	'
R44	R220K-1/4-10C	220k
R45	R1.5K-1/4-10C	1.5 k
R46	R10K-1/4-10C	10k
R47	R3.3K-1/4-10C	3.3 k
R48	R4.7K-1/4-10C	4.7 k
R49	R68K-1/4-10C	68 k
R50	R2.2K-1/4-10C	2.2 k
R51	R82-1/4-10C	82
R52	R10K-1/4-10C	10k
R53	R3.3K-1/4-10C	3.3 k
R54	R560-1/4-10C	560
R55	R2.2K-1/4-10C	2.2 k
R56	R680-1/4-10C	680
R57	R1K-1/4-10C	1k
R58	R33K-1/4-10C	33 k
R59	R10K-1/4-10C	10k
R60	R56K-1/4-10C	56k
R61	R4.7K-1/4-10C	4.7 k
R62	R2.2K-1/4-10C	2.2 k
R63	R560-1/4-10C	560
R64	R680-1/4-10C	680
R65	R100-1/4-10C	100
R66	R47-1/4-10C	47
R67	R4.7K-1/4-10C	4.7 k
R68	'	'
R69	R3.3K-1/4-10C	3.3 k
R70	R18K-1/4-10C	18 k
R71	R680-1/4-10C	680
R72	R2.2K-1/4-10C	2.2 k
R73	R560-1/4-10C	560
R74	R47-1/4-10C	47
R75	R10K-1/4-10C	10k
R76	R6.8K-1/4-10C	6.8 k
R77	R220-1/4-10C	220
R78	'	'

Symbol	Part No.	Description
R79	R68K-1/4-10C	68 k
R80	R10K-1/4-1 OC	10 k
R81	R82-1/4-10C	82
R82	R3.3K-1/4-1 OC	3.3 k
R83	R220-1/4-10C	220
R84		
R85	R10K-1/4-10C	10 k
R86	R18K-1/4-10C	18 k
R87	R120K-1/4-10C	120 k
R88	R10K-1/4-10C	10 k
R89	R3.3K-1/4-10C	3.3 k
R90	R82-1/4-10C	82
R91		
R92	R150-1/4-10C	150
R93		

## CAPACITORS

All capacitors are electrolytic, 20%, unless otherwise noted

C1	C100M-15-20E	100 $\mu$ F, 15WV
c2		
C3		
C4		
C5		
C6		
C7		
C8		
C9		
C10	C5M-15-20E	5 $\mu$ F, 15WV
C11	C390-3-20E	390 $\mu$ F, 3WV
C12	C100M-15-20E	100 $\mu$ F, 15WV
C13	C5M-15-20E	5 $\mu$ F, 15WV
C14	co. 001M-600-10MY	0.001 mylar 600WV, 10%
C15	C100M-15-20E	100 $\mu$ F, 15WV
C16	C100P-600-10C	100pF, ceramic 10%
C17	CO. 001M-15-10E	0.001 $\mu$ F, ceramic 10%
C18	C100M-15-20E	100 $\mu$ F, 15WV
C19	C270P-15-20C	270pF, ceramic 20%
C20	CO. 01M-15-20C	0.01 $\mu$ F, ceramic 20%
C21	C100M-15-20E	100 $\mu$ F, 15WV
c22	CO. 05M-25-20C	0.05 $\mu$ F, ceramic 20%
c23	C100-15-20E	100 $\mu$ F, 15wv
C24		
c25	CO. 0015M-600-10MY	0.0015 $\mu$ F, 600WV
C26	C100M-15-20E	100 $\mu$ F, 15WV
C27	CO. 22-600-10MY	0.22 $\mu$ F, mylar, 10%
C28	C100M-15-20E	100 $\mu$ F, 15WV
C29	CO. 01M-12-20E	0.01 $\mu$ F, 12WV
C30	C3000M-15-20E	3000 $\mu$ F, 15WV
C31	C100M-15-20E	100 $\mu$ F, 15WV
C32		
C33		

