

DIAGRAMS AND CIRCUIT BOARD ILLUSTRATIONS

Symbols and Reference Designators

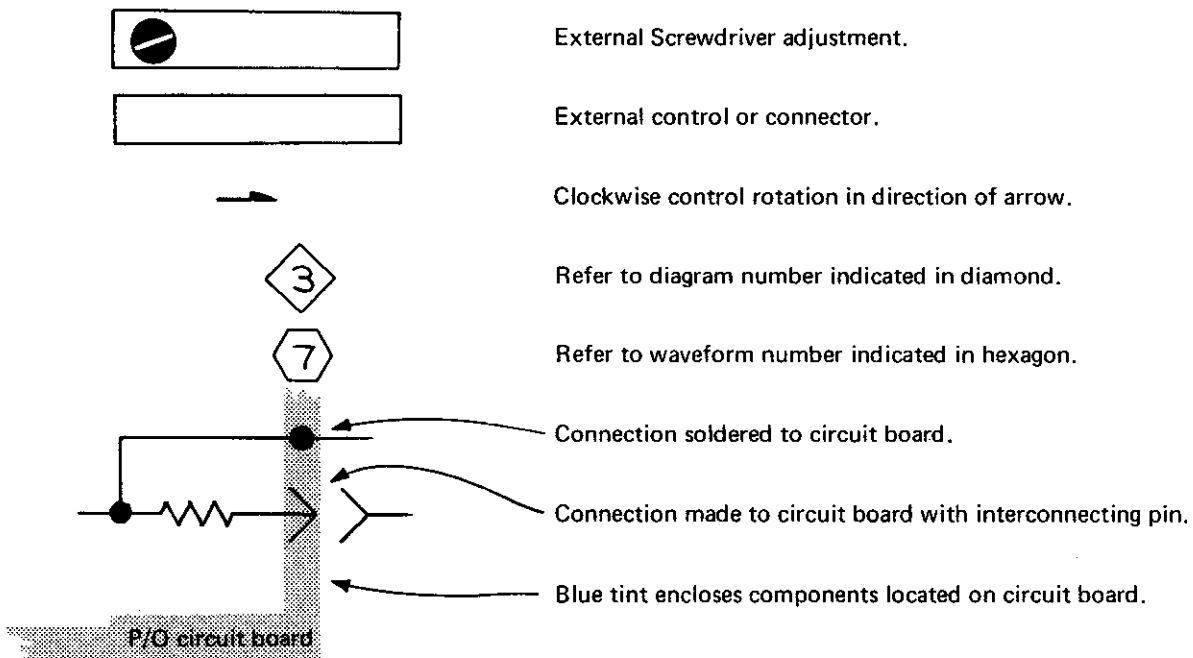
Electrical components shown on the diagrams are in the following units unless noted otherwise:

Capacitors =	Values one or greater are in picofarads (pF). Values less than one are in microfarads (μ F).
Resistors =	Ohms (Ω)

Symbols used on the diagrams are based on USA Standard Y32.2-1967.

Logic symbology is based on MIL-STD-806B in terms of positive logic. Logic symbols depict the logic function performed and may differ from the manufacturer's data.

The following special symbols are used on the diagrams:



The following prefix letters are used as reference designators to identify components or assemblies on the diagrams.

A	Assembly, separable or repairable (circuit board, etc.)	LR	Inductor/resistor combination
AT	Attenuator, fixed or variable	M	Meter
B	Motor	Q	Transistor or silicon-controlled rectifier
BT	Battery	P	Connector, movable portion
C	Capacitor, fixed or variable	R	Resistor, fixed or variable
CR	Diode, signal or rectifier	RT	Thermistor
DL	Delay line	S	Switch
DS	Indicating device (lamp)	T	Transformer
F	Fuse	TP	Test point
FL	Filter	U	Assembly, inseparable or non-repairable (integrated circuit, etc.)
H	Heat dissipating device (heat sink, heat radiator, etc.)	V	Electron tube
HR	Heater	VR	Voltage regulator (zener diode, etc.)
J	Connector, stationary portion	Y	Crystal
K	Relay		
L	Inductor, fixed or variable		

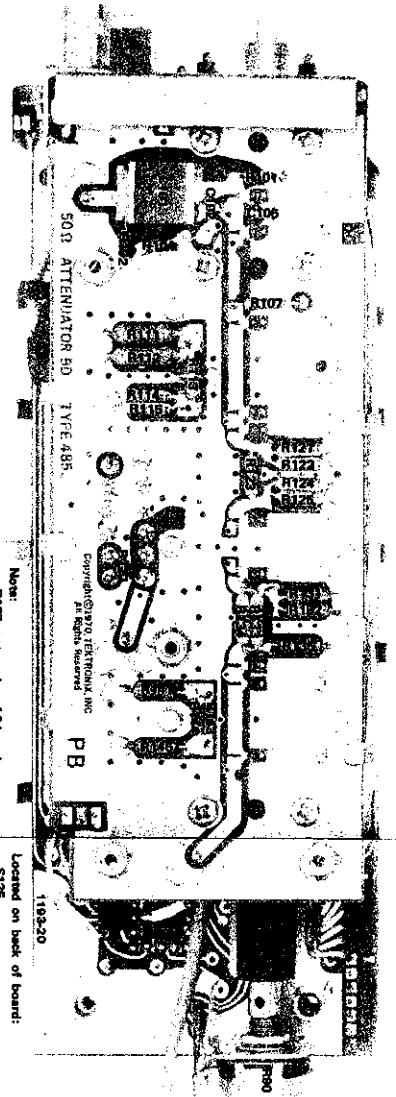


Fig. 8-1. A5 & A6 50 Ω Attenuator board.

Note:
R127 not used on A6 board.

Located on back of board:
S725
C104

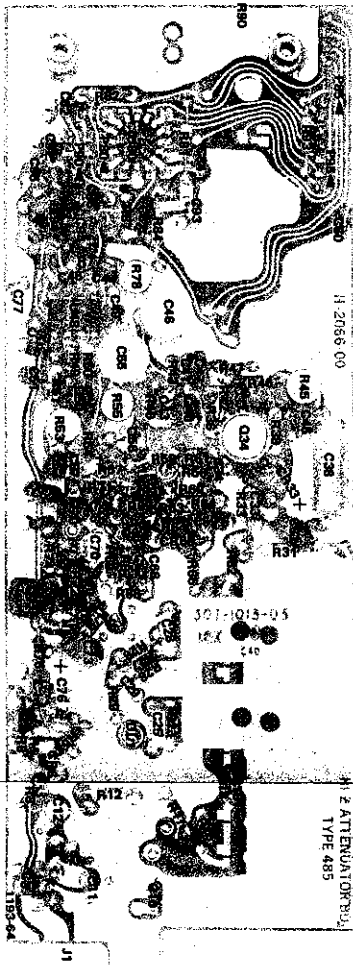
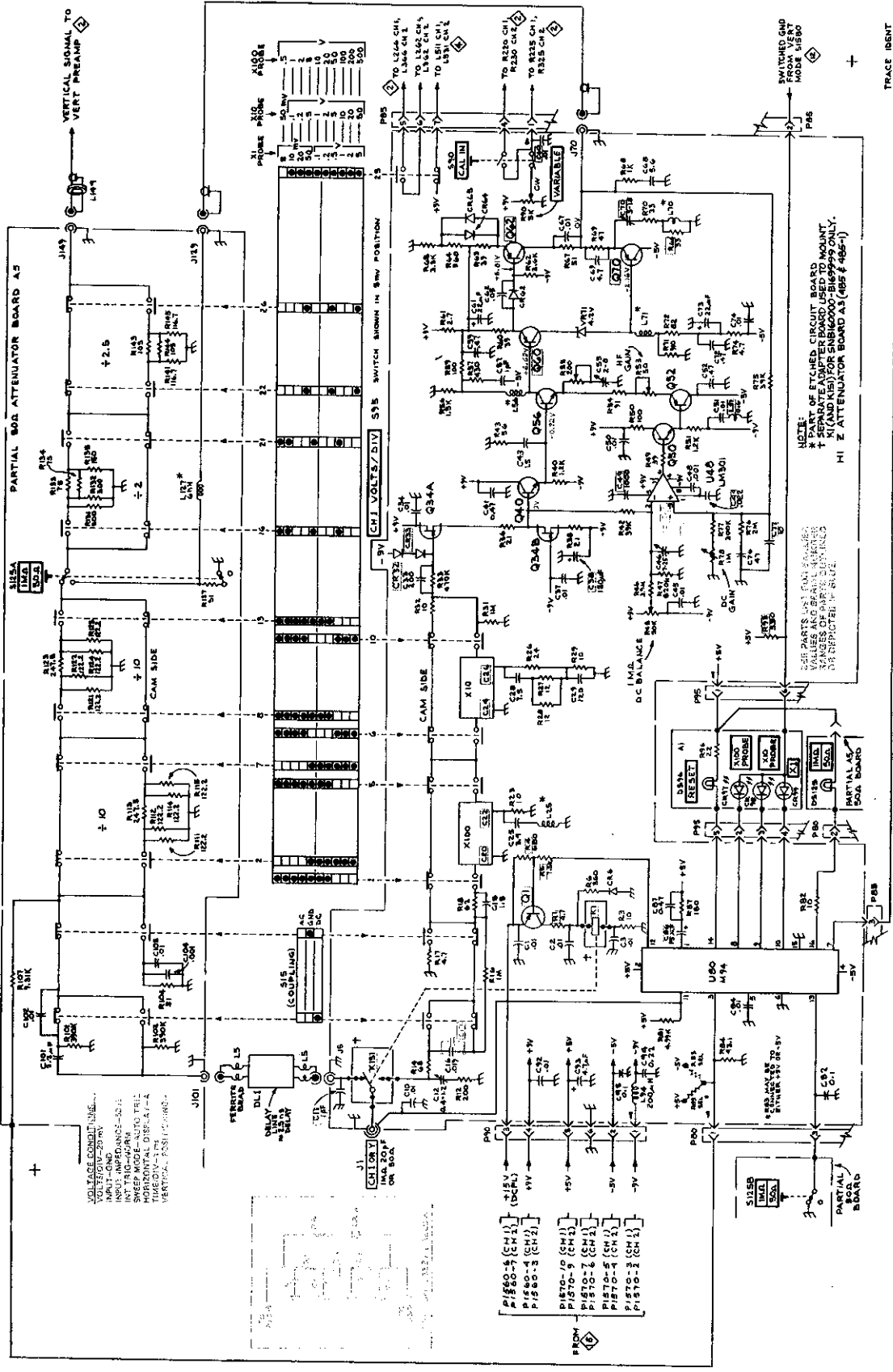
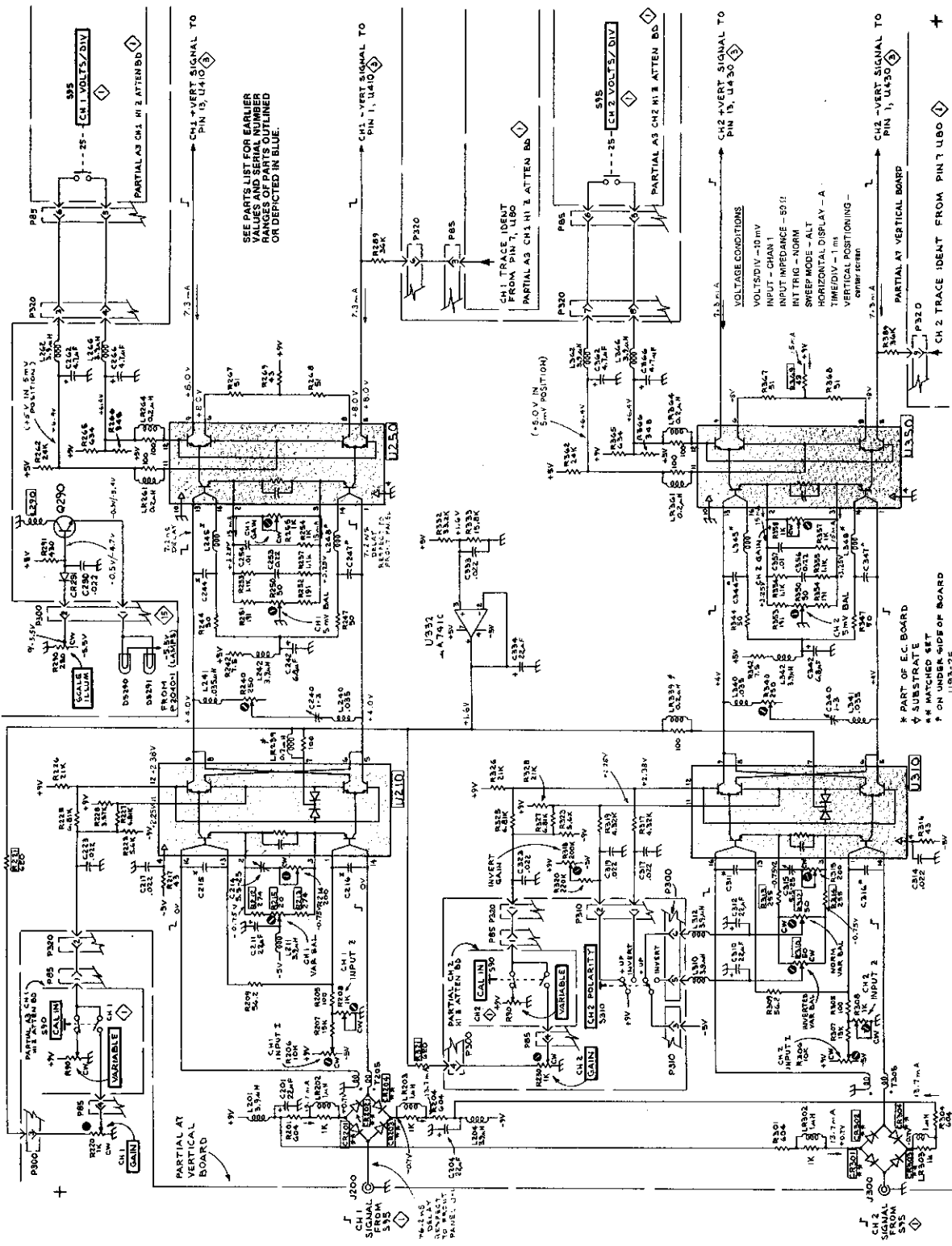


Fig. 8-2A. A3 HI Z Attenuator board (485 & 485-1 only) SN 8185790-up.

*See Parts List for
serial number ranges.



PARTIAL 500 ATTENUATOR BOARD A5
 CH1 ATTENUATORS (HI Z)
 (CH 2 IDENTICAL)
 485 OSCILLOSCOPE
 REV. I, JULY 1979
 NOTE: SEE PARTS LIST FOR PART NUMBERS, VALUES AND BOARD LOCATIONS. * (AND K15) FOR 8149000-8149999 ONLY. HI Z ATTENUATOR BOARD A5 (485 & 485-1)



SEE PARTS LIST FOR EARLIER
VALUES AND SERIAL NUMBER
OR DEPICTED IN BLUE.

