

HITACHI

Model V-550 B

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TKYO, JAPAN

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1. SPECIFICATIONS

o CRT

Type

Hitachi 150BCB31 rectangular mesh type tube with 10 KV acceleration potential and metal backed phosphor

Screen type

P31 (GH) phosphor standard

Useful screen area

8 x 10 div

Graticule

Internal graticule with centimeter divisions and 2mm subdivisions along the central axis 10% and 90% lines are indicated. Illumination continuously variable.

Focussing

Possible (with automatic focus correction circuit)

Trace rotation Present

Scale illumination Variable

Brightness adjustment Possible

o Z-AXIS

DC-coupled, positive-going signal decreases intensity: 5Vp-p signal causes noticeable modulation at normal intensity: DC to 3.5MHz.

Input impedance Approximately 20 k Ω

Maximum input voltage 50 V (DC + AC peak)

Coupling DC

o VERTICAL DEFLECTION (2 Identical Channels)

Bandwidth and Rise time

DC to at least 50MHz and rise time 7.0ns or less. DC to at least 10MHz and rise time 36ns or less at magnifier extends. Lower -3dB point, AC coupling 10Hz or less. 10x probe: 1Hz or less.

Deflection Factor

5mV/div to 5V/div in 10 calibrated steps, 1-2-5 sequence. Uncalibrated continuous control extends deflection factor to at least 12.5 Volts per division in the 5 Volts/div position. x5 magnifier increases sensitivity of each deflection factor setting to 1mV/div.

Accuracy

+3% (+10° C to +35° C)

+5% (0° C to +50° C)

Additional error for magnifier +2%

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Display modes

CH1, CH2 (normal or invert), Alternate, chopped (250kHz rate), Added

Input Impedance

1M ohm +2% in parallel with 30pF approx

Maximum Input Voltage

250V (DC+ AC peak) or 500Vp-p AC at 1KHz or less

Input coupling

AC-GND-DC

Delay Line

Permits viewing leading edge of display waveform.

3rd Channel Display (A Trigger View)

Display simultaneously channel 1, channel 2, and external trigger signal. The deflection factor is approx 200mV/div.

Sensitivity	INT: 1/1 \pm 30% of screen area
	EXT: 0.2 V/div \pm 30%
Frequency band	EXT: DC to 50 MHz (-3dB)
Position	Screen center \pm 2 div (trigger level knob is set at the center)

o HORIZONTAL DEFLECTION

Time Base A

50ns/div to 0.5s/div in 22 calibrated steps, 1-2-5 sequence. Uncalibrated continuous control extends deflection factor to at least 1.25 seconds per division in the 0.5 sec/div position. 10x mag extends fastest sweep rate to 5ns/div.

Time Base B

50ns/div to 50ms/div in 19 calibrated steps 1-2-5 sequence. 10x mag extends fastest sweep rate to 5ns/div.

Accuracy

\pm 3% (+10°C to +35 C)

\pm 5% (0°C to +50°C)

Additional error for magnifier \pm 2%

Horizontal Display Modes

A only, A intensified, B delayed, X-Y

Calibrated Sweep Delay Continuous calibrated control between 0.5 and 10 \times time base A setting.

Delay Time Jitter Better than 1:20,000

o TRIGGERING A AND B

A Trigger Modes

Automatic, Normal, Single sweep, TV-V, TV-H

A Trigger Hold-off

Adjustable control permits a stable presentation of repetitive complex waveform.

A Trigger Source
Internal (Ch1, Ch2), Line, External.

A Trigger Slope
+ or -

Triggering level For both A and B. Internal; 4div or more.
variable range External; approximately $\pm 2V$

Triggering sensitivity and frequency For both A and B. However, () is only for B

Frequency	Internal	External
DC(30Hz) ~ 10MHz	0.5 div	150 mV
10 MHz ~ 50MHz	1.5 div	500 mV

TV-V sensitivity: SYNC section less than 0.7div or 200mV
AUTO low band : Approximately 30Hz

A Trigger Coupling
AC : 30Hz to full bandwidth
HF REJ: attenuates signals below approx 4KHz
LF REJ: attenuates signals above approx 4KHz
DC : 0 to full bandwidth

A External Trigger Input Impedance
1M ohm $\pm 20\%$ in parallel with 30pF approx (However, setting HF REJ and LF REJ are not included.)

Maximum Input Voltage
250V (DC+ AC peak)
500Vp-p AC at 1KHz or less

B Trigger Modes and Source
Automatic, Normal (Internal, External)

B Trigger Slope
+ or -

Trigger Coupling

AC only; 30Hz to full bandwidth

o X-Y OPERATION (CH1; Horiz, CH2; Vert)

Deflection Factor

Same as vertical deflection

Accuracy

Y: $\pm 3\%$ ($+10^{\circ}\text{C}$ to $+35^{\circ}\text{C}$), $\pm 5\%$ (0°C to $+50^{\circ}\text{C}$)

X: $\pm 5\%$ ($+10^{\circ}\text{C}$ to $+35^{\circ}\text{C}$), $\pm 7\%$ (0°C to $+50^{\circ}\text{C}$)

Additional error for magnifier $\pm 2\%$

X-Bandwidth

DC to at least 500kHz

Phase Error

3° or less from DC to 50kHz

o CALIBRATOR

0.5V $\pm 1\%$ Frequency 1kHz $\pm 5\%$ square wave

Rise time $5\mu\text{s}$ or less

o POWER SUPPLY

VOLTAGE (50/60Hz)	FUSE
100 V (90 ~ 110 V)	2A
120 V (108 ~ 132 V)	2A
220 V (198 ~ 242 V)	1A
240 V (216 ~ 264 V)	1A

Nominal voltage $\pm 5\%$ at 400Hz

Power supply frequency. 50, 60, 400Hz

Power consumption Approximately 45W

o ENVIRONMENT

Operating ambient temperature	0° C ~ 50° C
Operating ambient humidity	35% ~ 85%
Specification guaranteed ambient temperature	10° C ~ 35° C
Specification guaranteed ambient humidity	45% ~ 85%

o DIMENSION AND WEIGHT

310w x 180h x 410d mm
(12.2w x 7.1h x 16.1d in)
9.3kg (221b)

2. COMPOSITION

(1) Model V-550B oscilloscope unit.....	1
(2) Probe (AT-10AD 1.5).....	2
(3) Fuse (2A for 100V and 120V set or 1A for 220V and 240V set).....	1
(4) Dust proof cover.....	1
(5) Power supply cord.....	1
(6) Operation Manual.....	1

3. PREVENTIVE MAINTENANCE

Preventive maintenance, when performed on a regular basis, can prevent instrument breakdown and may improve the reliability of the oscilloscope. The severity of environment to which this instrument is subjected will determine the frequency of maintenance. A convenient time to perform preventive maintenance is preceding recalibration of the instrument.

Disassembly

Remove the 4 screws in the top cover of the instrument. Gently separate the top cover from the instrument and lay aside. Most of the internal parts of the instrument are now accessible.

If access to the front of the circuit boards are necessary, remove the knobs from the external control shafts on the board. Remove the two screws securing the side panel to the Input circuit board and remove the instrument side panel. (See 5. DISASSEMBLY ILLUSTRATION.)

Cleaning

The instrument should be cleaned as often as operating conditions require. Accumulation of dirt in the instrument can cause component breakdown.

The covers provide protection against dust in the interior of the instrument. Loose dust accumulated on these covers can be removed with a soft cloth or small brush.

Dirt that remains can be removed with a soft cloth dampened in a mild detergent and water solution. Abrasive cleaners should not be used.

Cleaning the interior should only be occasionally necessary. The best way to clean the interior is to blow off the dust with a dry, low-velocity stream of air. A soft-bristle brush or a cotton-tipped applicator is useful for cleaning in narrow spaces or for cleaning more delicate components.

Visual Inspection

The instrument should be inspected occasionally for such defects as broken connections, improperly seated transistors, damaged circuit boards, and heat-damaged parts. The corrective procedure for most visible defects is apparant; however, particular care must be taken if heat-damaged components are found. Overheating usually indicates other trouble in the instrument; therefore, correcting the cause of the overheating is important to prevent recurrence of the damage.

4. CALIBRATION.

Hitachi Denshi, Ltd. provides complete instrument repair and recalibration at our oversea's office, and authorized dealer. Contact your local Hitachi Denshi, Ltd. office or representative.

4.1 TEST EQUIPMENT REQUIRED

The following test equipment and accessories, or equivalent, are required for the complete calibration of the V-550. The given specifications for the test equipment are the minimum necessary for accurate calibration. Therefore, the specifications of any test equipment used must meet or exceed the listed specifications. All the test equipment is assumed to be correctly calibrated and operating within the listed specification. Operating instructions for the test equipment are not given in this procedure. Refer to the instruction manual for the test equipment if more information is needed.

Table 4-1
TEST EQUIPMENT REQUIRED

Description	Minimum Specification	Usage	Examples of Applicable Test Equipment	
1. Constant Amplitude Signal Generator	50kHz reference frequency; maximum frequency 70MHz; variable amplitude.	Check horizontal, vertical and trigger bandwidth.	<p style="text-align: center;">FOR SERVICE MANUALS CONTACT: MAURITRON TECHNICAL SERVICES www.mauritron.co.uk TEL: 01844 - 351694 FAX: 01844 - 352554</p>	
2. Standard Amplitude Calibrator	Amplitude accuracy: 0.25%, variable amplitude; 5mV to 40 V; frequency: 1 kHz square wave.	Check horizontal and vertical gain.		
3. Square-wave Generator	Variable frequency: 10 Hz to 1 MHz; output amplitude; 10 mV to 100 V.	Check probe and vertical compensation.		
4. Digital Multimeter	0.1% accuracy.	Check power supply		
5. Time Mark Generator	0.1% accuracy.	Check horizontal timing.		
6. Cable	Impedance, 50 ohms; type, RG-58/U; length, 42 inches, connectors, BNC	External trigger operation check. Horizontal gain check and adjustment.		Hitachi Part No.4202
7. Termination	Impedance, 50 ohms; connectors, BNC	Vertical Amplifier compensation checks and adjustment.		Hitachi Part No.1401
8. Attenuator	Ratio, 10X; connectors, BNC; impedance, 50 ohms.	Vertical Amplifier bandwidth check.		Hitachi Part No.1501
9. T-Connector	Connectors, BNC.	External trigger operation checks.		Hitachi Part No.1301

4.2 PRELIMINARY PROCEDURE

This instrument should be calibrated at an ambient temperature of +20°C (+5°C) for best overall accuracy.

1. Connect the instrument to AC line voltage, 50/60/400 Hz line source.
2. Set the instrument controls as given in the Preliminary Control Settings. Allow at least fifteen minutes of warmup before proceeding.
3. See the Adjustment Locations in the pullout pages.

4.3 PRELIMINARY CONTROL SETTINGS

Preset the instrument controls to the settings given below, when starting the calibration procedures.

FOCUS	Midrange	<input type="checkbox"/> FINE	Midrange
TRACE ROTATION	As desired	VAR HOLD OFF	Fully counterclockwise
V. POSITION	Midrange, push in	<input type="checkbox"/> SWP VAR	Fully counterclockwise, push in
V. VARIABLE	CAL, fully clockwise	DISPLAY	A
AC-GND-DC	GND	- B TRIG -	
VOLTS/DIV	5mV/DIV	SOURCE	AUTO
V. MODE	CH1	LEVEL	Midrange, push in
TRIPLE	Normal (Button Out)	- A TRIG -	
INV	Normal (Button Out)	LEVEL	Midrange, push in
SCALE ILLUM	Fully counterclockwise	RESET	Normal
H. POSITION	Midrange	MODE	Auto
<input type="checkbox"/> PULL X10 MAG	Midrange, push in	COUPLING	AC
TIME/DIV A	1mS	SOURCE	CH1
DLY TIME MULT	Midrange		

4.4 INITIAL STARTING PROCEDURE

1. Rotate POWER/INTENSITY control to the midrange.
2. Wait a few seconds for the cathode ray tube (CRT) to warm up. A trace should appear on the display of the CRT.
3. If trace disappears, increase (clockwise) the POWER/INTENSITY control setting until the trace is easily observed.
4. Adjust FOCUS control for the best focused display.
5. Readjust POSITION controls if necessary, to center the trace.

POWER SUPPLY SYSTEM

NOTE

Before you begin, see ADJUSTMENT LOCATIONS in the pullout pages.

Control Settings

Preset the controls as given in the Preliminary Control Setting.

1-(1) Check Low-voltage Supply, if necessary

- a. Connect the digital voltmeter (DVM) from the +12 volt line.
: +11.975 V to +12.025 V (IC 1111)
- b. Connect the DVM from the -12 V line
: -11.75 V to -12.25 V (IC 1121)
- c. Connect the DVM from the +5V line
: +4.75 V to +5.25 V (IC 1131)
- d. Connect the DVM from the +99 V
: +97 V to +101 V (TR1101-Emitter)
- e. Connect the DVM from the 150 V
: +140 V to +160 V

1-(2) Adjust Low-voltage Supply

Adjust the adjustment RV1111 for DVM reading of +12V
(+0.025V).

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2. Check High Voltage Supply

- a. Connect the DVM to the H.V test point (D1024-Kathode) by High Voltage Probe.
- b. Check for a reading of -1405 V ~ -1495 V

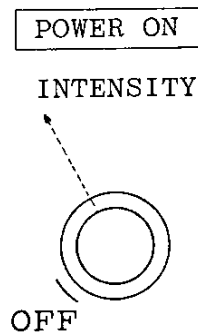
DISPLAY

Control Setting

Preset the controls as given in the Preliminary Control Setting.

3. Check/Adjust Grid Bias

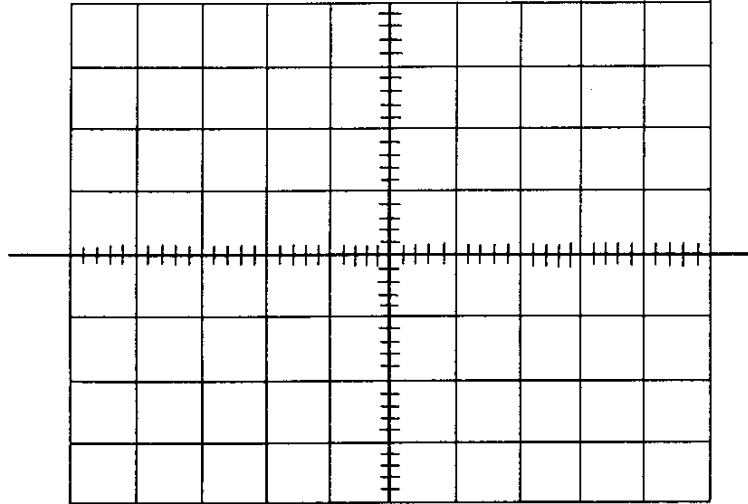
- a. DISPLAY switch to the X-Y position, and Vertical Mode switch to the CH2 X-Y position.
- b. Rotate the POWER/INTENSITY to the "I" letter of the "INTENSITY" as shown.



- c. When small spot appears, use the POSITION control to place spot at center of screen.
 - d. Adjust Grid Bias Adjustment RV1021 to obtain small, round spot.
4. Check/Adjust Trace Rotation
- a. Set the A TIME/DIV switch to 1mS.

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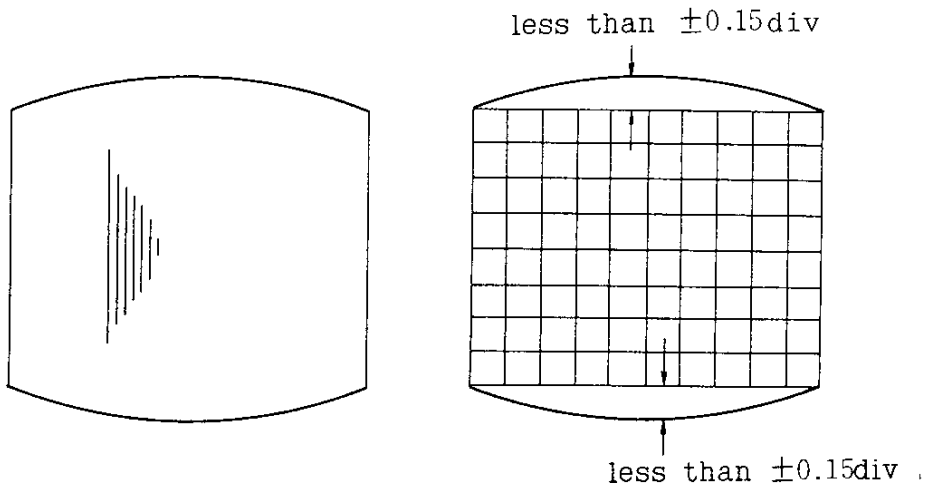
- b. Check that the trace is parallel to the center horizontal line.
- c. DISPLAY switch to the A position.
- d. Adjust TRACE ROTATION for a trace that is parallel with the horizontal graticule lines.



5. Check/Adjust GEOMETRY

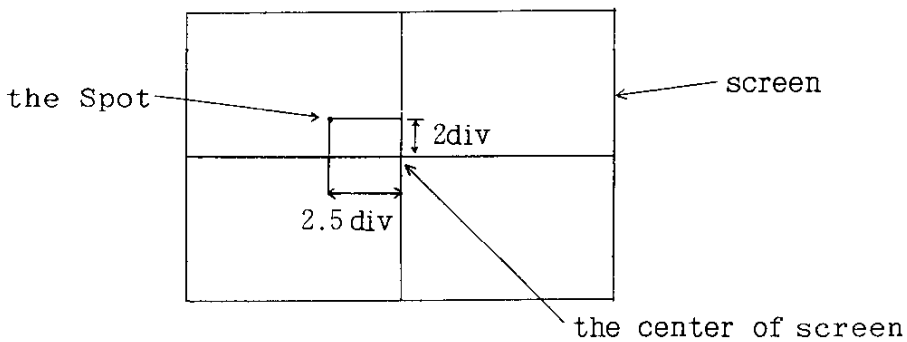
- a. Set the A TIME/DIV switch to the 1mS, and AC-GND-DC to DC.
- b. Connect the Constant Amplitude Signal Generator to the input.
- c. Set the VOLTS/DIV switch setting for a full-screen (8 division) deflection.
- d. Check that horizontal bowing is less than ± 0.15 division.
- e. Adjust the GEOM adjustment RV1033 for a display that is parallel with top and bottom horizontal lines.

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6. Check/Adjust ASTIGmatism and FOCUS.

- a. Vertical Mode switch to the CH2 X-Y position, and Display switch to the X-Y position, and AC-GND-DC to DC.
- b. Set the POWER ON INTENSITY control for a small spot, as the following figure, using position controls.



- c. Check that the spot is round.
- d. Adjust the FOCUS adjustment and the ASTIG adjustment RV1032 for a round spot.

HORIZONTAL SYSTEM

Control Settings

Preset the controls as given in the Preliminary Control settings.

7. Check/Adjust Horizontal Gain (Sweep Cal.)
 - a. Set the A TIME/DIV switch to the 1mS.
 - b. Set the input AC-GND-DC to DC.
 - c. DISPLAY switch to the A position.
 - d. Connect the cable to the output of the time mark generator.
 - e. Set the time mark generator for 1mS time marks.
 - f. Check that the time marks align with the graticule lines over the center eight divisions.
 - g. Adjust H GAIN adjustment RV830 so that the time marks align with the center eight graticule lines.
 - h. Check all other ranges of timing within 3%. Use appropriate settings on the time mark generator.
 - i. DISPLAY switch to the B position, set the A TIME/DIV switch to the 2mS and the B TIME/DIV switch to the 1mS.
 - j. Refer part (e) through (h) (in this case, adjust B Sweep CAL adjustment RV734).

8. Check/Adjust Horizontal X10 MAG Gain
 - a. Set X10 MAG (Pull out the inner knob of the POSITION control).
 - b. Refer item 5 part (a) through (e).
 - c. Adjust MAG GAIN adjustment RV831 for one-cycle time marks align with the ten-divisions graticule lines.

- d. Push in the inner of the POSITION control after the adjustment and check.
9. Check/Adjust MAG CENT.
 - a. Set the A TIME/DIV. switch to the 0.1ms.
 - b. Being the inner shift of H. POSITION is in pulled out state (X10 MAG), the left end of the trace is brought to the center point and then the inner shift of H. POSITION is depressed.
 - c. Observe the movement of the left end of the trace.
 - d. Adjust the MAG CENT Adjustment RV842 for the movement of the left end of the trace within ± 0.2 div.
 10. Check/Adjust High speed sweep accuracy.
 - a. Set the A TIME/DIV switch to $0.1 \mu S$.
 - b. Refer item 5 part (b) through (d).
 - c. Set the time mark generator for $0.1 \mu S$ time marks.
 - d. Refer item 5 part (f).
 - e. Adjust CV514 at that the time marks align with center eight graticule lines.
 - f. Refer item 5 part (h).
 - g. DISPLAY switch to the B position.
 - h. Set the A TIME/DIV switch to the $0.5 \mu S$ and the B TIME/DIV switch to the $0.1 \mu S$.
 - i. Refer part (c) through (f) (in this case, adjust CV 701).
 - j. Set the A TIME/DIV switch to $10 \mu S$.
 - k. Refer part (b).
 - l. Set the time mark generator for $10 \mu S$ time marks.

- m. Refer (d) through (f) (in this case, adjust CV 564.
 - n. DISPLAY switch to the B position.
 - o. Set the A TIME/DIV switch to the $50 \mu\text{S}$, and the B TIME/DIV switch to the $10 \mu\text{S}$.
 - p. Refer (h) through (i) (in this case, adjust CV729).
11. Check/Adjust Delay time
- a. Set the A TIME/DIV switch to 1mS , and the B TIME/DIV switch to $1\mu\text{S}$.
 - b. Set the DISPLAY switch to INTEN position.
 - c. Connect the cable to the output of the time mark generator.
 - d. Set the time mark generator for 1mS time marks.
 - e. Check that the reading of the DLY TIME MULT dial is 0.3 when the dial is fully counterclockwise.
 - f. Set the DLY TIME MULT dial to 1.0.
 - g. Check that the second time mark is bright.
 - h. Adjust RV556 so that the second time mark is bright when the dial reading is 1.0.
 - i. Set the dial to 9.0.
 - j. Check that the tenth time mark is bright.
 - k. Adjust RV555 so that the tenth time mark is bright when the dial reading is 9.0.

VERTICAL SYSTEM

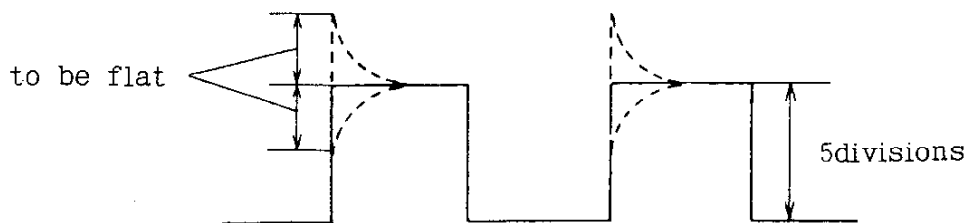
Control Setting

Preset the controls as given in the Preliminary Control Settings.

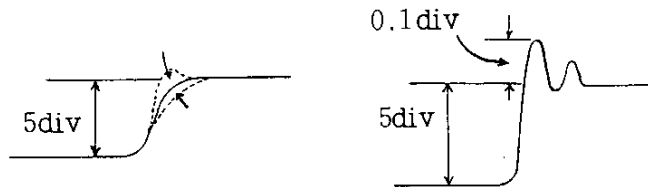
12. Check/Adjust DC Balance (Step attenuator balance).
 - a. Set the VOLTS/DIV switch to the 5mV position.
 - b. Position the trace to the horizontal center line.
 - c. Change the VOLTS/DIV switch to the 10mV position.
 - d. Check that the trace is within 0.1 division of the center horizontal line.
 - e. Adjust the CH1(CH2) ATT BAL adjustment, RV27(CH1) or RV127(CH2), for a trace at the horizontal center line.
 - f. Repeat part (a) through (e) until less than 0.1 division shift is noted when changing the VOLTS/DIV setting.

13. Check/Adjust Vertical Position Center.
 - a. Confirm the vertical POSITION control at the midrange.
 - b. Check the trace is within 1 division.
 - c. Adjust the Position Center adjustment RV97(CH1), RV197(CH2) for a trace at the horizontal center line.

14. Check/Adjust X1 AC GAIN.
 - a. Set the A TIME/DIV switch to the 1mS position.
 - b. Set the VOLTS/DIV switch to the 10mV position.
 - c. Set the AC-GND-DC switch to DC.
 - d. Connect the Square-wave Generator (using 1KHz out put range).
 - e. Adjust the output amplitude of that generator for 5 division deflection of screen.
 - f. Check the high-voltage level of pulse is flat.

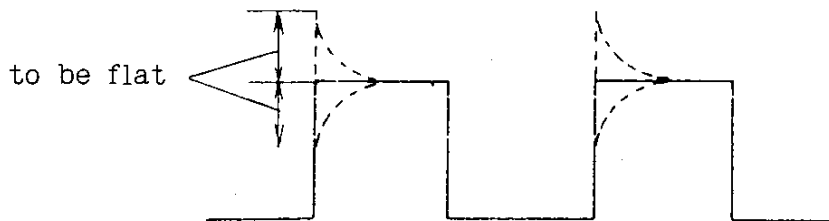


- g. Adjust the X1 AC GAIN RV33(CH1), RV133(CH2) adjustment for a flat level.
15. Check/Adjust Vertical Gain.
- Set the A VOLTS/DIV switch to the 10mV position and AC-GND-DC switch to DC.
 - Connect the standard amplitude calibrator to the input.
 - Set the standard amplitude calibrator for a $50\text{mV}_{\text{p-p}}$ (5 divisions of display) signal.
 - Check for a display of five divisions.
 - Adjust GAIN adjustment RV84(CH1), RV184(CH2) for a display of 5 divisions within 3%.
 - Check all the VOLTS/DIV switch settings.
16. Check/Adjust Vertical Step Response.
- Set the VOLTS/DIV switch to the 10mV position.
 - Set the A TIME/DIV switch to the $0.5\ \mu\text{S}$ position.
 - Connect the fast-rise, positive output (50mV, 1MHz) of the square-wave generator to input. Use a 50-ohm termination and cable.
 - Set the square-wave generator to 1MHz. Adjust the square-wave generator output for a 5-divisions display.
 - Adjust CV329 (at A TIME/DIV: $0.2\ \mu\text{S}$), CV322 (at $0.1\ \mu\text{S}$) for a square wave that is flat.
And Adjust CV304(CH1) (at A TIME/DIV: 50nS), CV182(CH2) (at A TIME/DIV: 50nS) for over-shoot that is $+0.1\text{div}$.



17. Check/Adjust Attenuation Compensation.

- a. Set the VOLTS/DIV switch to the 0.1V position and AC-GND-DC switch to DC.
- b. Connect the square-wave generator to the input for a 0.5V signal.
- c. Check for a square wave that is flat (flat top).
- d. Adjust CV7(CH1), CV107(CH2) for a square wave that is flat (flat top).
- e. Set the VOLTS/DIV switch to the 1V position.
- f. Set the square-wave generator for a 5V signal.
- g. Check for a square wave that is flat.
- h. Adjust CV12(CH1), CV112(CH2) for a square wave that is flat.



18. Check/Adjust Input Capacity

- a. Connect the L-C meter to Input terminal.
- b. Check the Input capacity for a approximately 30pF.
- c. Adjust the following trimmer condenser for a 30pF Input capacity under the following settings.

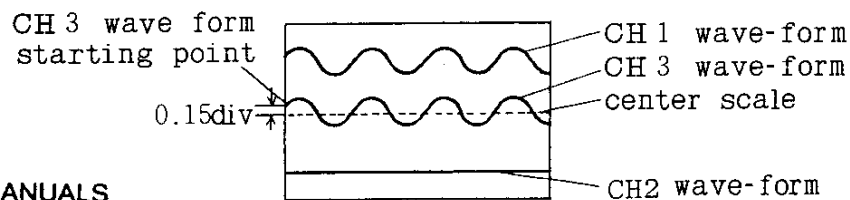
ATT	VOLT/DIV	Adjust	
		CH1	CH2
÷ 1	10mV	CV22	CV122
÷ 10	0.1V	CV6	CV106
÷ 100	1V	CV11	CV111

19. Check/Adjust TRIG CENT

- a. Set A TRIG SOURCE switch to CH1, A TRIG COUPLING switch to AC, A TRIG SLOPE knob push in, the VOLTS/DIV switch to 50mV, the A TIME/DIV switch to 20 μ s.
- b. Connect the sine-wave generator to the input for a 0.5div (50kHz).
- c. Set TRIG LEVEL knob so that synchronization is effected on the waveform, 0.5div on the screen.
- d. Under the state of (C), if synchronization is not effected by switching A TRIG COUPLING to "DC", set CH1(CH2) TRIG BAL RV64 (CH1) and RV164 (CH2) so that synchronization is effected.
- e. Next, set A TRIG SLOPE to -(pulled out state) and insure that synchronization is effected. After confirmation, leave A TRIG-SLOPE in depressed state. Readjust when stepped out.

20. Check/Adjust CH3 CENT

- a. Set the V MODE switch to ALT.
- b. Push the TRIPLE switch on.
- c. Check the initial point of CH3 waveform sweep is identical with the center horizontal division.
- d. Adjust the CH3 CENT adjustment RV204 so that the starting point of CH3 waveform comes to the 0.15 div on the center horizon scale.



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21. Check/Adjust EXT TRIG Step Response.

- a. Set the A TRIG SOURCE switch to the EXT position, the A COUPLING switch to the DC point, the A MODE switch to the AUTO position, the B TRIG SOURCE switch to the EXT position, and push the TRIPLE switch in.
- b. Connect the square-wave Generator (using 1kHz out put range) to A EXT TRIG terminal. Use a 50-ohm termination and cable.
- c. Check the high-voltage level of pulse is flat.
- e. Adjust CV402 for a flat level.

22. X-Y Operation

22-1. Check/Adjust X Gain.

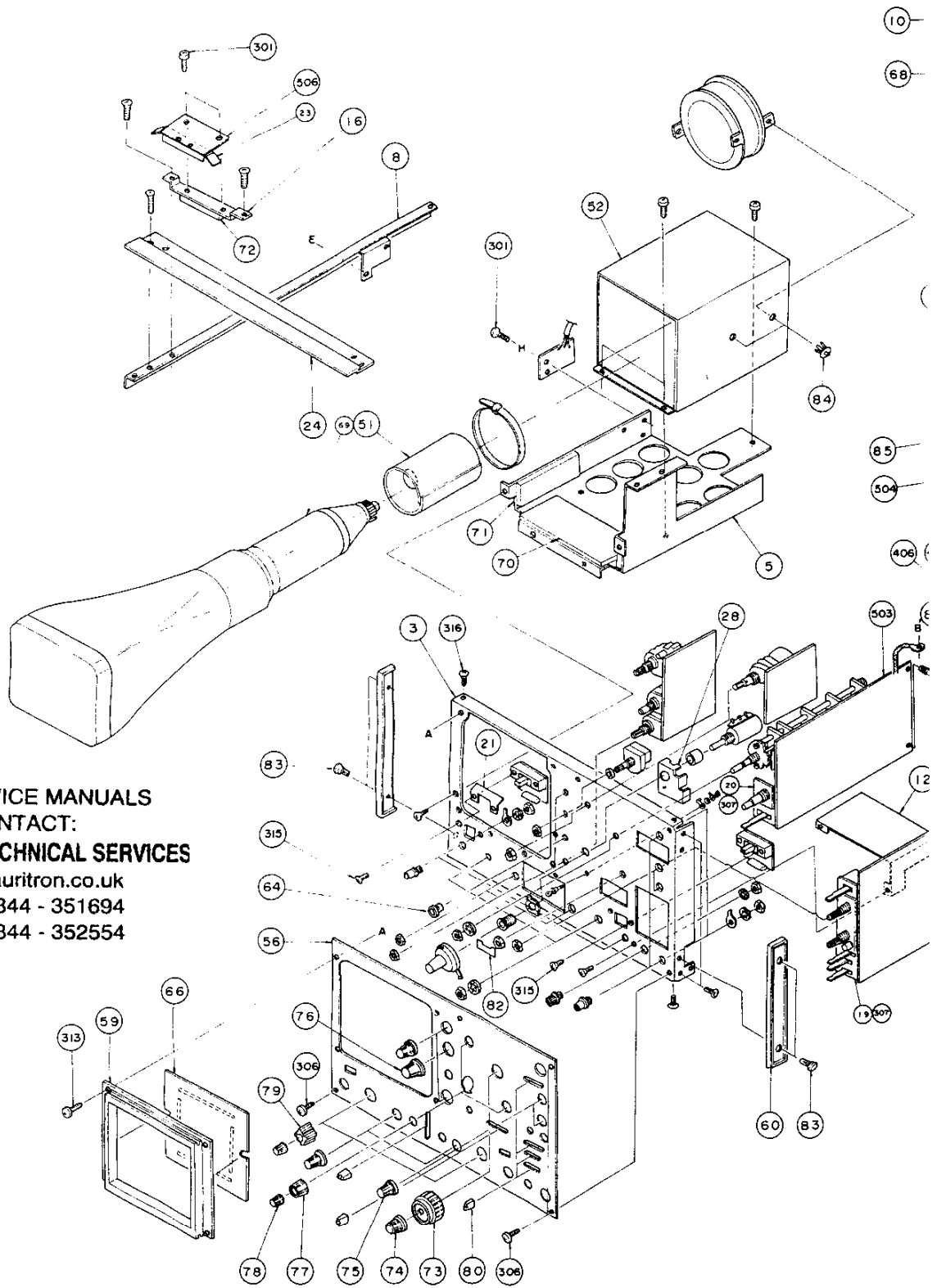
- a. Set the vertical MODE Switch to CH2 X-Y, the DISPLAY switch to X-Y, the AC-GND-DC switch of CH1 to DC, the AC-GND-DC switch of CH2 to GND.
- b. Set the VOLTS/DIV switch to the 10mV position, with X1 GAIN.
- c. Connect the standard amplitude calibrator to the CH1 input.
- d. Set the standard amplitude calibrator for a 50mV.
- e. Check for a display of 5 divisions.
- f. Adjust the X GAIN adjustment RV591 for a display of 5 divisions.

22-2. Check/Adjust X Position Center

- a. Set the DISPLAY switch to X-Y position, the vertical MODE switch to CH2/ X-Y position and the horizontal POSITION control to midposition, the AC-GND-DC switch of CH1 to GND.