## TRANSISTORS

Q1	TR-2N4123	2N4123
Q2	TR-2N3906	2N3906
Q3	TR-2N3646	2N3646
Q4		

Symbol	Part No.	Description
Q5	TR-2N4123	2N4123
Q6		
Q7	TR-2N3906	2N3906
Q8		
Q9	TR-2N4123	2N4123
Q10	TR-2N3906	2N3906
Q11	TR-2N4123	2N4123
Q12		
Q13		
Q14	TR-2N3906	2N3906
Q15		
Q16	TR-2N4123	2N4123
Q17		
Q18		
Q19		
Q20		
Q21		
Q22	TR-2N3906	2N3906
Q23	TR-2N4123	2N4123
Q24	TR-2N3906	2N3906
Q25	TR-2N3053	2N3053

## INTEGRATED CIRCUITS

IC-1	IC-MC714	MC 714, Dual Nor Gate
IC-2	IC-MC789	MC 789, Hex Inverter

## POTENTIOMETERS

VR1	P-2.5K-2-BW	2.5 k
VR2		
VR3		
VR4	SP-1K-1-BW	1 k, Slide Pot.
VR5		
VR6		
VR7		
VR8	TP-10K-1/4-BC	10 k
VR9		

## DIODES

D1	D-IN914	IN914
D2		
D3		
D4		
D5		
D6		
D7	D-1N4002	IN4002
D8		
D9	D-IN914	IN914
D10		
D11	2D-IN5235	IN5235

## SWITCHES

SW-1	PSW-4-16PDT	4 section pushbutton
SW-2	PSW-4-16PDT	
SW-3	SLSW-1-DPDT	DPDT (black) Slide switch
SW-4		DPDT Slide switch
SW-5	PSW-2-6PDT	2 section pushbutton 3PDT/section
SW-6	PSW-4-16PDT	4 section pushbutton 4PDT/section
SW-7	SLSW-1-DPDT-NE	DPDT with Red Neon Lamp

Symbol	Part No.	Description
<b>CONNECTORS</b>		
CN 1,2, 3, 4	CN-SO239	Coaxial Receptacles
CN 6,7, 8, 9	CN-MAB6	Hirschmann 6 pin female Receptacles
CN 10	CN-MASE16	Hirschmann 6 pin male Receptacles
CN 11	CN-4823'79-9	AMP Edge Connector, 22 pin
CN 12	CN-582370-9	AMP Edge Connector, 5 pin
CN 13	CN-582375-9	AMP Edge Connector, 4 pin

#### MISCELLANEOUS

T1	PT-96-P-3	Power Transformer, 10VCT, 1 A
CD 1		AC Power Cord
CTS 1	TS-3008	8P Terminal Strips #3008

## SYNC GENERATOR BOARD

#### RESISTORS

R1	R4. 7K-1/4-10C	4.7 k
R2	R18K-1/4-10C	18kR
R3	R4. 7K-1/4-10C	4.7 k
R4	RIK-1/4-10C	1 k
R5	R33K-1/3-10C	33 k
R6	RI0K-1/4-10C	10 k
R7	R3.3K-1/4-10C	3.3 k
R8	RIOK-1/4-10C	10 k
R9		
RI0	R120K-1/4-10C	120 k
RI1	RI. 5K-1/4-10C	1.5 k
R12	R680-1/4-10C	680 R
R12	R330-1/4-10C	330 R
R14	RIOK-1/4-10C	10 k
R15	R18K-1/4-10C	18 k
R16	R150-1/4-10C	150 R
R17	R220-1/4-10C	220 R
R18	R20-5-10W	20 R, 5 Watt, wire wound
R19	R18K-1/4-10C	18 k

#### POTENTIOMETER

VR-1	TPIOK 1/4-10BC	10 k
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#### CAPACITORS

C1	CO. IM-12-20C	0.1μF, 12WV, 20%, ceramic
c2	co. 02M-12-20C	0.02μF, 12WV 20%, ceramic
c3	C5M-25-20E	5μF, 25WV
c4	CO. IM-12-20C	0.1μF, 12WV 20%, ceramic
c5	CO. OIM-12-20C	0.01μF, 12WV 20%, ceramic