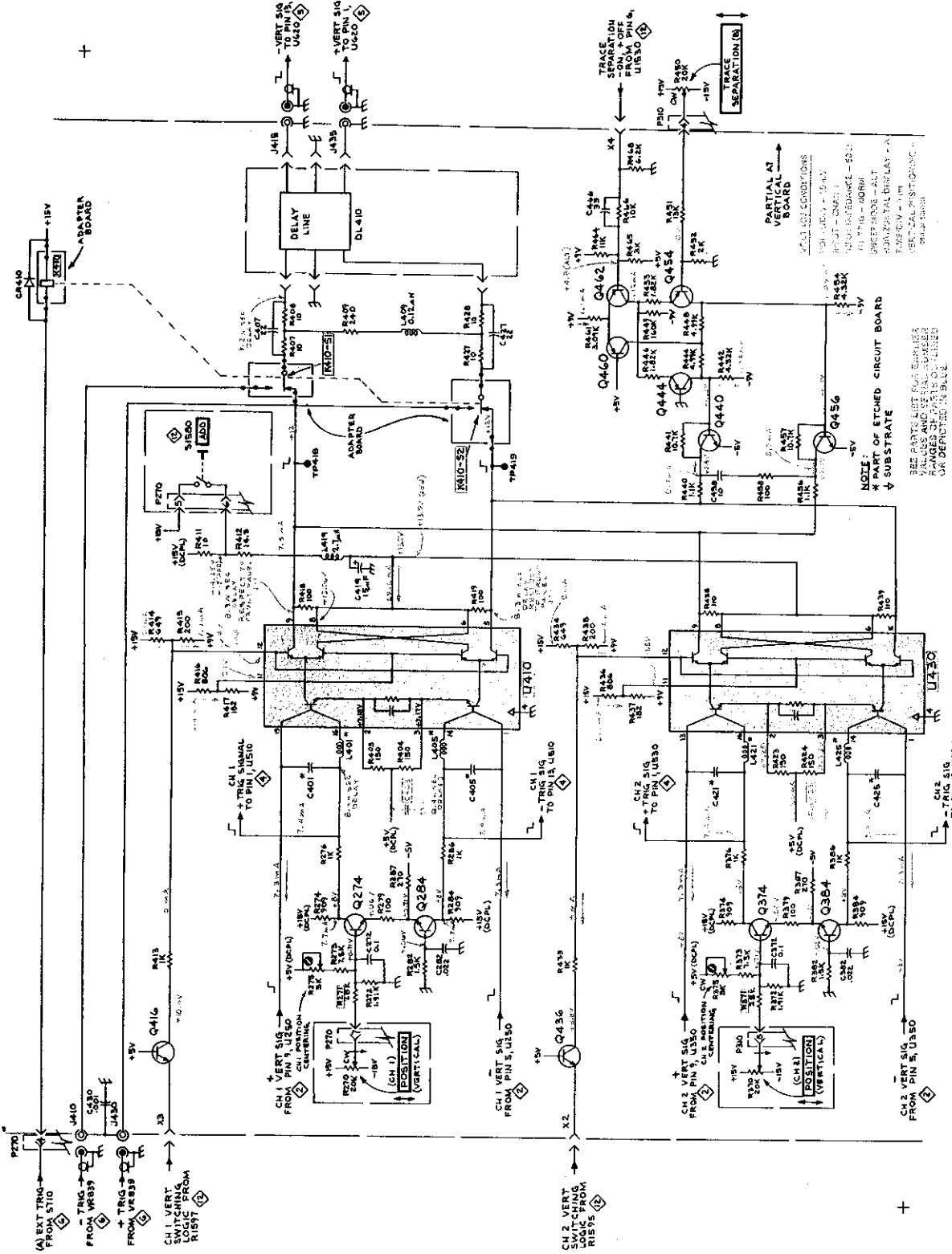
VOLTAGE CONDITIONS
VOLTS/DIV - 10 mV
INPUT IMPEDANCE - 50 Ω
INT TRIG - NORM
SWEEP MODE - ALT
HORIZONTAL DISPLAY - A
TIME/DIV - 1 ms
VERTICAL POSITIONING -
center screen

CH 1 & CH 2 VERTICAL PREAMPS

REV. E. MAR. 1977

485 OSCILLOSCOPE

84P



EXP

VERTICAL CHANNEL SWITCHING

1195-27 REV. 6, JULY 1979

465 OSCILLOSCOPE

P/O A7 VERT AMP BOARD

REV. D, SEPT 1974

INT TRIG
BAL ADJ

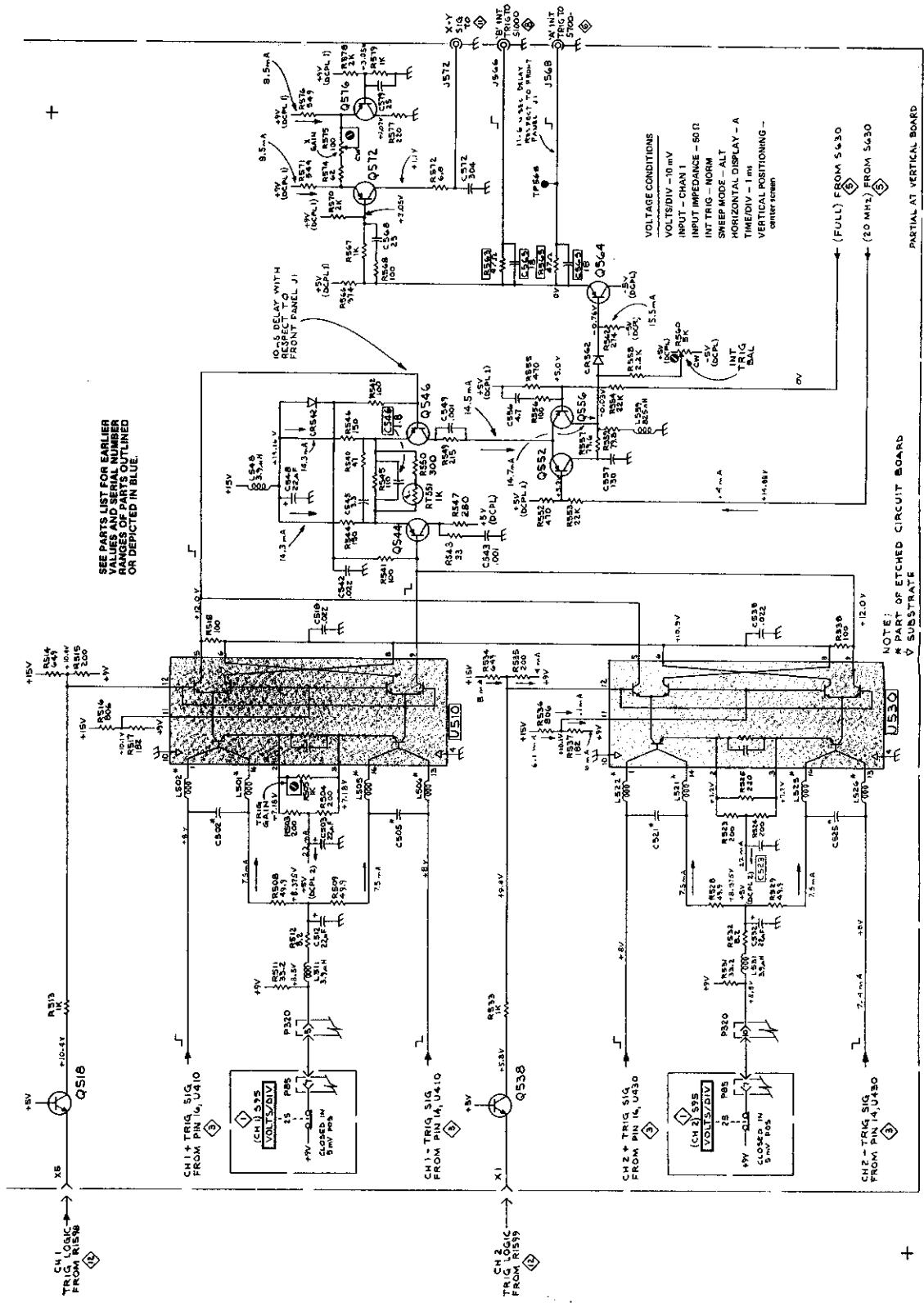
TRIG GAIN
TP568

TRIG GAIN
ADJ



Fig. 8-5. A7 Partial Vertical amplifier board.

*See Part List for
serial number ranges.



SEE PARTS LIST FOR EARLIER REVISIONS. PART NUMBER RANGES OF PARTS, UNLESS INDICATED OTHERWISE, ARE IDENTICAL TO PREVIOUS EDITIONS OR DEPICTED IN BLUE.

VOLTAGE CONDITIONS
VOLTS/DIV - 10 mV
INPUT - CHAN 1
INPUT IMPEDANCE - 50 Ω
INT TRIG - NORM
SLEEP MODE - ALT
HORIZONTAL DISPLAY - A
TIME/DIV - 1 mV
VERTICAL POSITIONING - CENTER SCRAM

NOTE: PARTS ETCHED CIRCUIT BOARD ON SUBSTRATE

PARTIAL AT VERTICAL BOARD

EXP

TRIGGER AMPLIFIER & SWITCHING

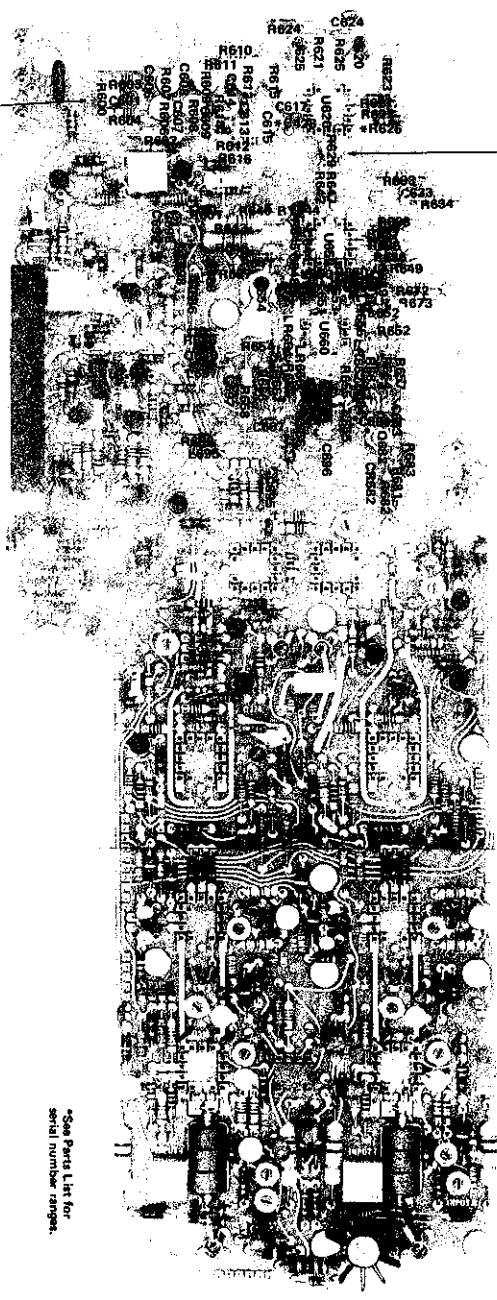
1957-25
REV. E, MAR. 1978

485 OSCILLOSCOPE

REV. 8, SEPT 1974

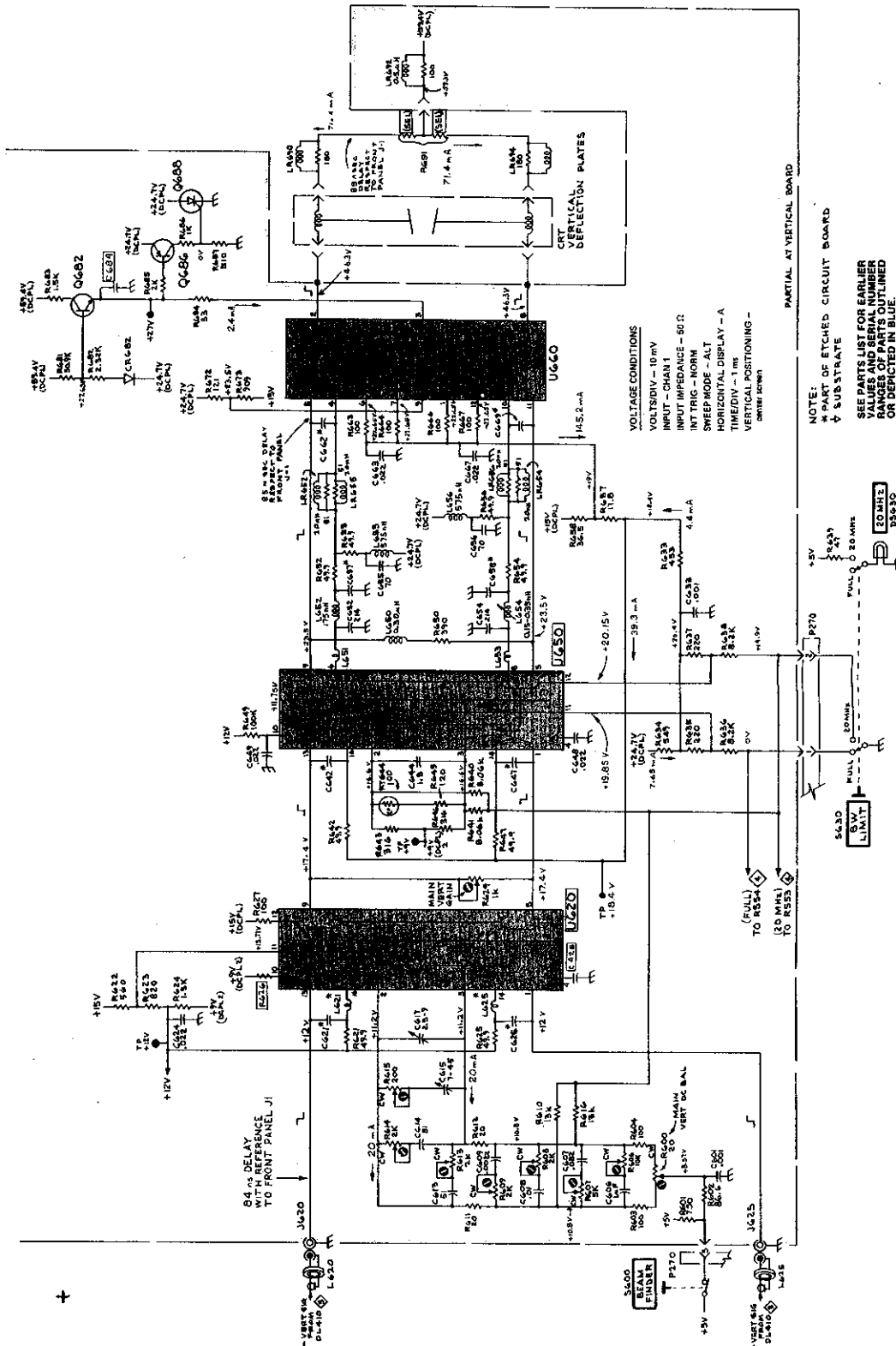
MAIN VERT
BAL ADJ

MAIN VERT
GAIN ADJ



*See Parts List for
serial number ranges.