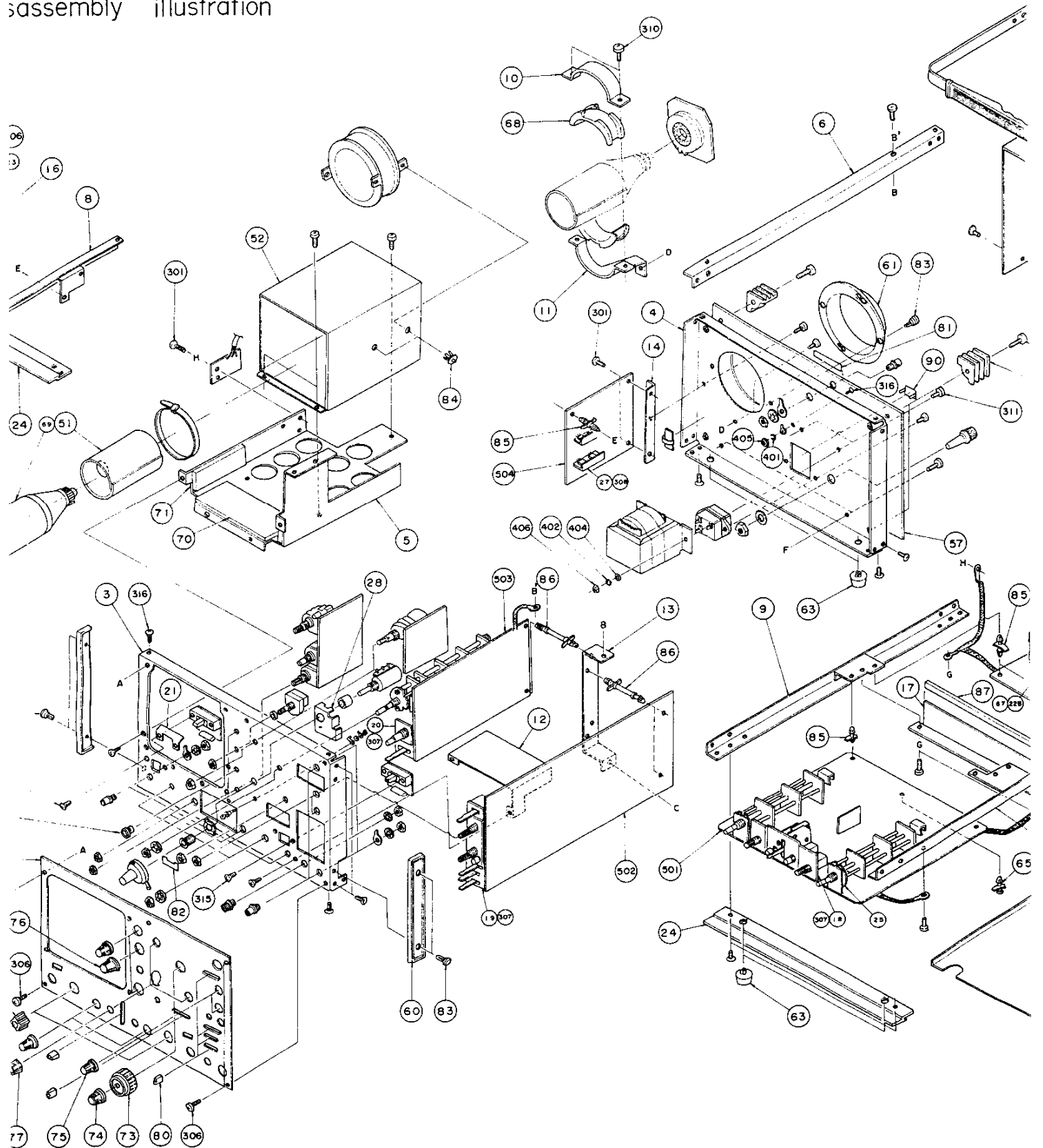
- b. Check to see that round spot is near the center graticule and is within 0.2 division against horizontal line.
 - c. Adjust the X CENT adjustment RV590 to position spot at the center.
23. Check/Adjust CAL terminal ($0.5V_{p-p}$, 1kHz)
- a. Set the VOLTS/DIV switch to the 0.1V position, the A TIME/DIV switch to the 1mS.
 - b. Connect the CAL to the input.
 - c. Check the deflection of 10th div on the screen is 0 as 1 period is 1div.
 - d. Adjust RV1203 for the deflection of 10th div on screen.
 - e. Check for a display of five divisions.
 - f. Adjust RV1205 for a display of 5 divisions within 1%.

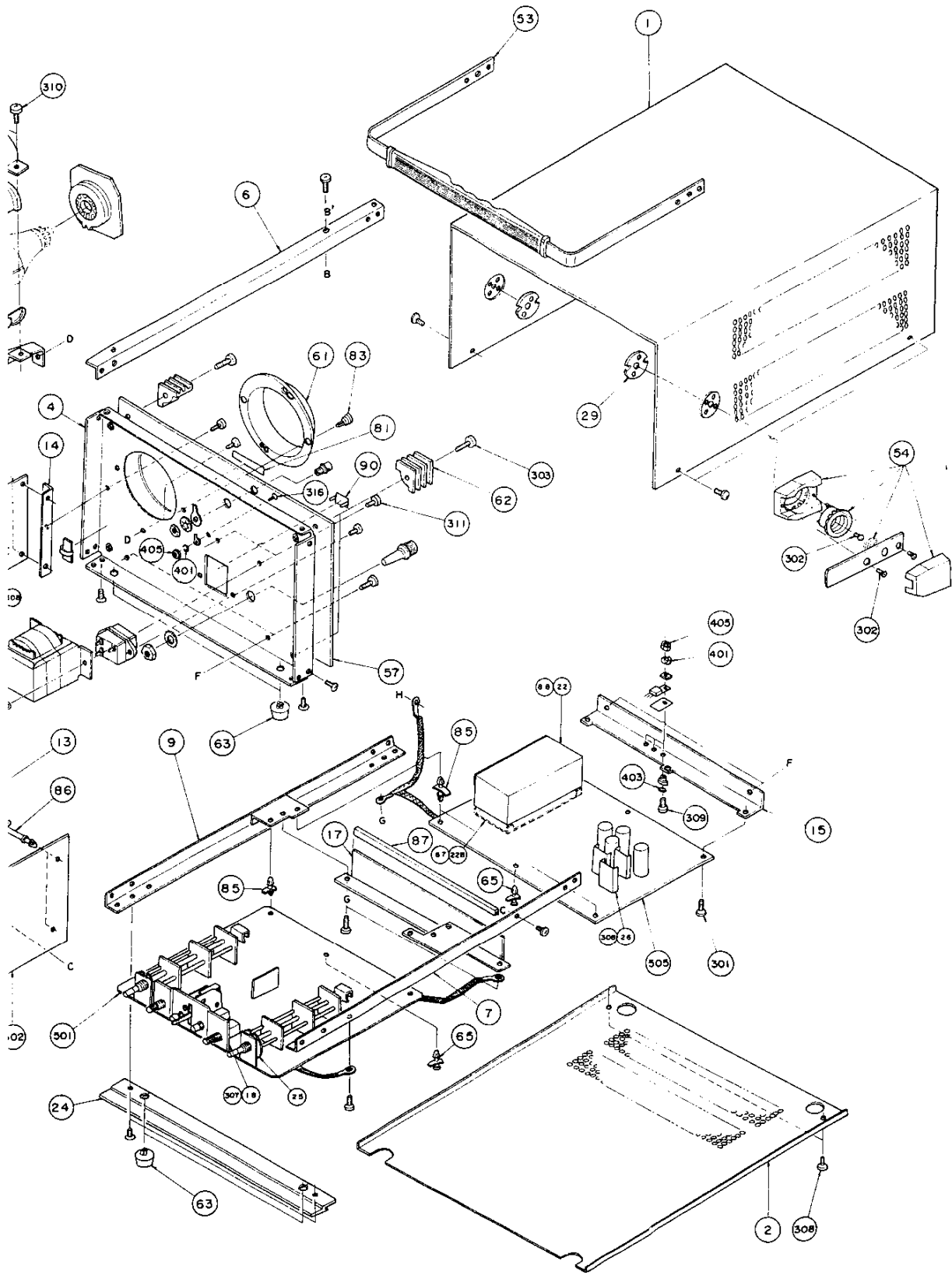
5. Disassembly illustration



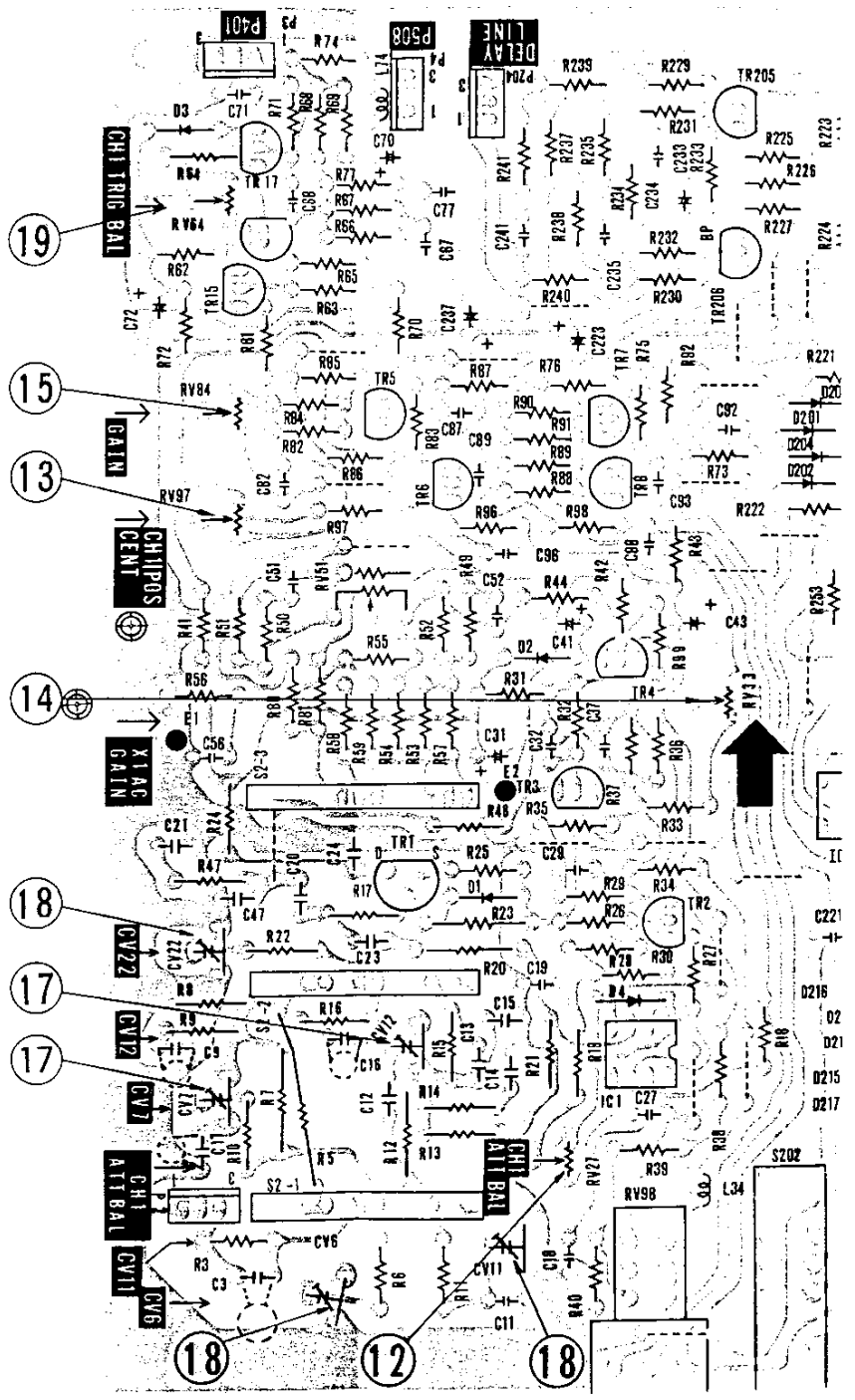
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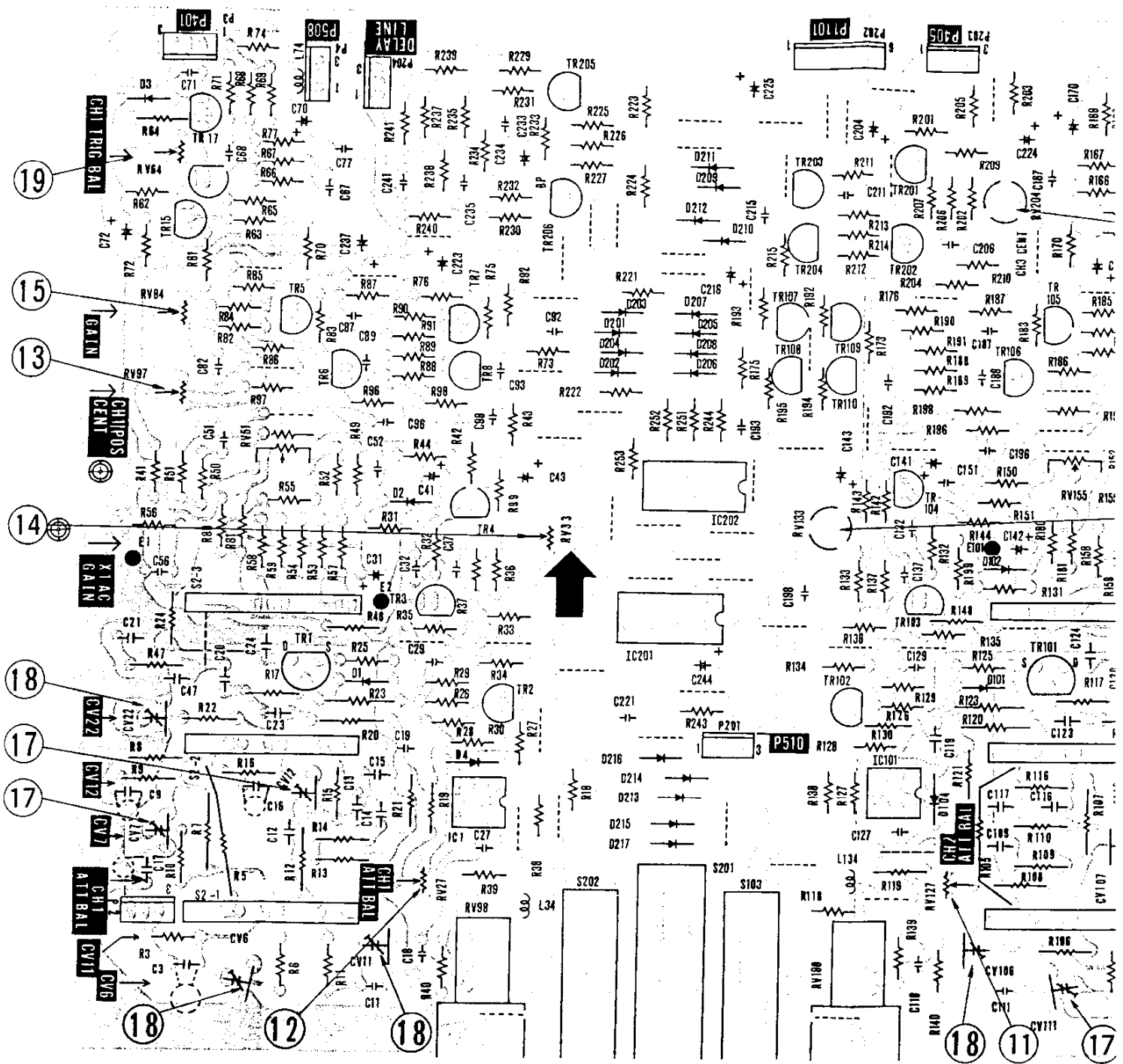
assembly illustration

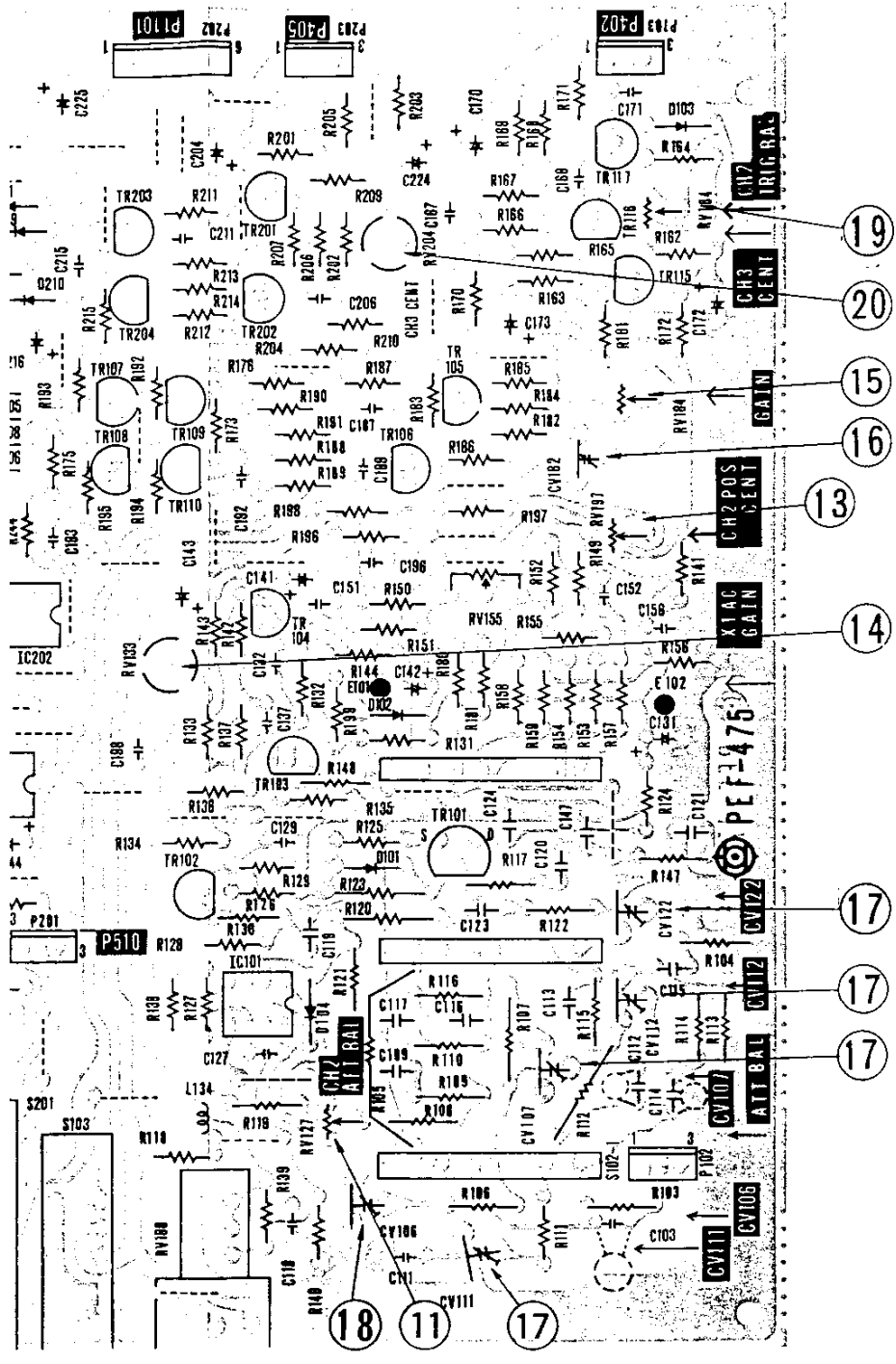




6. CIRCUIT BOARD ILLUSTRATION
(with Adjustment Location)







19

20

15

16

13

14

17

17

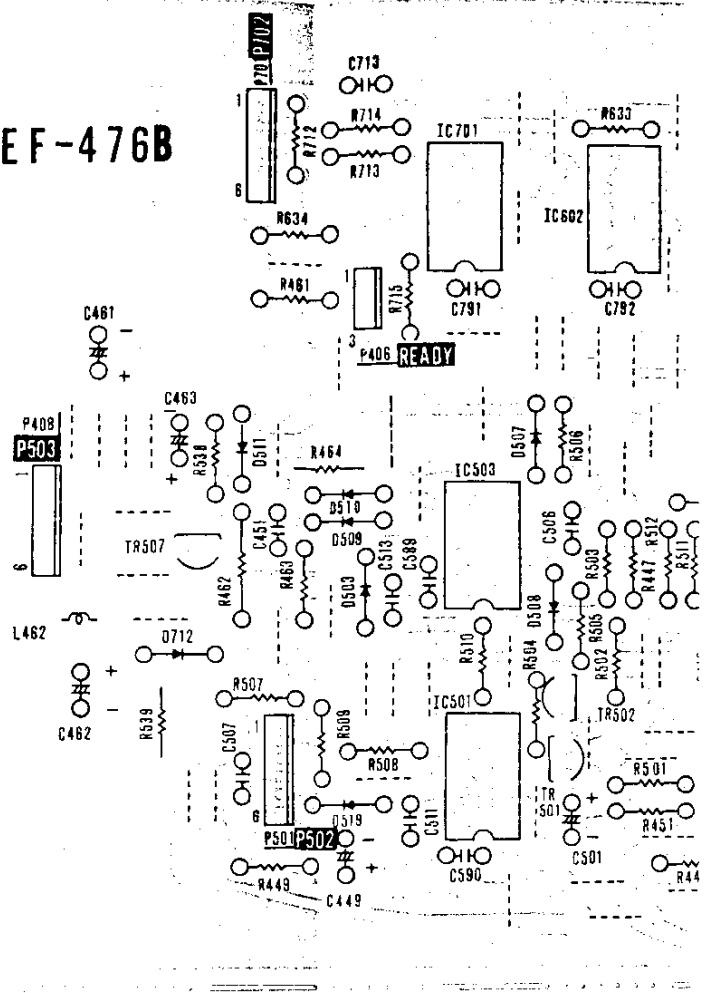
17

18

11

17

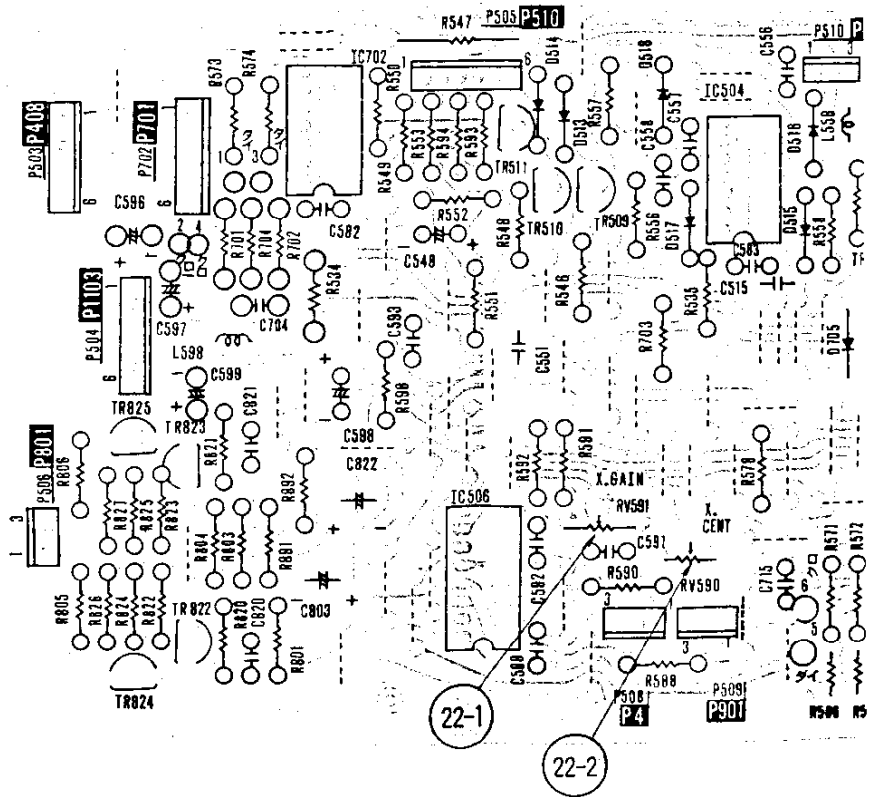
PEF-476B



PEF-478

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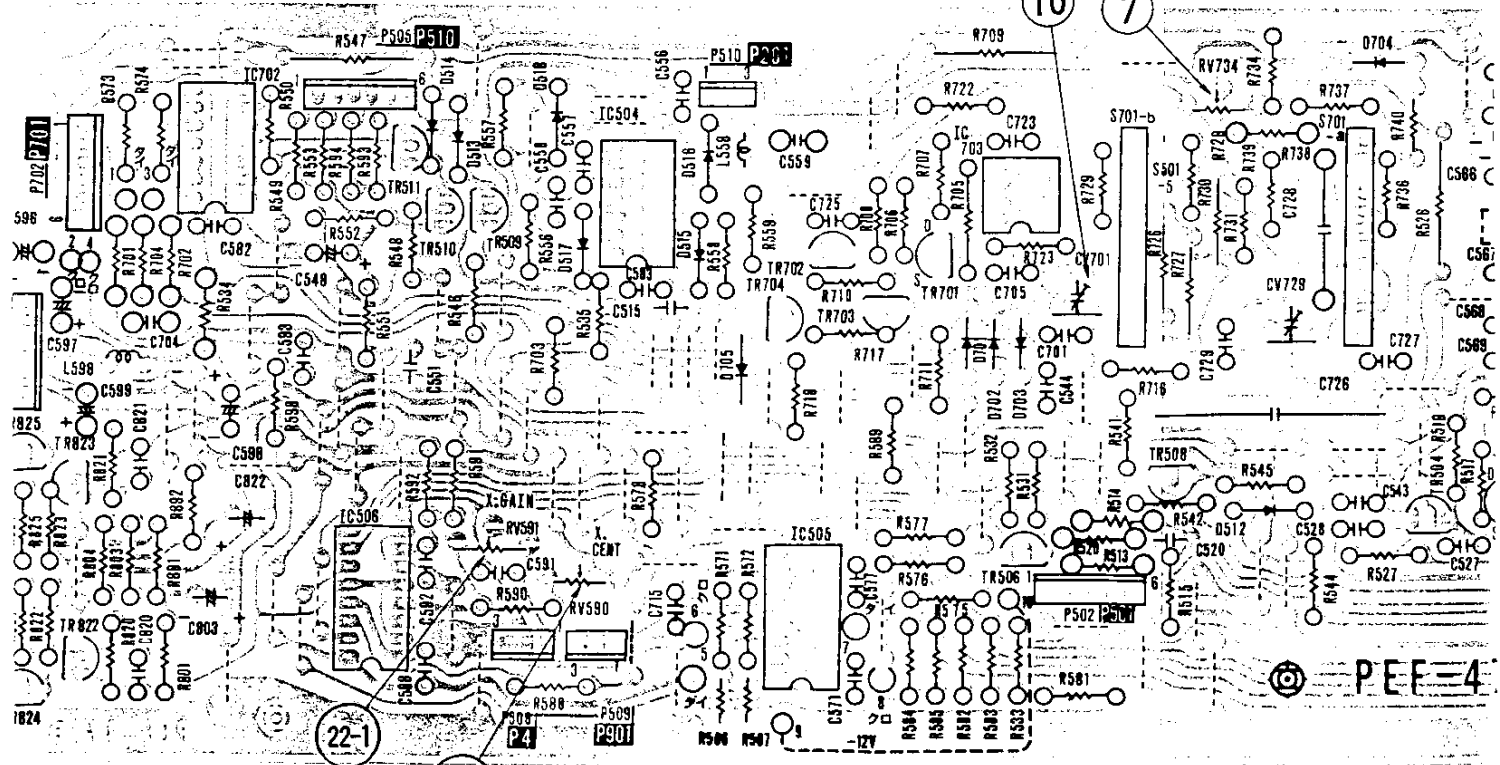
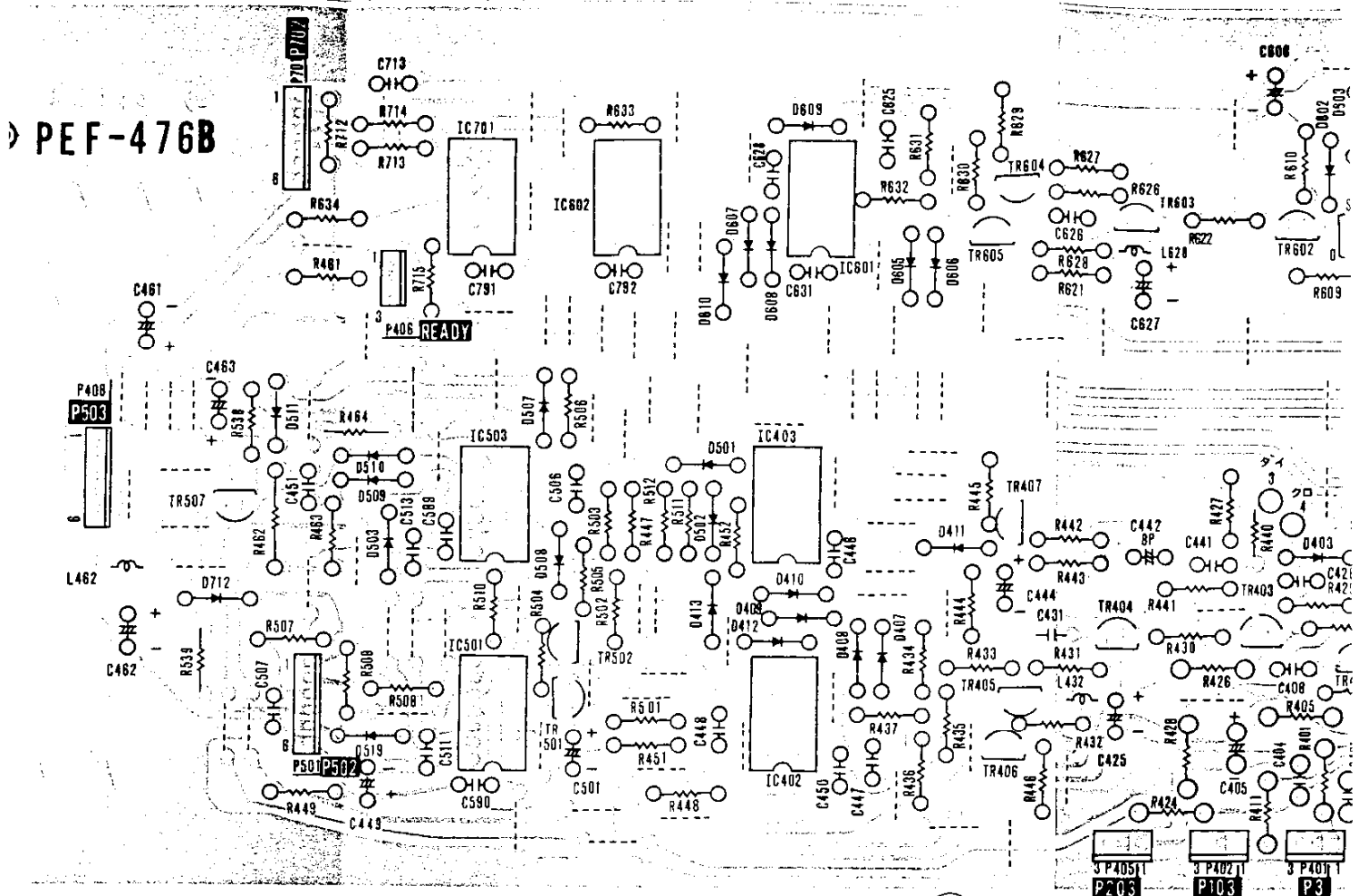
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22-1