Symbol	Part No.	Description
C6	C25M-25-20E	25μF, 25WV
C7	C100P-400-10MY	1000pF, 400WV, 10%, mylar
C8	C100M-15-20E	100μF, 15WV
C9	C470P-400-10C	470pF, 400WV 10%, ceramic
C10	co. 2-12-20C	0.2μF, 12WV, 20%, ceramic
C11	CO. 05M-12-20C	0.05μF, 12WV, 20%, ceramic
C12	CO. IM-12-20C	0.1μF, 12WV, 20%, ceramic

#### DIODES

D1	ZD-1N4729	1N4729
D2	ZD-1N5232	1N5232

#### TRANSISTORS

Q1	TR-1N4123	2N4123
Q2	"	"
Q3	"	"
Q4	FET-2N5484	2N5484(FET)
Q5	UJT-2N4870	2N4870

#### INTEGRATED CIRCUITS

IC-1	IC-MC790	MC790(Dual J-K Flip Flop)
IC-2	"	"
IC-3	"	"
IC-4	"	"
IC-5	"	"
IC-6	"	"
IC-7	IC-MC724	MC724 (Quad 2 Input Nand/Nor Gate)
IC-8	IC-MC799	MC799 (Dual Buffer)

# SUPPLEMENT

The following changes are incorporated into all SEG-1 Special-Effects Generators bearing Serial No. 1523 and higher. Minor modifications have been made to the circuit boards to accommodate these changes. Refer to the revised schematic diagram and the SEG-1 Service Manual.

From Serial No. 2000 and higher, the Signal Processing Board has been redesigned as a two-sided printed board. The Sync Generator Board has undergone minor changes in printed design as of the same serial number, and chassis modifications have been performed accordingly.

Details of the changes are given in the table below. Symbols and area coordinates refer to the schematic diagrams.

## SIGNAL PROCESSING BOARD

Symbol	Old Value	New Value	New Part No.	Remarks	Location
C19	270 pF	150 pF	C15OP-400-20C	Changed	C-6
c22	.05 $\mu$ F	.02 $\mu$ F	CO. 02M-25-20C	"	C-8
Q26		2N5485	FET2N5485	Added	H-2
R30	3.3 k			Deleted	G-1
R32	2.2 k	82OR	R820-1/4-10C	Changed	H-2
R49	68kR	5.6 k	R56K-1/4-10C	"	D-5
R79	68kR	5.6 k	R56K-1/4-1 OC	"	G-6
R8-7	120kR	100 k	RI 00K-1/4-1 OC	"	G-8
R94		68 k	R68K-1/4-1 OC	Added	H-2
R95		1 k	RIK-1/4-10C	Added	H-2
VR8	10 k	2.5 k	TP-25-1/4-BC	Changed	D-5
VR9	10 k	2.5 k	TP-25-1/4-BC	"	H-2
VR10		2.5 k	TP-25-1/4-BC	Added	G-6
VR11		2.5 k	TP-25-1/4-BC	"	G-8