Fig. 86. A7 Partial Vertical amplifier board.



VOLTAGE CONDITIONS
 VOLTS/DIV - 10 mV
 INPUT - CHAN 1
 INPUT IMPEDANCE - 50 Ω
 INT TRIG - NORM
 SWEEP MODE - ALT
 HORIZONTAL DISPLAY - A
 TIME/DIV - 1 ms
 VERTICAL POSITIONING -
 50% SCREEN

NOTE:
 * PART OF ETCHED CIRCUIT BOARD
 † SUBSTRATE

SEE PARTS LIST FOR EARLIER
 VALUES AND SERIAL NUMBER
 RANGES OF PARTS OUTLINED
 ON DEPICTED IN BLUE.

+

VERTICAL AMPLIFIER

REV. 6, MAR 1976
1193-31

485 OSCILLOSCOPE

+

A8 & A9 A TRIG BOARDS

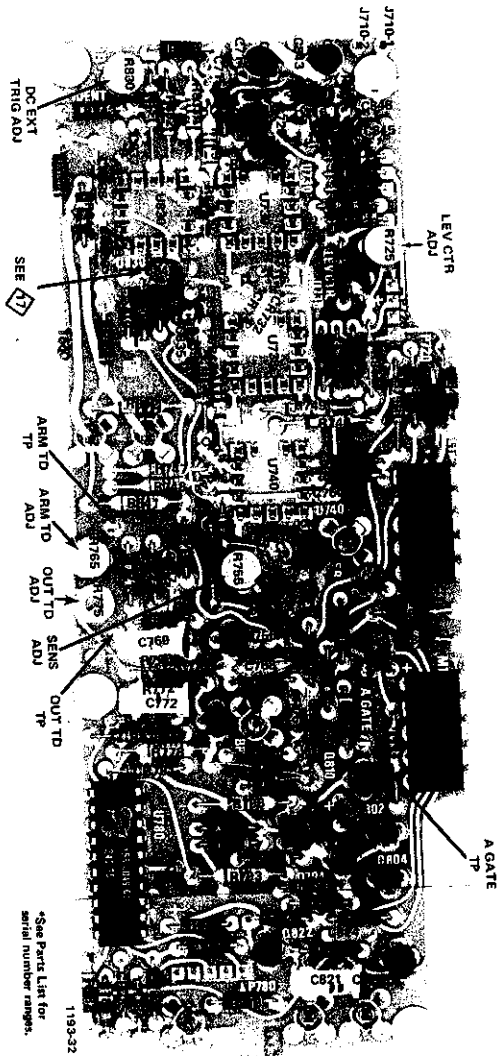


FIG. 8-7B

Fig. 8-7A, A8 A Trigger board (485 only)

*See Part List for serial number ranges.

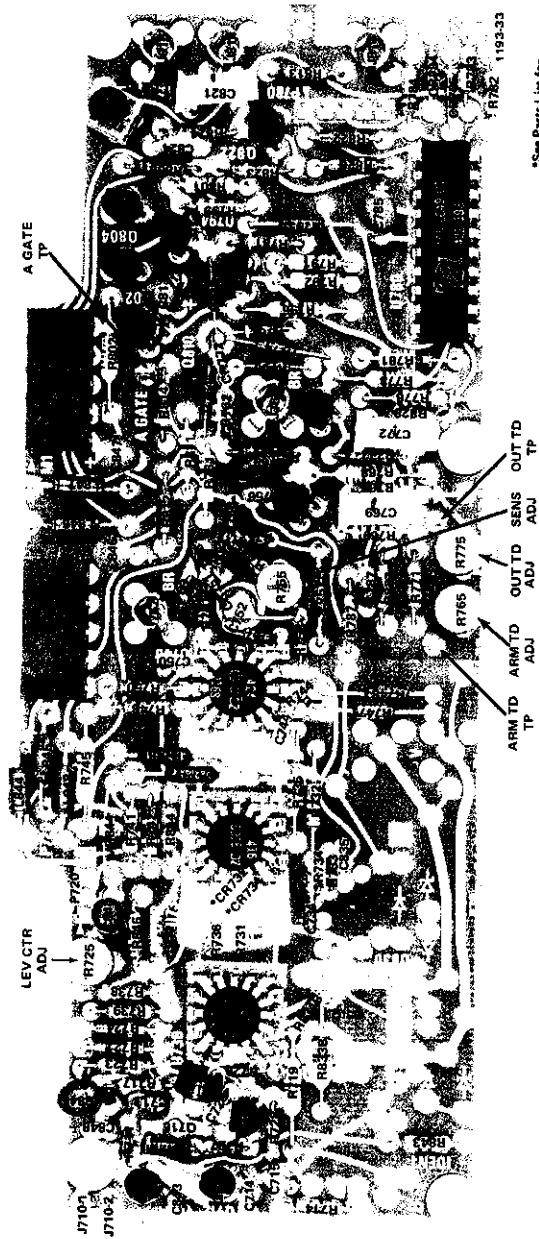
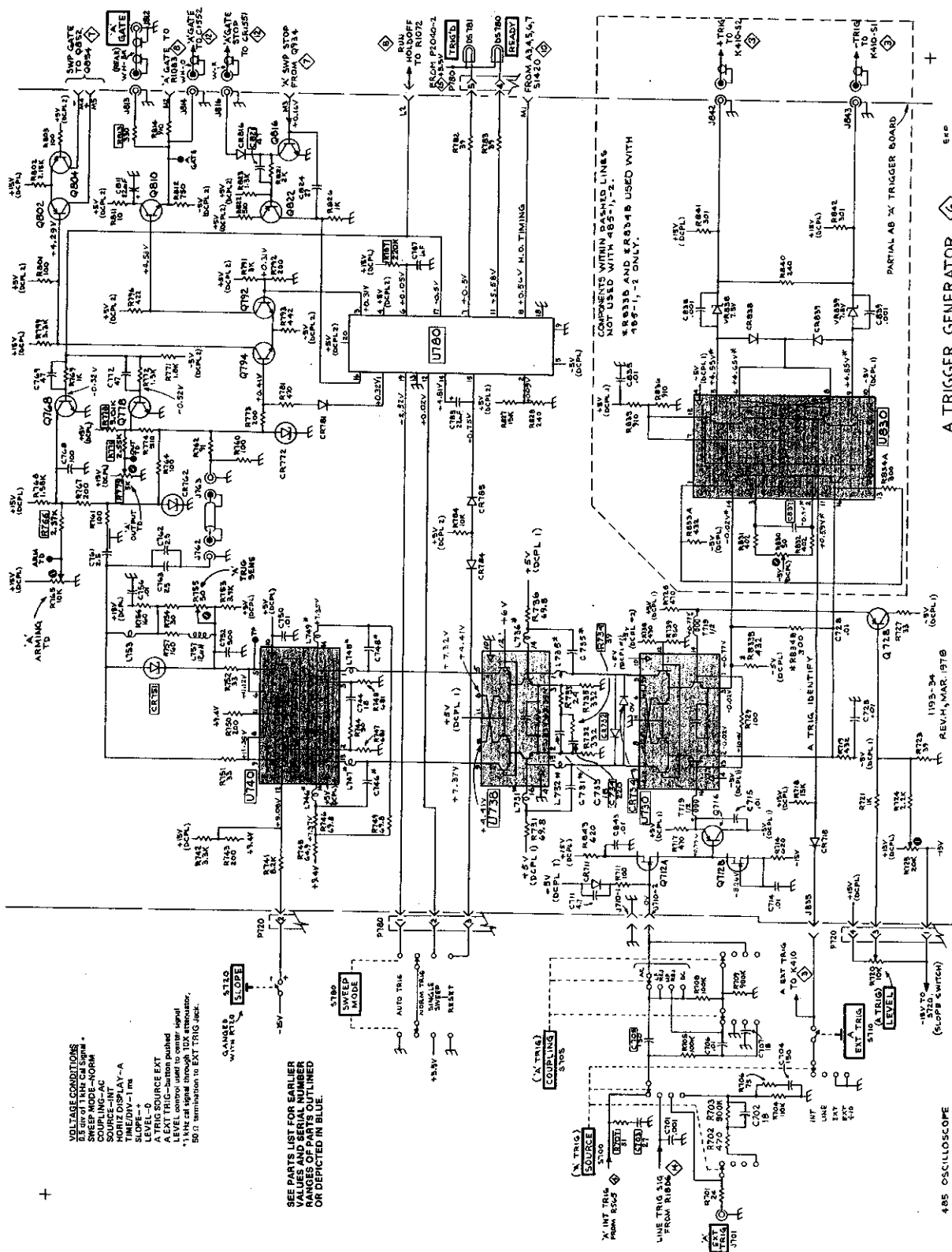


Fig. 8-78. AS A Trigger board (485-1,2 only).



EXP

A TRIGGER GENERATOR

1953-34
REV. H, MAR. 1978

485 OSCILLOSCOPE

VOLTAGE CONDITIONS
 250V ON 100V CALIBRATION
 SWEEP MODE-NORM
 COUPLING-AC
 HORIZ DISPLAY-A
 TIME/DIV-1 μs
 SLOPE-+
 A TRIG SOURCE EXT
 A EXT TRIG-button pushed
 LEVEL control used to obtain signal
 50Ω termination to EXT TRIG JACK.

5700
SWEEP
MODE

SEE PARTS LIST FOR EARLIER
 REVISIONS. PARTS IN
 RANGES OF PARTS OUTLINED
 OR DEPICTED IN BLUE.

5701
LINE TRIG
SOURCE

5702
LINE TRIG
SOURCE

5703
LINE TRIG
SOURCE

5704
LINE TRIG
SOURCE

5705
LINE TRIG
SOURCE

5706
LINE TRIG
SOURCE

5707
LINE TRIG
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5708
LINE TRIG
SOURCE

5709
LINE TRIG
SOURCE

5710
LINE TRIG
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5711
LINE TRIG
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5712
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5713
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5714
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5715
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5795
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5798
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5799
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SOURCE

5800
LINE TRIG
SOURCE

P/O A10 SWEEP BOARD

**Alternate location for some SN.

REV. D AUG 1976

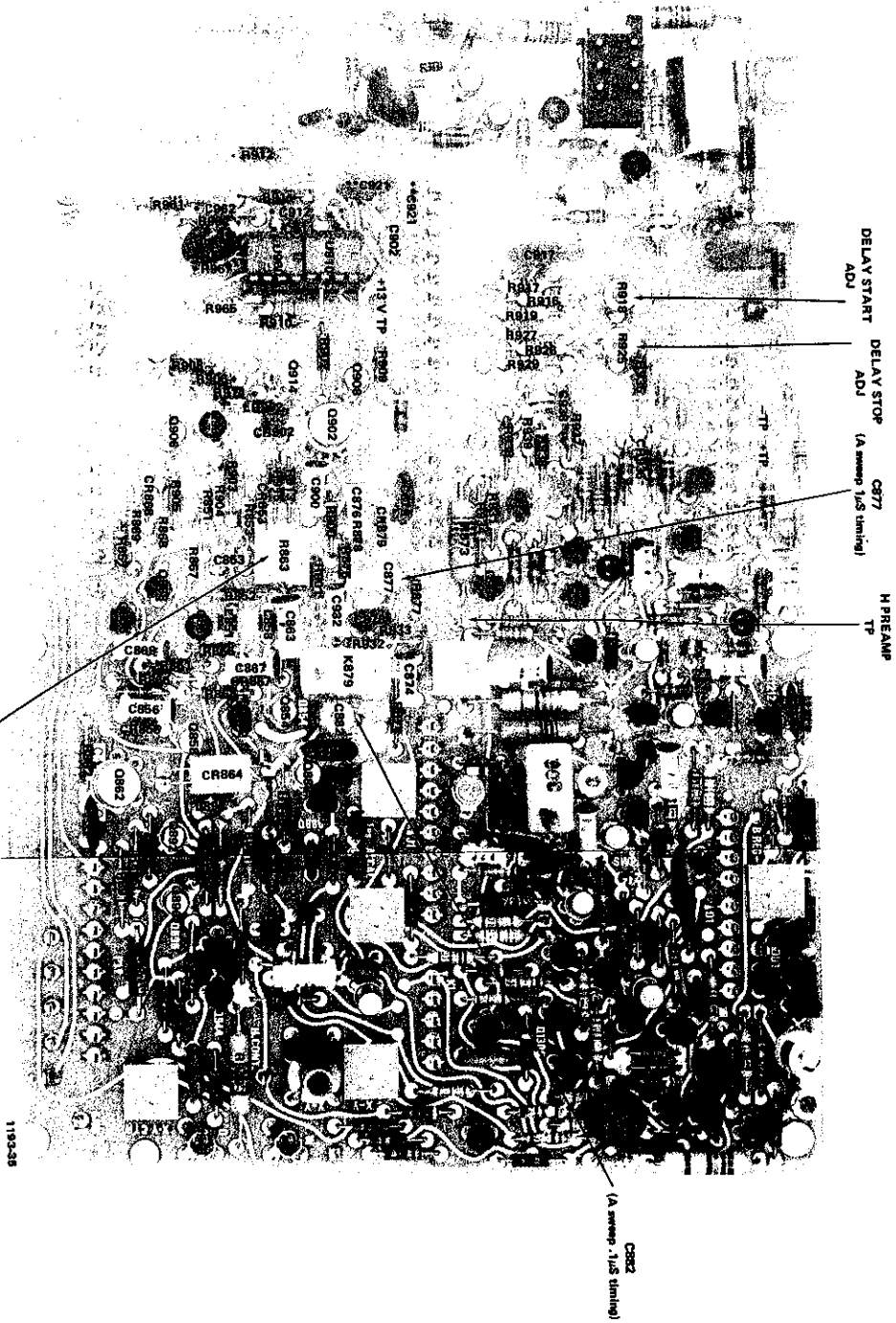
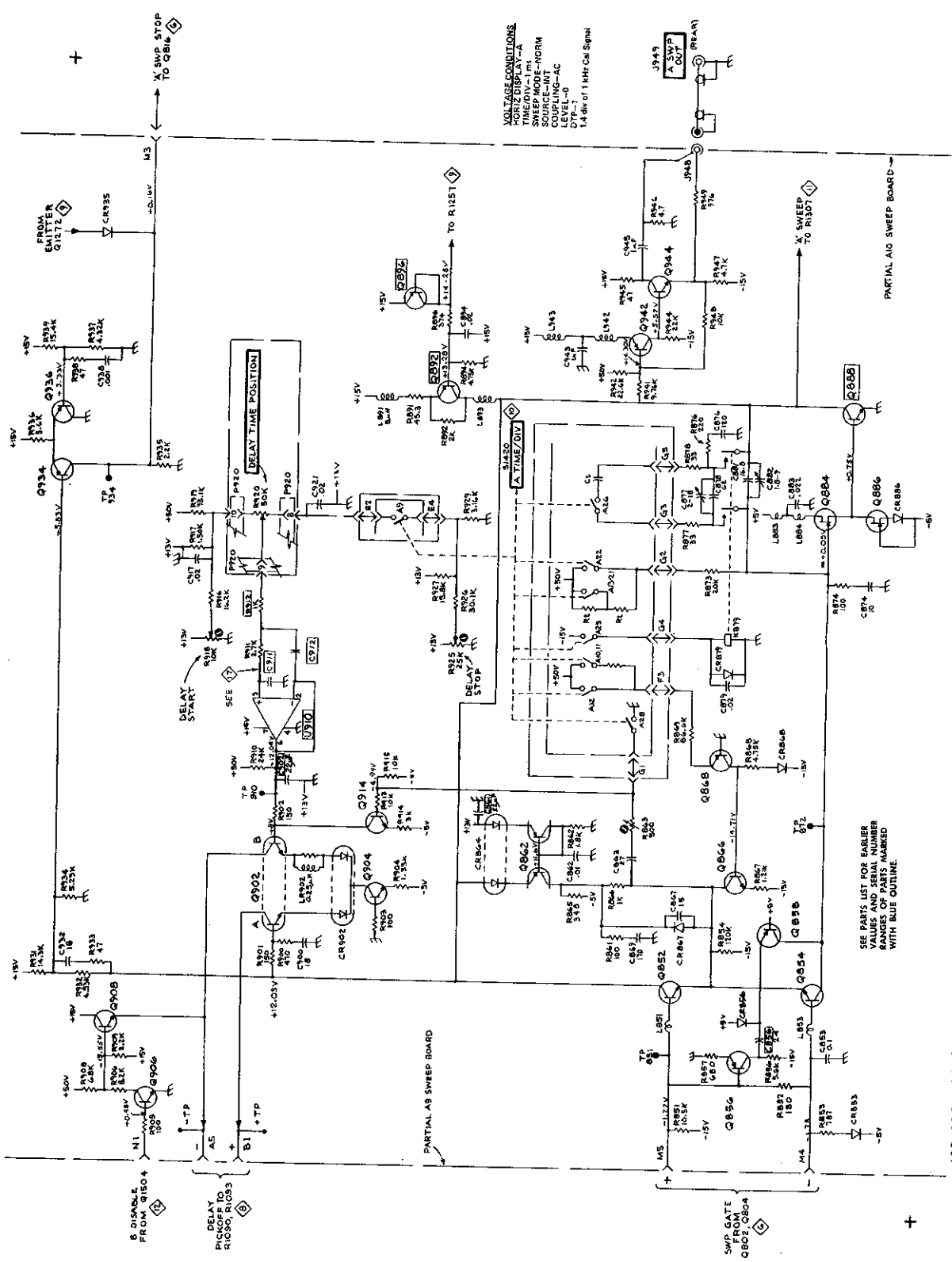