22-2

PEF-476B

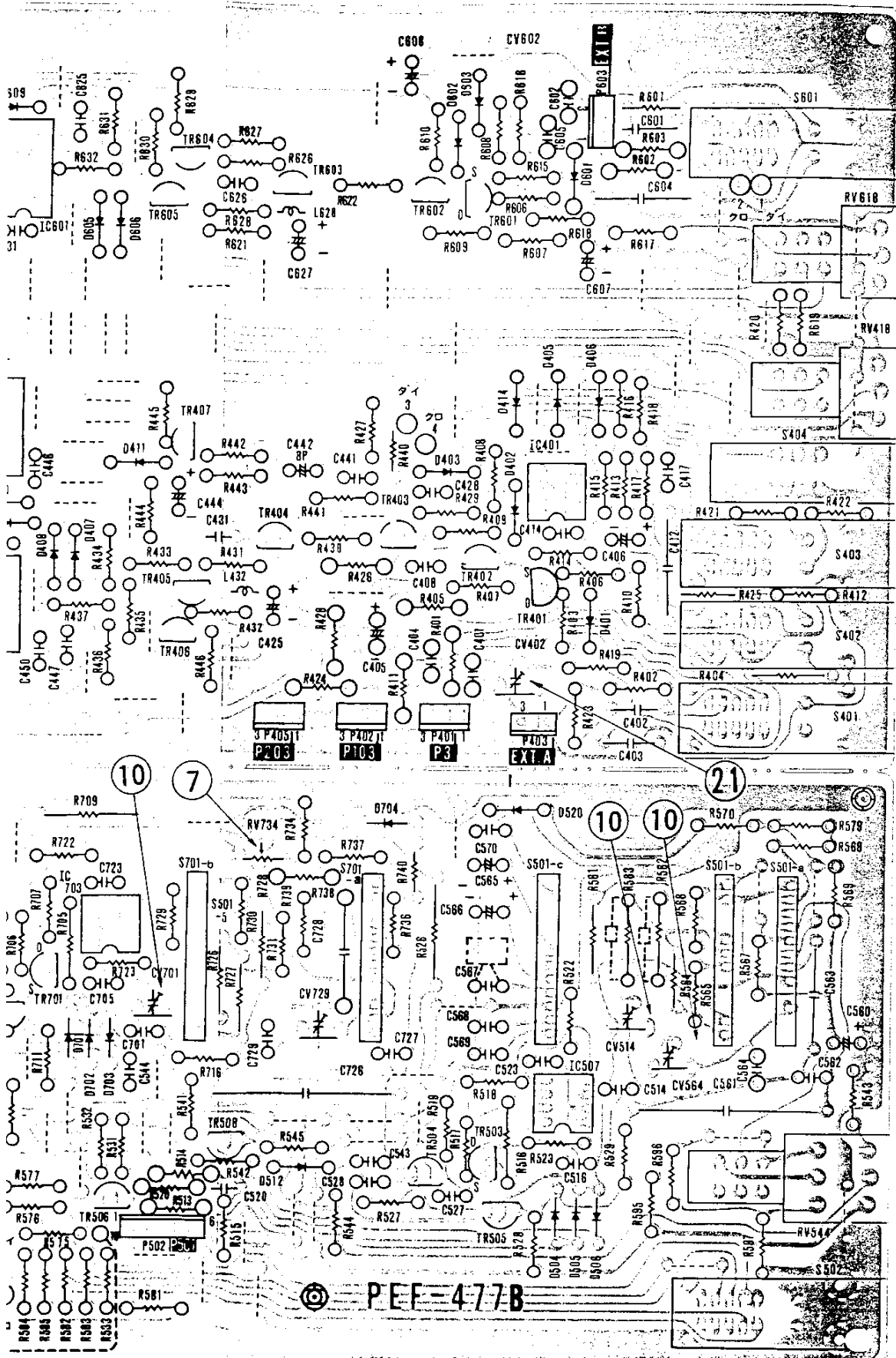


22-1

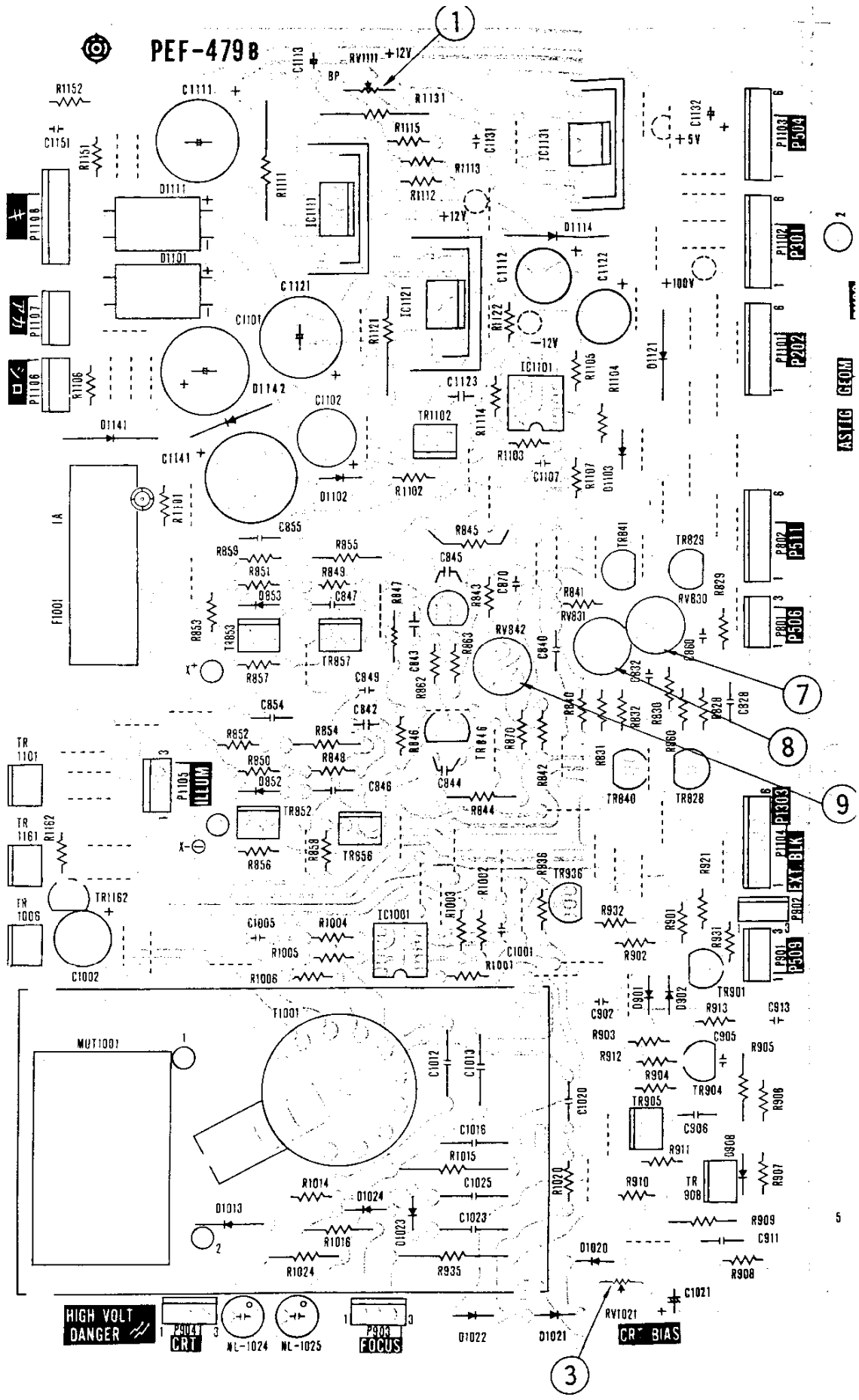
22-2

PB-3

PEF-4



PEF-479B



2

ASTIG GEOM

7

8

9

5

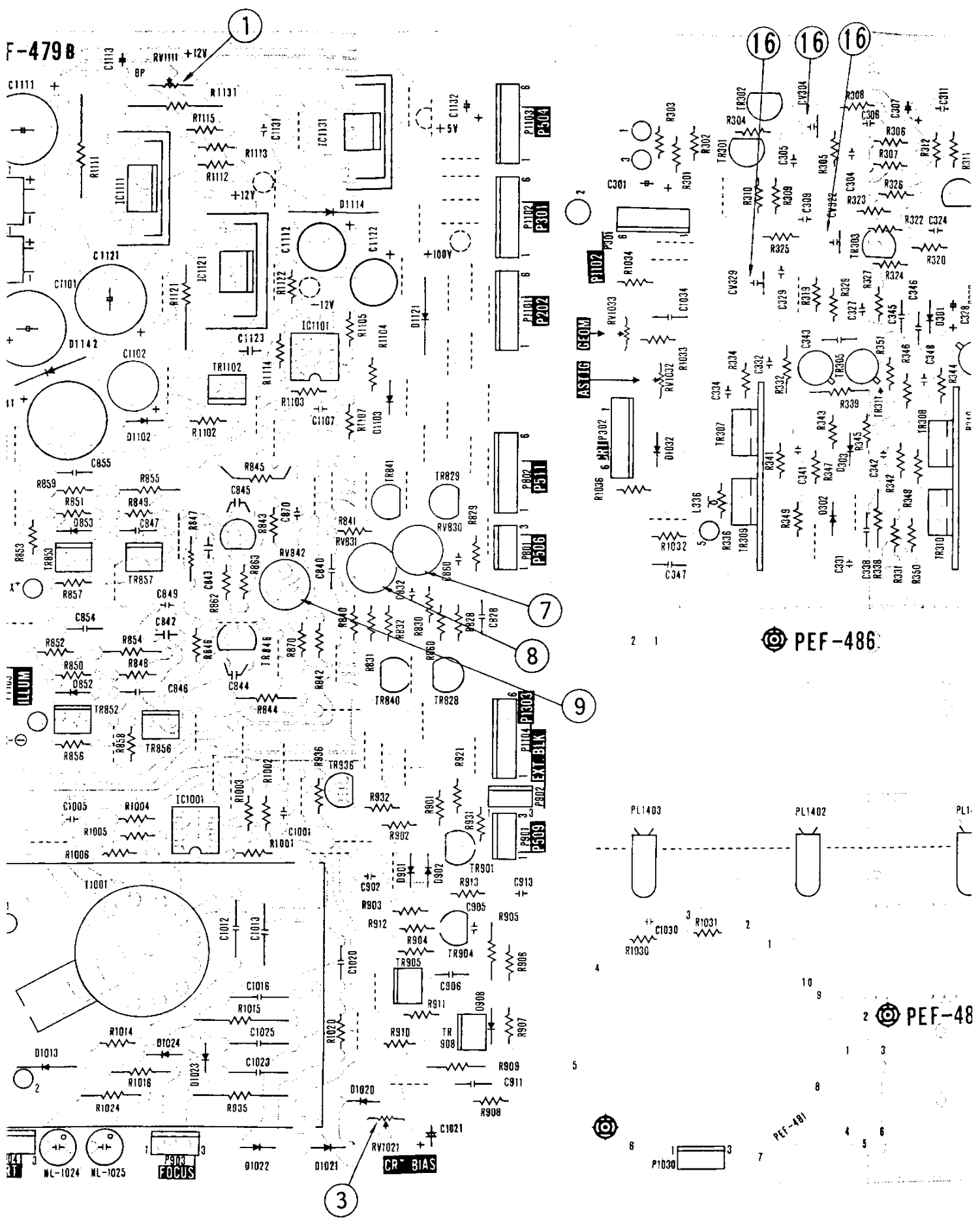
HIGH VOLT DANGER

GR T
NL-1024 NL-1025
FOCUS

RV1021
GR BIAS

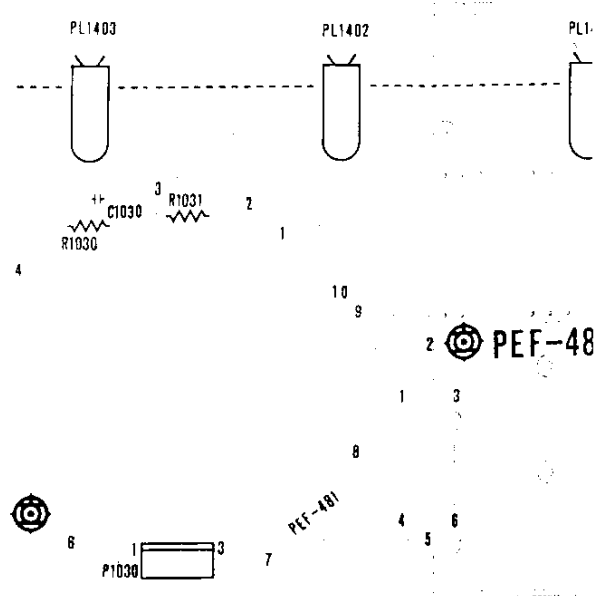
3

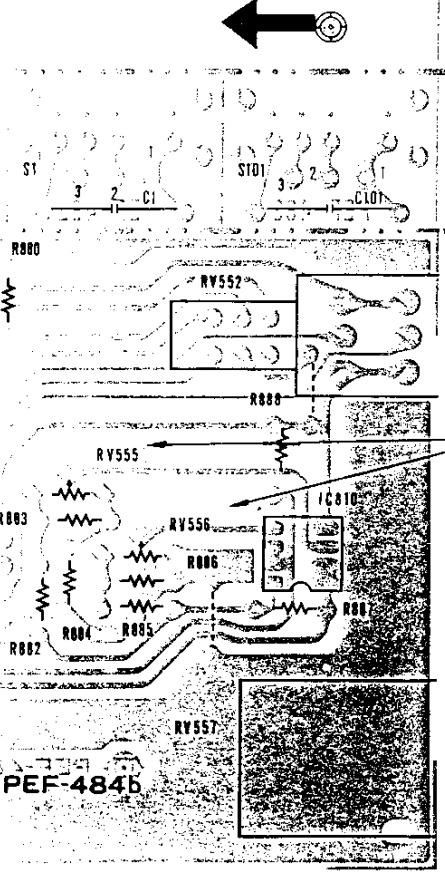
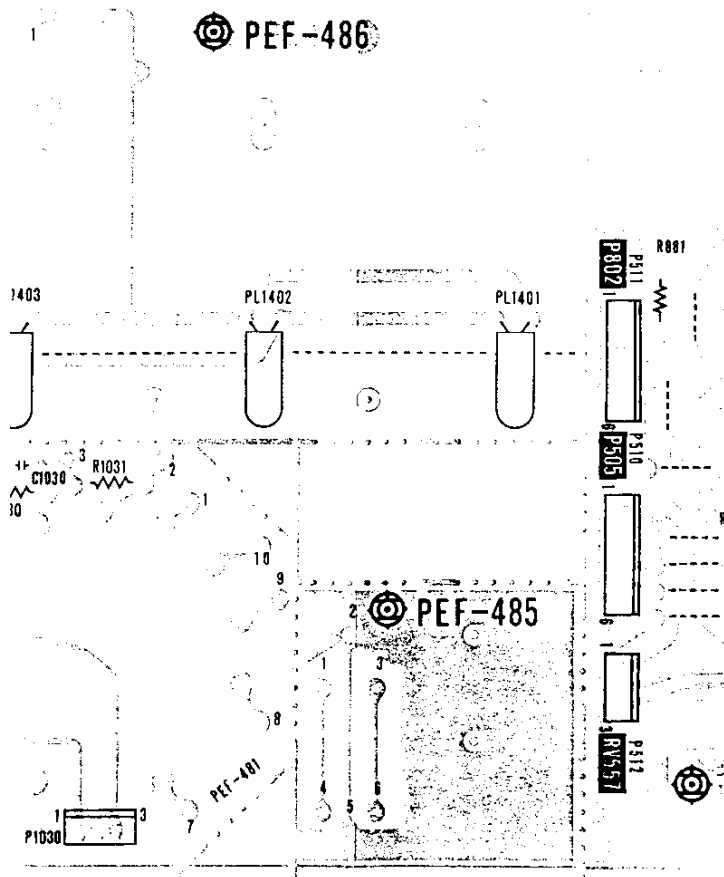
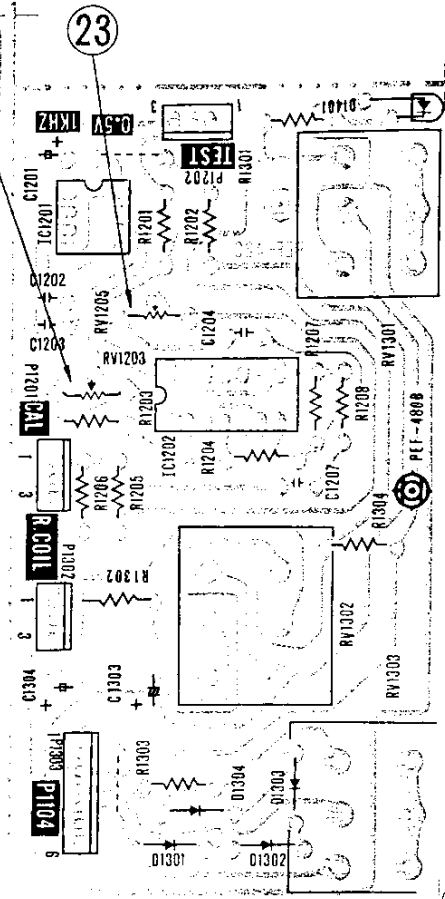
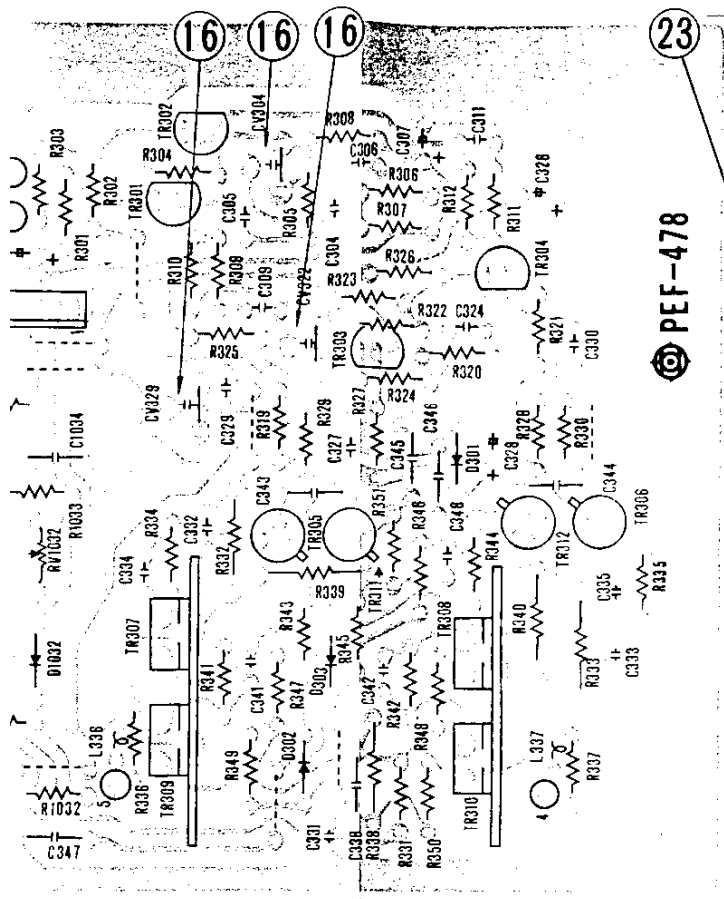
F-479 B



PEF-486

PEF-48





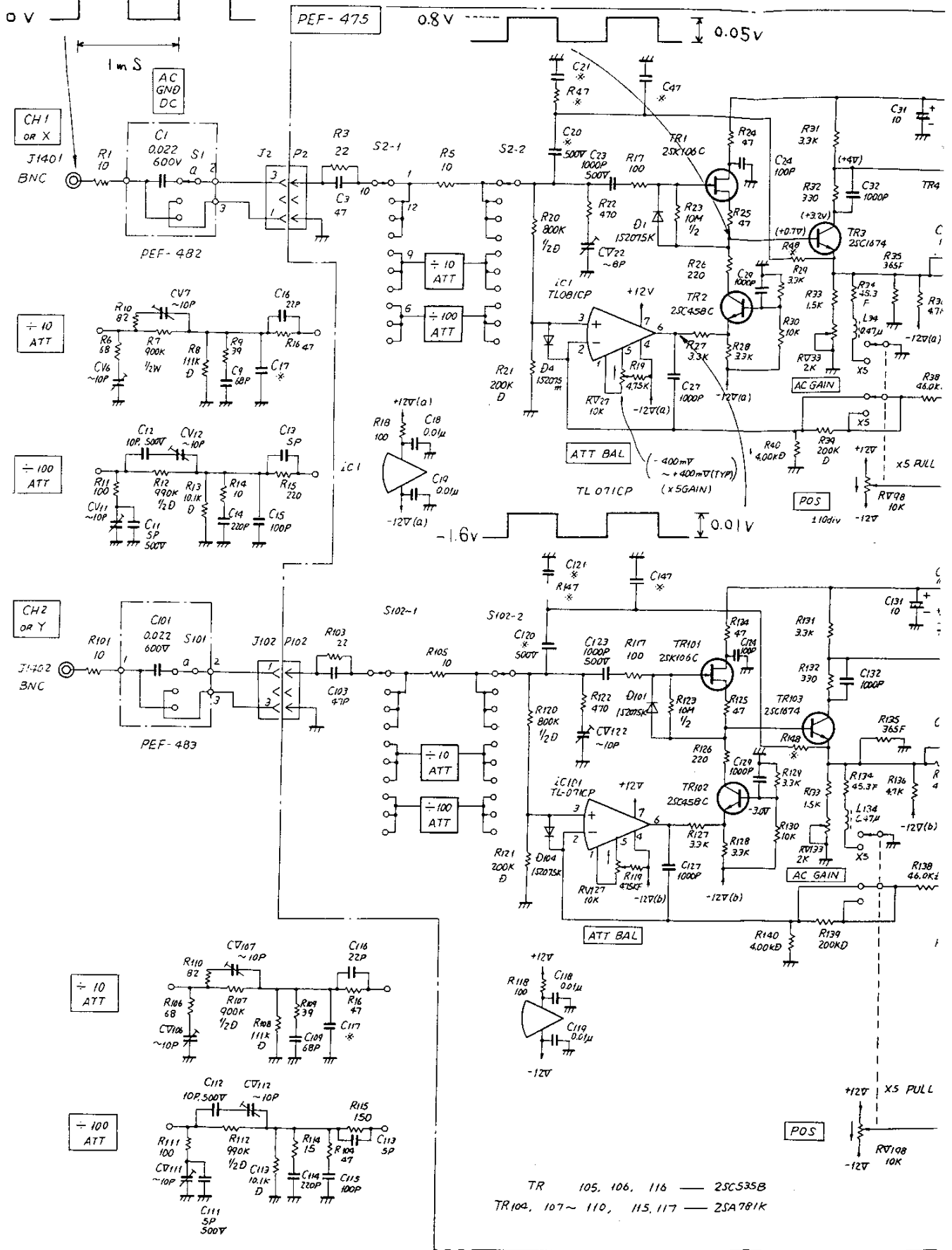
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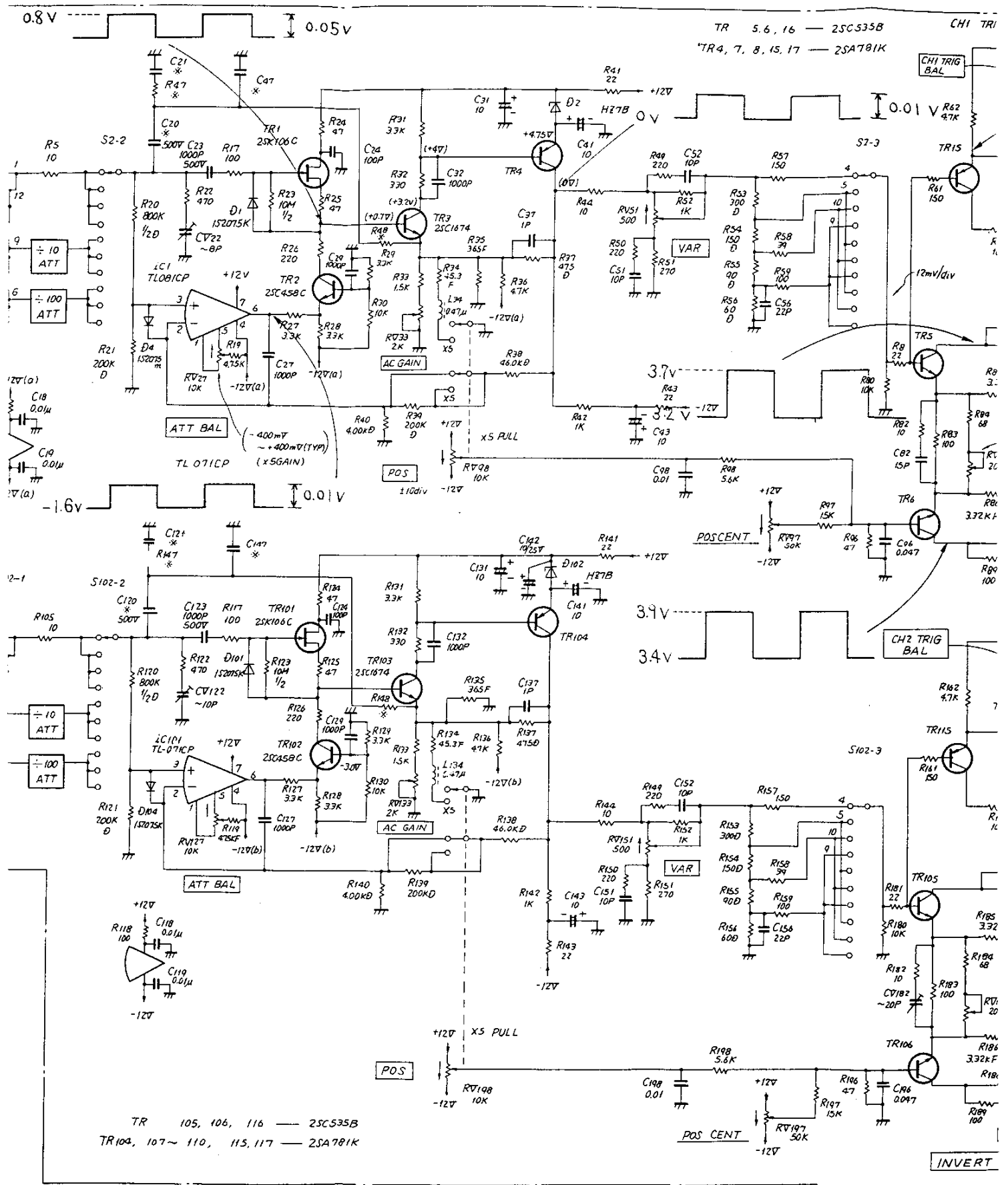


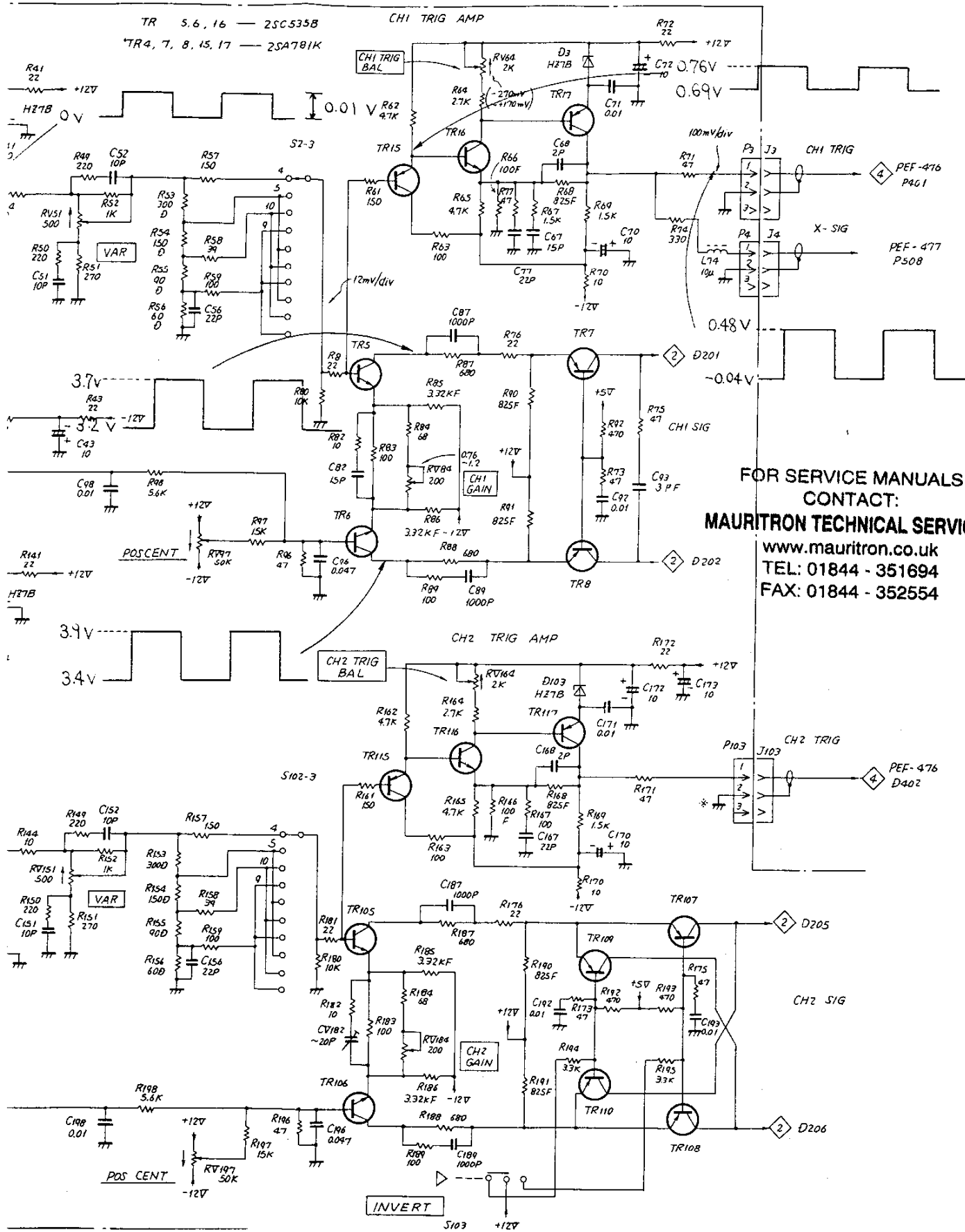
11


7. DIAGRAM

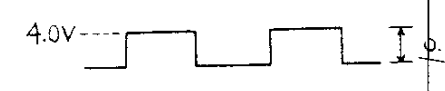
※ Refer to ELECTRIC PARTS
LIST, when this simbol is remarked








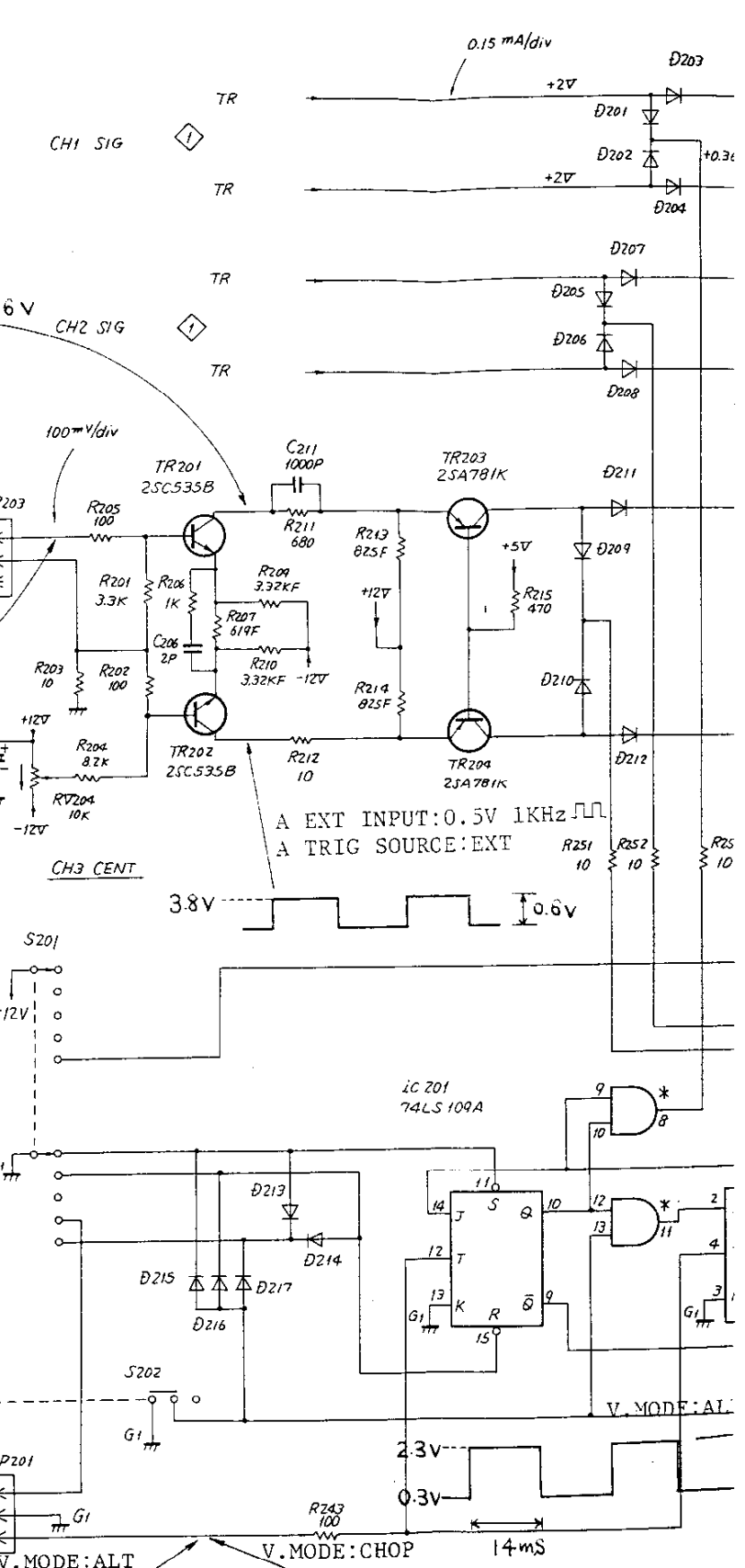
A EXT INPUT: 0.5V 1KHz 
 A TRIG SOURCE: EXT



PEF-476 CH3 SIG
 A EXT INPUT: 0.5V 1KHz 
 A TRIG SOURCE: EXT



CH3 CENT
 A EXT INPUT: 0.5V 1KHz 
 A TRIG SOURCE: EXT

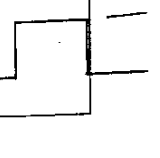
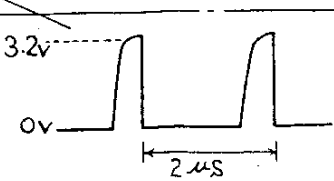
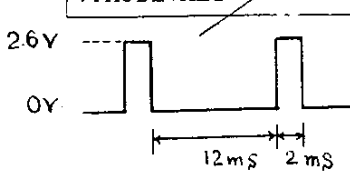