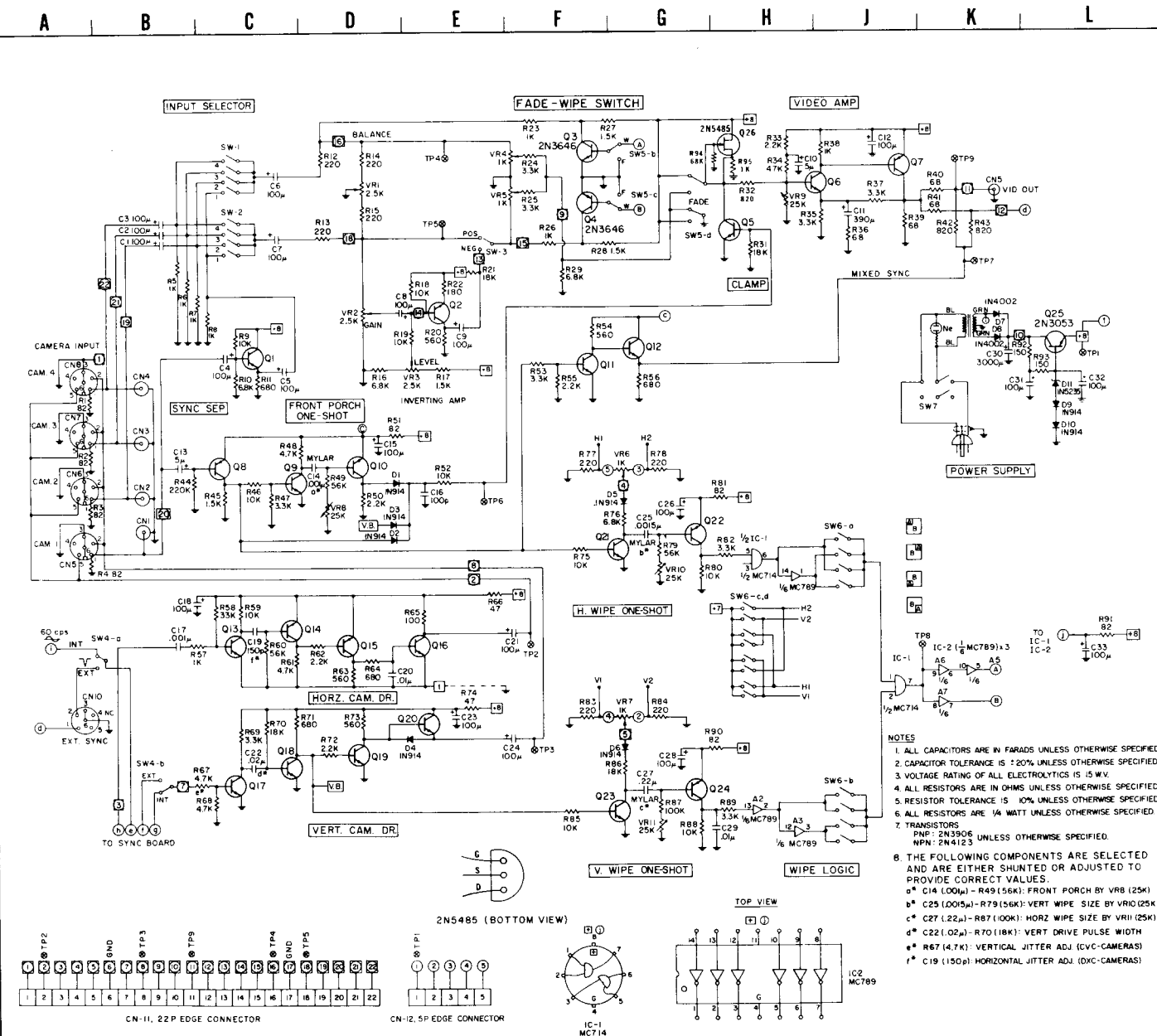
## SYNC GENERATOR BOARD \*

Symbol	Old Value	New Value	New Part No.	Remarks	Location
c4	0.1 $\mu$ F	.02 $\mu$ F	CO. 02M-15-20C	Changed	c-2
C13		.01 $\mu$ F	CO. 01M-15-20C	Added	c-2
IC-6		MC790	IC-MC790	1/2 section Added	A-3
Q6		2N4123	TR2N4123	Added	c-2
R5	3.3 k	4.7 k	R47K-1/4-1 OC	Changed	c-2
R7	3.3 k	10 k	RI 0K-1/4-1 OC	"	D-2
R16	150R	1 k	RIK-1/4-1 OC	"	B-3
R20		10 k	RI 0K-1/4-1 OC	Added	c-2