Fig. 8-8. A10 Partial Sweep board.

R863 (A sweep linearity)

*See Parts List for serial number ranges.

1193-35



VOLTAGE CONDITIONS
 HORIZ DISPLAY-A
 SWEEP MODE-NORM
 SOURCE-INT
 COUPLING-AC
 DTP-1 10
 1.4 div of 1 KHz CA Signal

405 OSCILLOSCOPE

REV. D, MAR 1978
 1193-36

SEE PARTS LIST FOR EARLIER
 VALUES AND SERIAL NUMBER
 MARKS OF PARTS MARKED
 WITH BLUE OUTLINE.

405 OSCILLOSCOPE

REV. E, AUG. 1975

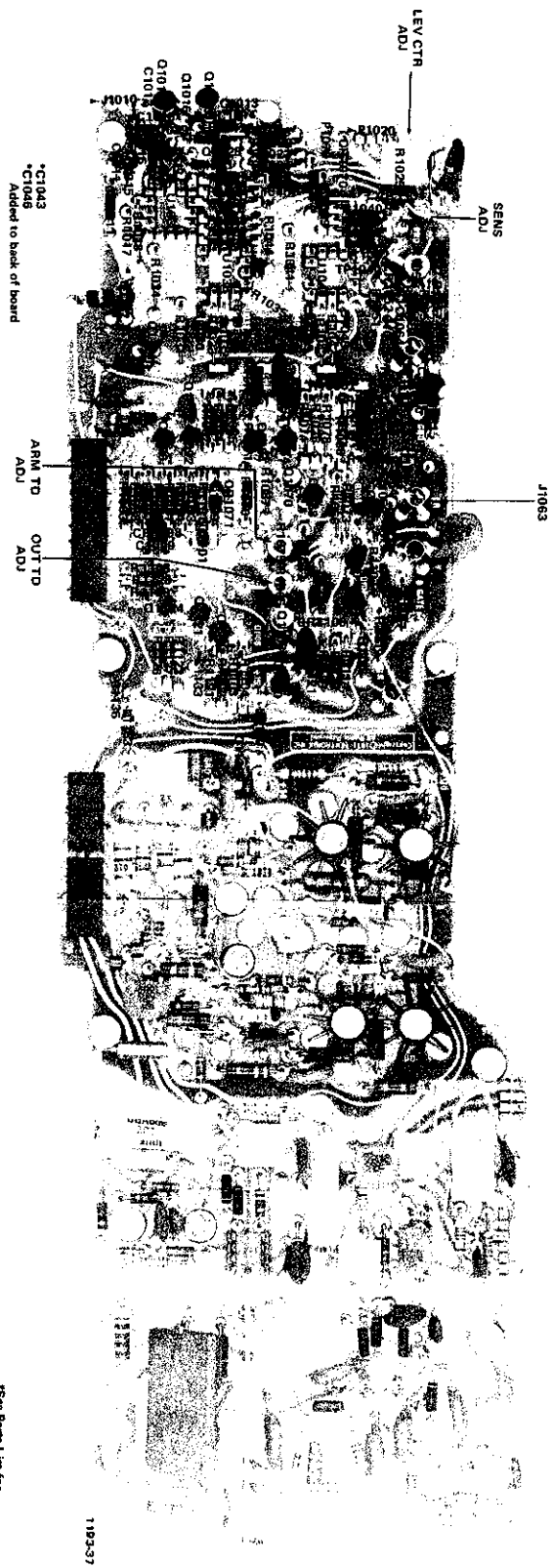
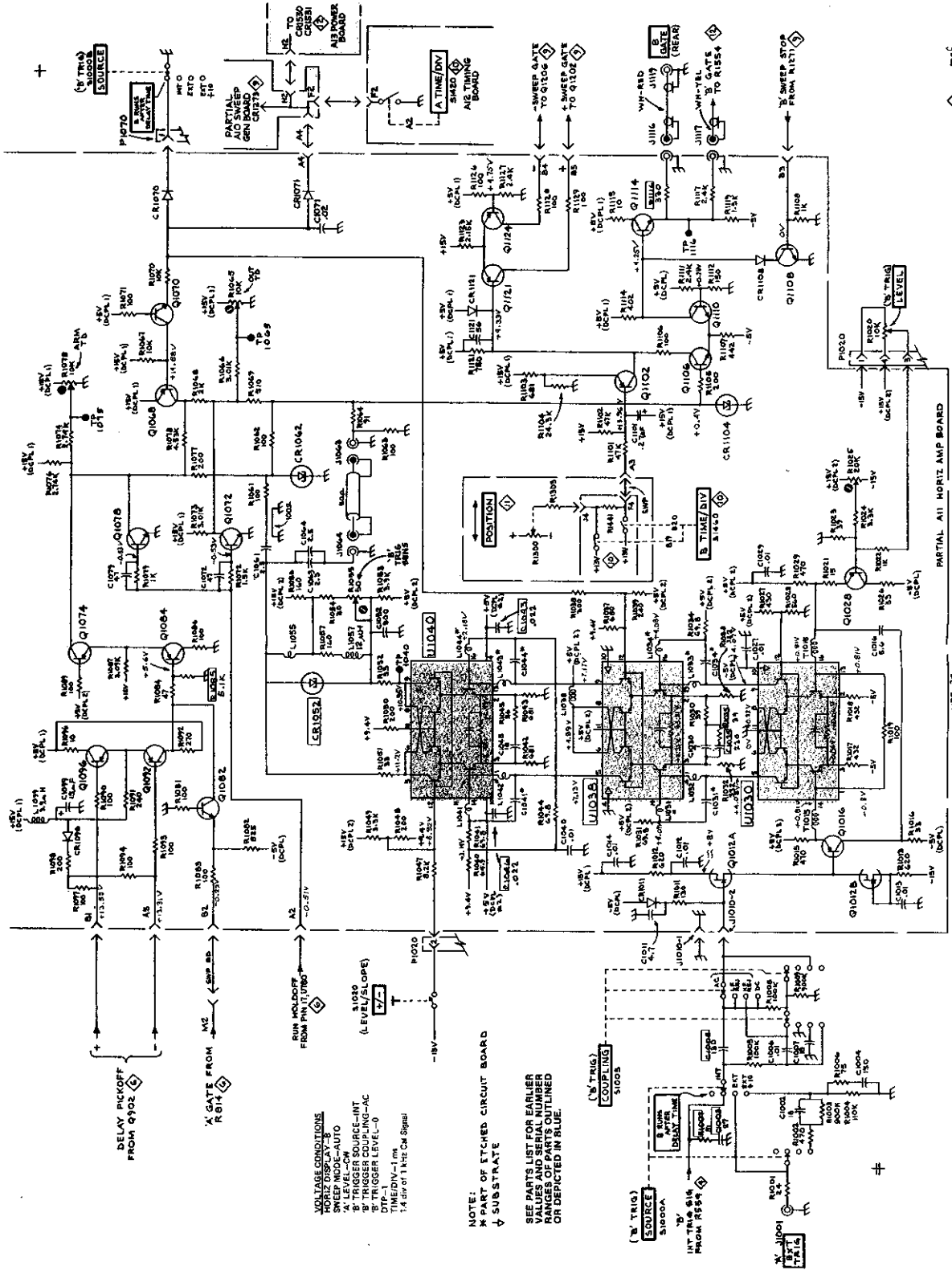


Fig. 8-9. A11 Partial Horizontal amplifier board.

*See Parts List for serial number ranges.

1B2-37



773

B TRIGGER GENERATOR

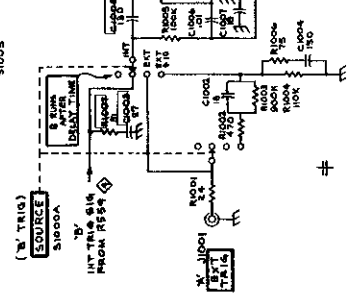
195-36 REV. F, AUG 1977

485 OSCILLOSCOPE

VOLTAGE CONDITIONS
 HORIZ. DIV. 100 NS
 SWEEP MODE-AUTO
 A' LEVEL-CW
 B' TRIGGER COUPLING-AC
 B' TRIGGER LEVEL-0
 DTP-1
 POSITION-1.0V
 1/4 DIV OF THE CH Signal

NOTE: PART OF ETCHED CIRCUIT BOARD
 ↓ SUBSTRATE

SEE PARTS LIST FOR EARLIER
 VALUES AND SERIAL NUMBER
 OR DEPICTED IN BLUE



See Parts List for
serial number ranges.
REV. D AUG 1977

Fig. 8-10. A10 Partial Sweep board.

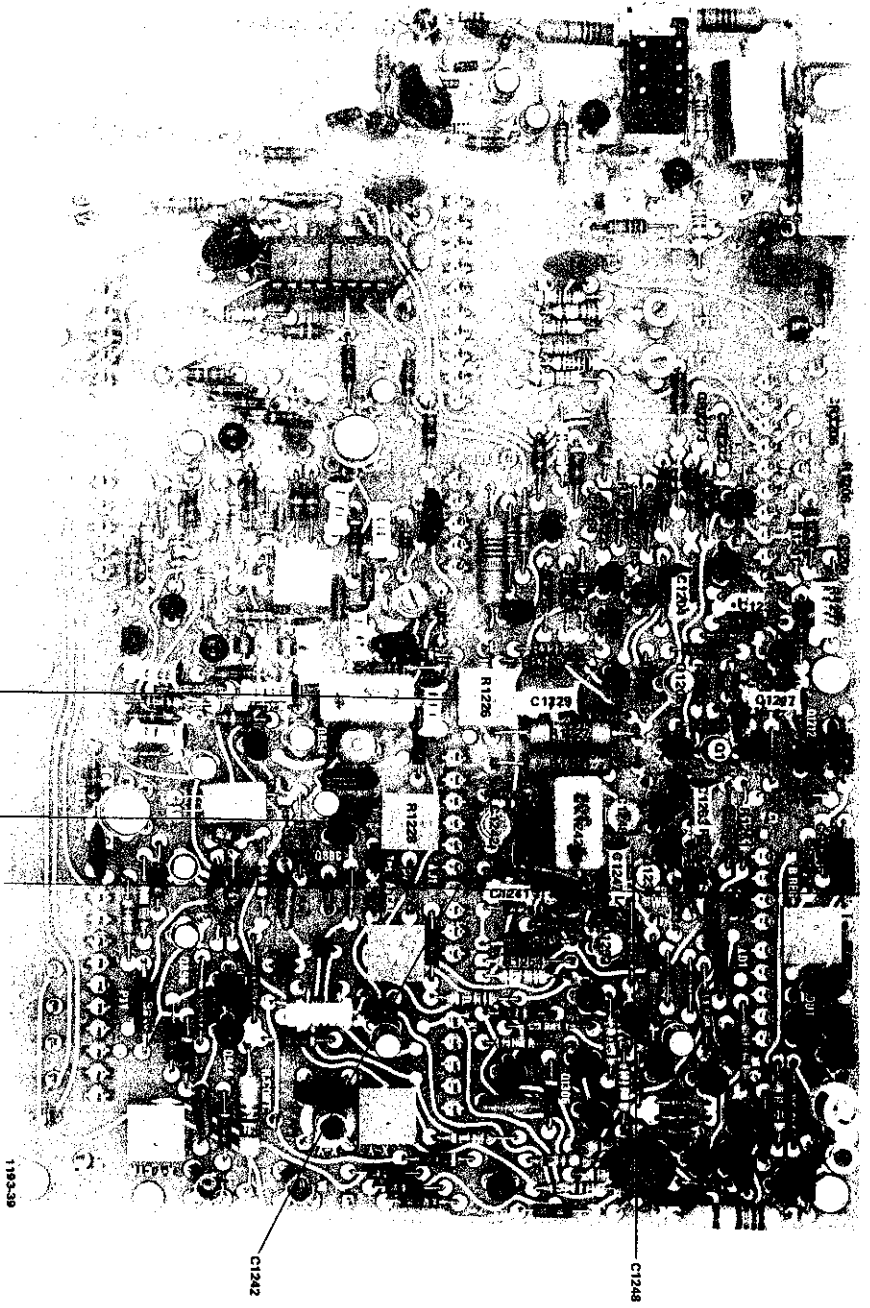




Fig. 8-17. A15 Partial Transformer board.