MODE
 CH1
 CH2
 ALT
 CHOP
 ADD

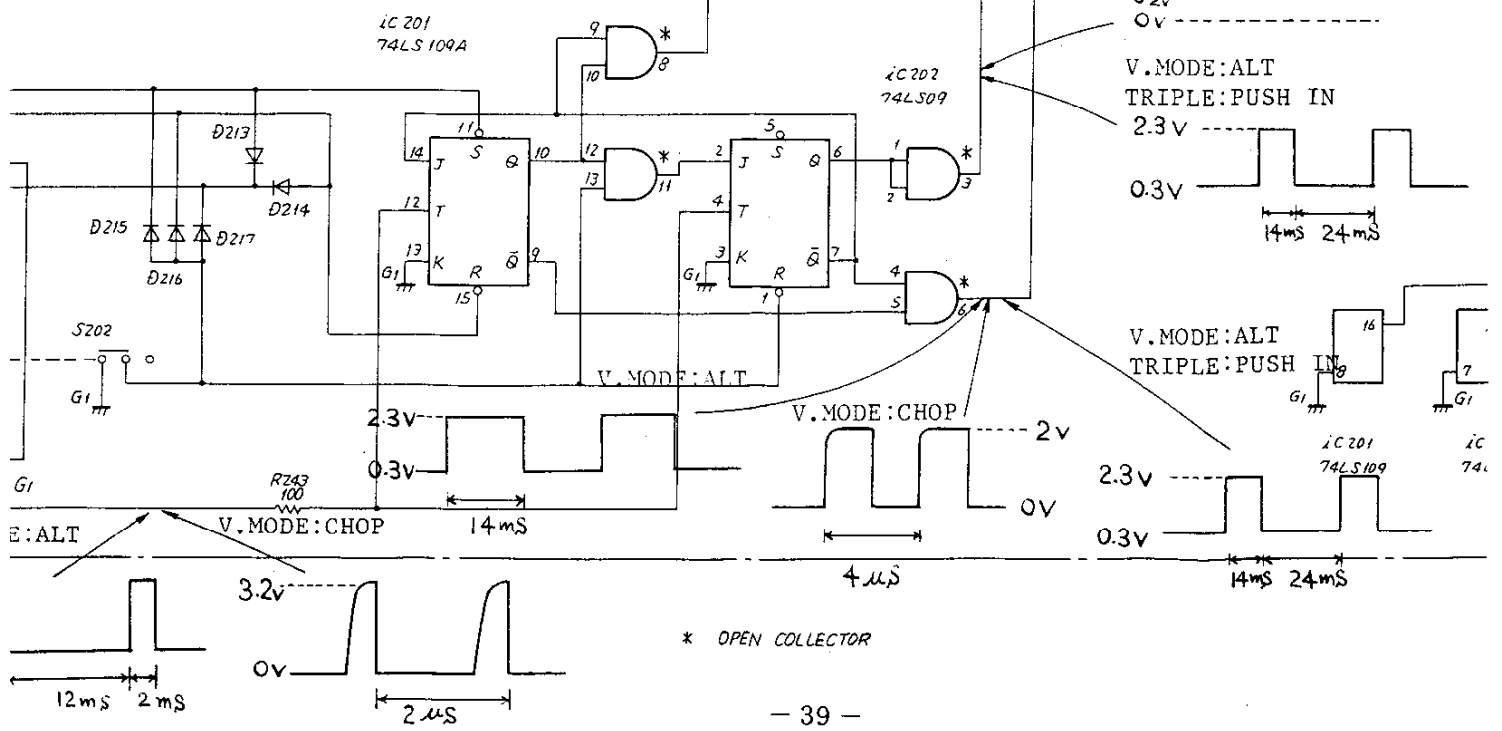
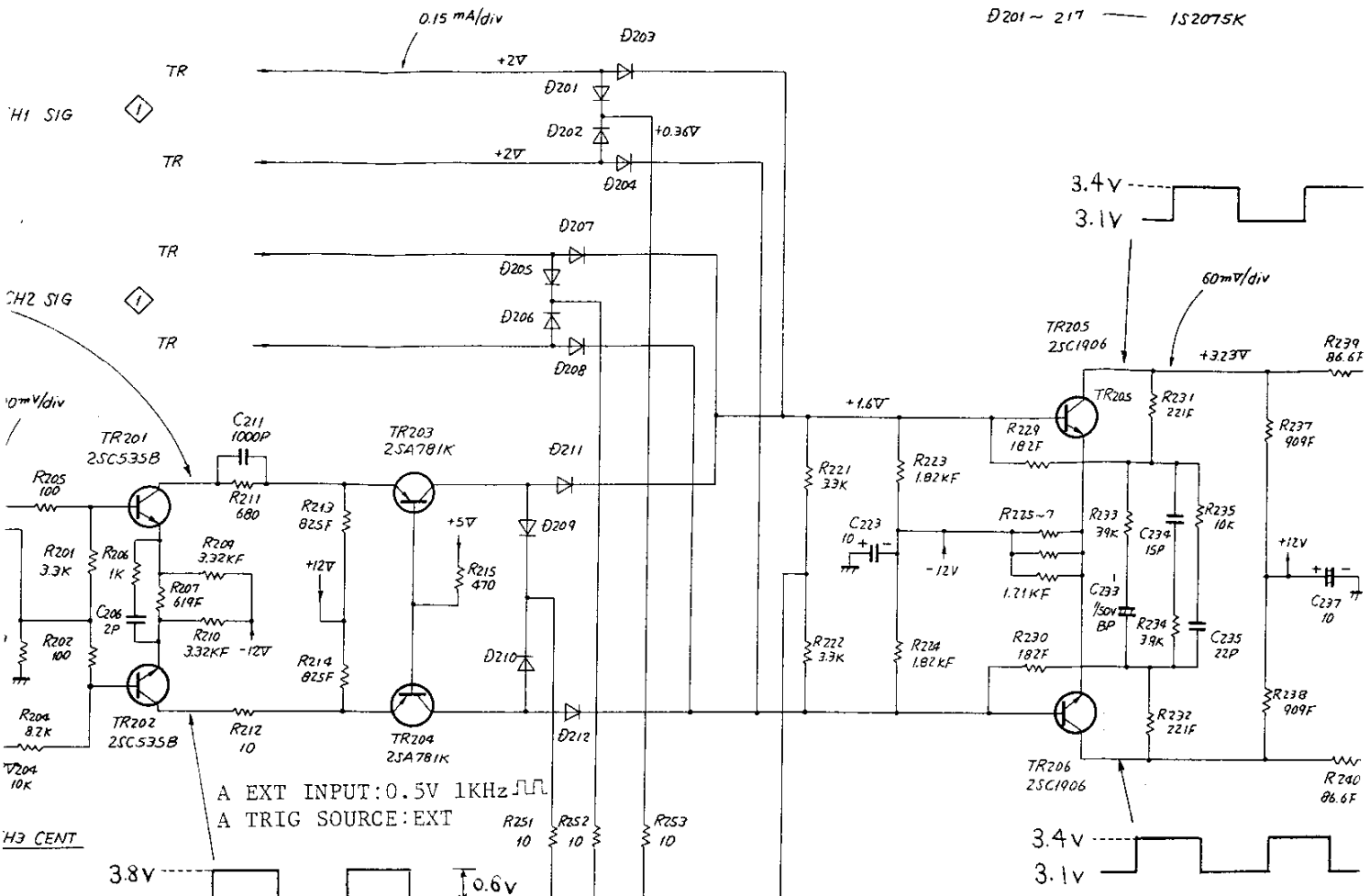
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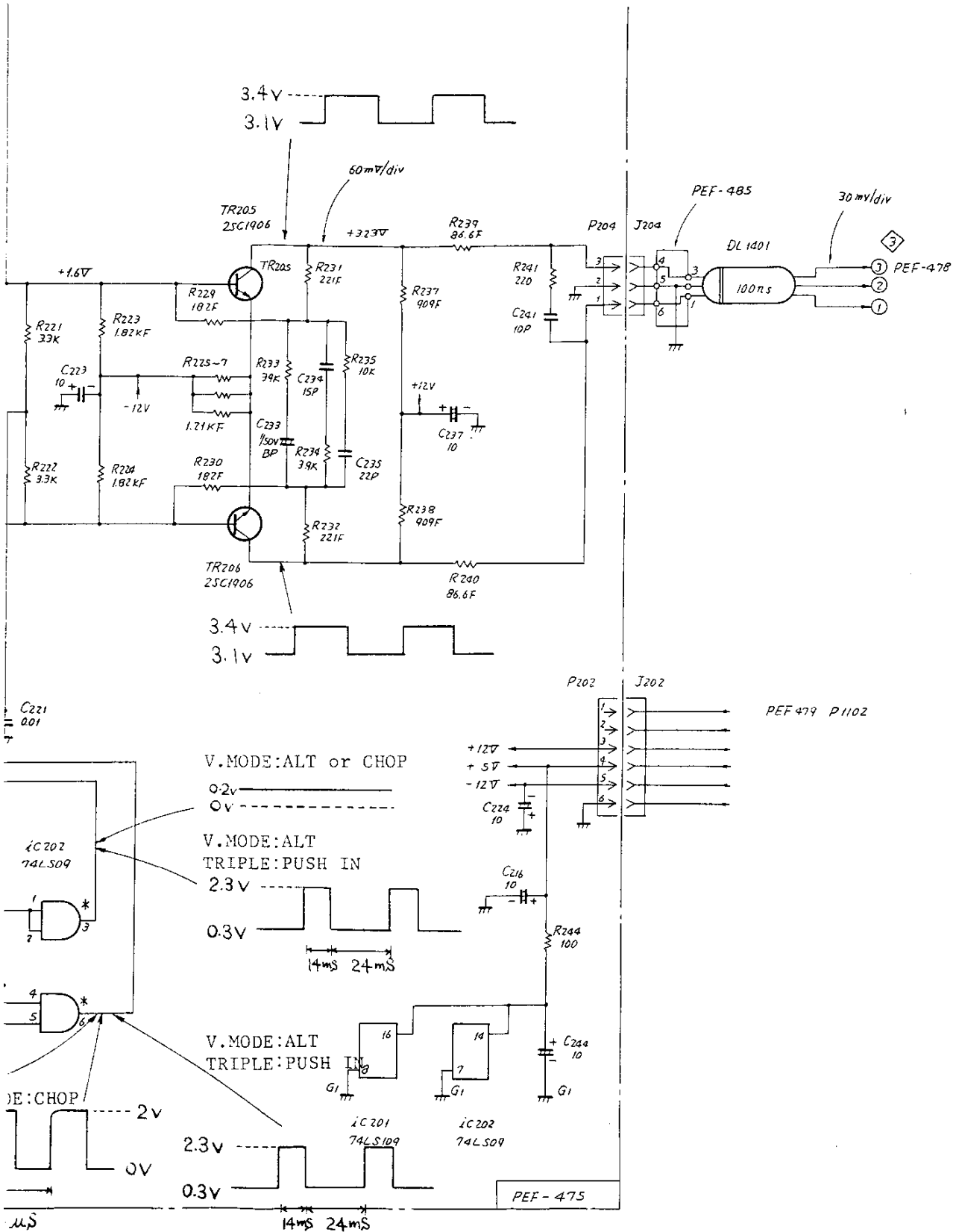
CHOP CONT PEF-477
 CH SW PULSE P510

TRIP L

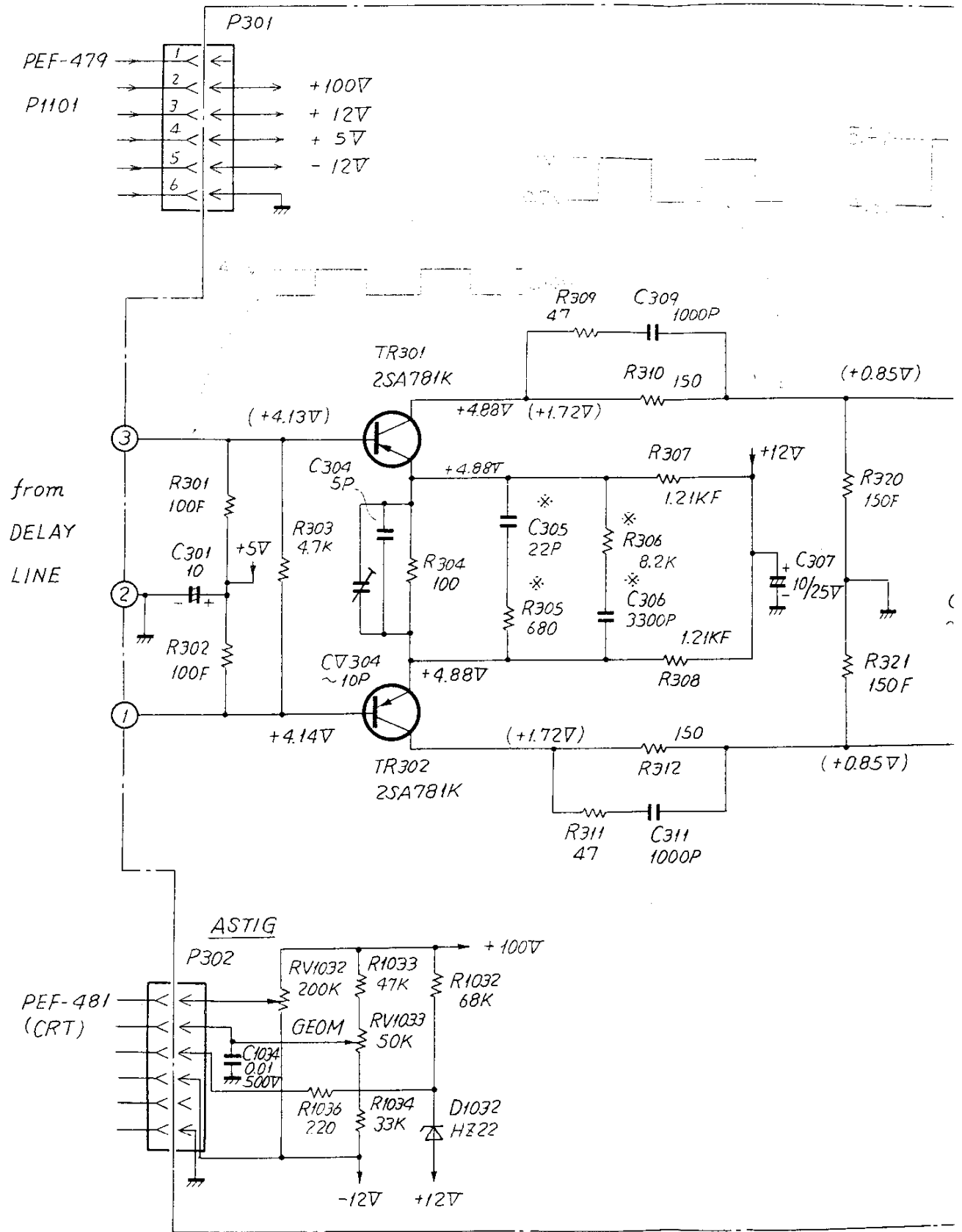


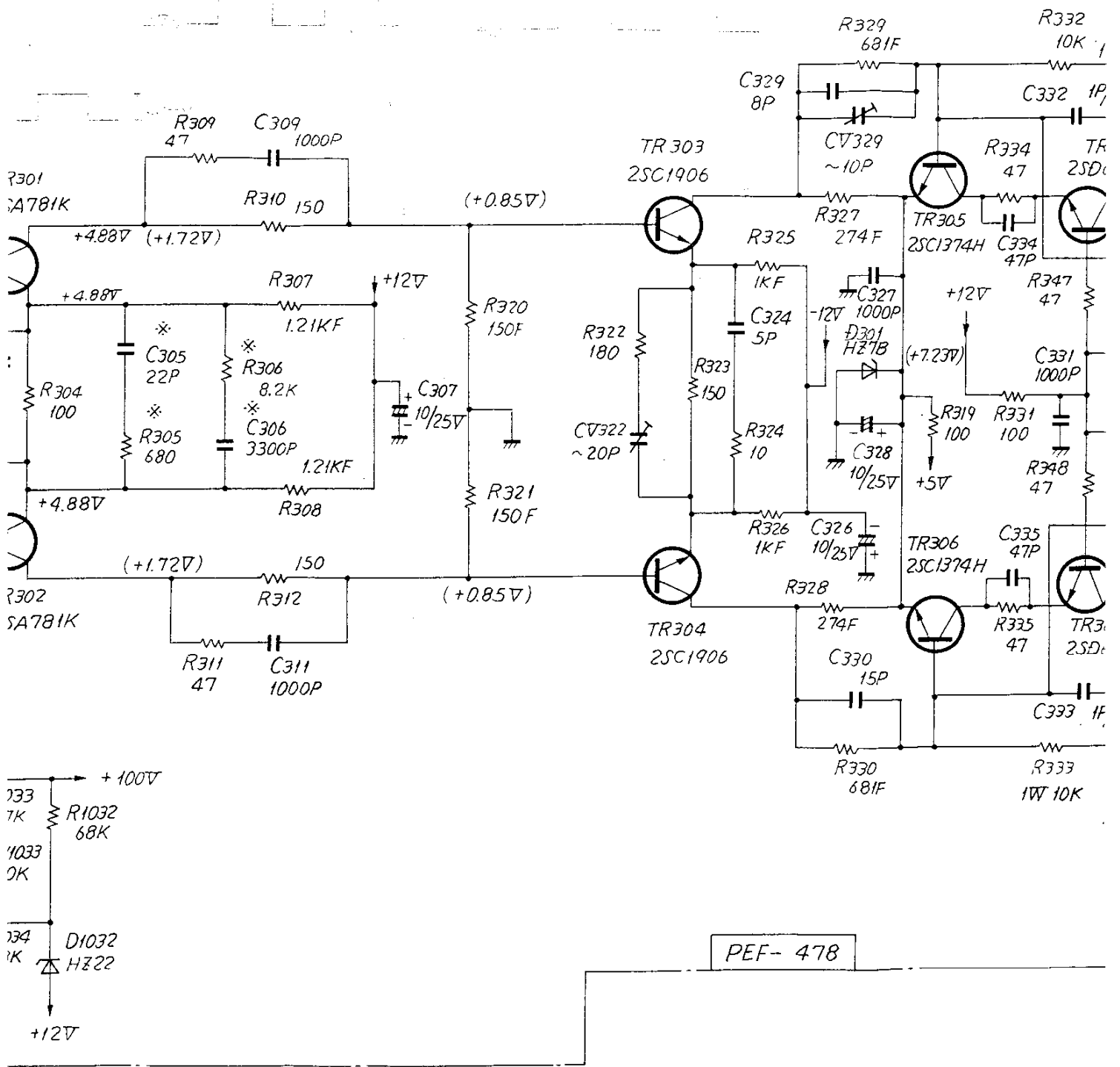
* DI



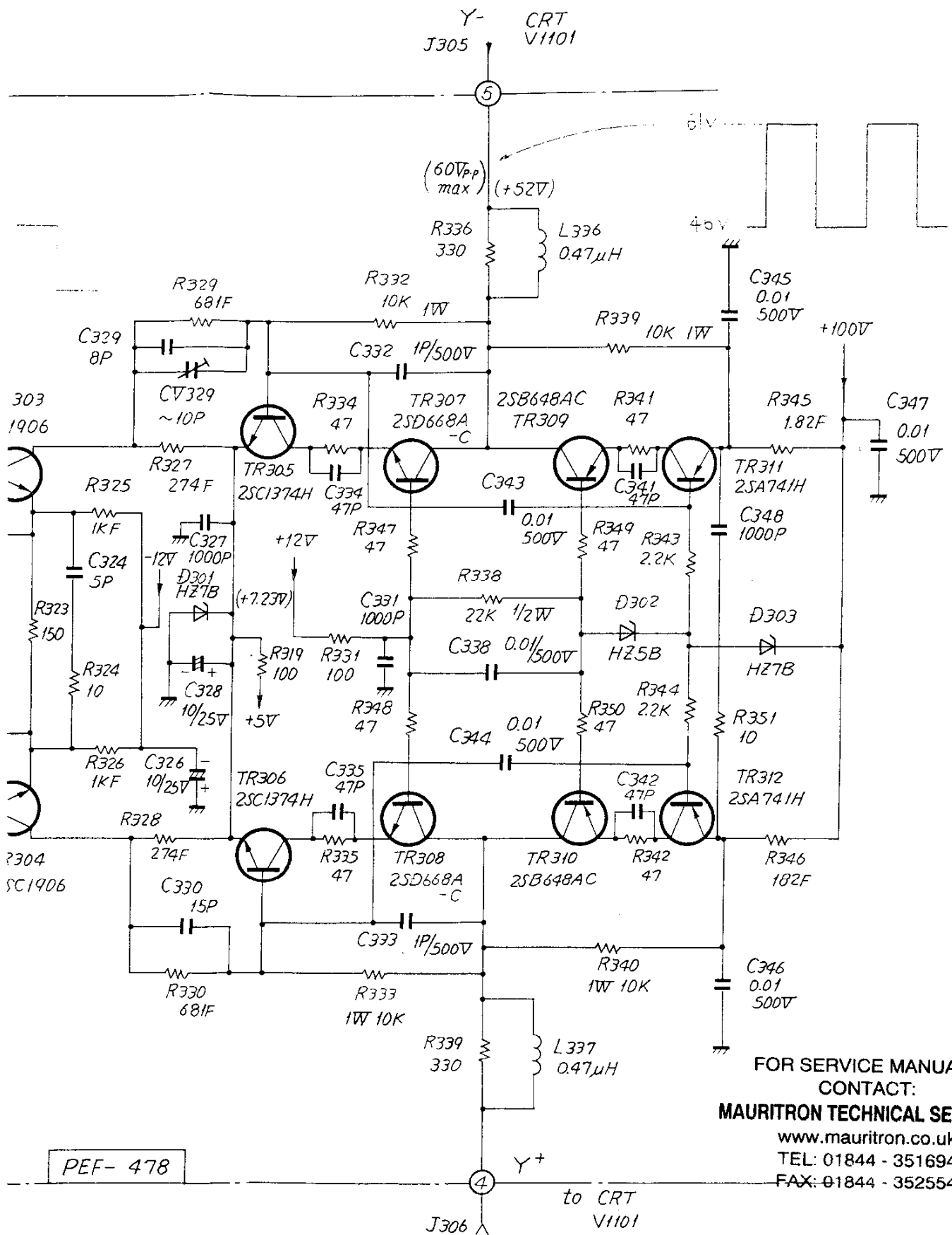


VERTICAL CHANNEL SWITCH





PEF-478



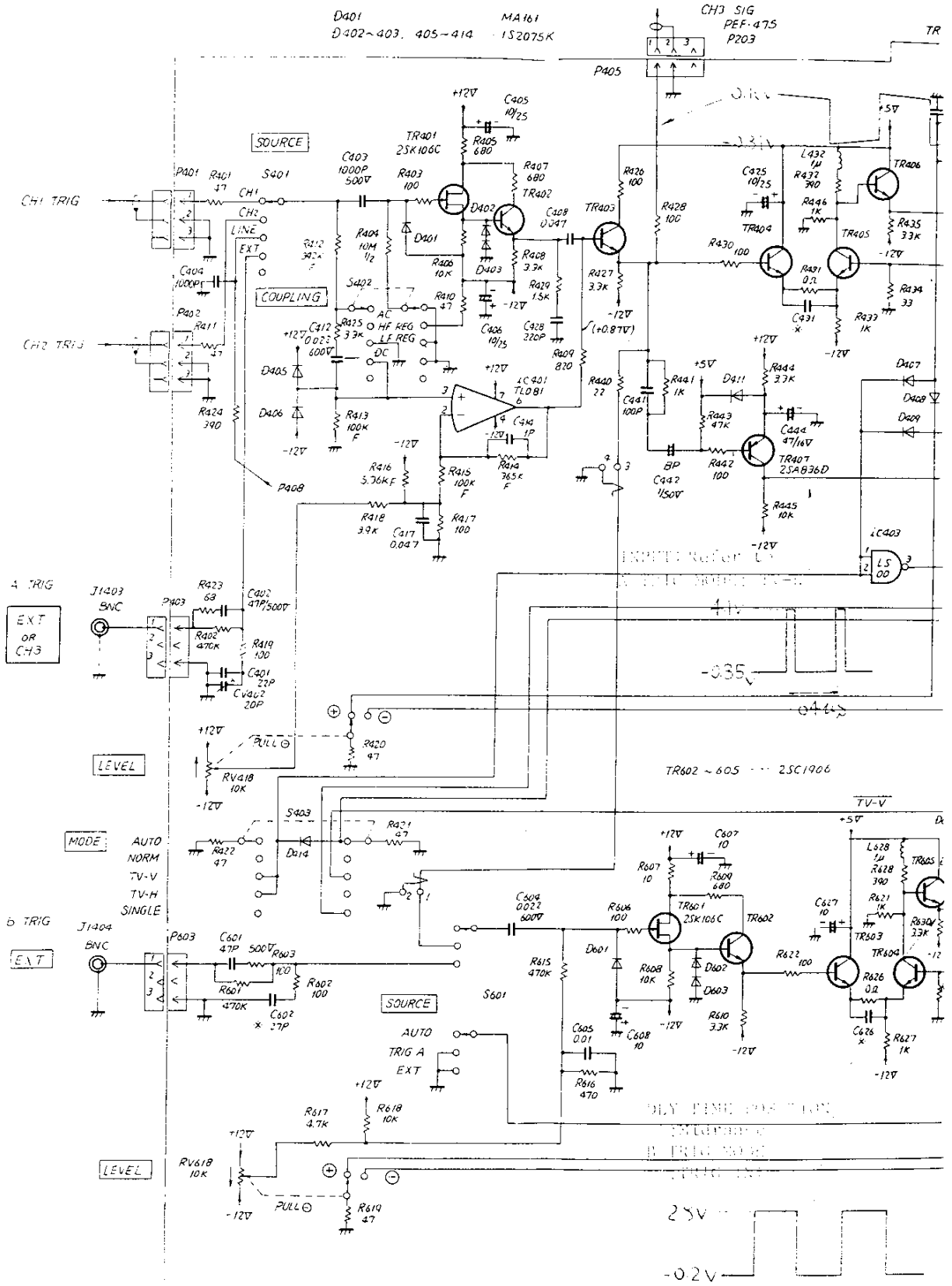
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PEF-478

VERTICAL OUTPUT AMPLIFIER

D401
D402-403, 405-414 MA61
1S2075K

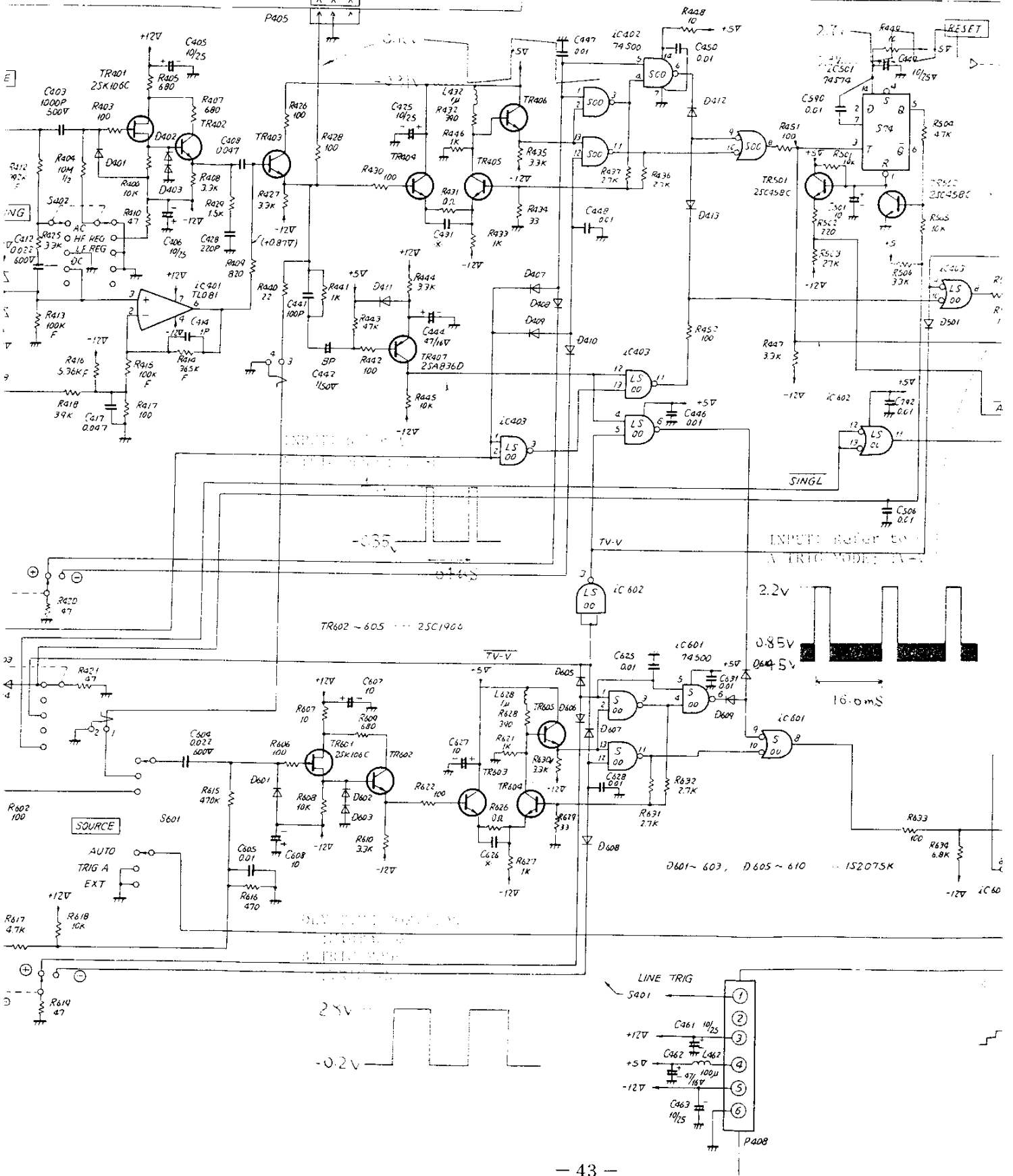
CH3 SIG
PEF-475
P203

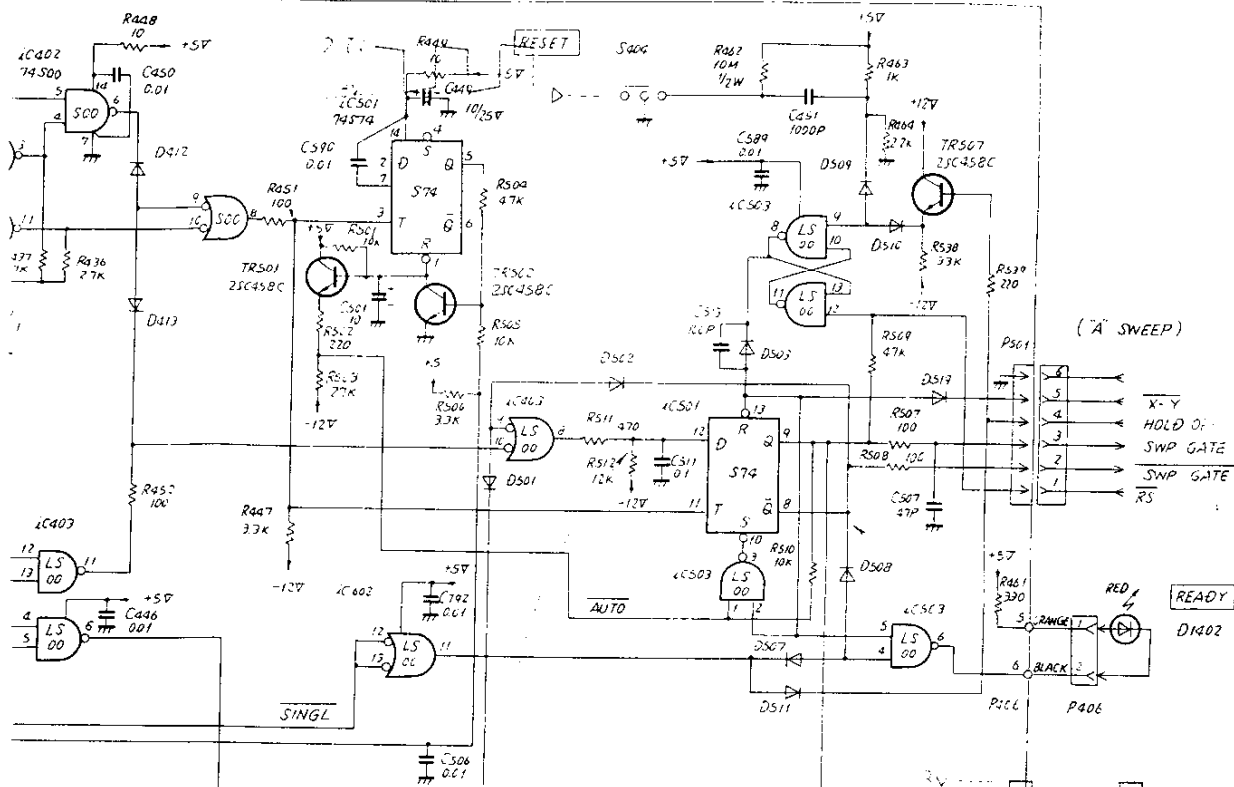


D401
D402-403, 405-414 MA161
IS2075K

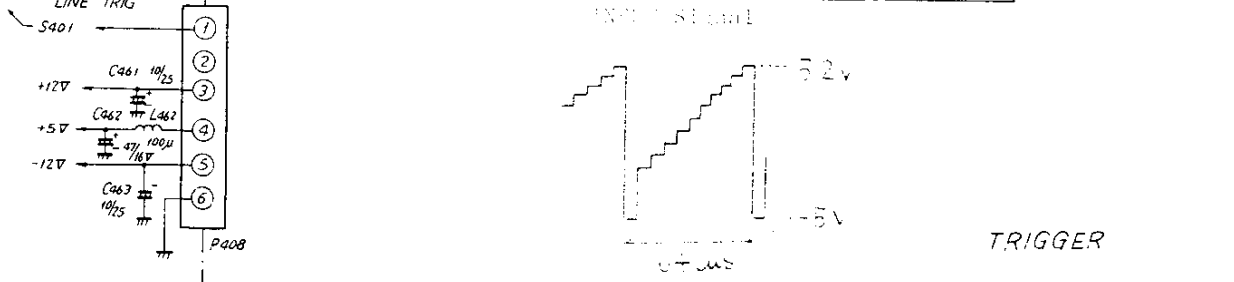
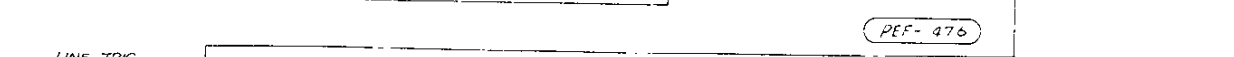
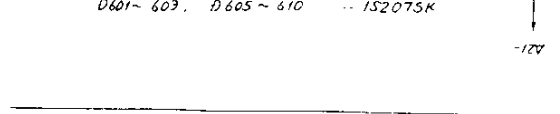
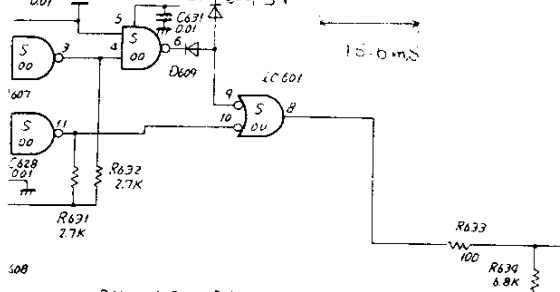
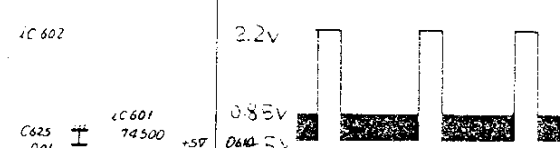
CH3 SIG
PEF-475
P203

TR402-406 2SC1906





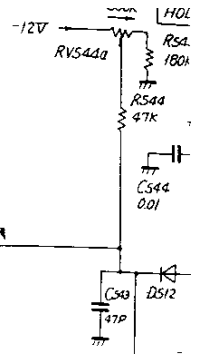
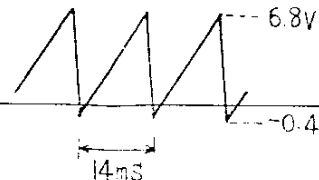
V-V INPUT Section 20



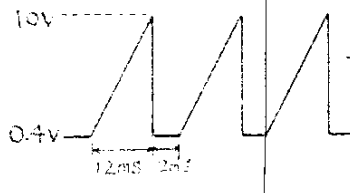
(A SWEEP)