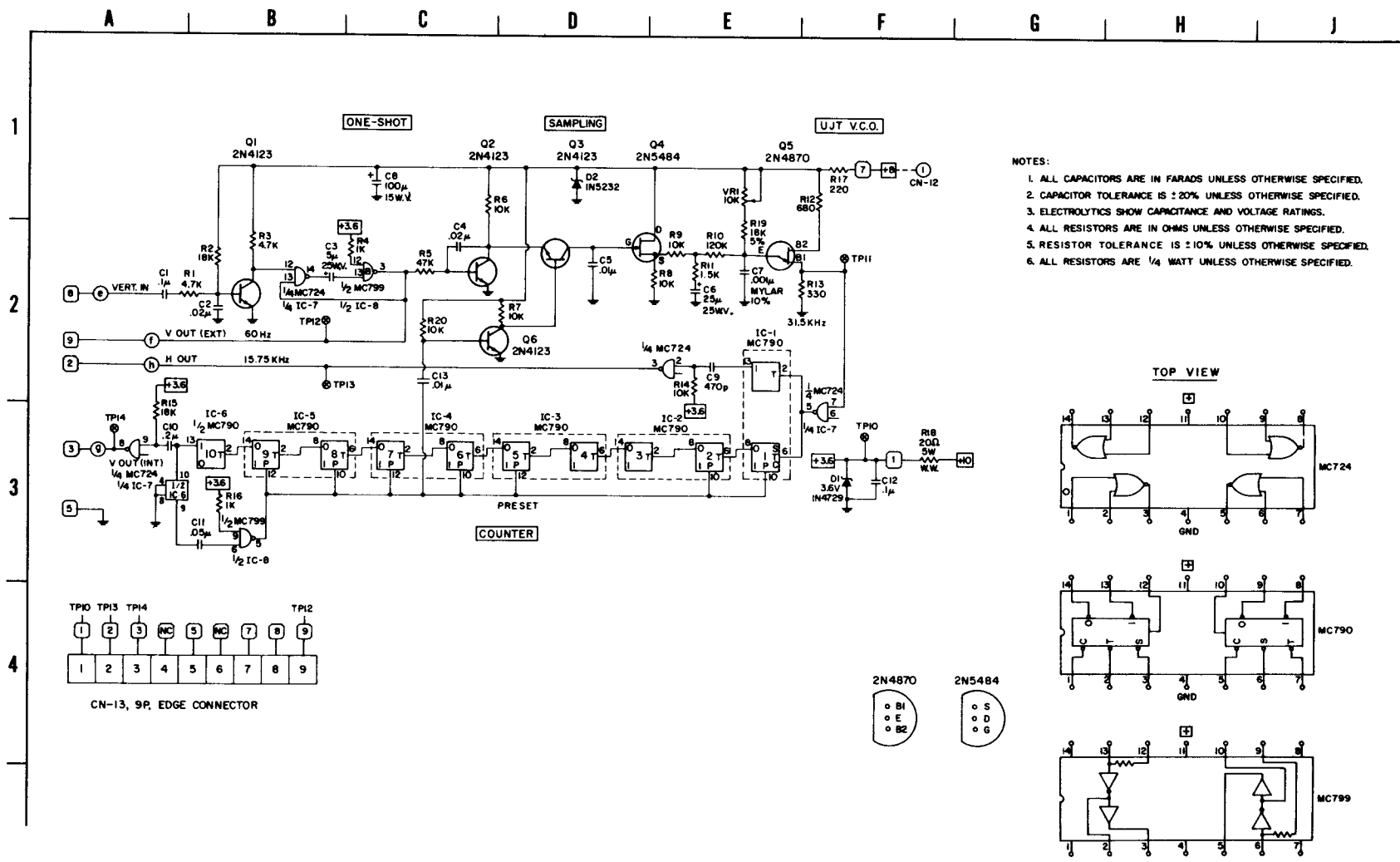
\*Modification recommended to older units.

The following schematics and printed circuit board diagrams show all changes to date. Printed circuit diagrams are given for former modified boards and for revised boards. The printed pattern of the conductor side of the printed circuit diagrams is shown in orange.