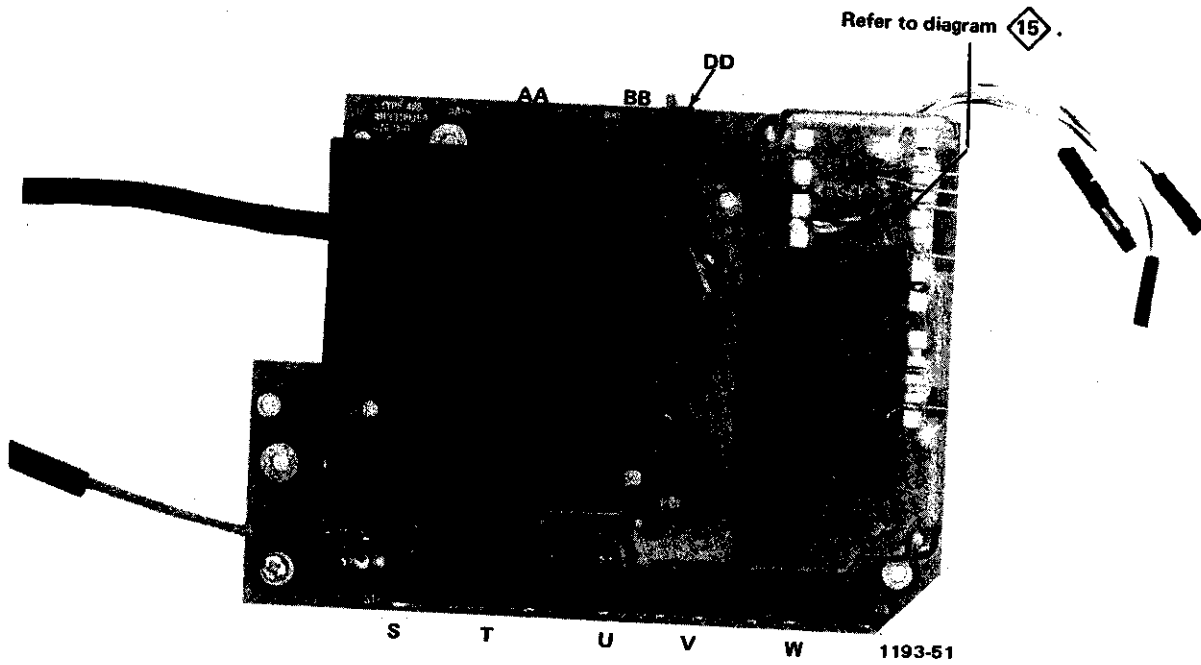


Fig. 8-18. A15 Transformer board.

VOLTAGE CONDITIONS
 B TIME/DIV-0.1 μs
 A TIME/DIV-1 μs
 HORIZ DISPLAY-ALT
 HORIZ POSITION-INT
 A TRIGGER SOURCE-INT
 B TRIGGER SOURCE-B RUNS
 HORIZ POSITIONING-MIDR

SEE PARTS LIST FOR EARLIER
 VALUES AND SERIAL NUMBER
 CHANGES ON PARTS OUTLINED
 OR DEFINED IN BLUE.

CRT
 CIRCUIT
 VES

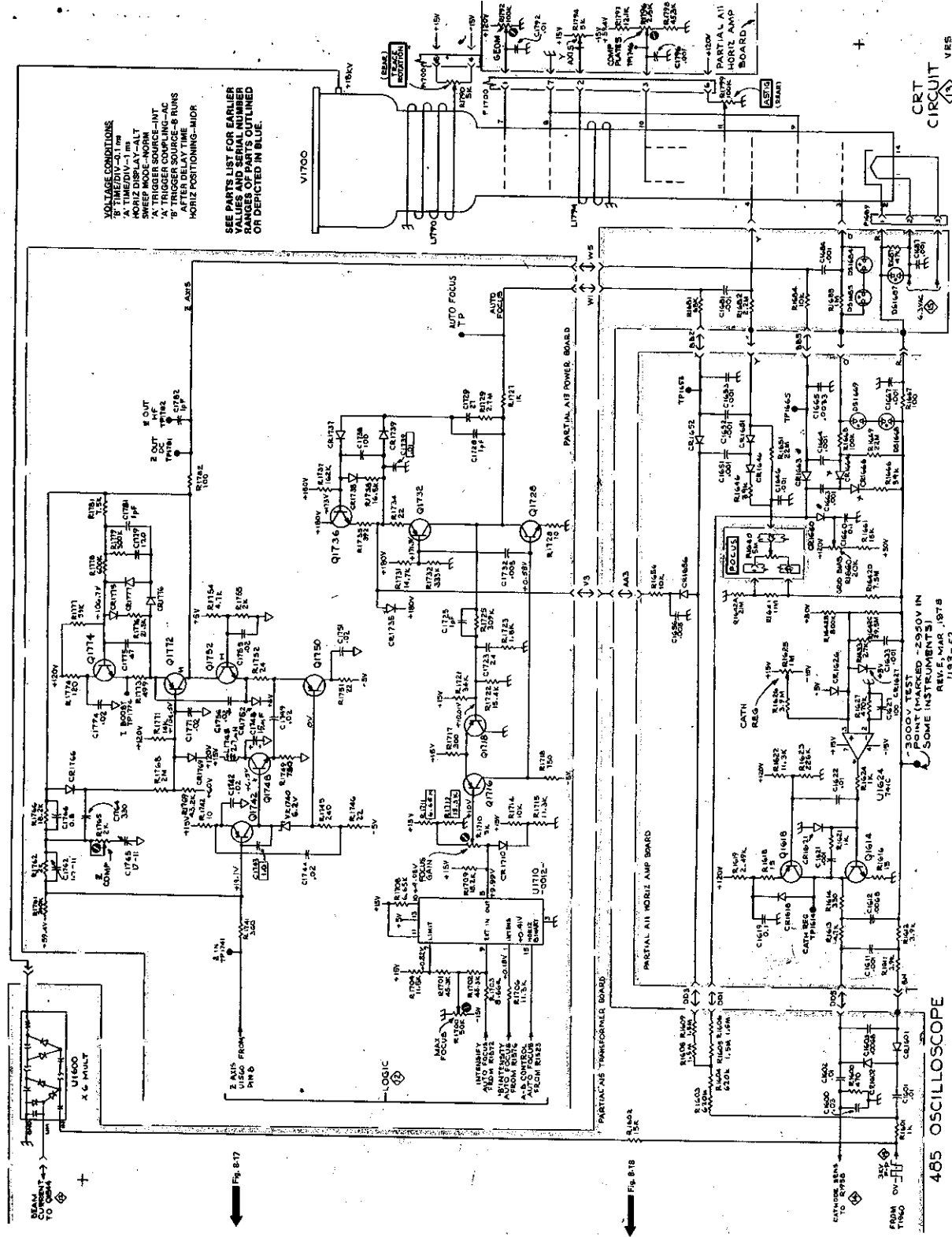


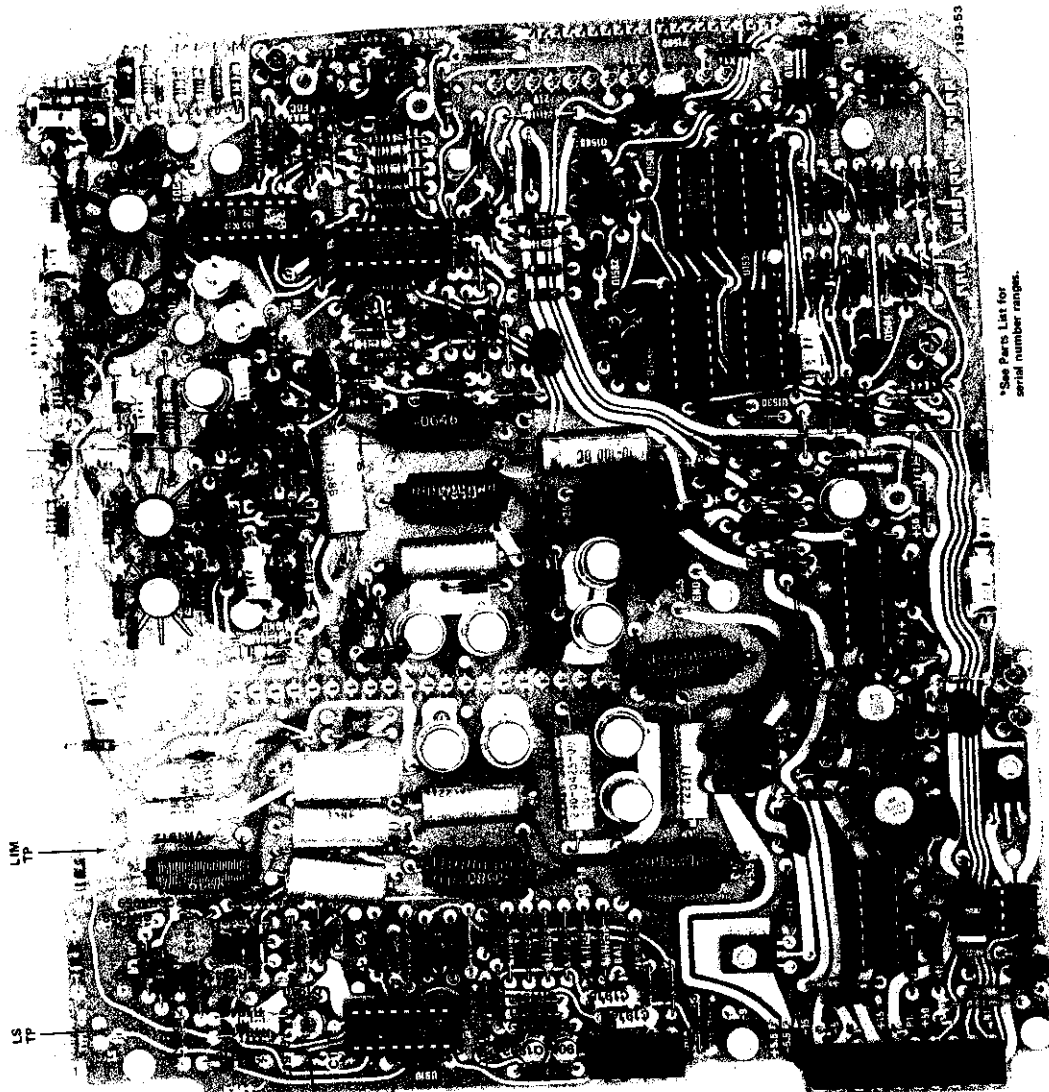
Fig. 8-7

Fig. 8-8

485 OSCILLOSCOPE

3000V TEST POINT (MARKED -2950V IN
 SOME INSTRUMENTS) 1B78
 1175-22

FIG. 8-20 & 8-21



+50.4V
ADJ

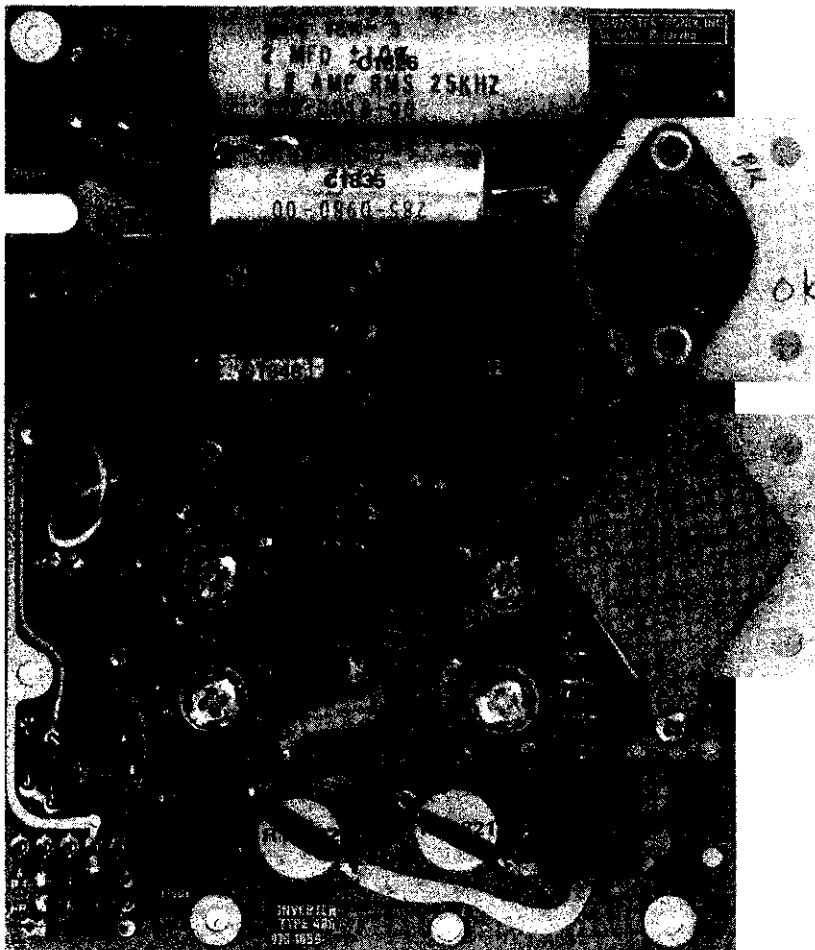
*R1903

Located on back of U1910.

MONO RAMP
SYMMETRY TP

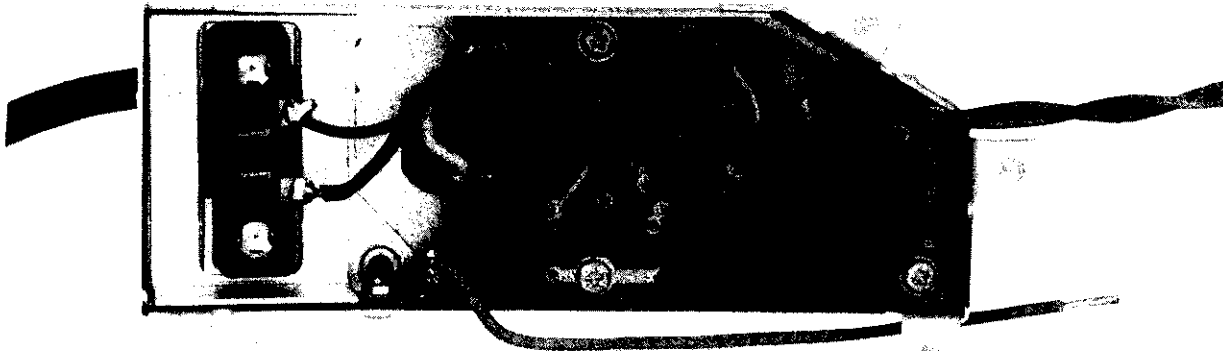
*See Parts List for
serial number ranges.