PEF-476
P501

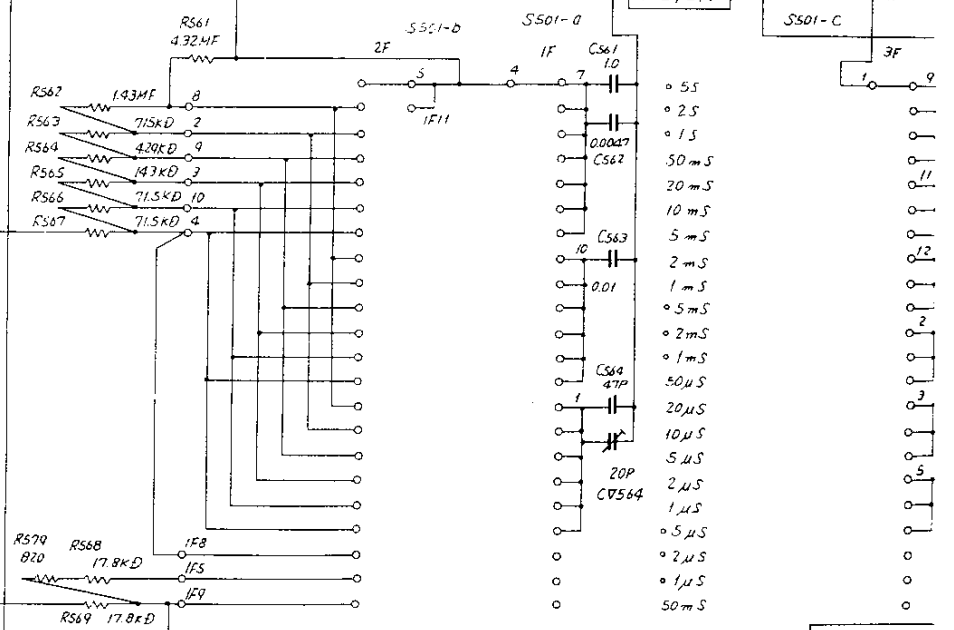
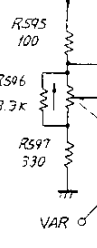
SWP GATE
SWP GATE
HOLD OFF
X-Y



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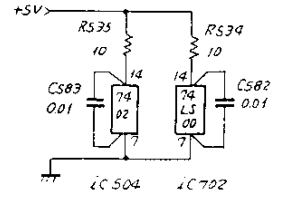
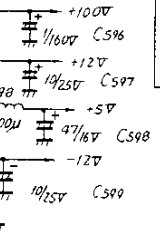
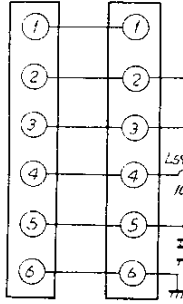


SWP VAR



(P5)

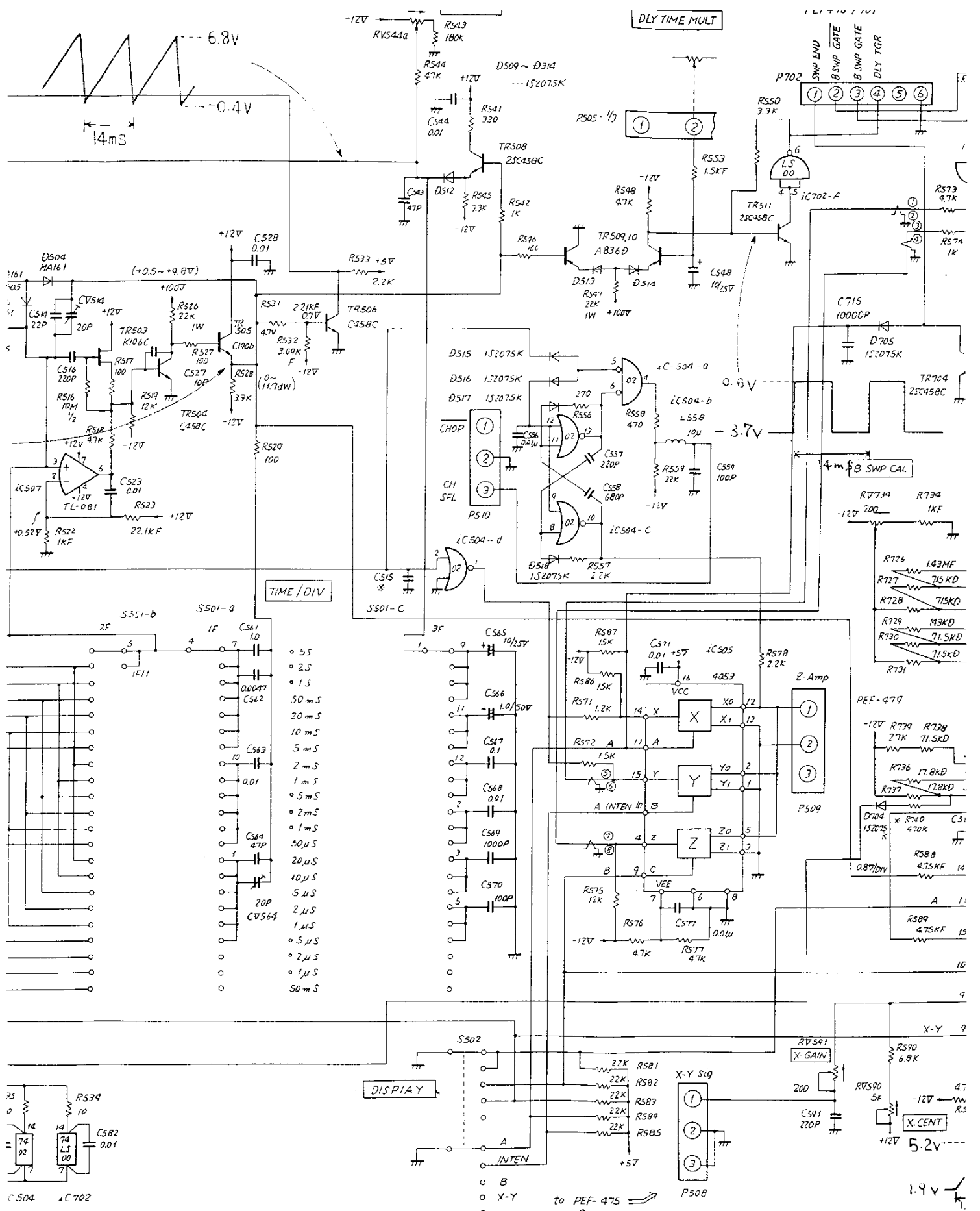
to PEF -476
to PEF -479



DISPLAY

DS:
DS
DS:
CHOP
CH
SFL

- 0 5S
- 0 2S
- 0 1S
- 50 mS
- 20 mS
- 10 mS
- 5 mS
- 2 mS
- 1 mS
- 0 5mS
- 0 2mS
- 0 1mS
- 50μS
- 20μS
- 10μS
- 5μS
- 2μS
- 1μS
- 0 5μS
- 0 2μS
- 0 1μS
- 50 mS

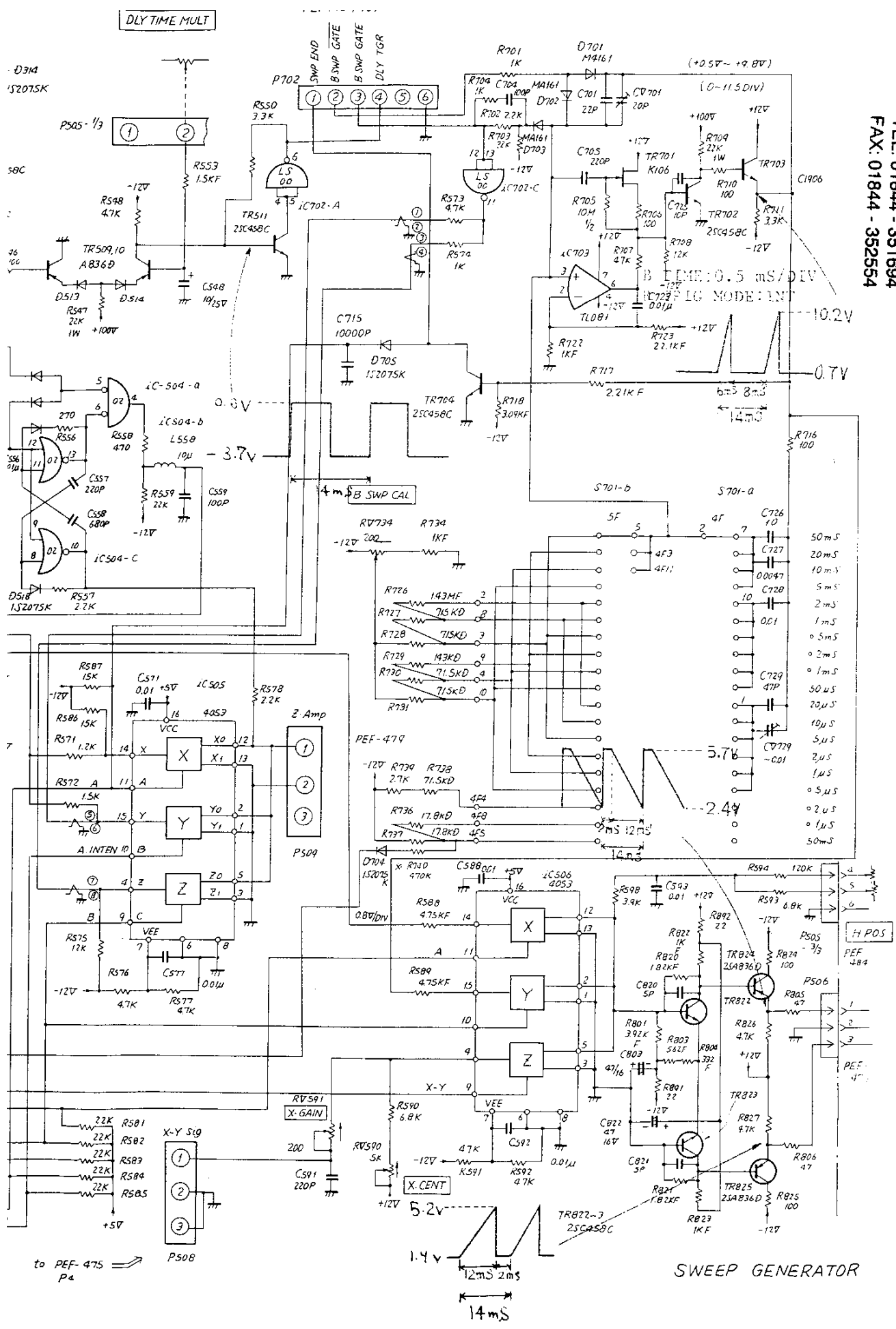


TIME / DIV

5	0.5S
4	0.2S
3	0.1S
2	50mS
1	30mS
0	10mS
10	5mS
9	2mS
8	1mS
7	0.5mS
6	0.2mS
5	0.1mS
4	50μS
3	20μS
2	10μS
1	5μS
0	2μS
9	1μS
8	0.5μS
7	0.2μS
6	0.1μS
5	50mS

FOR SERVICE MANUALS
CONTACT:

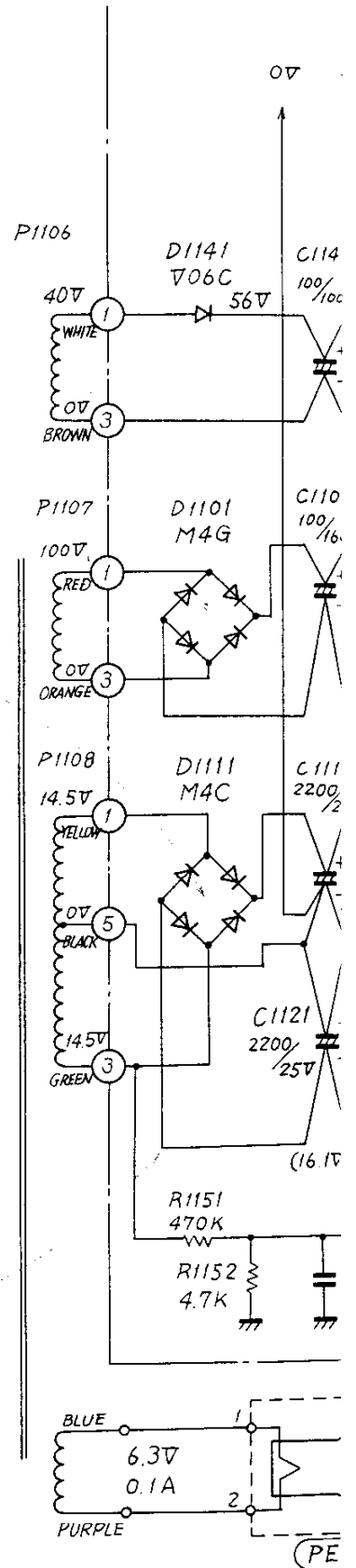
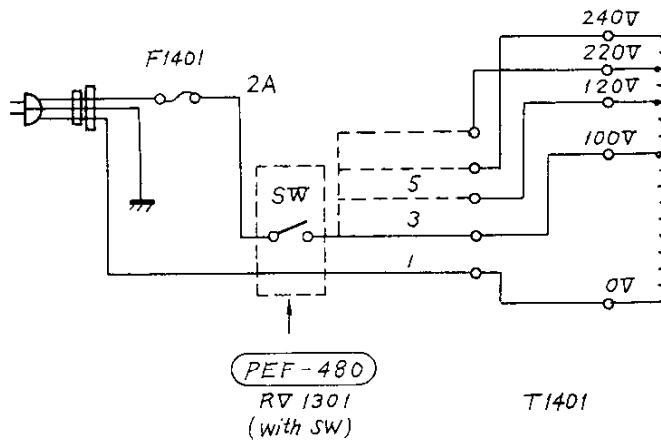
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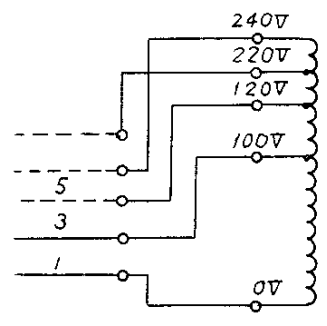
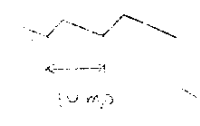
SWEEP GENERATOR

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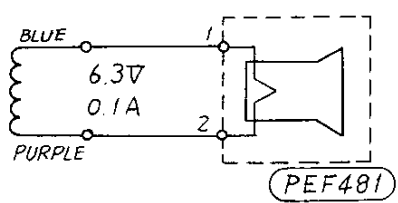
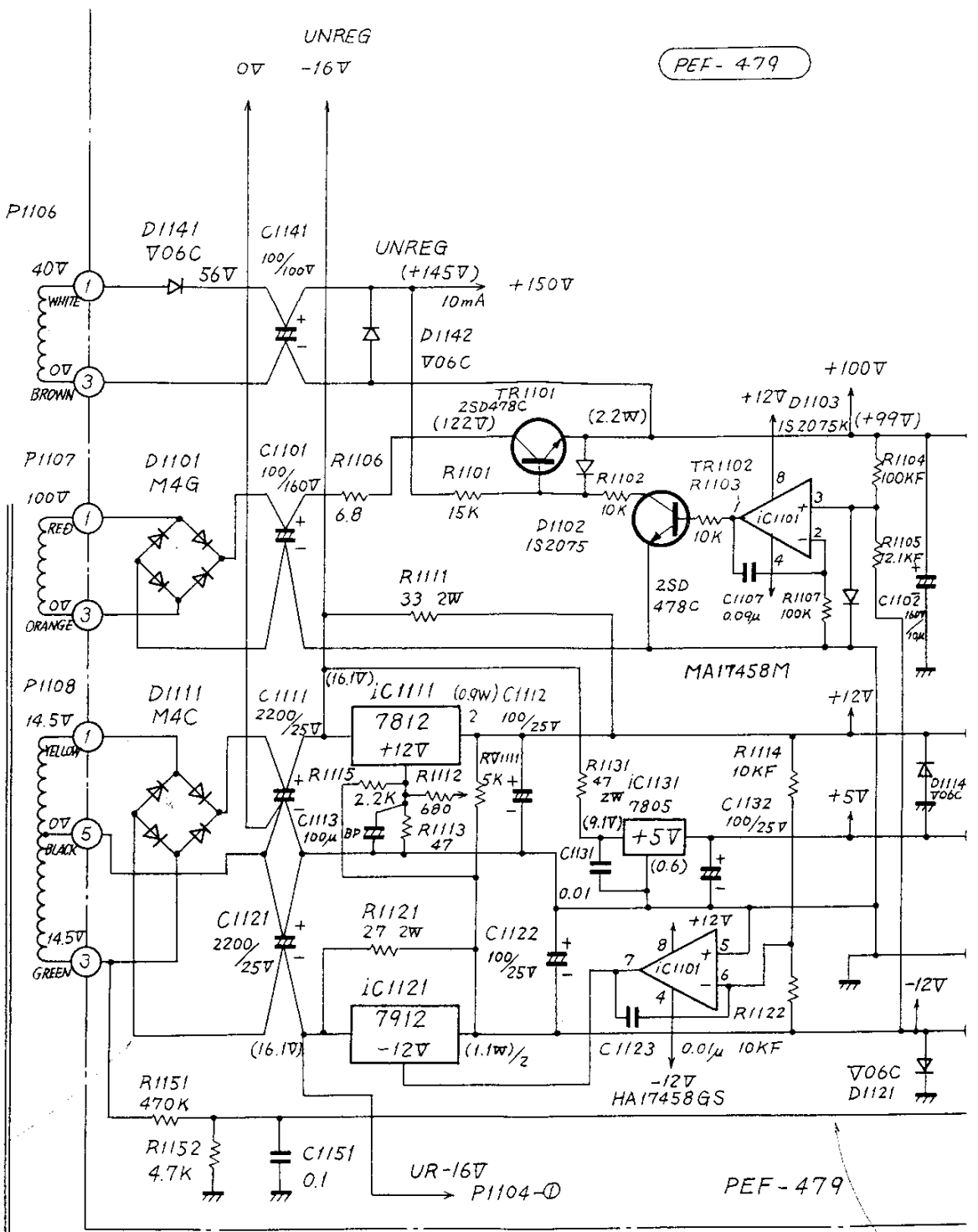
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UNREG
0V -16V



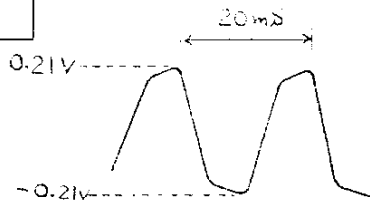
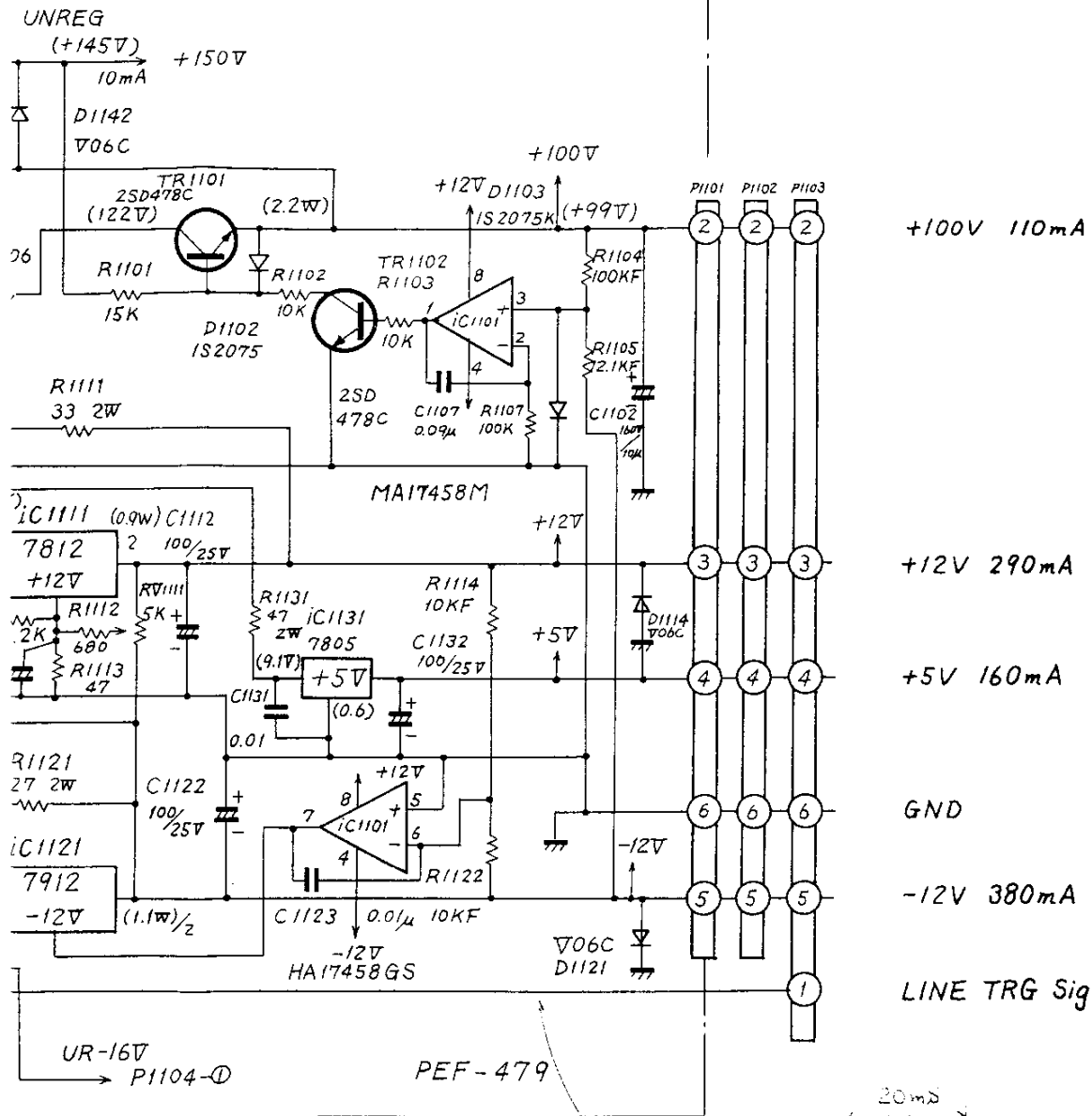
T1401



PEF481

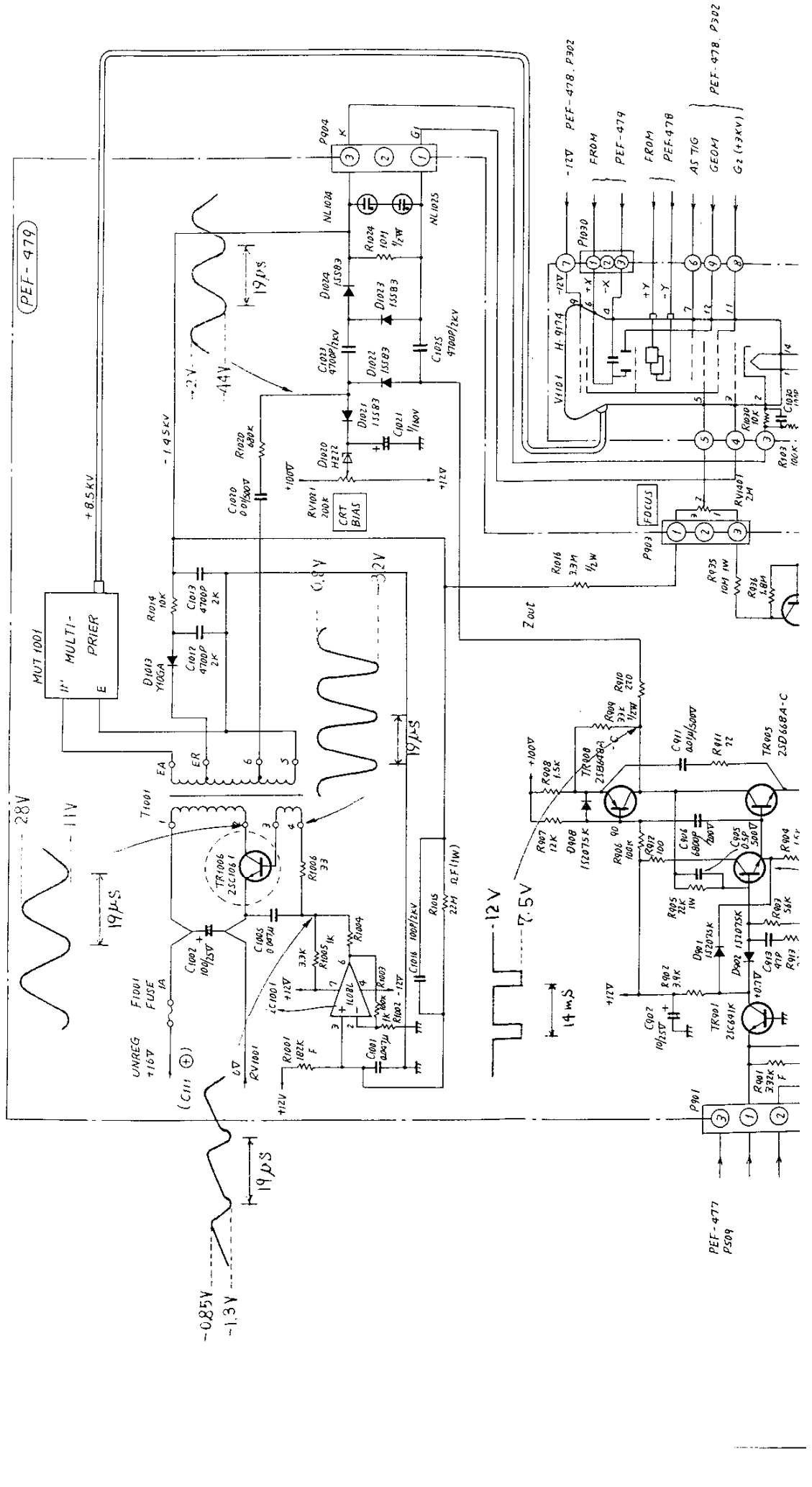
For V-55

PEF-479



For V-550

POWER SUPPLY



PEF-477
P-509

PEF-478, P-302

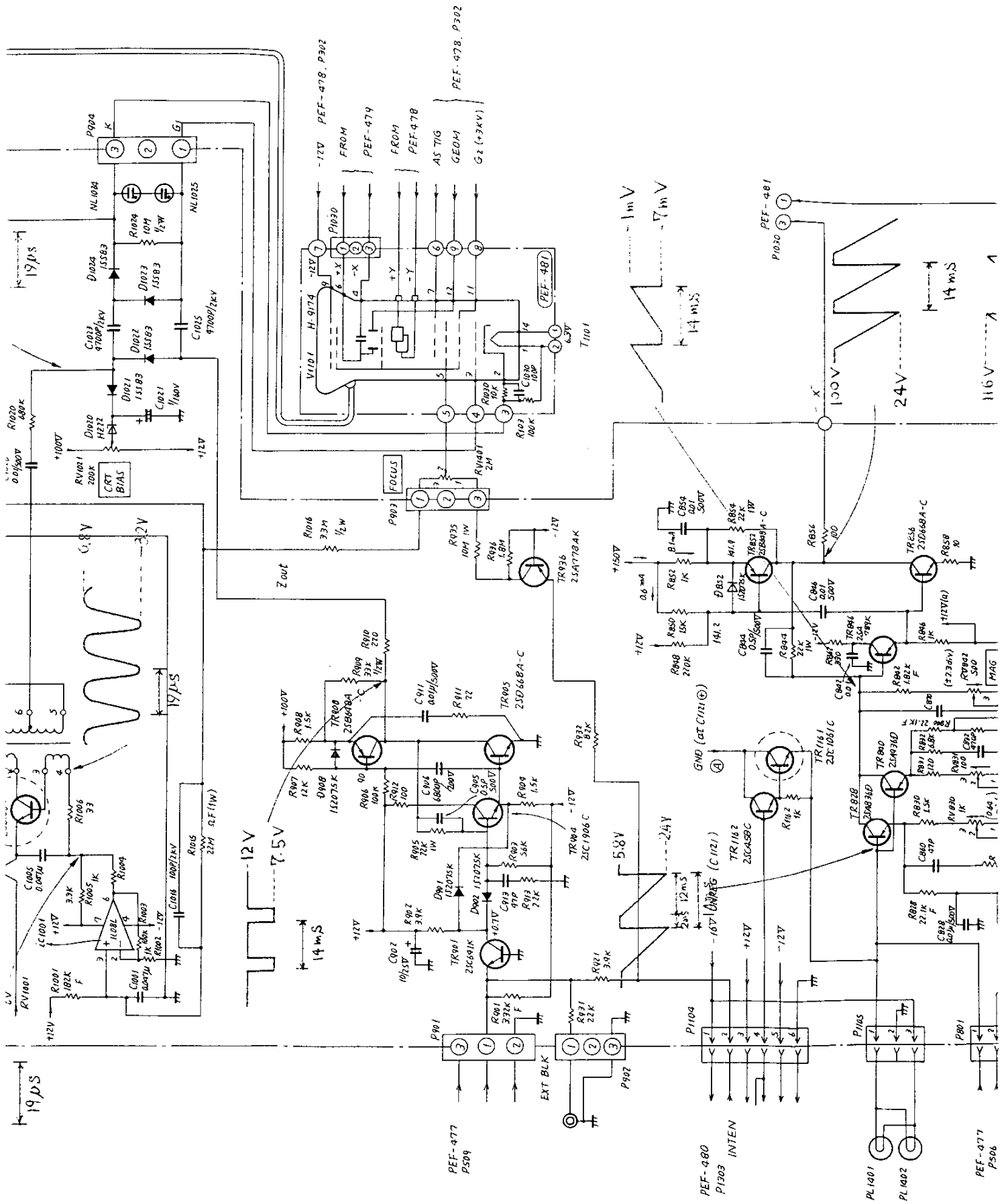
PEF-479

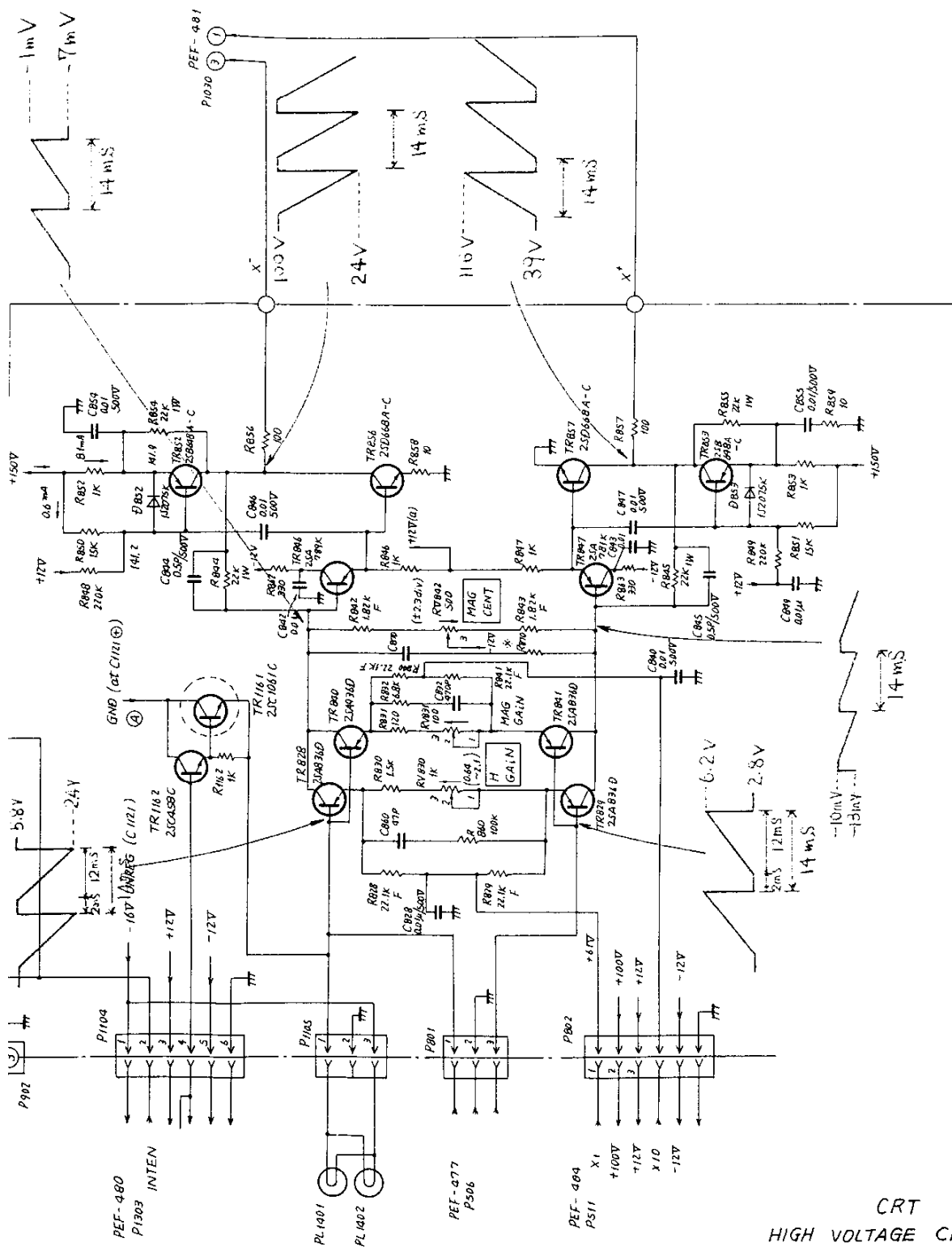
PEF-478

AS 71G

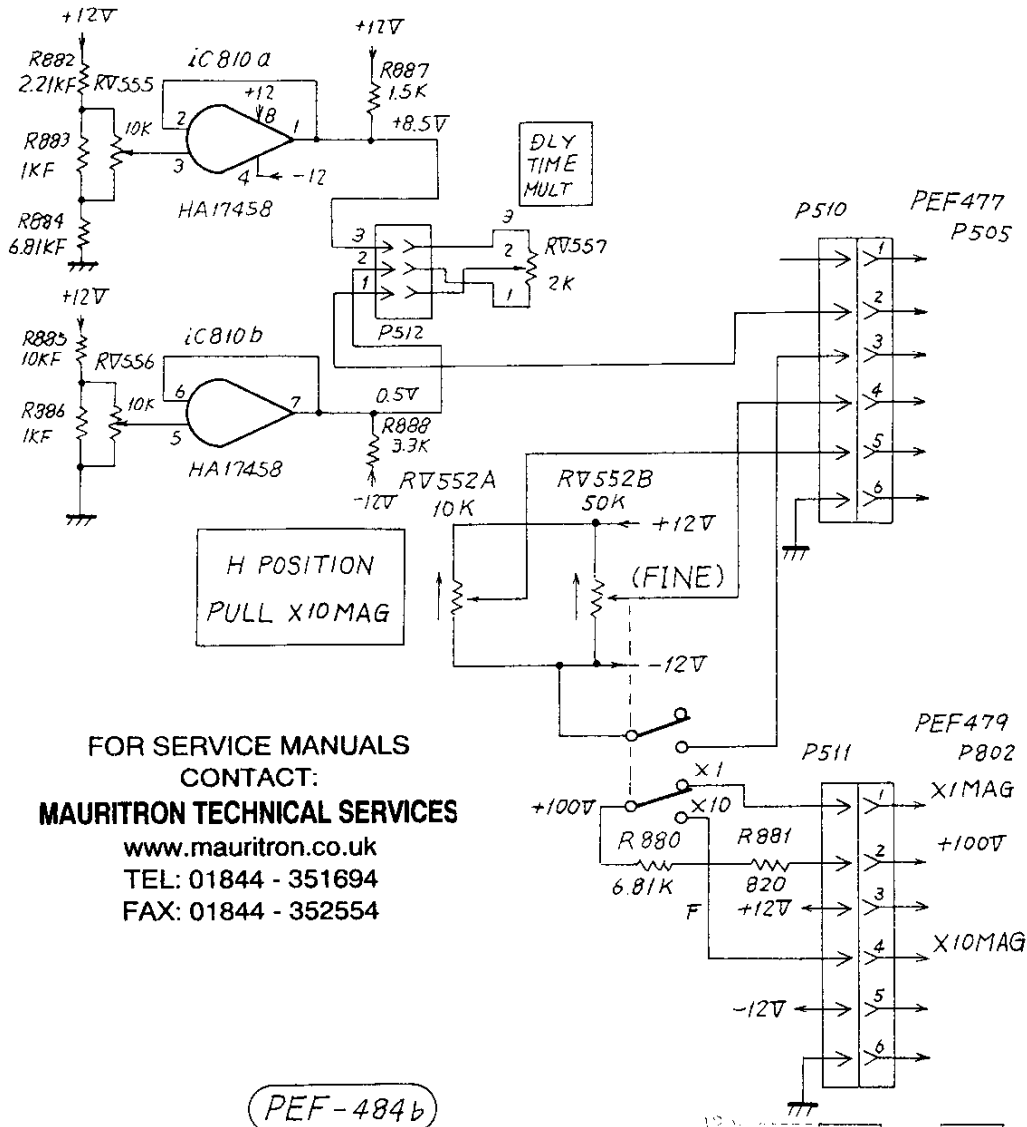
GEOM

G2 (+3KV)