# Schematic Diagram, Signal Processing Board



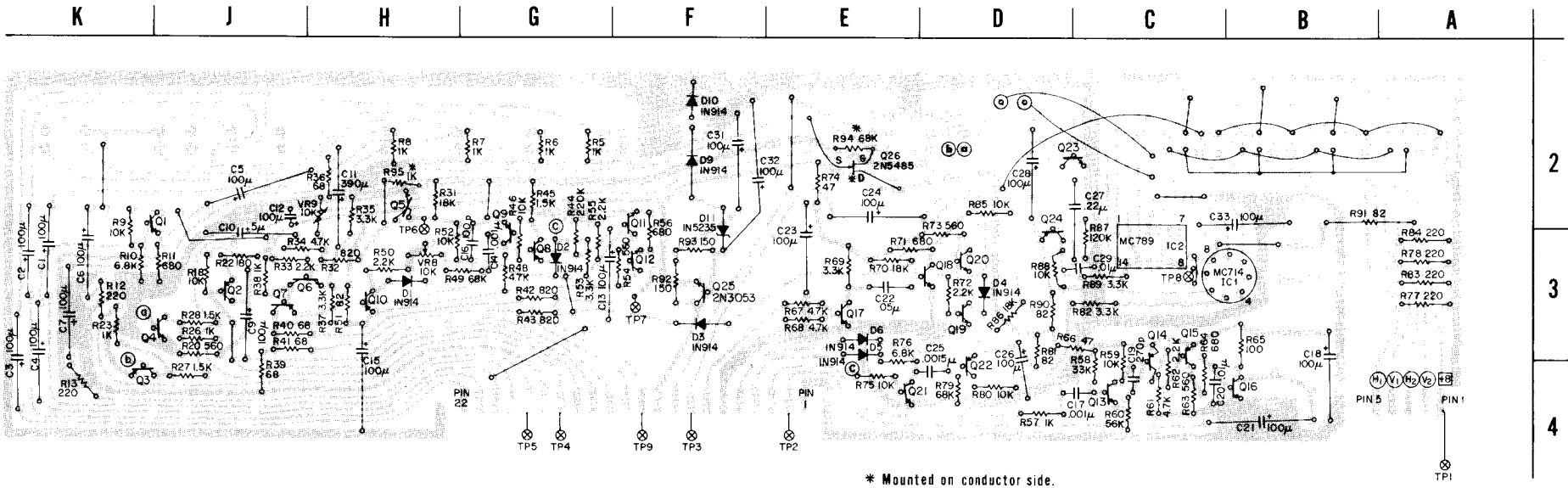




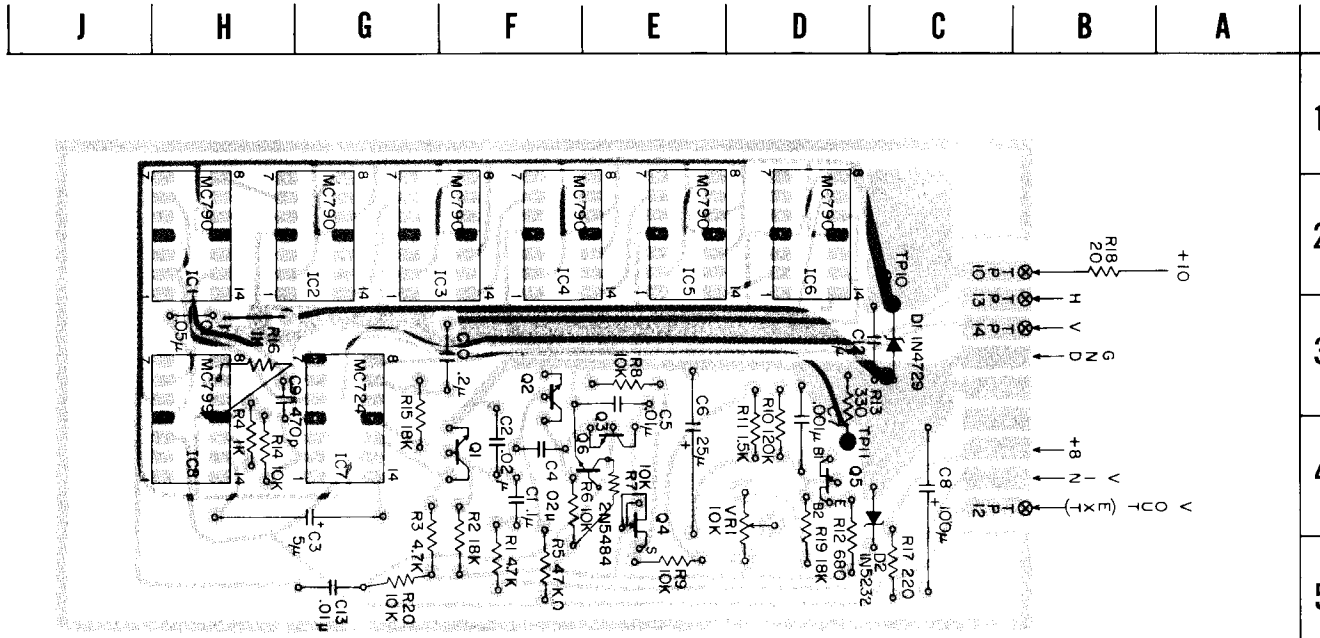
- NOTES:
1. ALL CAPACITORS ARE IN FARADS UNLESS OTHERWISE SPECIFIED.
  2. CAPACITOR TOLERANCE IS  $\pm 20\%$  UNLESS OTHERWISE SPECIFIED.
  3. ELECTROLYTICS SHOW CAPACITANCE AND VOLTAGE RATINGS.
  4. ALL RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
  5. RESISTOR TOLERANCE IS  $\pm 10\%$  UNLESS OTHERWISE SPECIFIED.
  6. ALL RESISTORS ARE  $\frac{1}{4}$  WATT UNLESS OTHERWISE SPECIFIED.