Fig. 8-19. A13 Partial Power Supply board.



1193-54

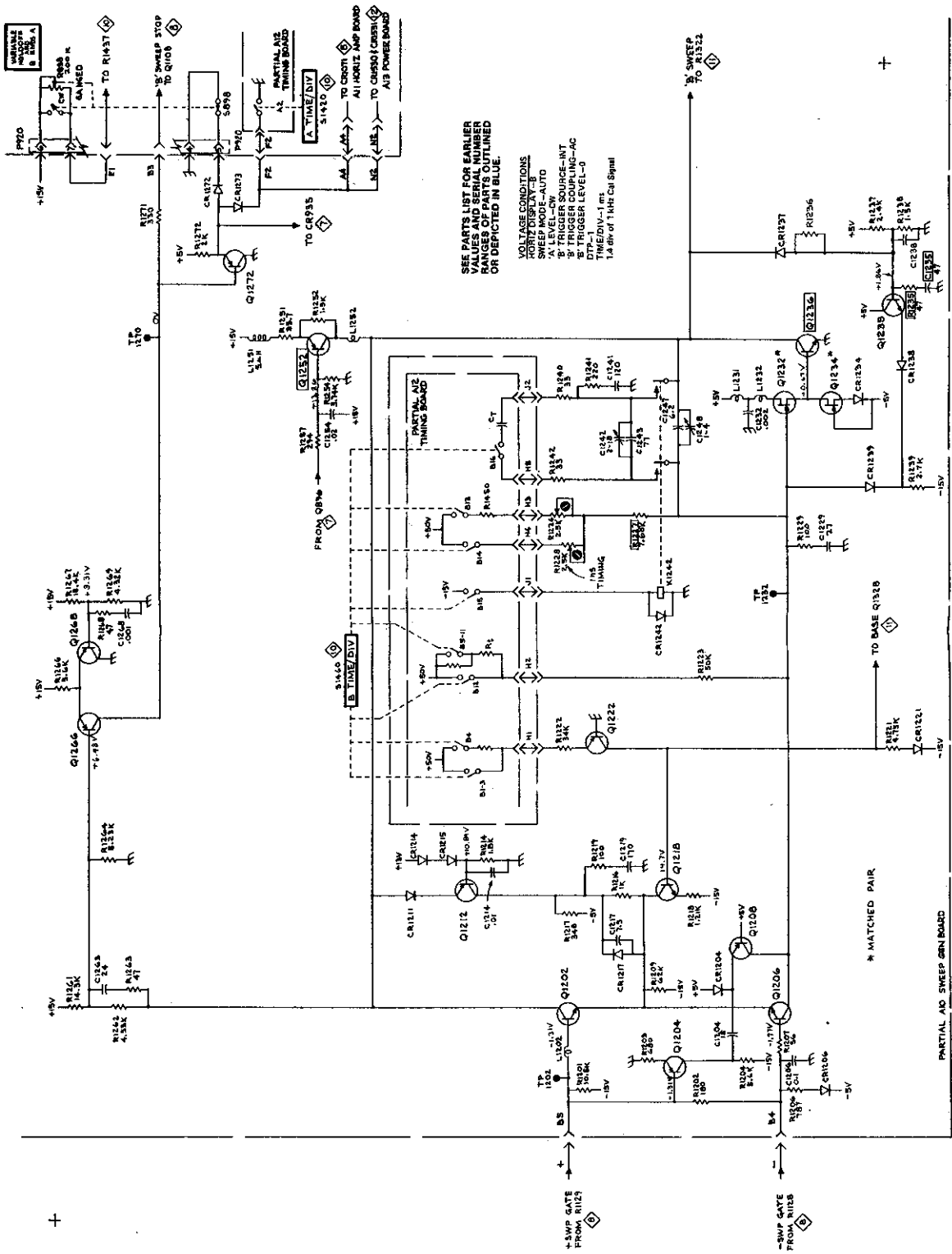
Fig. 8-20. A14 Inverter board.



1193-55

Fig. 8-21. A16 Line Filter board.

B TIME BASE GENERATOR



SEE PARTS LIST FOR EARLIER RANGES AND SERIAL NUMBER RANGES AND PARTS OUTLINED OR DEPICTED IN BLUE.

VOLTAGE CONDITIONS
 HORIZ DISPLAY-B
 SWEEP MODE-AUTO
 TRIGGER SOURCE-INT
 TRIGGER COUPLING-AC
 TRIGGER LEVEL-0
 TIME/DIV-1 ms
 1.4 DIV OF 1 kHz Cal Signal

B TIME BASE GENERATOR

1973-40
 REV. E, AUG. 1977

485 OSCILLOSCOPE

P/O A12 TIMING BOARD

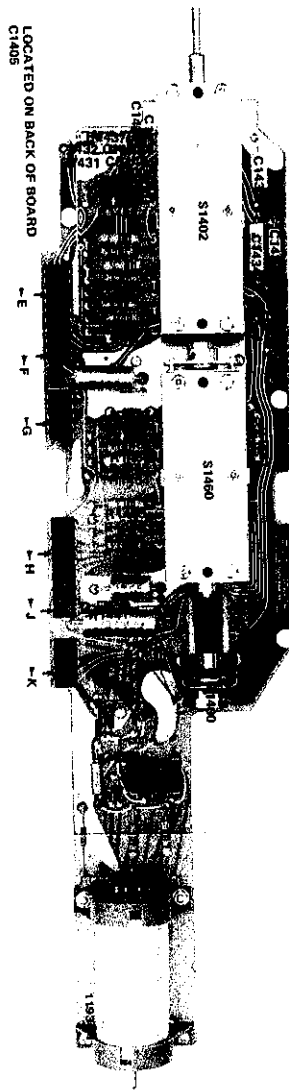
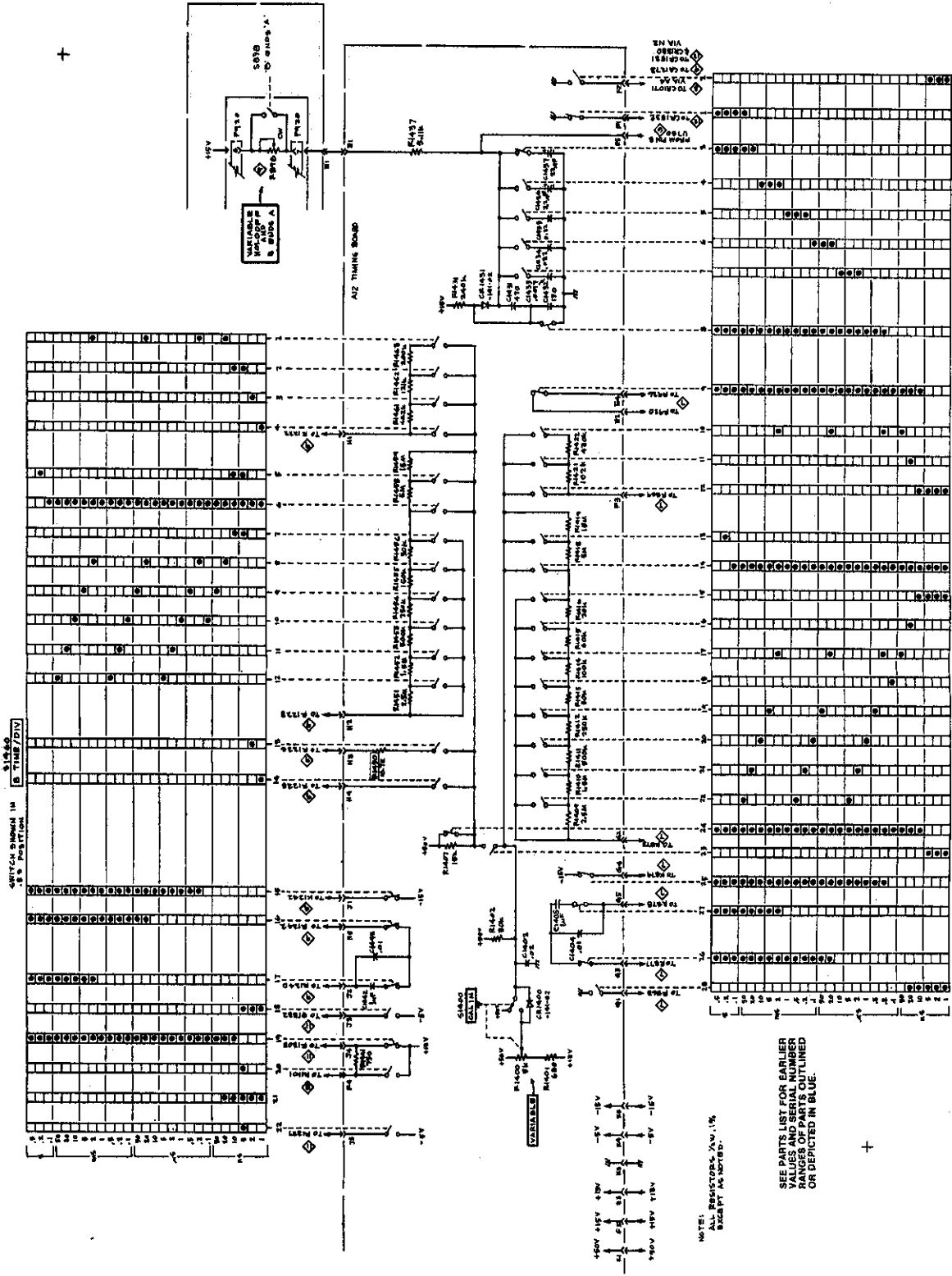


Fig. 8-11. A12 Partial Timing switch board.



SWITCH SHOWN IN .50 POSITION

A TIME/DIV AND DELAY TIME 5/10

REV. E, AUG. 1977

1193-42

SWITCH SHOWN IN .50 POSITION

485 OSCILLOSCOPE

NOTE: ALL RESISTORS 1/4 W, 1% EXCEPT AS NOTED.

SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER RANGES OF PARTS OUTLINED OR DEPICTED IN BLUE.

P/O A10 SWEEP BOARD
P/O A11 HORIZ BOARD

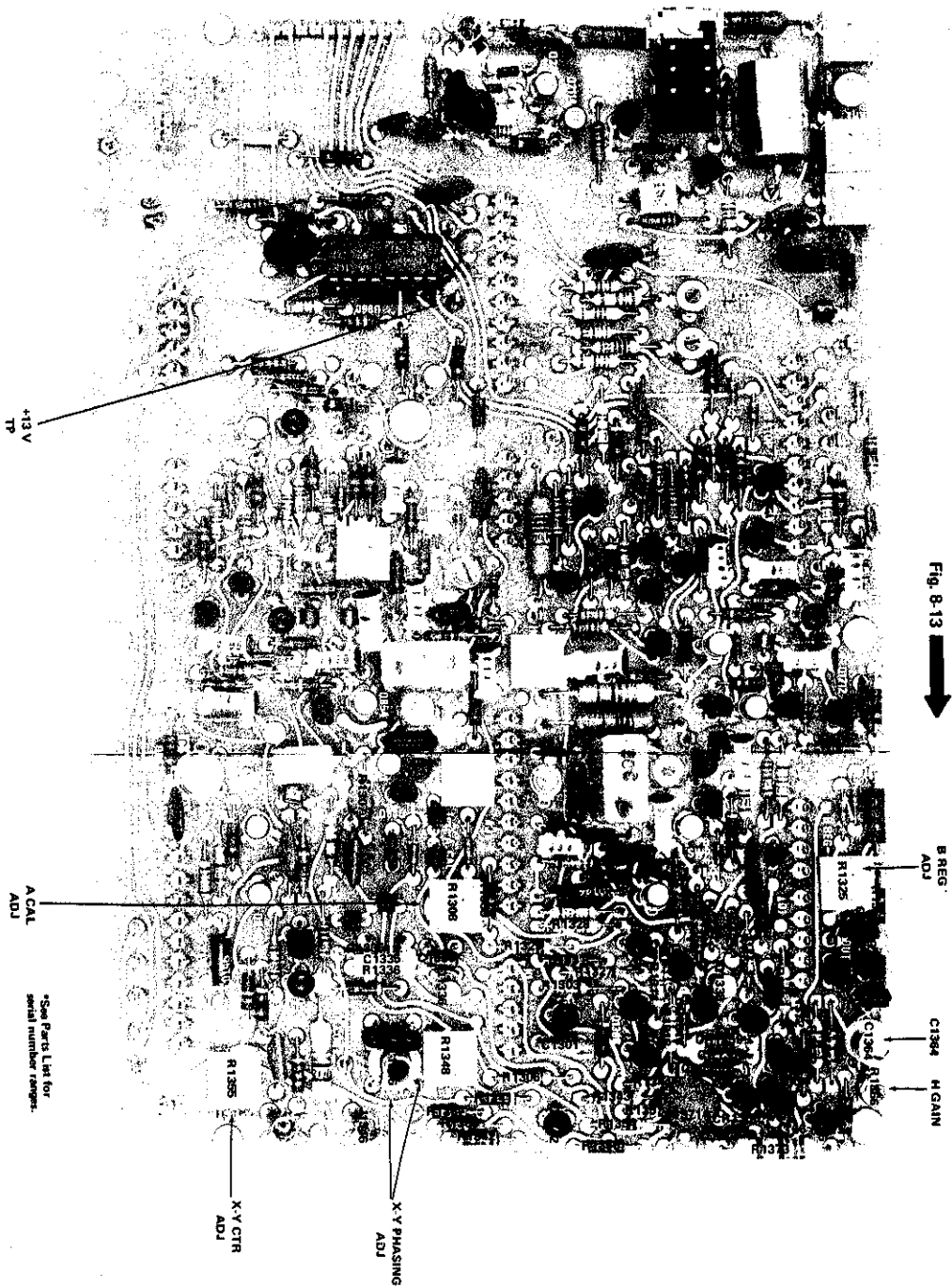
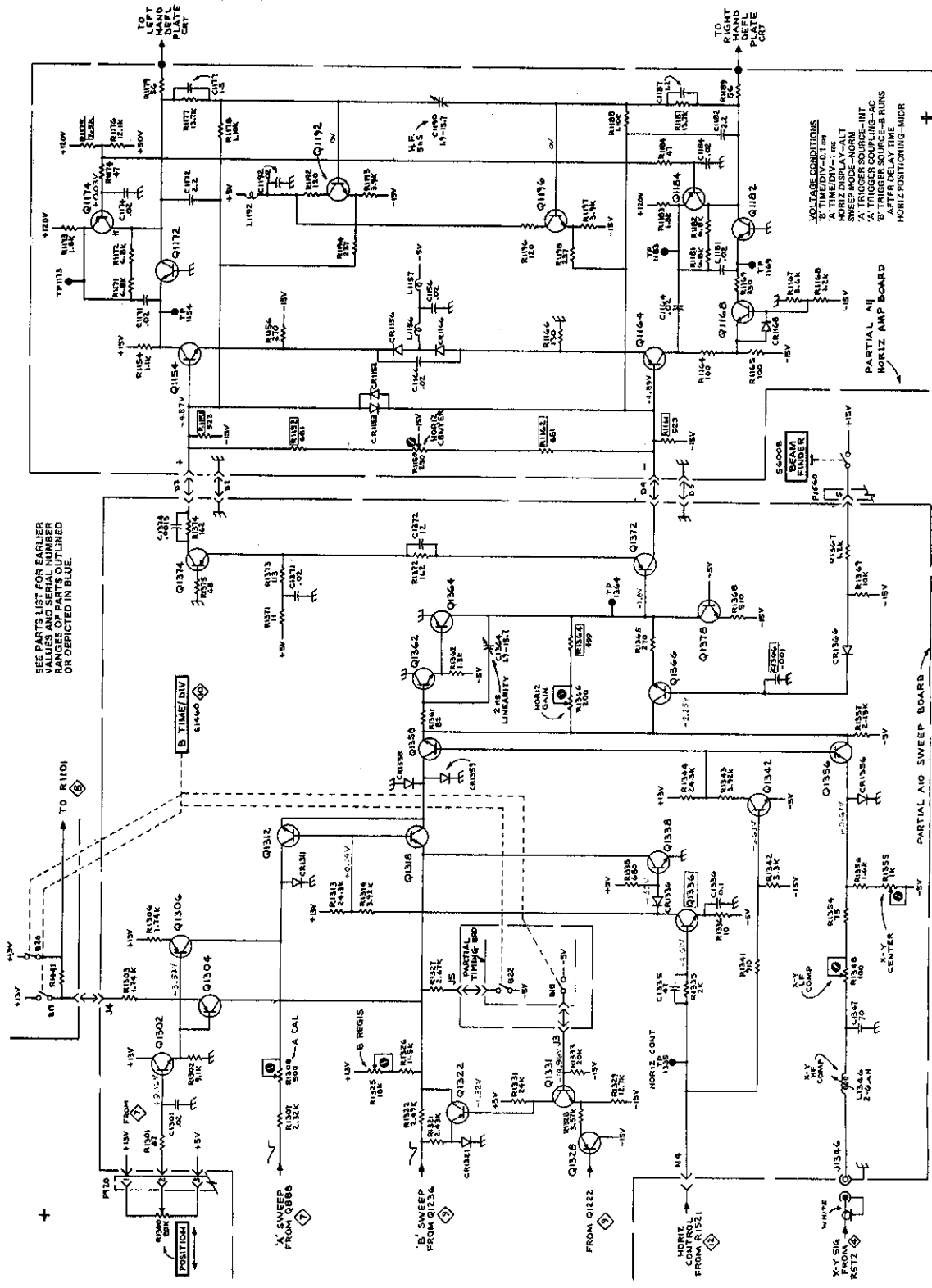