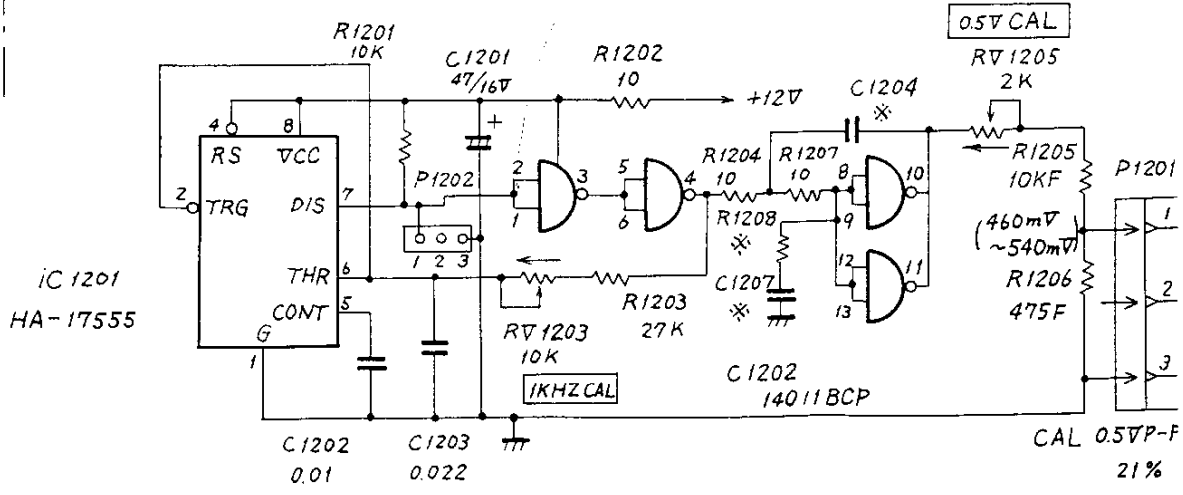
CRT
HIGH VOLTAGE CIRCUIT
Z AXIS AMPLIFIER
HORIZONTAL AMPLIFIER



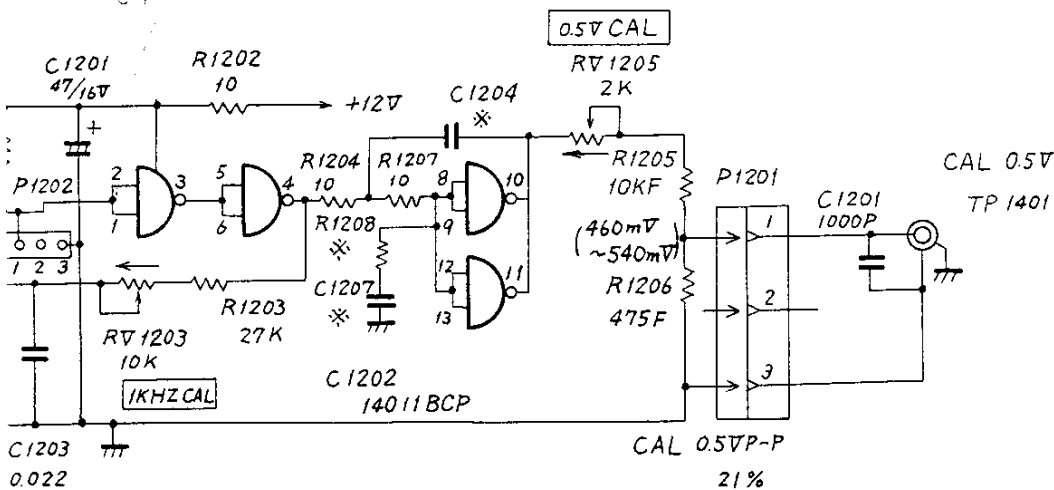
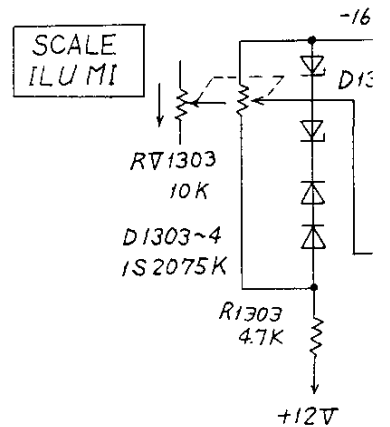
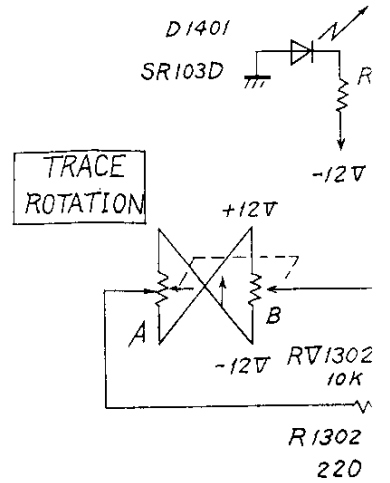
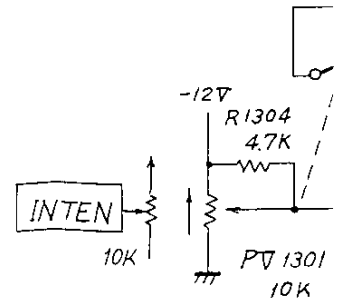
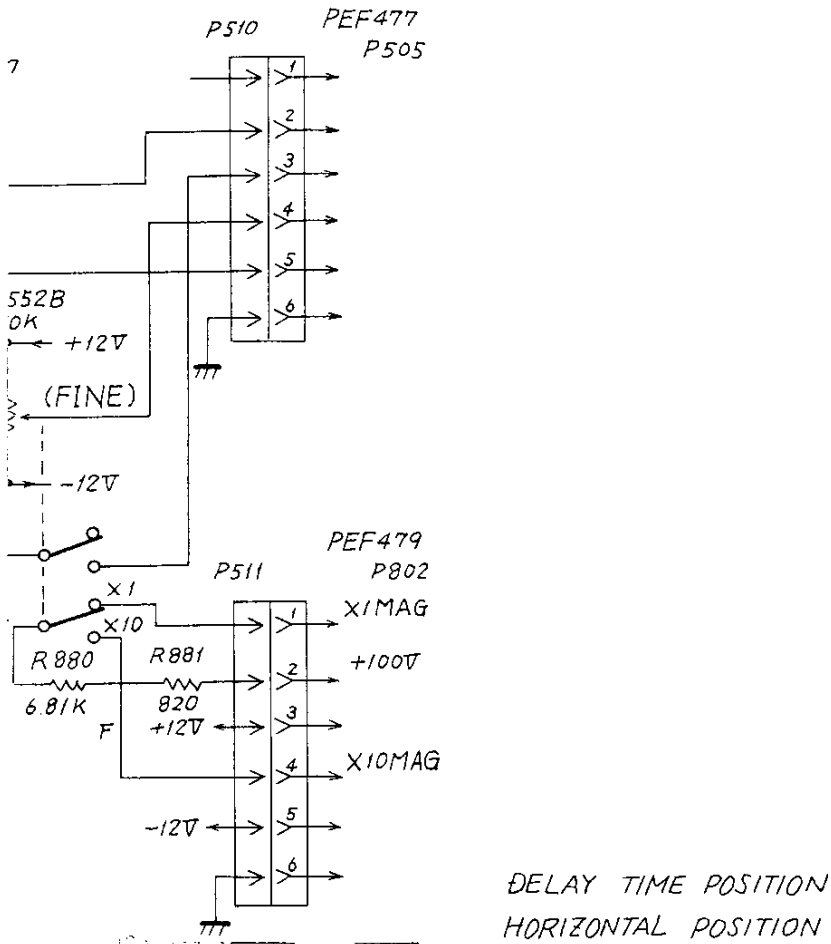
PEF-484b

DELAY TIME POSITI,
 HORIZONTAL POSITI

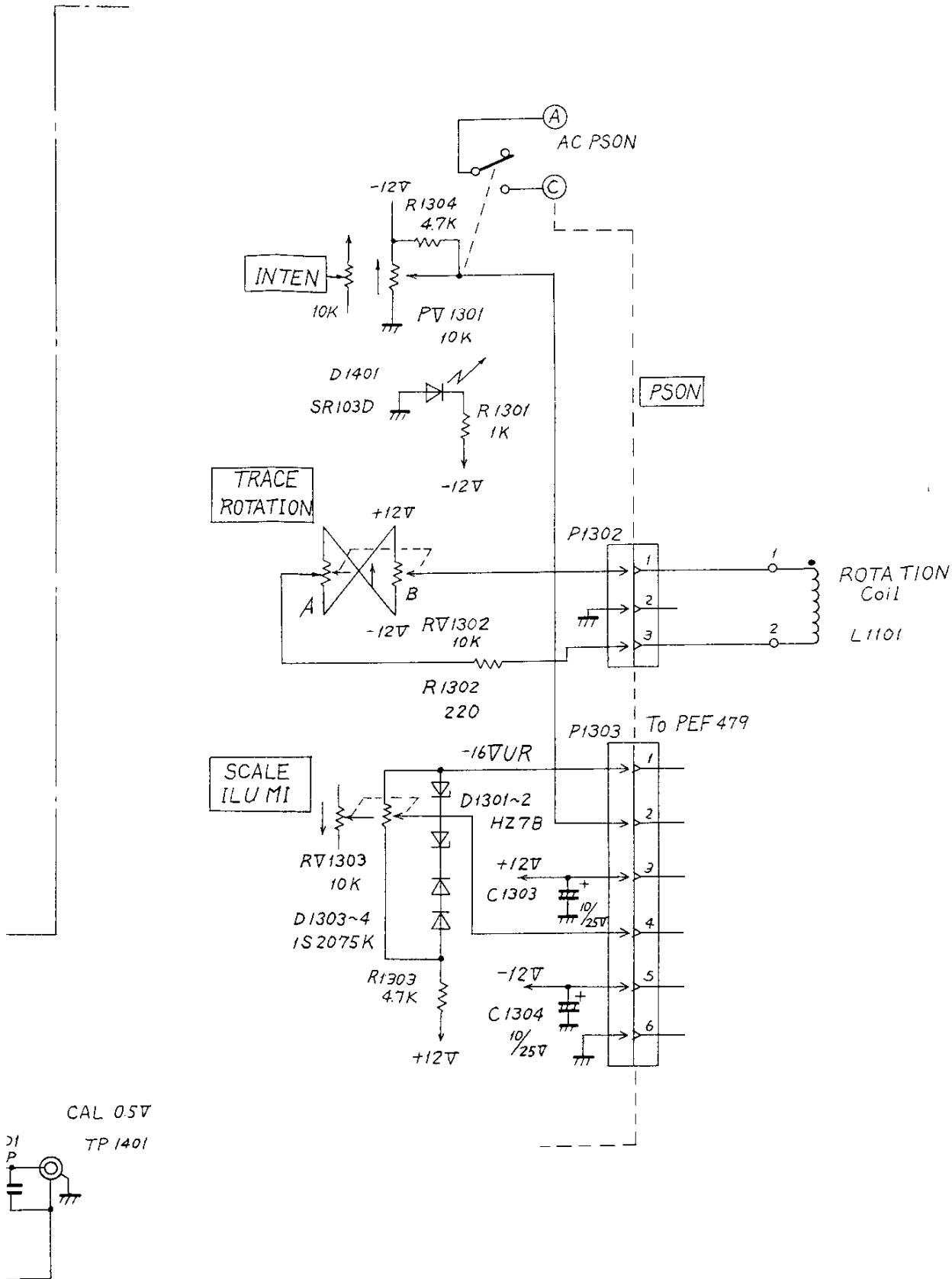
PEF-480



C

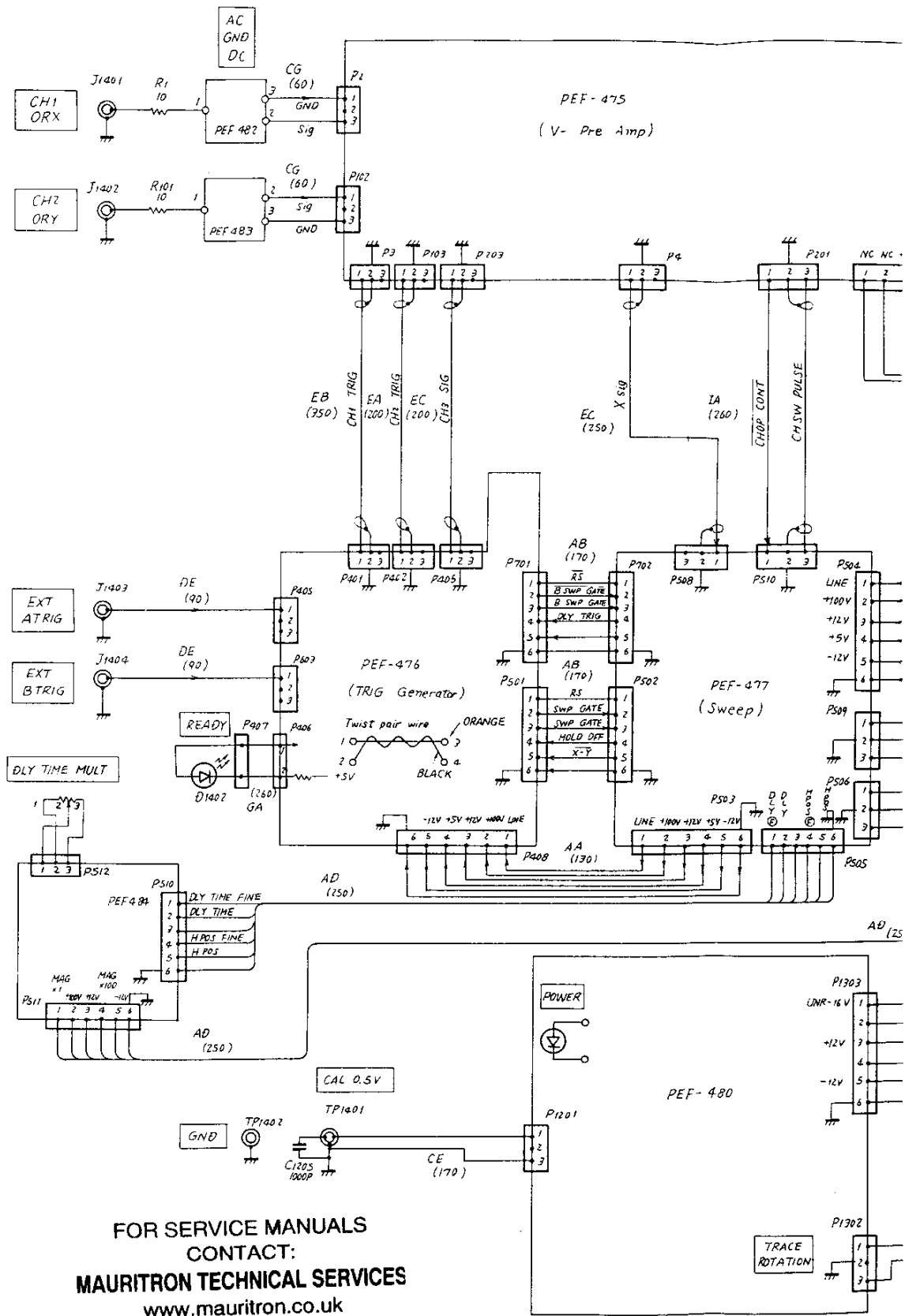


CALIBRATOR

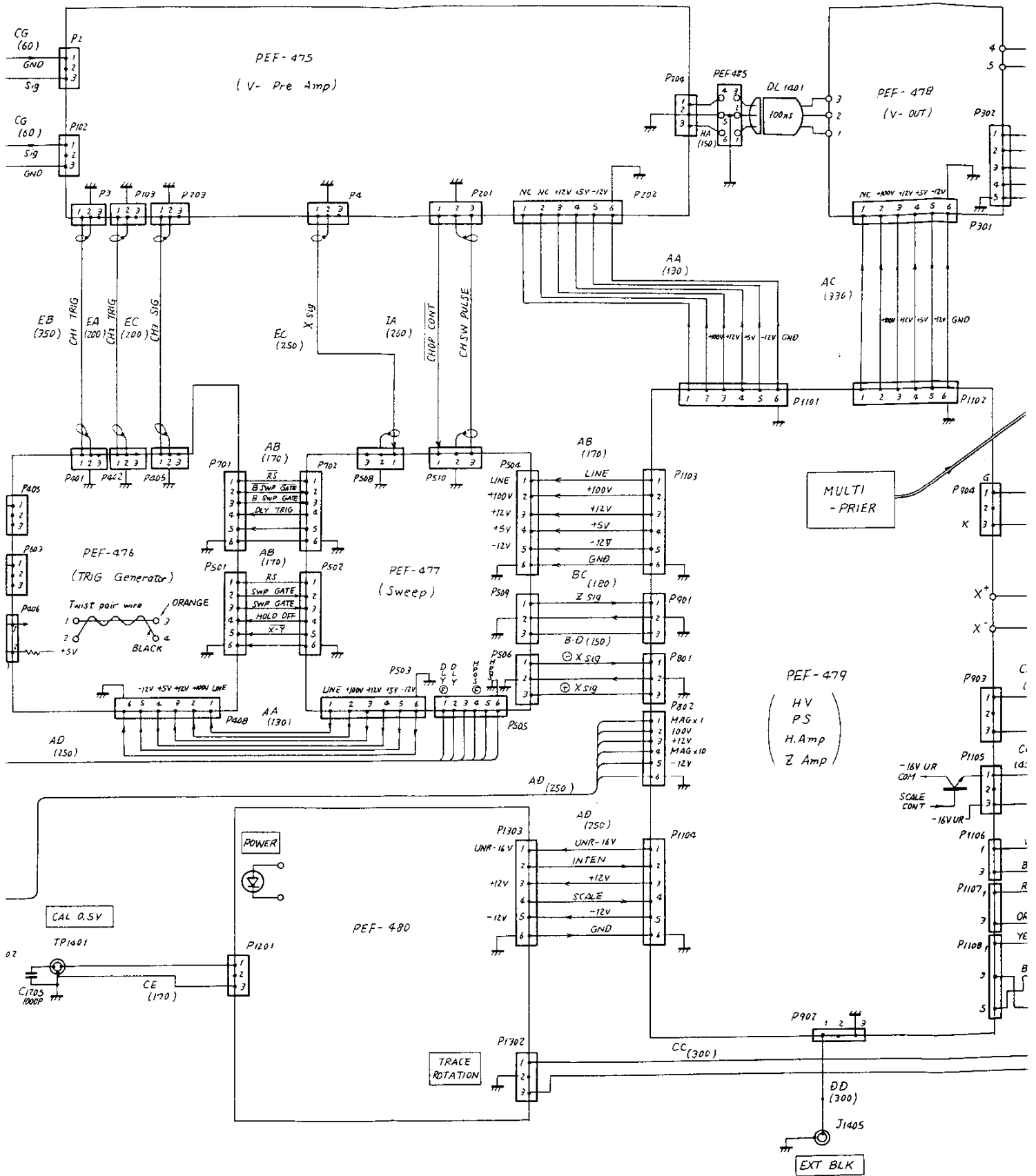


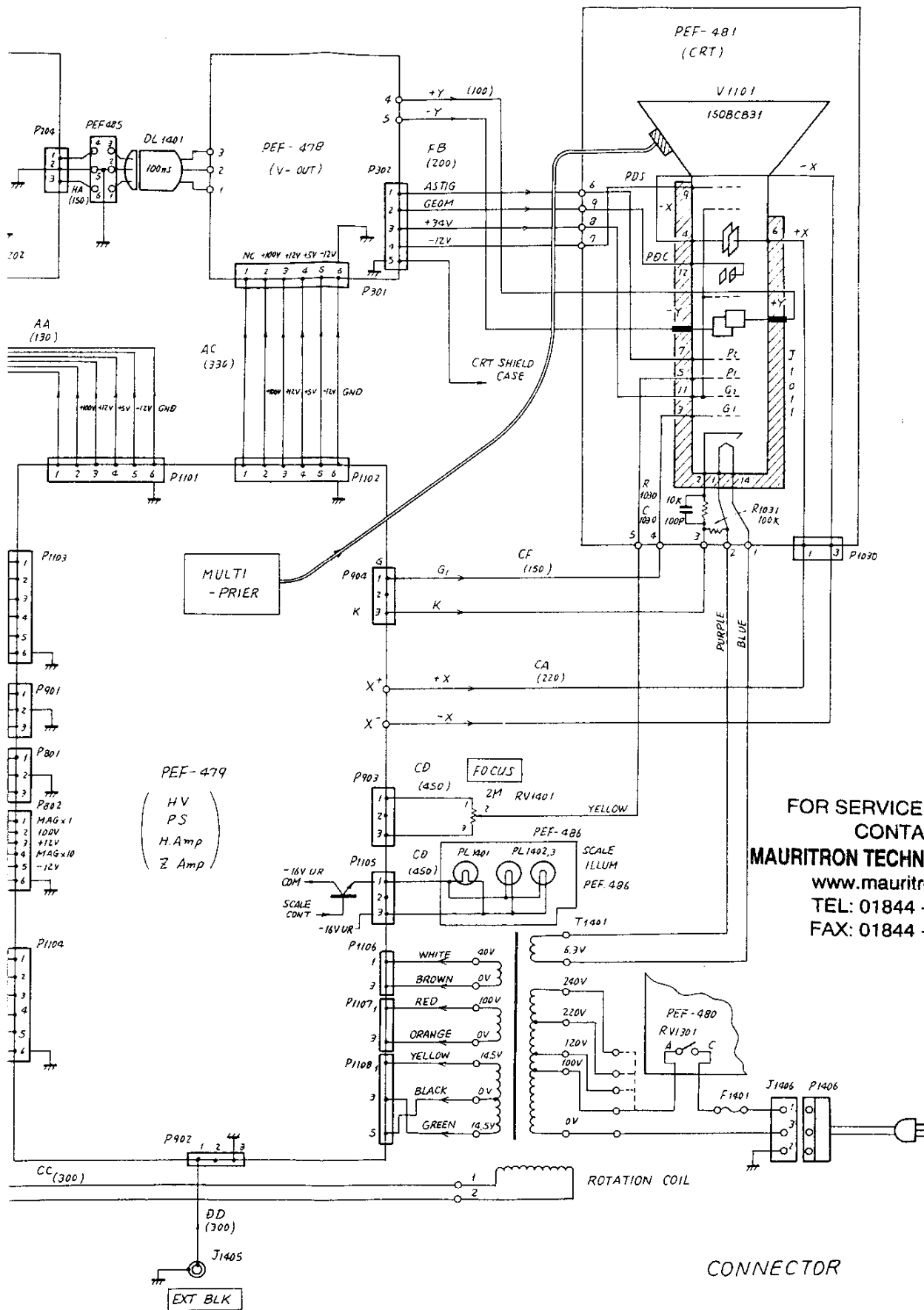
RATOR

INTENSITY
 TRACE ROTATION
 SCALE ILLUMINATION



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CONNECTOR

ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-475)

Symbol	Description	Code	Qty
C3	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C9	C,CERAMIC 50 V 68 PF+-5%	CCC1034	1
C11	C,CERAMIC 500 V 5 PF+-0.5PF	CCC0769	1
C12	C,CERAMIC 500 V 10 PF+-10%	CCC0772	1
C13	C,CERAMIC 50 V 5 PF+-0.25PF	CCC0999	1
C14	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C15	C,CERAMIC 50 V 100 PF+-10%	CCC1025	1
C18	C,CERAMIC 50 V 10000 PF+80%-20	CCC1030	1
C19	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C16	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C23	C,CERAMIC 500 V 1000 PF+-10%	CCD0217	1
C24	C,CERAMIC 50 V 100 PF+-10%	CCC1025	1
C27	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C29	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C31	C,AL ELYC 25 V 10 UF	CEC0175	1
C32	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C37	C,CERAMIC 50 V 1 PF+-0.25PF	CCC1133	1
C41	C,AL ELYC 25 V 10 UF	CEC0175	1
C43	C,AL ELYC 25 V 10 UF	CEC0175	1
C51	C,CERAMIC 50 V 10 PF+-0.5PF	CCC1002	1
C52	C,CERAMIC 50 V 10 PF+-0.5PF	CCC1002	1
C56	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C67	C,CERAMIC 50 V 15 PF+-5%	CCC1004	1
C68	C,CERAMIC 50 V 2 PF+-0.25PF	CCC0996	1
C70	C,AL ELYC 25 V 10 UF	CEC0175	1
C71	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C72	C,AL ELYC 25 V 10 UF	CEC0175	1
C77	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C82	C,CERAMIC 50 V 15 PF+-5%	CCC1004	1
C87	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1

Symbol	Description	Code	Qty
C89	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C92	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C93	C,CERAMIC 50 V 3 PF+-0.25PF	CCC0997	1
C96	C,PLASTIC 50 V 0.047 UF	CQA0101	1
C98	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
CV6	C,VALIABLE ECV-12W10 x40	CVE0024	1
CV7	C,VALIABLE ECV-12W10 x40	CVE0024	1
CV11	C,VALIABLE ECV-12W10 x40	CVE0024	1
CV12	C,VALIABLE ECV-12W10 x40	CVE0024	1
CV22	C,VALIABLE ECV-12W10 x40	CVE0024	1
D1	DIODE 1S2075K	HDS0108	1
D2	DIODE HZ7B	HDH0040	1
D3	DIODE HZ7B	HDH0040	1
D4	DIODE 1S2075K	HDS0108	1
IC1	IC,ANALOG TL071CP	ILT0041	1
TR1	TRANSISTOR 2SK106C	HTK0068	1
TR2	TRANSISTOR 2SC458C	HTC0148	1
TR3	TRANSISTOR 2SC1674K	HTC0557	1
TR4	TRANSISTOR 2SA781K	HTA0099	1
TR5	TRANSISTOR 2SC535B	HTC0167	1
TR6	TRANSISTOR 2SC535B	HTC0167	1
TR7	TRANSISTOR 2SA781K	HTA0099	1
TR8	TRANSISTOR 2SA781K	HTA0099	1
TR15	TRANSISTOR 2SA781K	HTA0099	1
TR16	TRANSISTOR 2SC535B	HTC0167	1
TR17	TRANSISTOR 2SA781K	HTA0099	1
R3	R,CARBON 1/4W 22 OHM +-5%	RCR3012	1
R4	R,CARBON 1/4W 15 OHM +-5%	RCR3008	1
R5	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1
R6	R,CARBON 1/4W 68 OHM +-5%	RCR3024	1

FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES
www.mauritron.co.uk
TEL: 01844 - 351694
FAX: 01844 - 352554

Symbol	Description				Code	Qty
R7	R,METAL	1/2W	900	KOHM +-0.5%	RMRO261	1
R8	R,METAL	1/4W	111	KOHM +-0.5%	RME0694	1
R9	R,CARBON	1/4W	39	OHM +-5%	RCR3018	1
R10	R,CARBON	1/4W	82	OHM +-5%	RCR3026	1
R11	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R12	R,METAL	1/2W	990	KOHM +-0.5%	RMRO264	1
R13	R,METAL	1/4W	10.1	KOHM +-0.5%	RME0695	1
R14	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R15	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R16	R,CARBON	1/4W	47	OHM + 5%	RCR3020	1
R17	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R18	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R19	R,METAL	1/4W	4.75	KOHM +-1%	RME0672	1
R20	R,METAL	1/2W	800	KOHM +-0.5%	RMRO259	1
R21	R,METAL	1/4W	200	KOHM +-0.5%	RME0702	1
R22	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R23	R,SOLID	1/2W	10	MOHM +-5%	RSE0311	1
R24	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R25	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R26	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R27	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R28	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R29	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R30	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R31	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R32	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R33	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R34	R,METAL	1/4W	45.3	OHM +-0.5%	RME0766	1
R35	R,METAL	1/4W	365	OHM +-1%	RME0705	1
R36	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1

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Symbol	Description			Code	Qty	
R37	R,METAL	1/4W	475	OHM +-0.5%	RME0703	1
R38	R,METAL	1/4W	46.0	KOHM +-0.5%	RME0706	1
R39	R,METAL	1/4W	200	KOHM +-0.5%	RME0702	1
R40	R,METAL	1/4W	4.00	KOHM +-0.5%	RME0707	1
R41	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R42	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R43	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R44	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R47	R,CARBON	1/4W	100	KOHM +-5%	RCR3100	1
R49	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R50	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R51	R,CARBON	1/4W	270	OHM +-5%	RCR3038	1
R52	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R53	R,METAL	1/4W	300	OHM +-0.5%	RME0708	1
R54	R,METAL	1/4W	150	OHM +-0.5%	RME0709	1
R55	R,METAL	1/4W	90.0	OHM +-0.5%	RME0710	1
R56	R,METAL	1/4W	60.0	OHM +-0.5%	RME0711	1
R57	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R58	R,CARBON	1/4W	39	OHM +-5%	RCR3018	1
R59	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R61	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R62	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R63	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R64	R,CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R65	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R66	R,METAL	1/4W	100	OHM +-1%	RME0652	1
R67	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R68	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R69	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R70	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1

Symbol	Description				Code	Qty
R71	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R72	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R73	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R74	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R75	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R76	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R77	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R80	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R81	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R82	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R83	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R84	R,CARBON	1/4W	68	OHM +-5%	RCR3024	1
R85	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R86	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R87	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R88	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R89	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R90	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R91	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R92	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R96	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R97	R,CARBON	1/4W	15	KOHM +-5%	RCR3080	1
R98	R,CARBON	1/4W	5.6	KOHM +-5%	RCR3070	1
RV27	VR,METAL	TM8KH1-7E1		10K OHM	RNT0181	1
RV33	VR,METAL	TM8KH1-7E1		2K OHM	RNT0182	1
RV51	SW,ROTARY	S21P	3310	(WITH VR)	HX3142079	R
RV64	VR,METAL	TM8KH1-7E1		2K OHM	RNT0182	1
RV84	VR,METAL	TM8KH1-7E1		200 OHM	RNT0183	1
RV97	VR,METAL	TM8KH1-7E1		50K OHM	RNT0184	1
RV98	VR,CARBON	EVH-YK3325B14			RDE0003	1

Symbol	Description					Code	Qty
L34	COIL	FL-3H	R47M			TLF0052	1
L74	COIL	FL-3H	100K			TLF0028	1
P2	CONNECTOR	171825-3				JBX0468	1
P3	CONNECTOR	171825-3				JBX0468	1
P4	CONNECTOR	171825-3				JBX0468	1
S2	SW, ROTARY	S21P	3310	(WITH VR)		HX3142079	1
C103	C, CERAMIC	50	V	47	PF+-5%	CCC1014	1
C109	C, CERAMIC	50	V	68	PF+-5%	CCC1034	1
C111	C, CERAMIC	500	V	5	PF+-0.5PF	CCC0769	1
C112	C, CERAMIC	500	V	10	PF+-10%	CCC0772	1
C113	C, CERAMIC	50	V	5	PF+-0.25PF	CCC0999	1
C114	C, CERAMIC	50	V	220	PF+-10%	CCC1027	1
C115	C, CERAMIC	50	V	100	PF+-10%	CCC1025	1
C118	C, CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C119	C, CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C116	C, CERAMIC	50	V	22	PF+-5%	CCC1007	1
C123	C, CERAMIC	500	V	1000	PF+-10%	CCD0217	1
C124	C, CERAMIC	50	V	100	PF+-10%	CCC1025	1
C127	C, PLASTIC	50	V	1000	PF+-10%	CQA0091	1
C129	C, CERAMIC	50	V	1000	PF+80%-20%	CCC1029	1
C131	C, AL ELYC	25	V	10	UF	CEC0175	1
C132	C, CERAMIC	50	V	1000	PF+80%-20%	CCC1029	1
C137	C, CERAMIC	50	V	1	PF+-0.25PF	CCC1133	1
C141	C, AL ELYC	25	V	10	UF	CEC0175	1
C142	C, AL ELYC	25	V	10	UF	CEC0175	1
C143	C, AL ELYC	25	V	10	UF	CEC0175	1
C151	C, CERAMIC	50	V	10	PF+-0.5PF	CCC1002	1
C152	C, CERAMIC	50	V	10	PF+-0.5PF	CCC1002	1
C156	C, CERAMIC	50	V	22	PF+-5%	CCC1007	1
C167	C, CERAMIC	50	V	22	PF+-5%	CCC1007	1