Schematic Diagram, Sync Generator Board

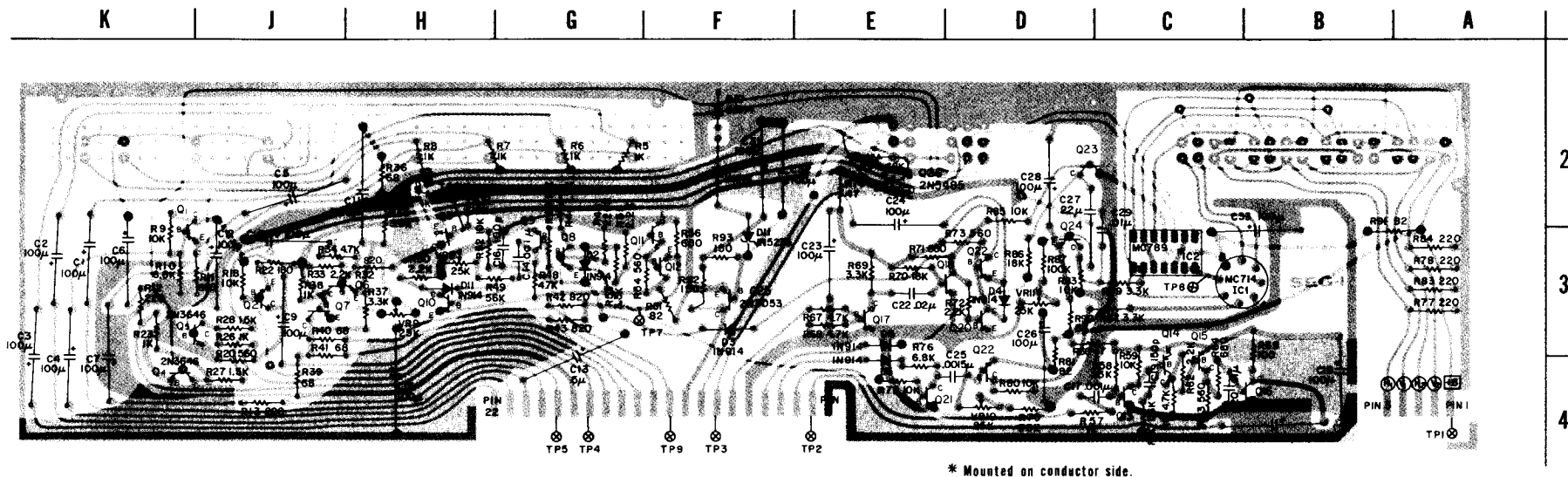
PRINTED CIRCUIT, SIGNAL PROCESSING BOARD, Serial No. 1523 to 1999