Fig. 8-13

REV. C, SEPT 1974

Fig. 8-12. A10 Partial Sweep board.

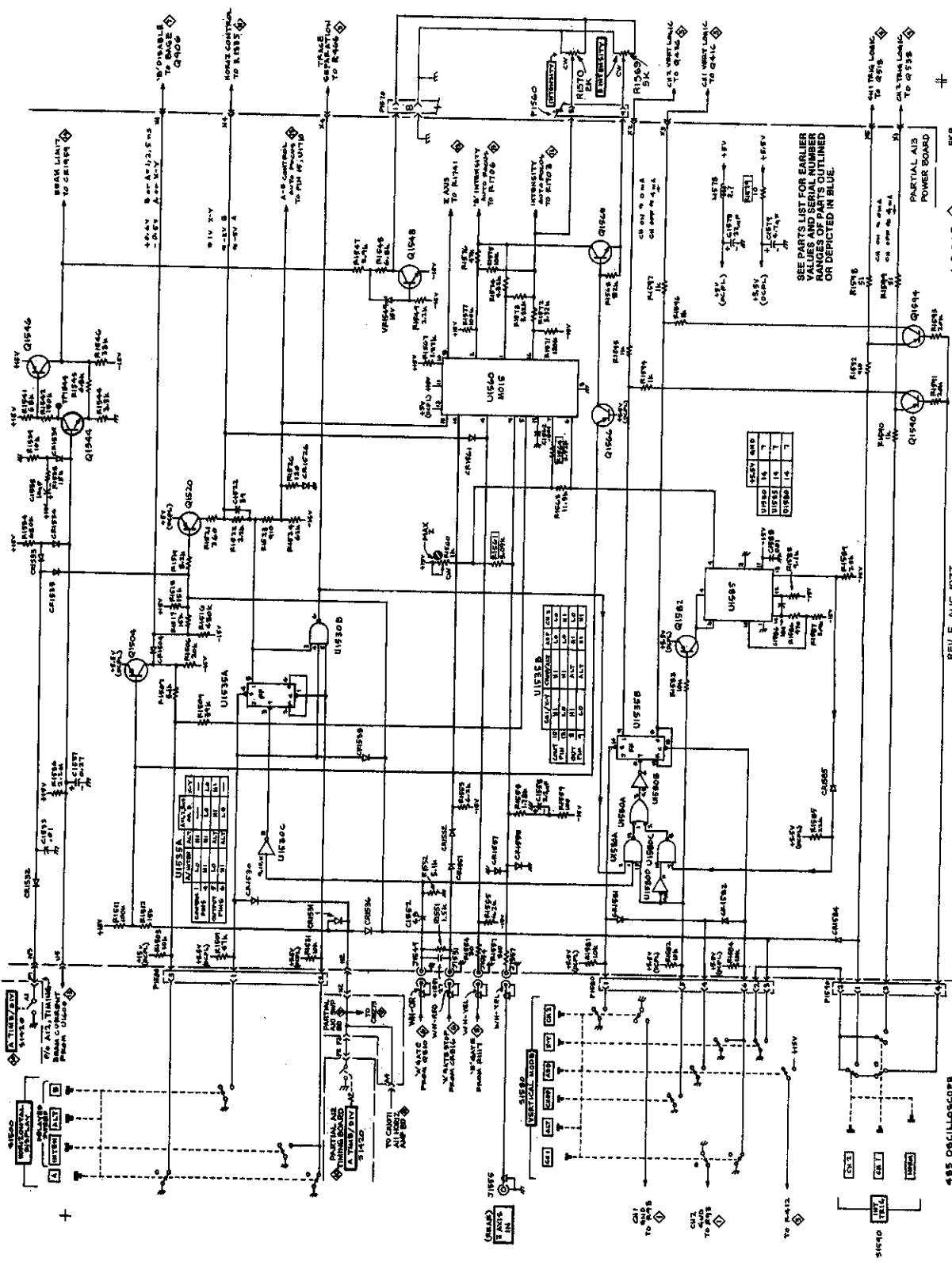
*See Parts List for serial number ranges.



485 OSCILLOSCOPE

1093-418
REV. D, AUG 1976

HORIZONTAL AMPLIFIER



SEE PARTS LIST FOR EARLIER VALUES AND SERIAL NUMBER IDENTIFICATION OF PARTS OUTLINED OR DEFECTED IN BLUE.

Q1520A	Q1520B	Q1520C	Q1520D	Q1520E	Q1520F	Q1520G	Q1520H	Q1520I	Q1520J	Q1520K	Q1520L	Q1520M	Q1520N	Q1520O	Q1520P	Q1520Q	Q1520R	Q1520S	Q1520T	Q1520U	Q1520V	Q1520W	Q1520X	Q1520Y	Q1520Z
14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

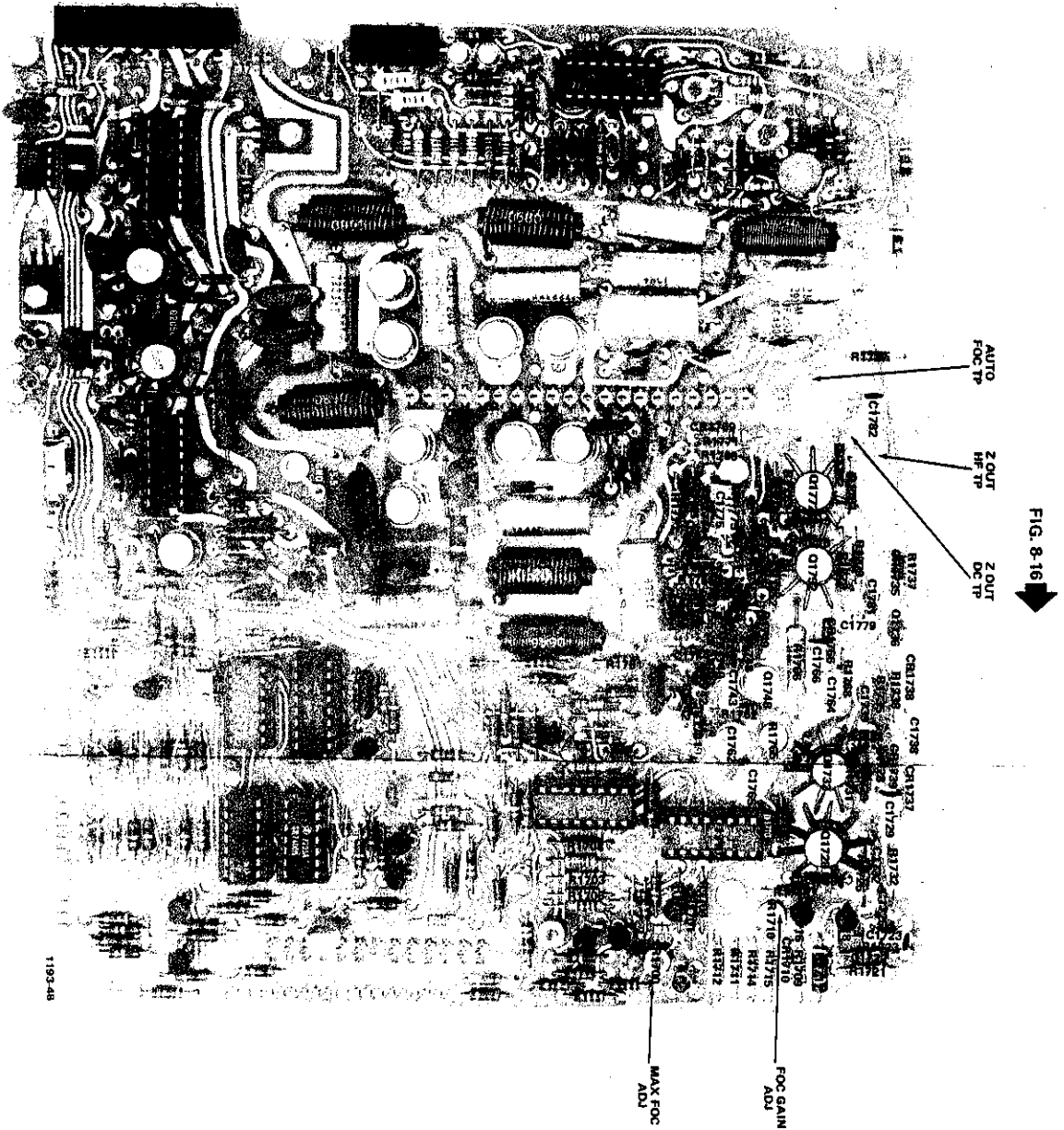
U1520A	U1520B	U1520C	U1520D	U1520E	U1520F	U1520G	U1520H	U1520I	U1520J	U1520K	U1520L	U1520M	U1520N	U1520O	U1520P	U1520Q	U1520R	U1520S	U1520T	U1520U	U1520V	U1520W	U1520X	U1520Y	U1520Z
14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14

LOGIC

REV. F, AUG. 1977 1155-47

485 OSCILLOSCOPE

P/O A11 HORIZ BOARD
P/O A13 POWER SUPPLY BOARD



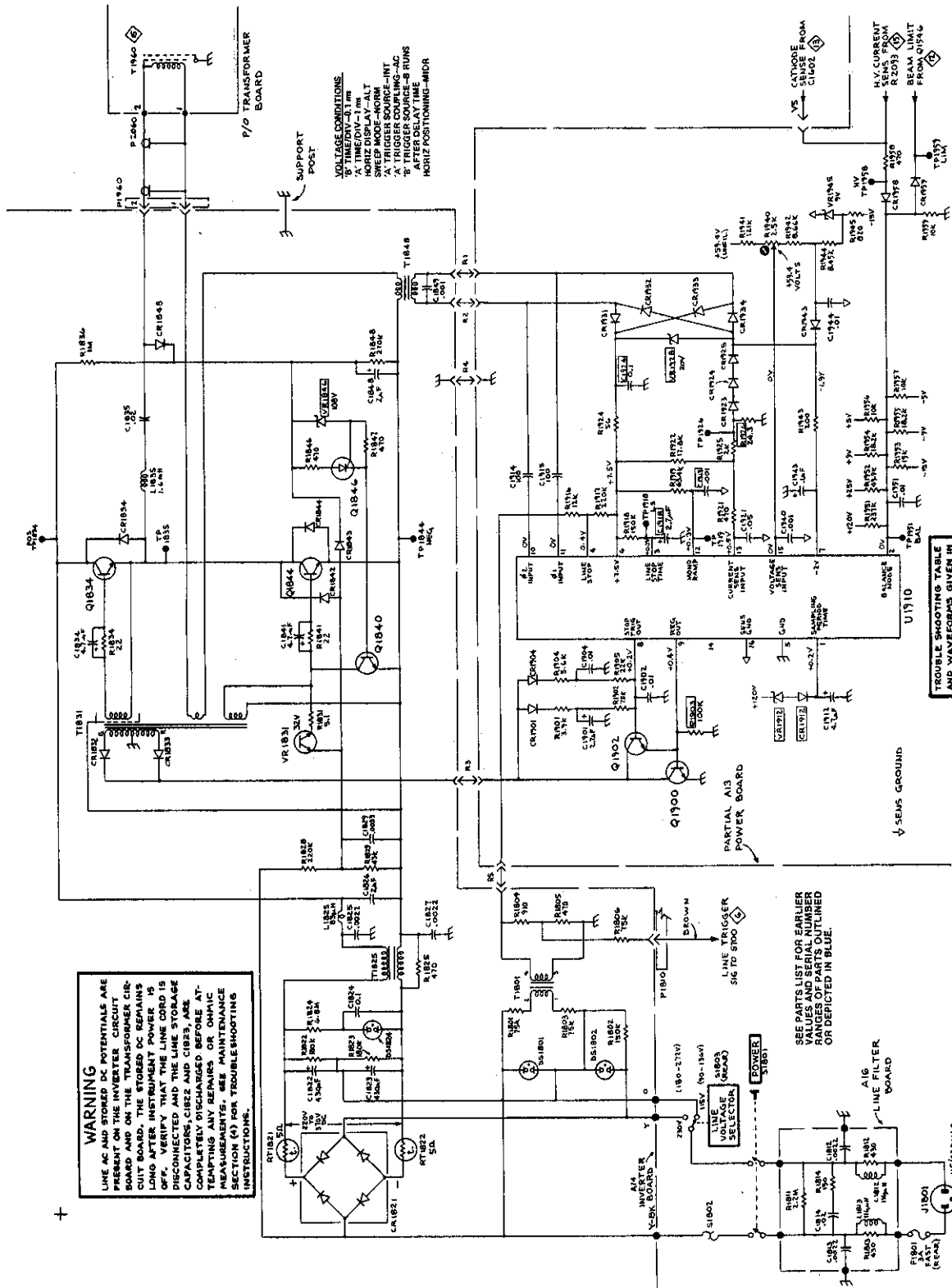
1193-48

Fig. 8-15. A13 Power Supply board.