Symbol	Description	Code	Qty
C168	C,CERAMIC 50 V 2 PF+-0.25PF	CCC0996	1
C170	C,AL ELYC 25 V 10 UF	CEC0175	1
C171	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C172	C,AL ELYC 25 V 10 UF	CEC0175	1
C173	C,AL ELYC 25 V 10 UF	CEC0175	1
C187	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C189	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C192	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C193	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C196	C,PLASTIC 50 V 47000 PF+-10%	CQA0101	1
C198	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
CV106	C,VALIABLE ECV-1ZW10 x 40	CVE0024	1
CV107	C,VALIABLE ECV-1ZW10 x 40	CVE0024	1
CV111	C,VALIABLE ECV-1ZW10 x 40	CVE0024	1
CV112	C,VALIABLE ECV-1ZW10 x 40	CVE0024	1
CV122	C,VALIABLE ECV-1ZW10 x 40	CVE0024	1
CV182	C,VARIABLE ECV-1ZW20 x 40	CVE0019	1
D101	DIODE 1S2075K	HDS0108	1
D102	DIODE HZ7B	HDH0040	1
D103	DIODE HZ7B	HDH0040	1
D104	DIODE 1S2075K	HDS0108	1
IC101	IC,ANALOG TL071CP	ILT0041	1
TR101	TRANSISTOR 2SK106C	HTK0068	1
TR102	TRANSISTOR 2SC458C	HTC0148	1
TR103	TRANSISTOR 2SC1674K	HTC0557	1
TR104	TRANSISTOR 2SA781K	HTA0099	1
TR105	TRANSISTOR 2SC535B	HTC0167	1
TR106	TRANSISTOR 2SC535B	HTC0167	1
TR107	TRANSISTOR 2SA781K	HTA0099	1
TR108	TRANSISTOR 2SA781K	HTA0099	1

Symbol	Description				Code	Qty
TR109	TRANSISTOR	2SA781K			HTA0099	1
TR110	TRANSISTOR	2SA781K			HTA0099	1
TR115	TRANSISTOR	2SA781K			HTA0099	1
TR116	TRANSISTOR	2SC535B			HTC0167	1
TR117	TRANSISTOR	2SA781K			HTA0099	1
R103	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R104	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R105	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R106	R,CARBON	1/4W	68	OHM +-5%	RCR3024	1
R107	R,METAL	1/2W	900	KOHM +-0.5%	RMRO261	1
R108	R,METAL	1/4W	111	KOHM +-0.5%	RME0694	1
R109	R,CARBON	1/4W	39	OHM +-5%	RCR3018	1
R110	R,CARBON	1/4W	82	OHM +-5%	RCR3026	1
R111	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R112	R,METAL	1/2W	990	KOHM +-0.5%	RMRO264	1
R113	R,METAL	1/4W	10.1	KOHM +-0.5%	RME0695	1
R114	R,CARBON	1/4W	15	OHM +-5%	RCR3008	1
R115	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R116	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R117	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R118	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R119	R,METAL	1/4W	4.75	KOHM +-1%	RME0672	1
R120	R,METAL	1/2W	800	KOHM +-0.5%	RMRO259	1
R121	R,METAL	1/4W	200	KOHM +-0.5%	RME0702	1
R122	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R123	R,SOLID	1/2W	10	MOHM +-5%	RSE0311	1
R124	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R125	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R126	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R127	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1

Symbol	Description				Code	Qty
R128	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R129	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R130	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R131	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R132	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R133	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R134	R,METAL	1/4W	45.3	OHM +-0.5%	RME0766	1
R135	R,METAL	1/4W	365	OHM +-1%	RME0705	1
R136	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R137	R,METAL	1/4W	475	OHM +-0.5%	RME0703	1
R138	R,METAL	1/4W	46.0	KOHM +-0.5%	RME0706	1
R139	R,METAL	1/4W	200	KOHM +-0.5%	RME0702	1
R140	R,METAL	1/4W	4.00	KOHM +-0.5%	RME0707	1
R141	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R142	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R143	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R144	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R147	R,CARBON	1/4W	100	KOHM +-5%	RCR3100	1
R149	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R150	R,CARBON	1/4W	220	OHM +-5%	RCR3036	1
R151	R,CARBON	1/4W	270	OHM +-5%	RCR3038	1
R152	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R153	R,METAL	1/4W	300	OHM +-0.5%	RME0708	1
R154	R,METAL	1/4W	150	OHM +-0.5%	RME0709	1
R155	R,METAL	1/4W	90.0	OHM +-0.5%	RME0710	1
R156	R,METAL	1/4W	60.0	OHM +-0.5%	RME0711	1
R157	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R158	R,CARBON	1/4W	39	OHM +-5%	RCR3018	1
R159	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R161	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1

Symbol	Description				Code	Qty
R162	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R163	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R164	R,CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R165	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R166	R,METAL	1/4W	100	OHM +-1%	RME0652	1
R167	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R168	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R169	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R170	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R171	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R172	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R173	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R175	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R176	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R180	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R181	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R182	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R183	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R184	R,CARBON	1/4W	68	OHM +-5%	RCR3024	1
R185	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R186	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R187	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R188	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R189	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R190	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R191	R,METAL	1/4W	825	OHM +-1%	RME0663	1
R192	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R193	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R194	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R195	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1

Symbol	Description				Code	Qty
R196	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R197	R,CARBON	1/4W	15	KOHM +-5%	RCR3080	1
R198	R,CARBON	1/4W	5.6	KOHM +-5%	RCR3070	1
RV127	VR,METAL	TM8KH1-7E1		10K OHM	RNT0181	1
RV133	VR,METAL	TM10K(PV)1SB		2K OHM	RNT0033	1
RV151	SW,ROTARY	S21P	3310	(WITH VR)	HX3142079	R
RV164	VR,METAL	TM8KH1-7E1		2K OHM	RNT0182	1
RV184	VR,METAL	TM8KH1-7E1		200 OHM	RNT0183	1
RV197	VR,METAL	TM8KH1-7E1		50K OHM	TNT0184	1
RV198	VR,CARBON	EVH-YK3325B14			RDE0003	1
L134	COIL	FL-3H	R47M		TLF0052	1
P102	CONNECTOR	171825-3			JBX0468	1
P103	CONNECTOR	171825-3			JBX0468	1
S102	SW,ROTARY	S21P	3310	(WITH VR)	HX3142079	1
S103	SW,PB	UEG22-2		(LOCK)	HX8311793-C	1
	CONNECTOR	163740-1			JBX0557	1
C204	C,AL ELYC	25	V	10 UF	CEC0175	1
C206	C,CERAMIC	50	V	2 PF+-0.25PF	CCC0996	1
C211	C,CERAMIC	50	V	1000 PF+80%-20%	CCC1029	1
C216	C,AL ELYC	25	V	10 UF	CEC0175	1
C221	C,CERAMIC	50	V	10000 PF+80%-20%	CCC1030	1
C223	C,AL ELYC	25	V	10 UF	CEC0175	1
C224	C,AL ELYC	25	V	10 UF	CEC0175	1
C225	C,AL ELYC	25	V	10 UF	CEC0175	1
C233	C,AL ELYC	50	V	1 UF	CET0031	1
C234	C,CERAMIC	50	V	15 PF+-5	CCC1004	1
C237	C,AL ELYC	25	V	10 UF	CEC0175	1
C235	C,CERAMIC	50	V	22 PF+-5	CCC1007	1
C241	C,CERAMIC	50	V	10 PF+-0.5PF	CCC1002	1
C244	C,AL ELYC	25	V	10 UF	CEC0175	1

Symbol	Description					Code	Qty
D201	DIODE	1S2075 K				HDS0108	1
D202	DIODE	1S2075 K				HDS0108	1
D203	DIODE	1S2075 K				HDS0108	1
D204	DIODE	1S2075 K				HDS0108	1
D205	DIODE	1S2075 K				HDS0108	1
D206	DIODE	1S2075 K				HDS0108	1
D207	DIODE	1S2075 K				HDS0108	1
D208	DIODE	1S2075 K				HDS0108	1
D209	DIODE	1S2075 K				HDS0108	1
D210	DIODE	1S2075 K				HDS0108	1
D211	DIODE	1S2075 K				HDS0108	1
D212	DIODE	1S2075 K				HDS0108	1
D213	DIODE	1S2075 K				HDS0108	1
D214	DIODE	1S2075 K				HDS0108	1
D215	DIODE	1S2075 K				HDS0108	1
D216	DIODE	1S2075 K				HDS0108	1
D217	DIODE	1S2075 K				HDS0108	1
IC201	IC,DIGITAL	HD74LS109AP				IDH0713	1
IC202	IC,DIGITAL	HD74LS09P				IDH0680	1
R201	R,CARBON	1/4W	3.3	KOHM	+5%	RCR3064	1
R202	R,CARBON	1/4W	100	OHM	+5%	RCR3028	1
R203	R,CARBON	1/4W	10	OHM	+5%	RCR3004	1
R204	R,CARBON	1/4W	8.2	KOHM	+5%	RCR3074	1
R205	R,CARBON	1/4W	100	OHM	+5%	RCR3028	1
R206	R,CARBON	1/4W	1.0	KOHM	+5%	RCR3052	1
R207	R,METAL	1/4W	619	OHM	+1%	RME0693	1
R209	R,METAL	1/4W	3.32	KOHM	+1%	RME0670	1
R210	R,METAL	1/4W	3.32	KOHM	+1%	RME0670	1
R211	R,CARBON	1/4W	680	OHM	+5%	RCR3048	1
R212	R,CARBON	1/4W	10	OHM	+5%	RCR3004	1

Symbol	Description					Code	Qty
R213	R,METAL	1/4W	825	OHM	+ -1%	RME0663	1
R214	R,METAL	1/4W	825	OHM	+ -1%	RME0663	1
R215	R,CARBON	1/4W	470	OHM	+ -5%	RCR3044	1
R221	R,METAL	1/4W	3.32	KOHM	+ -1%	RME0670	1
R222	R,METAL	1/4W	3.32	KOHM	+ -1%	RME0670	1
R223	R,METAL	1/4W	1.82	KOHM	+ -1%	RME0667	1
R224	R,METAL	1/4W	1.82	KOHM	+ -1%	RME0667	1
R225	R,METAL	1/4W	1.21	KOHM	+ -1%	RME0665	1
R226	R,METAL	1/4W	1.21	KOHM	+ -1%	RME0665	1
R227	R,METAL	1/4W	1.21	KOHM	+ -1%	RME0665	1
R229	R,METAL	1/4W	182	OHM	+ -1%	RME0655	1
R230	R,METAL	1/4W	182	OHM	+ -1%	RME0655	1
R231	R,METAL	1/4W	221	OHM	+ -1%	RME0656	1
R232	R,METAL	1/4W	221	OHM	+ -1%	RME0656	1
R233	R,CARBON	1/4W	39	KOHM	+ -5%	RCR3090	1
R234	R,CARBON	1/4W	3.9	KOHM	+ -5%	RCR3066	1
R235	R,CARBON	1/4W	10	KOHM	+ -5%	RCR3076	1
R237	R,METAL	1/4W	909	OHM	+ -1%	RME0714	1
R238	R,METAL	1/4W	909	OHM	+ -1%	RME0714	1
R239	R,METAL	1/4W	86.6	OHM	+ -0.5%	RME0713	1
R240	R,METAL	1/4W	86.6	OHM	+ -0.5%	RME0713	1
R241	R,CARBON	1/4W	220	OHM	+ -5%	RCR3036	1
R243	R,CARBON	1/4W	100	OHM	+ -5%	RCR3028	1
R244	R,CARBON	1/4W	100	OHM	+ -5%	RCR3028	1
R251	R,CARBON	1/4W	10	OHM	+ -5%	RCR3004	1
R252	R,CARBON	1/4W	10	OHM	+ -5%	RCR3004	1
R253	R,CARBON	1/4W	10	OHM	+ -5%	RCR3004	1
TR201	TRANSISTOR	2SC535B				HTC0167	1
TR202	TRANSISTOR	2SC535B				HTC0167	1
TR203	TRANSISTOR	2SA781K				HTA0099	1

Symbol	Description	Code	Qty
TR204	TRANSISTOR 2SA781K	HTA0099	1
TR205	TRANSISTOR 2SC1906	HTC0338	1
TR206	TRANSISTOR 2SC1906	HTC0338	1
RV204	VR,METAL TM10K(PV)1SB 10K OHM	RNT0031	1
P201	CONNECTOR 171825-3	JBX0468	1
P202	CONNECTOR 171825-6	JBX0470	1
P203	CONNECTOR 171825-3	JBX0468	1
P204	CONNECTOR 171825-3	JBX0468	1
S201	SW,LEVER SLA225	SSL0056	1
S202	SW,PB UEG22-2 (LOCK)	HX8311793-C	1
PEF-475	PCB PB-2(PEF-475)	HX116441	1
		HX3142112	R
PEF-487	PCB PB-3(PEF-476,477,487)	HX116442	R
<p>FOR SERVICE MANUALS CONTACT: MAURITRON TECHNICAL SERVICES www.mauritron.co.uk TEL: 01844 - 351694 FAX: 01844 - 352554</p>			

**ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-476)**

Symbol	Description	Code	Qty
C401	C,CERAMIC 500 V 22 PF+-10%	CCC0776	1
C402	C,CERAMIC 500 V 47 PF+-5%	CCC0868	1
C403	C,CERAMIC 500 V 1000 PF+-10%	CCD0217	1
C404	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C405	C,AL ELYC 25 V 10 UF	CEC0175	1
C406	C,AL ELYC 25 V 10 UF	CEC0175	1
C408	C,PLASTIC 50 V 47000 PF+-10%	CQA0101	1
C412	C,PLASTIC 600 V 22000 PF+-10%	CQX0071	1
C414	C,CERAMIC 50 V 1 PF+-0.25PF	CCC1133	1
C417	C,PLASTIC 50 V 47000 PF+-10%	CQA0101	1
C425	C,AL ELYC 25 V 10 UF	CEC0175	1
C428	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C441	C,CERAMIC 50 V 100 PF+-10%	CCC1025	1
C442	C,AL ELYC 50 V 1 UF	CET0031	1
C444	C,AL ELYC 16 V 47 UF	CEC0170	1
C446	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C447	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C448	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C449	C,AL ELYC 25 V 10 UF	CEC0175	1
C450	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C451	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
C461	C,AL ELYC 25 V 10 UF	CEC0175	1
C462	C,AL ELYC 16 V 47 UF	CEC0170	1
C463	C,AL ELYC 25 V 10 UF	CEC0175	1
C507	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C501	C,AL ELYC 25 V 10 UF	CEC0175	1
C506	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C511	C,PLASTIC 50 V 0.1 UF+-10%	CQA0103	1
CV402	C,VARIABLE ECV-1ZW20 x40	CVE0019	1
C590	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1

Symbol	Description				Code	Qty
C589	C,CERAMIC	50 V	10000	PF+80%-20%	CCC1030	1
D401	DIODE	MA161			HDM0051	1
D402	DIODE	1S2075K			HDS0108	1
D403	DIODE	1S2075K			HDS0108	1
D405	DIODE	1S2075K			HDS0108	1
D406	DIODE	1S2075K			HDS0108	1
D407	DIODE	1S2075K			HDS0108	1
D408	DIODE	1S2075K			HDS0108	1
D409	DIODE	1S2075K			HDS0108	1
D410	DIODE	1S2075K			HDS0108	1
D411	DIODE	1S2075K			HDS0108	1
D412	DIODE	1S2075K			HDS0108	1
D413	DIODE	1S2075K			HDS0108	1
D414	DIODE	1S2075K			HDS0108	1
D712	DIODE	1S2075K			HDS0108	1
IC401	IC,ANALOG	TL081CP			ILT0037	1
IG402	IC,DIGITAL	HD74S00			IDH0402	1
IC403	IC,DIGITAL	HD74LS00P			IDH0467	1
IC501	IC,DIGITAL	HD74S74			IDH0428	1
IC503	IC,DIGITAL	HD74LS00P			IDH0467	1
DI402	DIODE	SR103D			HDS0234	1
R401	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R402	R,CARBON	1/4W	470	KOHM +-5%	RCR3104	1
R403	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R404	R,SOLID	1/2W	10	MOHM +-5%	RSE0311	1
R405	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R406	R,CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R407	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R408	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R409	R,CARBON	1/4W	820	OHM +-5%	RCR3050	1
R410	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1

FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES
www.mauritron.co.uk
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Symbol	Description				Code	Qty
R411	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R412	R, METAL	1/4W	392	KOHM +-1%	RME0722	1
R413	R, METAL	1/4W	100	KOHM +-1%	RME0688	1
R414	R, METAL	1/4W	365	KOHM +-1%	RME0697	1
R415	R, METAL	1/4W	100	KOHM +-1%	RME0688	1
R416	R, METAL	1/4W	5.36	KOHM +-1%	RME0698	1
R417	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R418	R, CARBON	1/4W	3.9	KOHM +-5%	RCR3066	1
R419	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R420	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R421	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R422	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R423	R, CARBON	1/4W	68	OHM +-5%	RCR3024	1
R424	R, CARBON	1/4W	390	OHM +-5%	RCR3042	1
R425	R, CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R426	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R427	R, CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R428	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R429	R, CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R430	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R432	R, CARBON	1/4W	390	OHM +-5%	RCR3042	1
R433	R, CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R434	R, CARBON	1/4W	33	OHM +-5%	RCR3016	1
R435	R, CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R436	R, CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R437	R, CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R440	R, CARBON	1/4W	22	OHM +-5%	RCR3012	1
R441	R, CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R442	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R443	R, CARBON	1/4W	47	KOHM +-5%	RCR3092	1

Symbol	Description				Code	Qty
R444	R, CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R445	R, CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R446	R, CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R447	R, CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R448	R, CARBON	1/4W	10	OHM +-5%	RCR3004	1
R449	R, CARBON	1/4W	10	OHM +-5%	RCR3004	1
R451	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R452	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R461	R, CARBON	1/4W	330	OHM +-5%	RCR3040	1
R462	R, SOLID	1/2W	10	MOHM +-5%	RSE0311	1
R463	R, CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R501	R, CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R502	R, CARBON	1/4W	220	OHM +-5%	RCR3036	1
R503	R, CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R504	R, CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R505	R, CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R506	R, CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R507	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R508	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R509	R, CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R511	R, CARBON	1/4W	470	OHM +-5%	RCR3044	1
R512	R, CARBON	1/4W	12	KOHM +-5%	RCR3078	1
R510	R, CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R538	R, CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R539	R, CARBON	1/4W	220	OHM +-5%	RCR3036	1
RV418	VR, CARBON	EVH-YK3325B14			RDE0003	1
L462	COIL	FL-5H	101K		TLF0067	1
L432	COIL	FL-3H	IROM		TLF0054	1
R464	R, CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
TR401	TRANSISTOR	2SK106C			IITK0068	1

Symbol	Description	Code	Qty
TR402	TRANSISTOR 2SC1906	HTC0338	1
TR403	TRANSISTOR 2SC1906	HTC0338	1
TR404	TRANSISTOR 2SC1906	HTC0338	1
TR405	TRANSISTOR 2SC1906	HTC0338	1
TR406	TRANSISTOR 2SC1906	HTC0338	1
TR407	TRANSISTOR 2SA836D	HTA0105	1
TR501	TRANSISTOR 2SC458C	HTC0148	1
TR502	TRANSISTOR 2SC458C	HTC0148	1
TR507	TRANSISTOR 2SC458C	HTC0148	1
P401	CONNECTOR 171825-3	JBX0468	1
P402	CONNECTOR 171825-3	JBX0468	1
P403	CONNECTOR 171825-3	JBX0468	1
P405	CONNECTOR 171825-3	JBX0468	1
P406	CONNECTOR 171825-3	JBX0468	1
P408	CONNECTOR 171825-6	JBX0470	1
S401	SW, LEVER SLA225	SSL0056	1
S402	SW, LEVER SLA225	SSL0056	1
S403	SW, LEVER SLA225	SSL0056	1
S404	SW, PB UEG22-2 (NON-LOCK)	HX8311793-D	1
C601	C, CERAMIC 500 V 47 PF+-5%	CCC0868	1
C602	C, CERAMIC 500 V 27 PF+-10%	CCC0777	1
C604	C, PLASTIC 600 V 22000 PF+-10%	CQX0071	1
C605	C, CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C607	C, AL ELYC 25 V 10 UF	CEC0175	1
C608	C, AL ELYC 25 V 10 UF	CEC0175	1
C625	C, CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C627	C, AL ELYC 25 V 10 UF	CEC0175	1
C628	C, CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C631	C, CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C713	C, CERAMIC 50 V 47 PF+-5%	CCC1014	1

Symbol	Description	Code	Qty
C791	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C792	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
D601	DIODE 1S2075K	HDS0108	1
D602	DIODE 1S2075K	HDS0108	1
D603	DIODE 1S2075K	HDS0108	1
D605	DIODE 1S2075K	HDS0108	1
D606	DIODE 1S2075K	HDS0108	1
D607	DIODE 1S2075K	HDS0108	1
D608	DIODE 1S2075K	HDS0108	1
D609	DIODE 1S2075K	HDS0108	1
D610	DIODE 1S2075K	HDS0108	1
D501	DIODE 1S2075K	HDS0108	1
D502	DIODE 1S2075K	HDS0108	1
D503	DIODE 1S2075K	HDS0108	1
D507	DIODE 1S2075K	HDS0108	1
D508	DIODE 1S2075K	HDS0108	1
D509	DIODE 1S2075K	HDS0108	1
D510	DIODE 1S2075K	HDS0108	1
D511	DIODE 1S2075K	HDS0108	1
D519	DIODE 1S2075K	HDS0108	1
TR601	TRANSISTOR 2SK106C	HTK0068	1
TR602	TRANSISTOR 2SC1906	HTC0338	1
TR603	TRANSISTOR 2SC1906	HTC0338	1
TR604	TRANSISTOR 2SC1906	HTC0338	1
TR605	TRANSISTOR 2SC1906	HTC0338	1
IC601	IC,DIGITAL HD74S00	IDH0402	1
IC602	IC,DIGITAL HD74LS00P	IDH0467	1
IC701	IC,DIGITAL HD74S74	IDH0428	1
R601	R,CARBON 1/4W 470 KOHM +-5%	RCR3104	1
R602	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1

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Symbol	Description				Code	Qty
R603	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R606	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R607	R, CARBON	1/4W	10	OHM +-5%	RCR3004	1
R608	R, CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R609	R, CARBON	1/4W	680	OHM +-5%	RCR3048	1
R610	R, CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R615	R, CARBON	1/4W	470	KOHM +-5%	RCR3104	1
R616	R, CARBON	1/4W	470	OHM +-5%	RCR3044	1
R617	R, CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R618	R, CARBON	1/4W	10	KOHM +-5%	RCR3076	1
R619	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R621	R, CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R622	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R627	R, CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R628	R, CARBON	1/4W	390	OHM +-5%	RCR3042	1
R629	R, CARBON	1/4W	33	OHM +-5%	RCR3016	1
R630	R, CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R631	R, CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R632	R, CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R633	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R634	R, CARBON	1/4W	6.8	KOHM +-5%	RCR3072	1
R712	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R713	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R714	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R715	R, CARBON	1/4W	10	OHM +-5%	RCR3004	1
RV618	VR, CARBON	EVH-YK3325B14			RDE0003	1
L628	COIL	FL-3H	IROM		TLF0054	1
P603	CONNECTOR	171825-3			JBX0468	1
P701	CONNECTOR	171825-6			JBX0470	1
P501	CONNECTOR	171825-6			JBX0470	1

Symbol	Description	Code	Qty
S601	SW, LEVER SLA225	SSL0056	1
	WIRE 1/0.4 × 2 (ORANGE & BLACK)	BBI0037	0.5meter
PEF-476	PCB PB-3 (PEF-476, 477, 487)	HX116442	1

ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-477)

Symbol	Description					Code	Qty
C514	C,CERAMIC	50	V	22	PF+-5%	CCC1007	1
C516	C,CERAMIC	50	V	220	PF+-10%	CCC1027	1
C520	C,CERAMIC	50	V	22	PF+-5%	CCC1007	1
C523	C,PLASTIC	50	V	10000	PF+-10%	CQA0097	1
C527	C,CERAMIC	50	V	10	PF+-0.5PF	CCC1002	1
C528	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C543	C,CERAMIC	50	V	47	PF+-5%	CCC1014	1
C544	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C548	C,AL ELYC	25	V	10	UF	CEC0175	1
C551	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C556	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C557	C,CERAMIC	50	V	220	PF+-10%	CCC1027	1
C558	C,CERAMIC	50	V	680	PF+-10%	CCC1365	1
C559	C,CERAMIC	50	V	100	PF+-10%	CCC1025	1
C560	C,AL ELYC	16	V	47	UF	CEC0170	1
C561	C,PLASTIC	1MF+0.01MF			100V +-0.5%	HX3142077-A	1
C562	C,PLASTIC	50	V	4700	PF+-10%	CQA0095	1
C563	C,PLASTIC	1MF+0.01MF			100V +-0.5%	HX3142077-A	R
C564	C,CERAMIC	50	V	47	PF+-5%	CCC1014	1
C565	C,AL ELYC	25	V	10	UF	CEC0175	1
C566	C,AL ELYC	50	V	1	UF NP	CEC0391	1
C567	C,PLASTIC	50	V	0.1	UF+-10%	CQA0103	1
C568	C,PLASTIC	50	V	10000	PF+-10%	CQA0097	1
C569	C,PLASTIC	50	V	1000	PF+-10%	CQA0091	1
C570	C,CERAMIC	50	V	100	PF+-10%	CCC1025	1
C571	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C577	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C582	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C583	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1
C588	C,CERAMIC	50	V	10000	PF+80%-20%	CCC1030	1

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Symbol	Description	Code	Qty
C591	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C592	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C593	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C596	C,AL ELYC 160 V 1 UF	CEC0213	1
C597	C,AL ELYC 25 V 10 UF	CEC0175	1
C598	C,AL ELYC 16 V 47 UF	CEC0170	1
C599	C,AL ELYC 25 V 10 UF	CEC0175	1
CV514	C,VARIABLE ECV-1ZW20 x 40	CVE0019	1
CV564	C,VARIABLE ECV-1ZW20 x 40	CVE0019	1
D504	DIODE MA161	HDM0051	1
D505	DIODE MA161	HDM0051	1
D506	DIODE MA161	HDM0051	1
D512	DIODE 1S2075K	HDS0108	1
D513	DIODE 1S2075K	HDS0108	1
D514	DIODE 1S2075K	HDS0108	1
D515	DIODE 1S2075K	HDS0108	1
D516	DIODE 1S2075K	HDS0108	1
D517	DIODE 1S2075K	HDS0108	1
D518	DIODE 1S2075K	HDS0108	1
D520	DIODE 1S2075K	HDS0108	1
IC504	IC,DIGITAL HD7402P	IDH0179	1
IC505	IC,DIGITAL MC14053BCP	IDM0113	1
IC506	IC,DIGITAL MC14053BCP	IDM0113	1
IC507	IC,ANALOG TL081CP	ILT0037	1
TR503	TRANSISTOR 2SK106C	HTK0068	1
TR504	TRANSISTOR 2SC458C	HTC0148	1
TR505	TRANSISTOR 2SC1906	HTC0338	1
TR506	TRANSISTOR 2SC458C	HTC0148	1
TR508	TRANSISTOR 2SC458C	HTC0148	1
TR509	TRANSISTOR 2SA836D	HTA0105	1

Symbol	Description				Code	Qty
TR510	TRANSISTOR	2SA836D			HTA0105	1
TR511	TRANSISTOR	2SC458C			HTC0148	1
R513	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R514	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R515	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R516	R,SOLID	1/2W	10	MOHM +-5%	RSE0311	1
R517	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R518	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R519	R,CARBON	1/4W	12	KOHM +-5%	RCR3078	1
R520	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R522	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R523	R,METAL	1/4W	22.1	KOHM +-1%	RME0680	1
R526	R,METAL	1/4W	22	KOHM +-5%	RMR2784	1
R527	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R528	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R529	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R531	R,METAL	1/4W	2.21	KOHM +-1%	RME0668	1
R532	R,METAL	1/4W	3.09	KOHM +-1%	RME0720	1
R533	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R534	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R535	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R541	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R542	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R543	R,CARBON	1/4W	180	KOHM +-5%	RCR3420	1
R544	R,CARBON	1/4W	47	KOHM +-5%	RCR3092	1
R545	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R546	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R547	R,METAL	1/4W	22	KOHM +-5%	RMR2784	1
R548	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R549	R,METAL	1/4W	15.0	KOHM +-1%	RME0678	1

Symbol	Description				Code	Qty
R552	R,METAL	1/4W	3.32	KOHM +-1%	RME0670	1
R553	R,METAL	1/4W	1.50	KOHM +-1%	RME0666	1
R556	R,CARBON	1/4W	270	OHM +-5%	RCR3038	1
R557	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R558	R,CARBON	1/4W	470	OHM +-5%	RCR3044	1
R559	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R561	R,METAL	1/2W	4.32	MOHM +-1%	RMR3283	1
R562	R,METAL	1/2W	1.43	MOHM +-1%	RMR3282	1
R563	R,METAL	1/8W	715	KOHM +-0.5%	RMR2262	1
R564	R,METAL	1/4W	429	KOHM +-0.5%	RME0699	1
R565	R,METAL	1/4W	143	KOHM +-0.5%	RME0718	1
R566	R,METAL	1/4W	71.5	KOHM +-0.5%	RME0717	1
R567	R,METAL	1/4W	71.5	KOHM +-0.5%	RME0717	1
R568	R,METAL	1/4W	17.8	KOHM +-0.5%	RME0700	1
R569	R,METAL	1/4W	17.8	KOHM +-0.5%	RME0700	1
R570	R,CARBON	1/4W	470	KOHM +-5%	RCR3104	1
R571	R,CARBON	1/4W	1.2	KOHM +-5%	RCR3054	1
R572	R,CARBON	1/4W	1.5	KOHM +-5%	RCR3056	1
R573	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R574	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R575	R,CARBON	1/4W	12	KOHM +-5%	RCR3078	1
R576	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R577	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R578	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R579	R,CARBON	1/4W	820	OHM +-5%	RCR3050	1
R581	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R582	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R583	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R584	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1
R585	R,CARBON	1/4W	22	KOHM +-5%	RCR3084	1

Symbol	Description				Code	Qty
R586	R,CARBON	1/4W	15	KOHM +-5%	RCR3306	1
R587	R,CARBON	1/4W	15	KOHM +-5%	RCR3306	1
R588	R,METAL	1/4W	4.75	KOHM +-1%	RME0672	1
R589	R,METAL	1/4W	4.75	KOHM +-1%	RME0672	1
R590	R,CARBON	1/4W	6.8	KOHM +-5%	RCR3072	1
R591	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R592	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R593	R,CARBON	1/4W	6.8	KOHM +-5%	RCR3072	1
R594	R,CARBON	1/4W	120	KOHM +-5%	RCR3417	1
R595	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R596	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R597	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R598	R,CARBON	1/4W	3.9	KOHM +-5%	RCR3066	1
RV544	VR,CARBON	1 KOHM & 500 KOHM (WITH SW)			HX3142080	1
RV590	VR,CARBON	EVL-SOAA00B53			RDE0004	1
RV591	VR,CARBON	EVL-SOAA00B22			RDE0012	1
L558	COIL	FL-3H	100K		TLF0028	1
L598	COIL	FL-5H	101K		TLF0067	1
P502	CONNECTOR	171825-6			JBX0470	1
P503	CONNECTOR	171825-6			JBX0470	1
P504	CONNECTOR	171825-6			JBX0470	1
P506	CONNECTOR	171825-3			JBX0468	1
P505	CONNECTOR	171825-6			JBX0470	1
P508	CONNECTOR	171825-3			JBX0468	1
P509	CONNECTOR	171825-3			JBX0468	1
P510	CONNECTOR	171825-3			JBX0468	1
S501	SW,ROTARY	S21P 3322/2219			HX3142078	1
S502	SW,LEVER	SLA225			SSL0056	1
C701	C,CERAMIC	50	V	22 PF+-5%	CCC1007	1
C704	C,CERAMIC	50	V	22 PF+-5%	CCC1007	1

Symbol	Description	Code	Qty
C705	C,CERAMIC 50 V 220 PF+-10%	CCC1027	1
C715	C,PLASTIC 50 V 10000 PF+-10%	CQA0097	1
C723	C,CERAMIC 50 V 10000 PF+80%-20%	CCC1030	1
C725	C,CERAMIC 50 V 10 PF+-0.5PF	CCC1002	1
C726	C,PLASTIC 1MF+0.01MF 100V+-0.5%	HX3142077-A	1
C727	C,PLASTIC 50 V 4700 PF+-10%	CQA0095	1
C728	C,PLASTIC 1MF+0.01MF 100V+-0.5%	HX3142077-A	R
C729	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
CV701	C,VARIABLE ECV-1ZW20 × 40	CVE0019	1
CV729	C,VARIABLE ECV-1ZW20 × 40	CVE0019	1
D701	DIODE MA161	HDM0051	1
D702	DIODE MA161	HDM0051	1
D703	DIODE MA161	HDM0051	1
D704	DIODE 1S2075K	HDS0108	1
D705	DIODE 1S2075K	HDS0108	1
IC702	IC,DIGITAL HD74LS00P	IDH0467	1
IC703	IC,ANALOG TL081CP	ILT0037	1
TR701	TRANSISTOR 2SK106C	HTK0068	1
TR702	TRANSISTOR 2SC458C	HTC0148	1
TR703	TRANSISTOR 2SC1906	HTC0338	1
TR704	TRANSISTOR 2SC458C	HTC0148	1
P702	CONNECTOR 171825-6	JBX0470	1
S701	SW,ROTARY S21P 3322/2219	HX3142078	R
R701	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R702	R,CARBON 1/4W 2.2 KOHM +-5%	RCR3060	1
R703	R,CARBON 1/4W 22 KOHM +-5%	RCR3084	1
R704	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R705	R,SOLID 1/2W 10 MOHM +-5%	RSE0311	1
R706	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R707	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1