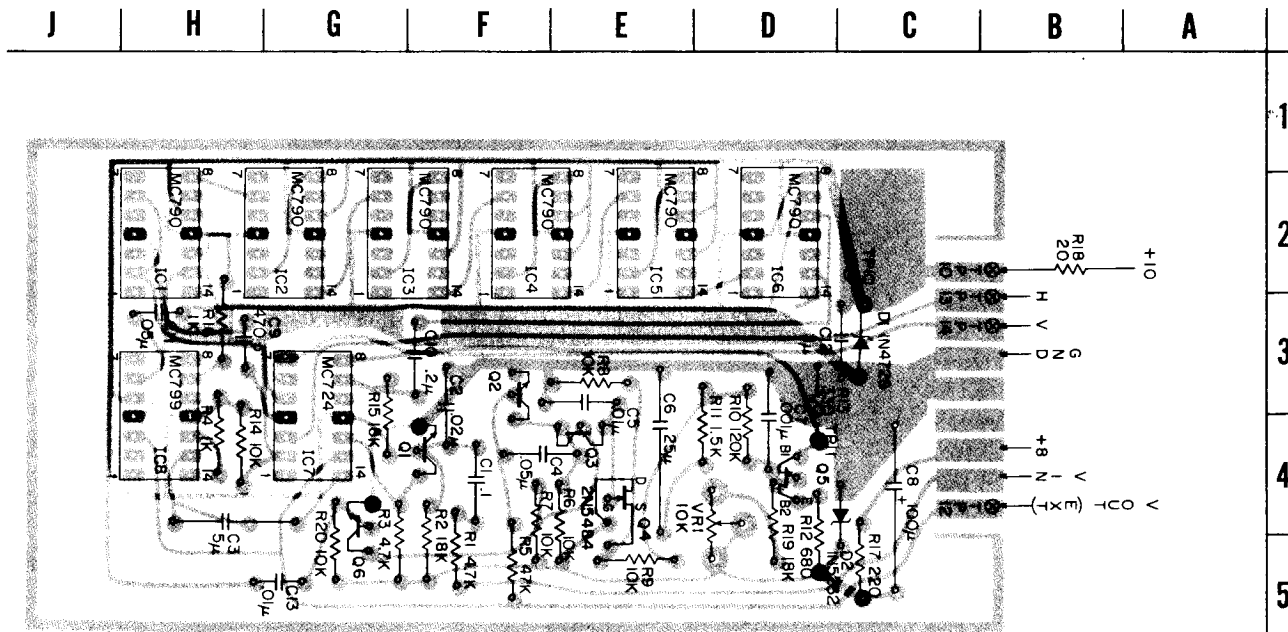
PRINTED CIRCUIT, SYNC GENERATOR BOARD, Serial No. 1523 to 1999



PRINTED CIRCUIT, SIGNAL PROCESSING BOARD, Serial No. 2000 and Later



PRINTED CIRCUIT, SYNC GENERATOR BOARD, Serial No. 2000 and Later



The following list contains stock numbers for cabinet parts and hardware. Refer to the SEG-1 Service Manual for a complete list of electrical parts.

### MECHANICAL PARTS

Part No.	Description	Q'ty
DWG-V-218-1	Screw, Pan Head (+) #4-40 x 1/4	4
-2	Clear Mylar Washer #4	4
-3	Front Panel	1
-4	Switch Mounting Bracket	1
-7	Screw, Pan Head (+) #6-32 x 3/8	8
-8	Clear Mylar Washer #4	8
-9	Speed Nut, Tinnerman # C8936-632	4
-11	Speed Nut, Tinnerman #C-7795-440-1	12
-12	Pal Nut, Reg. Type # 4-40	4
-13	Screw, Flat Head (+) # 4-40 x 3/4	4
-14	Speed Nut, Tinnerman # C-8022-632 -27	4
-15	Pal Nut #4-40	12
-18	Rubber Bumper # 4076	4
-20	Bottom Assembly	1
-21	Top Cover Assembly	1
-22	Knob for Pushbutton Switch	14
-23	Knob for Slide Switch	4
-24	Knob for Rotating Pots	3
-25	Standoff	8
-26	Screw, Flat Head (-) #4-40 x 3/16	8
-27	Sync Board Screw (+) #4-40 x 3/4	4
-28	Power Cord Strain Relief Bushing	1
-29	Screw, Flat Head (+) # 4-40 x 1/2	4
-30	Screw, Flat Head (+) # 6-32 x 1/4	8