REV. D MAR 1979

WARNING
 LINE AC AND STORED DC POTENTIALS ARE PRESENT ON THE INVERTER CIRCUIT BOARD AND ON THE TRANSFORMER CIRCUIT BOARD. THE STORED DC POTENTIALS AND RESIDUAL VOLTAGES MAY BE OF VARIOUS TYPES THAT THE LINE CORD IS DISCONNECTED AND THE LINE STORAGE CAPACITORS, C1822 AND C1823, ARE COMPLETELY DISCHARGED BEFORE ATTEMPTING ANY REPAIRS OR OHMIC MEASUREMENTS. SEE MAINTENANCE SECTION (4) FOR TROUBLESHOOTING INSTRUCTIONS.

VOLTAGE CONDITIONS
 A TIME DIV-1 mV
 B HORIZ DISPLAY-ALT
 C SPEED MODE-ACOR
 D TRIGGER SOURCE-INT
 E TRIGGER COUPLING-AC
 F AFTER DELAY TIME
 G HORIZ POSITIONING-MIDR



DOUBLE SHOOTING TABLE AND WAVEFORMS GIVEN IN MAINTENANCE SECTION (4)

REV. G. MAR. 1978
 1193-56

463 OSCILLOSCOPE

+

SUPPORT POST

+

POWER INVERTER

+

↓ SENS GROUND

+

VE GASTHODE FROM C1802

+

H.V. CURRENT FROM R2033

+

BEAM LIMIT FROM Q1546

+

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+

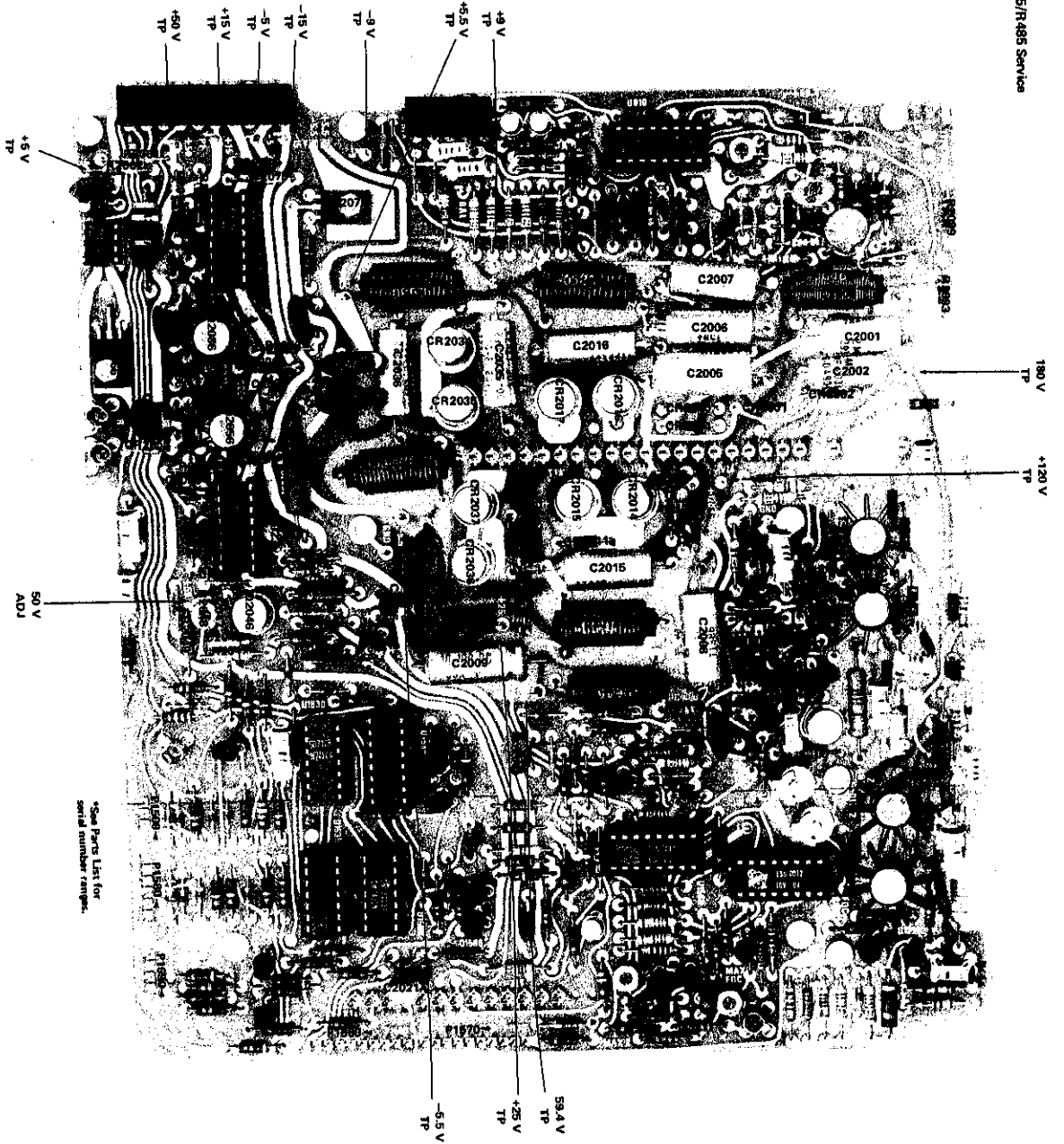
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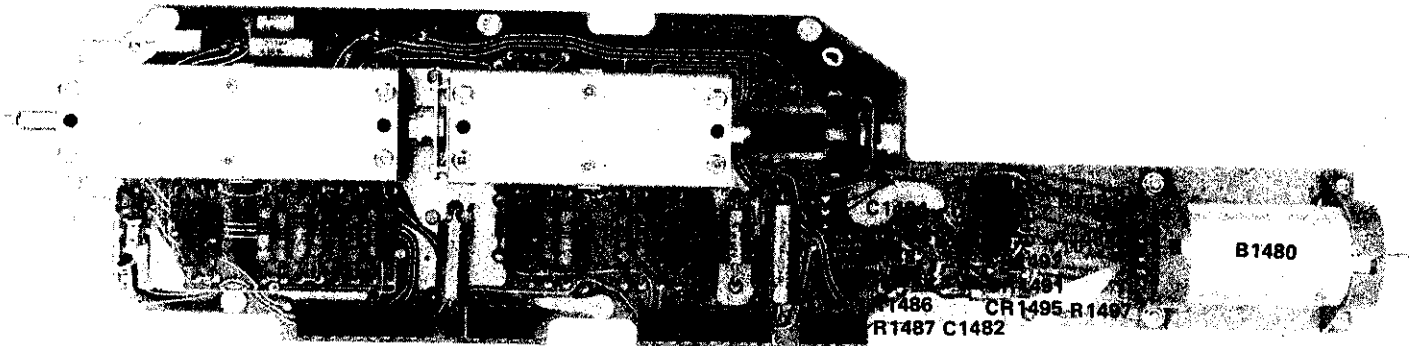
P/O A13 POWER SUPPLY BOARD



REV. B, SEPT 1974

Fig. 8-22. A13 Partial Power supply board.

Fig. 8-24 



Ⓐ

Fig. 8-23. A12 Partial Timing switch board.

P/O A10 SWEEP BOARD
P/O A12 TIMING BOARD

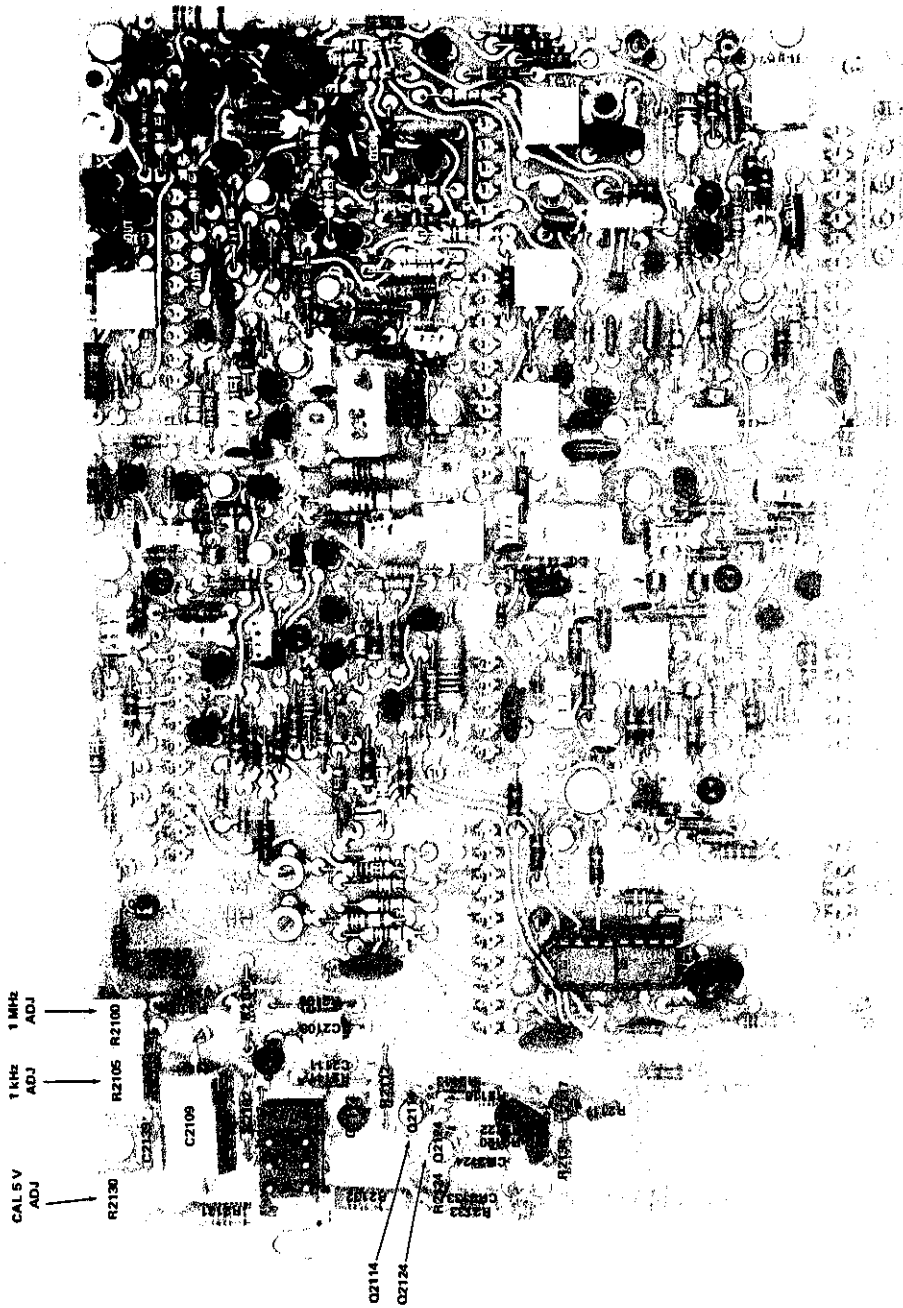
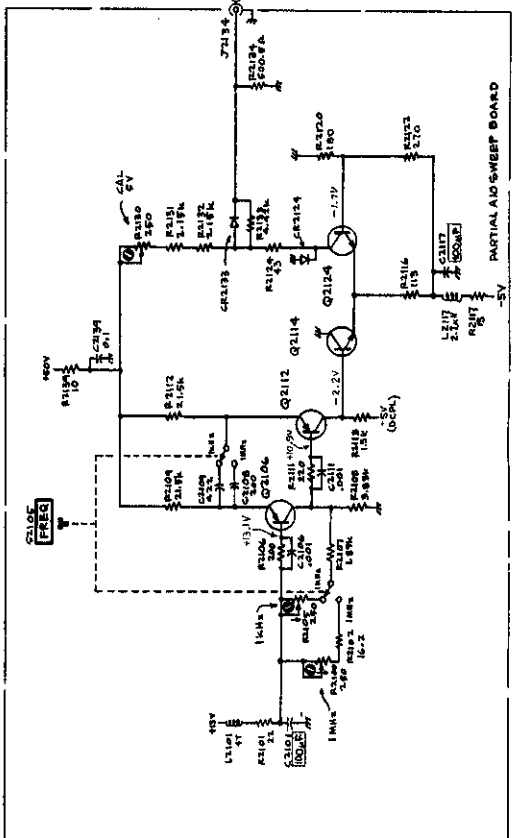
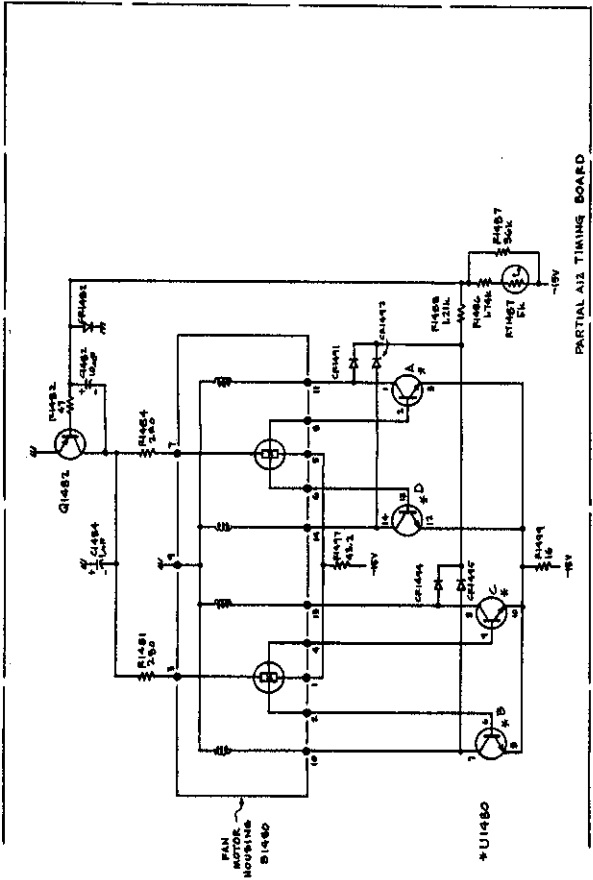


Fig. 8-24. A10 Partial Sweep board.



REV. 8, AUG. 1975
1193-G1

CALIBRATOR AND FAN CIRCUIT

485 OSCILLOSCOPE