Symbol	Description				Code	Qty
R708	R,CARBON	1/4W	12	KOHM +-5%	RCR3078	1
R709	R,METAL	1W	22	KOHM +-5%	RMR2784	1
R710	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R711	R,CARBON	1/4W	3.3	KOHM +-5%	RCR3064	1
R716	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R717	R,METAL	1/4W	2.21	KOHM +-1%	RME0668	1
R718	R,METAL	1/4W	3.09	KOHM +-1%	RME0720	1
R722	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R723	R,METAL	1/4W	22.1	KOHM +-1%	RME0680	1
R726	R,METAL	1/2W	1.43	MOHM +-1%	RMR3282	1
R727	R,METAL	1/2W	715	KOHM +-0.5%	RMR2262	1
R728	R,METAL	1/2W	715	KOHM +-0.5%	RMR2262	1
R729	R,METAL	1/4W	143	KOHM +-0.5%	RME0718	1
R730	R,METAL	1/4W	71.5	KOHM +-0.5%	RME0717	1
R731	R,METAL	1/4W	71.5	KOHM +-0.5%	RME0717	1
R734	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R736	R,METAL	1/4W	17.8	KOHM +-0.5%	RME0700	1
R737	R,METAL	1/4W	17.8	KOHM +-0.5%	RME0700	1
R738	R,METAL	1/4W	71.5	KOHM +-0.5%	RME0717	1
R739	R,CARBON	1/4W	2.7	KOHM +-5%	RCR3062	1
R740	R,CARBON	1/4W	470	KOHM +-5%	RCR3104	1
RV734	VR,CARBON	EVL-SOAA00B22			RDE0012	1
C803	C,AL ELYC	16	V	47 UF	CEC0170	1
C820	C,CERAMIC	50	V	5 PF+-0.25PF	CCC0999	1
C821	C,CERAMIC	50	V	5 PF+-0.25PF	CCC0999	1
C822	C,AL ELYC	16	V	47 UF	CEC0170	1
TR822	TRANSISTOR	2SC458C			HTC0148	1
TR823	TRANSISTOR	2SC458C			HTC0148	1
TR824	TRANSISTOR	2SA836D			HTA0105	1
TR825	TRANSISTOR	2SA836D			HTA0105	1

Symbol	Description				Code	Qty
R801	R,METAL	1/4W	3.92	KOHM +-1%	RME0671	1
R803	R,METAL	1/4W	562	OHM +-1%	RME0661	1
R804	R,METAL	1/4W	332	OHM +-1%	RME0658	1
R805	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R806	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R820	R,METAL	1/4W	1.82	KOHM +-1%	RME0667	1
R821	R,METAL	1/4W	1.82	KOHM +-1%	RME0667	1
R822	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R823	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R824	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R825	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R826	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R827	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R891	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
R892	R,CARBON	1/4W	22	OHM +-5%	RCR3012	1
PEF-477	PCB	PB-3 (PEF-476,477,487)			116442	R

FOR SERVICE MANUALS
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ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-478)

Symbol	Description	Code	Qty
C301	C,AL ELYC 25 V 10 UF	CEC0175	1
C304	C,CERAMIC 50 V 5 PF+-0.25PF	CCC0999	1
C305	C,CERAMIC 50 V 22 PF+-5%	CCC1007	1
C306	C,PLASTIC 50 V 3300 PF+-10%	CQA0094	1
C307	C,AL ELYC 25 V 10 UF	CEC0175	1
C309	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C311	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C324	C,CERAMIC 50 V 5 PF+-0.25PF	CCC0999	1
C326	C,AL ELYC 25 V 10 UF	CEC0175	1
C327	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C328	C,AL ELYC 25 V 10 UF	CEC0175	1
C329	C,CERAMIC 50 V 8 PF+-0.5PF	CCC1001	1
C330	C,CERAMIC 50 V 15 PF+-5%	CCC1004	1
C331	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
C332	C,CERAMIC 500 V 1 PF+-0.25PF	CCC1353	1
C333	C,CERAMIC 500 V 1 PF+-0.25PF	CCC1353	1
C334	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C335	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C338	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C341	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C342	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C343	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C344	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C345	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C346	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C347	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C348	C,CERAMIC 50 V 1000 PF+80%-20%	CCC1029	1
CV304	C,VALIABLE ECV-1ZW10×40	CVE0024	1
CV322	C,VALIABLE ECV-1ZW20×40	CVE0019	1
CV329	C,VALIABLE ECV-1ZW10×40	CVE0024	1

Symbol	Description				Code	Qty
D301	DIODE	HZ7B			HDH0040	1
D302	DIODE	HZ5B			HDH0029	1
D303	DIODE	HZ7B			HDH0040	1
TR301	TRANSISTOR	2SA781K			HTA0099	1
TR302	TRANSISTOR	2SA781K			HTA0099	1
TR303	TRANSISTOR	2SC1906			HTC0338	1
TR304	TRANSISTOR	2SC1906			HTC0338	1
TR305	TRANSISTOR	2SC1374H			HTC0328	1
TR306	TRANSISTOR	2SC1374H			HTC0328	1
TR307	TRANSISTOR	2SD668A-C			HTD0100	1
TR308	TRANSISTOR	2SD668A-C			HTD0100	1
TR309	TRANSISTOR	2SB648A-C			HTB0087	1
TR310	TRANSISTOR	2SB648A-C			HTB0087	1
TR311	TRANSISTOR	2SA741H			HTA0088	1
TR312	TRANSISTOR	2SA741H			HTA0088	1
L336	COIL	FL-3H R47M			TLF0052	1
L337	COIL	FL-3H R47M			TLF0052	1
P301	CONNECTOR	171825-6			JBX0470	1
P302	CONNECTOR	171825-6			JBX0470	1
J305	PIN	FOR CONNECTOR			HX8193940	1
J306	PIN	FOR CONNECTOR			HX8193940	1
R301	R, METAL	1/4W	100	OHM +-1%	RME0652	1
R302	R, METAL	1/4W	100	OHM +-1%	RME0652	1
R303	R, CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R304	R, CARBON	1/4W	100	OHM +-5%	RCR3028	1
R305	R, CARBON	1/4W	680	OHM +-5%	RCR3048	1
R306	R, CARBON	1/4W	8.2	KOHM +-5%	RCR3074	1
R307	R, METAL	1/4W	1.21	KOHM +-1%	RME0665	1
R308	R, METAL	1/4W	1.21	KOHM +-1%	RME0665	1
R309	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1

Symbol	Description				Code	Qty
R310	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R311	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R312	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R319	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R320	R,METAL	1/4W	150	OHM +-1%	RME0654	1
R321	R,METAL	1/4W	150	OHM +-1%	RME0654	1
R322	R,CARBON	1/4W	180	OHM +-5%	RCR3034	1
R323	R,CARBON	1/4W	150	OHM +-5%	RCR3032	1
R324	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R325	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R326	R,METAL	1/4W	1.00	KOHM +-1%	RME0664	1
R327	R,METAL	1/4W	274	OHM +-1%	RME0715	1
R328	R,METAL	1/4W	274	OHM +-1%	RME0715	1
R329	R,METAL	1/4W	681	OHM +-1%	RME0662	1
R330	R,METAL	1/4W	681	OHM +-1%	RME0662	1
R331	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R332	R,METAL	1 W	10	KOHM +-5%	RMR2782	1
R333	R,METAL	1 W	10	KOHM +-5%	RMR2782	1
R334	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R335	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R336	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R337	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R338	R,CARBON	1/2W	22	KOHM +-5%	RCR3191	1
R339	R,METAL	1 W	10	KOHM +-5%	RMR2782	1
R340	R,METAL	1 W	10	KOHM +-5%	RMR2782	1
R341	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R342	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R343	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R344	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R345	R,METAL	1/4W	182	OHM +-1%	RME0655	1

Symbol	Description				Code	Qty
R346	R, METAL	1/4W	182	OHM +-1%	RME0655	1
R347	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R348	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R349	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R350	R, CARBON	1/4W	47	OHM +-5%	RCR3020	1
R351	R, CARBON	1/4W	10	OHM +-5%	RCR3004	1
C1034	C, CERAMIC	500	V10000	pF+-10%	CCD0218	1
D1032	DIODE	HZ22			HDH0072	1
R1032	R, CARBON	1/4W	68	KOHM +-5%	RCR3096	1
R1033	R, CARBON	1/4W	47	KOHM +-5%	RCR3092	1
R1034	R, CARBON	1/4W	33	KOHM +-5%	RCR3088	1
R1036	R, CARBON	1/4W	220	OHM +-5%	RCR3036	1
RV1032	VR, CARBON	EVT-SOAA00B25			RDE0029	1
RV1033	VR, CARBON	EVT-SOAA00B54		50K OHM	RDE0017	1
PEF-478	PCB	PBL (PEF-478 486)			HX116440	R
					HX283881	R
					HX283882	R
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**ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-479)**

Symbol	Description	Code	Qty
C828	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C832	C,CERAMIC 50 V 470 PF+-10%	CCC1162	1
C840	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C844	C,CERAMIC 500 V 0.5 PF+-0.25PF	CCC0111	1
C845	C,CERAMIC 500 V 0.5 PF+-0.25PF	CCC0111	1
C846	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C847	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C849	C,CERAMIC 50 V10000 PF+80%-20%	CCC1030	1
C854	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C855	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C860	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
C842	C,CERAMIC 50 V10000 PF+80%-20%	CCC1030	1
C843	C,CERAMIC 50 V10000 PF+80%-20%	CCC1030	1
D852	DIODE 1S2075K	HDS0108	1
D853	DIODE 1S2075K	HDS0108	1
TR828	TRANSISTOR 2SA836D	HTA0105	1
TR829	TRANSISTOR 2SA836D	HTA0105	1
TR840	TRANSISTOR 2SA836D	HTA0105	1
T841	TRANSISTOR 2SA836D	HTA0105	1
TR846	TRANSISTOR 2SA781K	HTA0099	1
TR847	TRANSISTOR 2SA781K	HTA0099	1
TR852	TRANSISTOR 2SB648A-C	HTB0087	1
TR853	TRANSISTOR 2SB648A-C	HTB0087	1
TR856	TRANSISTOR 2SD668A-C	HTD0100	1
TR857	TRANSISTOR 2SD668A-C	HTD0100	1
R828	R,METAL 1/4W 22.1 KOHM +-1%	RME0680	1
R829	R,METAL 1/4W 22.1 KOHM +-1%	RME0680	1
R830	R,CARBON 1/4W 1.5 KOHM +-5%	RCR3056	1
R831	R,CARBON 1/4W 120 OHM +-5%	RCR3030	1
R832	R,CARBON 1/4W 6.8 KOHM +-5%	RCR3072	1

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Symbol	Description				Code	Qty
R840	R,METAL	1/4W	22.1	KOHM +-1%	RME0680	1
R841	R,METAL	1/4W	22.1	KOHM +-1%	RME0680	1
R842	R,METAL	1/4W	1.82	KOHM +-1%	RME0667	1
R843	R,METAL	1/4W	1.82	KOHM +-1%	RME0667	1
R844	R,METAL	1 W	22	KOHM +-5%	RMR2784	1
R845	R,METAL	1 W	22	KOHM +-5%	RMR2784	1
R846	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R847	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R848	R,CARBON	1/4W	220	KOHM +-5%	RCR3102	1
R849	R,CARBON	1/4W	220	KOHM +-5%	RCR3102	1
R850	R,CARBON	1/4W	15	KOHM +-5%	RCR3080	1
R851	R,CARBON	1/4W	15	KOHM +-5%	RCR3080	1
R852	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R853	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
R854	R,METAL	1 W	22	KOHM +-5%	RMR2784	1
R855	R,METAL	1 W	22	KOHM +-5%	RMR2784	1
R856	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R857	R,CARBON	1/4W	100	OHM +-5%	RCR3028	1
R862	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R863	R,CARBON	1/4W	330	OHM +-5%	RCR3040	1
R858	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R859	R,CARBON	1/4W	10	OHM +-5%	RCR3004	1
R860	R,CARBON	1/4W	100	KOHM +-5%	RCR3100	1
RV830	VR,METAL	TM10K(PV)1SB		1K OHM	RNT0029	1
RV831	VR,METAL	TM10K(PV)1SB		100 OHM	RNT0028	1
RV842	VR,METAL	TM10K(PV)1SB		500 OHM	RNT0039	1
P801	CONNECTOR	171825-3			JBX0468	1
P802	CONNECTOR	171825-6			JBX0470	1
C905	C,CERAMIC	500 V	0.5	PF+-0.25PF	CCC0111	1
C906	C,CERAMIC	500 V	10000	PF+-10%	CCD0218	1

Symbol	Description	Code	Qty
C911	C,CERAMIC 500 V10000 PF+-10%	CCD0218	1
C902	C,AL ELYC 25 V 10 UF	CEC0175	1
C913	C,CERAMIC 50 V 47 PF+-5%	CCC1014	1
D901	DIODE 1S2075k	HDS0108	1
D902	DIODE 1S2075k	HDS0108	1
D908	DIODE 1S2075k	HDS0108	1
R901	R,METAL 1/4W 3.32 KOHM +-1%	RME0670	1
R902	R,CARBON 1/4W 3.9 KOHM +-5%	RCR3066	1
R903	R,CARBON 1/4W 56 KOHM +-5%	RCR3094	1
R904	R,CARBON 1/4W 1.5 KOHM +-5%	RCR3056	1
R905	R,METAL 1 W 22 KOHM +-5%	RMR2784	1
R906	R,CARBON 1/4W 100 KOHM +-5%	RCR3100	1
R907	R,CARBON 1/4W 12 KOHM +-5%	RCR3078	1
R908	R,CARBON 1/4W 1.5 KOHM +-5%	RCR3056	1
R909	R,CARBON 1/2W 33 KOHM +-5%	RCR3195	1
R910	R,CARBON 1/4W 220 OHM +-5%	RCR3036	1
R911	R,CARBON 1/4W 22 OHM +-5%	RCR3012	1
R912	R,CARBON 1/4W 100 OHM +-5%	RCR3028	1
R913	R,CARBON 1/4W 2.2 KOHM +-5%	RCR3060	1
R921	R,CARBON 1/4W 3.9 KOHM +-5%	RCR3066	1
R931	R,CARBON 1/4W 22 KOHM +-5%	RCR3084	1
R932	R,CARBON 1/4W 82 KOHM +-5%	RCR3098	1
R935	R,METAL 1 W 10 MOHM +-5%	HX3142076-B	1
R936	R,CARBON 1/2W 1.8 MOHM +-5%	RCR3476	1
TR901	TRANSISTOR 2SC641K-C	HTC0192	1
TR904	TRANSISTOR 2SC1906	HTC0338	1
TR905	TRANSISTOR 2SD668A-C	HTD0100	1
TR908	TRANSISTOR 2SB648A-C	HTB0087	1
TR936	TRANSISTOR 2SA778AK	HTA0104	1
P901	CONNECTOR 171825-3	JBX0468	1

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Symbol	Description	Code	Qty
P902	CONNECTOR 171825-3	JBX0468	1
P903	CONNECTOR 171825-3	JBX0468	1
P904	CONNECTOR 171825-3	JBX0468	1
C1001	C, PLASTIC 50 V47000 PF+-10%	CQA0101	1
C1002	C, AL ELYC 25 V 100 UF	CEC0177	1
C1005	C, PLASTIC 50 V47000 PF+-10%	CQA0101	1
C1012	C, CERAMIC 2000 V 4700 PF+-10%	CCD0221	1
C1013	C, CERAMIC 2000 V 4700 PF+-10%	CCD0221	1
C1016	C, CERAMIC 2000 V 100 PF+-10%	CCC1366	1
C1020	C, CERAMIC 500 V10000 PF+-10%	CCD0218	1
C1021	C, AL ELYC 160 V 1 UF	CEC0213	1
C1023	C, CERAMIC 2000 V 4700 PF+-10%	CCD0221	1
C1025	C, CERAMIC 2000 V 4700 PF+-10%	CCD0221	1
D1013	DIODE Y10GA	HDY0031	1
D1020	DIODE HZ22	HDH0072	1
D1021	DIODE 1SS83	HDS0250	1
D1022	DIODE 1SS83	HDS0250	1
D1023	DIODE 1SS83	HDS0250	1
D1024	DIODE 1SS83	HDS0250	1
IC1001	IC, ANALOG TL081CP	ILT0037	1
TR1006	TRANSISTOR 2SC1061C	HTC0032	1
R1001	R, METAL 1/4W 182 KOHM +-1%	RME0721	1
R1002	R, CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R1003	R, CARBON 1/4W 100 KOHM +-5%	RCR3100	1
R1004	R, CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R1005	R, CARBON 1/4W 3.3 KOHM +-5%	RCR3064	1
R1006	R, CARBON 1/4W 33 OHM +-5%	RCR3016	1
R1014	R, CARBON 1/4W 10 KOHM +-5%	RCR3076	1
R1015	R, METAL 1 W 22 MOHM +-1%	HX3142076-A	1
R1016	R, CARBON 1/2W 3.3 MOHM +-5%	RCR4282	1

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Symbol	Description	Code	Qty
R1020	R,CARBON 1/4W 680 KOHM +-5%	RCR3105	1
R1024	R,SOLID 1/2W 10 MOHM +-5%	RSE0311	1
RV1021	VR,CARBON EVT-S0AA00B25	RDE0029	1
NL1024	LAMP NE-2	ELL0019	1
NL1025	LAMP NE-2	ELL0019	1
T1001	XFMR HIGH VOLTAGE XFMR (FOR V-550)	HX3142082 - A	1
MUT1001	MULTIPLIER 8.5KV (WITH ANODE CAP)	HX3142083 - A	1
F1001	FUSE MF61NM 1 (1A 250V)JIS	EFG0344	1
FH1001	SOCKET,FUS F-3265 1P PHENOLIT RESIN	EFH0026	1
D1101	DIODE M4G-1	HDM0034	1
D1102	DIODE 1S2075K	HDS0108	1
D1103	DIODE 1S2075K	HDS0108	1
D1111	DIODE M4C-1	HDM0033	1
D1114	DIODE V06C	HDV0019	1
D1121	DIODE V06C	HDV0019	1
D1141	DIODE V06C	HDV0019	1
D1142	DIODE V06C	HDV0019	1
IC1101	IC,ANALOG HA17458GS	ILH0054	1
IC1111	IC,DIGITAL UA7812UC	IDM0318	1
IC1121	IC,DIGITAL UA7912UC	IDM0319	1
IC1131	IC,DIGITAL UA7805UC	IDM0320	1
TR1101	TRANSISTOR 2SD478C	HTD0053	1
TR1102	TRANSISTOR 2SD478C	HTD0053	1
TR1161	TRANSISTOR 2SC1061C	HTC0032	1
TR1162	TRANSISTOR 2SC458C	HTC0148	1
R1101	R,CARBON 1/4W 15 KOHM +-5%	RCR3080	1
R1102	R,CARBON 1/4W 10 KOHM +-5%	RCR3076	1
R1103	R,CARBON 1/4W 10 KOHM +-5%	RCR3076	1
R1104	R,METAL 1/4W 100 KOHM +-1%	RME0688	1
R1105	R,METAL 1/4W 12.1 KOHM +-1%	RME0677	1

Symbol	Description				Code	Qty
R1111	R,METAL	2 W	33	OHM +-5%	RMR2790	1
R1112	R,CARBON	1/4W	680	OHM +-5%	RCR3048	1
R1113	R,CARBON	1/4W	47	OHM +-5%	RCR3020	1
R1114	R,METAL	1/4W	10.0	KOHM +-1%	RME0676	1
R1115	R,CARBON	1/4W	2.2	KOHM +-5%	RCR3060	1
R1121	R,METAL	2 W	27	OHM +-5%	RMR3151	1
R1122	R,METAL	1/4W	10.0	KOHM +-1%	RME0676	1
R1131	R,METAL	2 W	47	OHM +-5%	RMR2791	1
R1151	R,CARBON	1/4W	470	KOHM +-5%	RCR3104	1
R1152	R,CARBON	1/4W	4.7	KOHM +-5%	RCR3068	1
R1162	R,CARBON	1/4W	1.0	KOHM +-5%	RCR3052	1
RV1111	VR,CARBON	EVL-SOAA00B53			RDE0004	1
R1106	R,CARBON	1/4W	6.8	OHM +-5%	RCR3003	1
R1107	R,CARBON	1/4W	100	KOHM +-5%	RCR3100	1
C1101	C,AL ELYC	160 V	100	UF	CEC0340	1
C1102	C,AL ELYC	160 V	10	UF	CEC0214	1
C1111	C,AL ELYC	25 V	2200	UF	CEC0347	1
C1112	C,AL ELYC	25 V	100	UF	CEC0177	1
C1113	C,AL ELYC	16 V	100	UF	CEC0364	1
C1121	C,AL ELYC	25 V	2200	UF	CEC0347	1
C1122	C,AL ELYC	25 V	100	UF	CEC0177	1
C1123	C,PLASTIC	50 V	10000	PF+-10%	CQA0097	1
C1131	C,CERAMIC	50 V	10000	PF+80%-20%	CCC1030	1
C1132	C,AL ELYC	25 V	100	UF	CEC0177	1
C1141	C,AL ELYC	100 V	100	UF	CEC0209	1
C1151	C,PLASTIC	50 V	0.1	MF+-10%	CQA0103	1
P1105	CONNECTOR	171825-3			JBX0468	1
P1101	CONNECTOR	171825-6			JBX0470	1
P1102	CONNECTOR	171825-6			JBX0470	1
P1103	CONNECTOR	171825-6			JBX0470	1

Symbol	Description	Code	Qty
P1104	CONNECTOR 171825-6	JBX0470	1
P1106	CONNECTOR 171825-3	JBX0468	1
P1107	CONNECTOR 171825-3	JBX0468	1
P1108	CONNECTOR 171825-6	JBX0470	1
C1107	C,PLASTIC 50 V 1000 PF+-10%	CQA0091	1
PEF-479	PCB PB-1 (PEF-478 ~486)	HX116440	1
		HX283881	R
		HX283882	R
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ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-480)

Symbol	Description	Code	Qty
C1303	C,AL ELYC 25 V 10 UF	CEC0175	1
C1304	C,AL ELYC 25 V 10 UF	CEC0175	1
D1301	DIODE HZ7B	HDH0040	1
D1302	DIODE HZ7B	HDH0040	1
D1303	DIODE 1S2075K	HDS0108	1
D1304	DIODE 1S2075K	HDS0108	1
D1401	DIODE SR103D (WITH MOUNT)	HDS0234	1
R1301	R,CARBON 1/4W 1.0 KOHM +-5%	RCR3052	1
R1302	R,CARBON 1/4W 220 OHM +-5%	RCR3036	1
R1303	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1
R1304	R,CARBON 1/4W 4.7 KOHM +-5%	RCR3068	1
RV1301	VR,CARBON 1/2W 10KOHM+-20% & 10KOHM+-20% (WITH UL SW)	HX3142075-A	1
RV1302	VR,CARBON 1/2W 10KOHM+-20% & 10KOHM+-20%	HX3142092-A	1
RV1303	VR,CARBON 1/2W 10KOHM+-20% & 10KOHM+-20%	HX3142092-A	1
P1302	CONNECTOR 171825-3	JBX0468	1
P1303	CONNECTOR 171825-6	JBX0470	1
	SPACER FOR TO-1, TC-18 TYPE	H5487338 ~ 39	1
C1201	C,AL ELYC 16 V 47 UF	CEC0170	1
C1202	C,CERAMIC 50 V10000 PF+80%-20%	CCC1030	1
C1203	C,PLASTIC 50 V22000 PF+-10%	CQA0099	1
IC1201	IC,ANALOG HA17555GS	ILH0063	1
IC1202	IC,DIGITAL MC14011BCP	IDM0169	1
R1201	R,CARBON 1/4W 10 KOHM +-5%	RCR3076	1
R1202	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1
R1203	R,CARBON 1/4W 27 KOHM +-5%	RCR3086	1
R1204	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1
R1205	R,METAL 1/4W 10.0 KOHM +-1%	RME0676	1
R1206	R,METAL 1/4W 475 OHM +-1%	RME0660	1
R1207	R,CARBON 1/4W 10 OHM +-5%	RCR3004	1

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Symbol	Description	Code	Qty
RV1203	VR, CARBON EVL-SOAA00B14	RDE0034	1
RV1205	VR, CARBON EVL-SOAA00B23	RDE0015	1
P1201	CONNECTOR 171825-3	JBX0468	1
P1202	CONNECTOR 171825-3	JBX0468	1
PEF-480	PCB PB-1 (PEF478 ~486)	HX116440	R
		HX283881	R
		HX283882	R

CIRCUIT BOARD (PEF-481)

Symbol	Description	Code	Qty
R1030	R, CARBON 1/4W 10 KOHM +-5%	RCR3076HA	1
R1031	R, CARBON 1/4W 100 KOHM +-5%	RCR3100HA	1
V1101	CRT 150BCB31	DPX0061	1
J1011	SOCKET PS-085	JSP0001	1
P1030	CONNECTOR 171825-3	JBX0468	1
C1030	C, CERAMIC 50 V 100 PF+-10%	CCC1025VA	1
PEF-481	PCB PB-1 (PEF-478 ~486)	HX116440	R
		HX283881	R
		HX283882	R

**ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-482,483)**

Symbol	Description	Code	Qty
S1	SW,SLIDE SSB023 L=9 NS PCB	SSV0042	1
S101	SW,SLIDE SSB023 L=9 NS PCB	SSV0042	1
C1	C,PLASTIC 600 V22000 PF+-10%	CQX0071	1
C101	C,PLASTIC 600 V22000 PF+-10%	CQX0071	1
PEF-482	PCB PB-1 (PEF-478 ~ 486)	HX116440	R
		HX283881	R
		HX283882	R
PEF-483	PCB PB-1 (PEF-478 ~ 486)	HX116440	R
		HX283881	R
		HX283882	R
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ELECTRICAL REPLACEABLE PARTS LIST
CIRCUIT BOARD (PEF-484b)

Symbol	Description	Code	Qty
R880	R, METAL 1/4W 6.81 KOHM +-1%	RME0674	1
R881	R, CARBON 1/4W 820 OHM +-5%	RCR3050	1
R882	R, METAL 1/4W 2.21 KOHM +-1%	RME0668	1
R883	R, METAL 1/4W 1.00 KOHM +-1%	RME0664	1
R884	R, METAL 1/4W 6.81 KOHM +-1%	RME0674	1
R885	R, METAL 1/4W 10.0 KOHM +-1%	RME0676	1
R886	R, METAL 1/4W 1.00 KOHM +-1%	RME0664	1
R887	R, CARBON 1/4W 1.5 KOHM +-5%	RCR3056	1
R888	R, CARBON 1/4W 3.3 KOHM +-5%	RCR3064	1
RV552	VR, CARBON 0.2W 10KOHM +-20% & 50KOHM +-20% (WITH SW)	HX3142080-A	1
RV555	VR, CARBON EVL-SOAA00B14	RDE0034	1
RV556	VR, CARBON EVL-SOAA00B14	RDE0034	1
RV557	VR, WIRE MF220D 2KOHM +-5%	RXM0009	1
	DIAL DFA-N	RZY0002	1
IC810	IC, ANALOG HA17458GS	ILH0054	1
P510	CONNECTOR 171825-6	JBX0470	1
P511	CONNECTOR 171825-6	JBX0470	1
P512	CONNECTOR 171825-3	JBX0468	1
J512	CONNECTOR ASSEMBLY HB	HX3142085-HB	R
PEF-484b	PCB PB-1 (PEF-478-486)	HX116440	R
		HX283881	R
		HX283882	R

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ELECTRICAL REPLACEABLE PARTS LIST
CABINET

Symbol	Description	Code	Qty
T1401	XFMR For V-550	HX3142118-A	1
	BAND SKB-4M	ERL0093	1
	ADHESIVE AGENT	VEB0003	R
	FASTENER NYLON	ERL0002	2
	WIRE STICKER T-25	ERL0012	1
F1401	FUSE MF61NM 2 (2A 250V)JIS	EFG0352	1
	SOCKET, FUS SN-1301	EFH0193	1
R1	R, CARBON 1/4W 10 OHM +-5%	RCR3004	1
R101	R, CARBON 1/4W 10 OHM +-5%	RCR3004	1
J1401	COAX.CON BNC071	JHB0088	1
J1402	COAX.CON BNC071	JHB0088	1
J1403	COAX.CON BNC071	JHB0088	1
J1404	COAX.CON BNC071	JHB0088	1
J1405	COAX.CON BNC071	JHB0088	1
PEF-485	PCB PB-1(PEF-478 ~486)	HX116440	R
		HX283881	R
		HX283882	R
PEF-486	PCB PB-1(PEF-478 ~486)	HX116440	R
		HX283881	R
		HX283882	R
TP1401	TERMINAL BLACK	HX4114183-A	1
TP1402	TERMINAL Z-048	HX8338351	1
L1101	COIL For V-550	HX3142116	1
C1205	C, PLASTIC AMS 102K50 (50V 0.001UF)	CQA0003	1
PL1401~3	LAMP 14V 80MA	HX8329332	3
RV1401	VR, CARBON EVM-R7GS20B26	RDE0028	1
DL1401	DELAY LINE 758DL 100NS 186OHM	HX8311698	1
J1406	CONNECTOR CM3 (C-170)	JJC0026	1
P1406	CORD SET <For 120V Set> SVT 3X#18 VM0033-VM0076B 8FEET, GRY	BBZ0184	1
	<For 220V or 240V Set> VM0099-VM0081 8FEET	BBZ0183	(1)
	CORD BAND CB-3	ERS0004	1

Symbol	Description	Code	Qty
	CONNECTOR ASSEMBLY For V-550	HX3142084 A	1
		HX3142085 A	0
	TERMINAL B5	HX324662 B5	4
	TERMINAL D3	HX324662 D3	1
	BRAIDED WIRE 0.75SQ PLATED TIN	BSE0001	1
	WIRE, NEWFL 1/0.5WHT	BB10042	
	WIRE, VINYL UL-1015#22 YEL	BBA0465	
	WIRE, VINYL WL1H12/0.18 BLK	BBA0041	
	WIRE, VINYL WL1H12/0.18 WHT	BBA0043	
	WIRE PLATED SOLDER	BSB0001	
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MECHANICAL REPLACEABLE PARTS LIST

Symbol	Description	Code	Qty	Remarks
1	Cover	288054-A	1	
2	Cover, bottom	3149269-A	1	
3	Chassis, front	117440-AA	1	
4	Chassis, rear	288055-AA	1	
5	Chassis	288056-A	1	
6	Angle	3149270-A	1	
7	Angle	3149271-A	1	
8	Angle	3149272-A	1	
9	Angle	3149273-A	1	
10	CRT band (1)	8330671-A	1	
11	CRT band (2)	3149274-A	1	
12	Plate, shield	3149275-A	1	
13	Bracket, support	8338296-A	1	
14	Bracket, PEF478	8330676-A	1	
15	Bracket, PEF479	3149277-A	1	
16	Bracket	8330677-A	1	
17	Plate, shield	8330678-A	1	
21	Plate, shield	8338330-A	1	
24	Plate	3149278-A	2	
28	Bracket, MD	8345458-A	1	
29	Plate	8345476-A	2	
51	Shield band	8330708-A	1	
69	Rubber	8330710-A	1	
52	Shield case	3149287-B	1	
53	Handle	3156107-A	1	
54	Lock, handle	8345467-A	2	
56	Panel, front	292449~50-A	1	
57	Panel, rear	3149298~99-A	1	
59	Bezel	288060-A	1	
60	Cover, side	3149315-A	2	

Symbol	Description	Code	Qty	Remarks
61	Cover, rear	3149316-A	1	
62	Foot, rear	3149317-A	4	
63	Foot	3140755-A	4	
64	Bush	ERR0073	1	B-312-250
65	Spacer	XCI0097	2	PS-4N(6.4H)
66	Filter	3149318-A	1	
68	Rubber	3144055-B	2	
70	Rubber	8330712-C	1	
71	Cushion	8330711-B	2	
72	Cushion	8330711-F	1	
73	Knob	3149319-A	1	AT
74	Knob	3149320-A	1	BT
75	Knob	3149321-A	6	S18
76	Knob	3149322-B	1	S24
77	Knob	3149323-A	2	URV
78	Knob	3149324-A	4	S18B
79	Knob	3122685-D	2	0022
80	Knob	3149325-B	6	LSW
81	Label	8316162-A	1	SER.NO.
82	Label	8345932-A	1	
83	Rivet	8340163-B	6	NO.1027
84	Rivet	8340164-A	4	NO.113
83	Support	8340165-A	5	LCBS-03N
86	Support	8340165-G	4	LCBS-014N
87	Bush	8340166-A	1	CE-012
90A	Label, 120V	8330692-A	1	U TYPE
90B	Label, 220V	8330693-A	1	E TYPE
90C	Label, 240V	8330694-A	1	K TYPE
301	Screw, sems (sw.w)	XCA0661	8	M3 × 8
302	Screw, sems (sw)	XCA1319	6	M4 × 12

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Symbol	Description	Code	Qty	Remarks
303	Screw, sems (sw.w)	8340167-C	4	M4 × 20
306	Screw	XCA6205	3	M2 × 5
308	Screw	XCA6308	21	M3 × 8
309	Screw	XCA6312	3	M3 × 12
310	Screw	XCA1797	2	M3 × 20
311	Screw	XCA6410	2	M4 × 10
313	Screw, black	XCA1820	4	M3 × 10
315	Screw, flat	XCA0168	4	M2.6 × 4
316	Screw, flat	XCA7306	29	M3 × 6
401	Washer, spring	XCA1879	4	M3
402	Washer, spring	XCA1881	2	M4
403	Washer	XCA1855	3	M3
404	Washer	XCA1857	2	M4
405	Nut	XCA1706	4	M3
406	Nut	XCA1707	2	M4
501	Board	PEF-475	1	
18	Bracket, LSW	8330679-A	1	
307	Screw	XCA6306	1	M3 × 6
25	Plate, earth	8318959-A	2	
502	Board	PEF-476	1	
19	Bracket, LSW	8330680-A	1	
307	Screw	XCA6306	2	M3 × 6
503	Board	PEF-477	1	
20	Bracket, LSW	8330681-A	1	
307	Screw	XCA6306	1	M3 × 6
504	Board	PEF-478	1	
27	Heat sink	8329720-A	2	
308	Screw	XCA6308	4	M3 × 8
505	Board	PEF-479	1	
26	Heat sink	8329719-A	3	

Symbol	Description	Code	Qty	Remarks
308	Screw	XCA6308	3	M3 × 8
22	HV case	8330683-A	1	
88	Plate	8340226-A	1	
22B	HV plate	8340247-A		
67	Plate	8340248-A	1	
506	Board	PEF-486	1	
23	Plate	8330684-A	1	

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