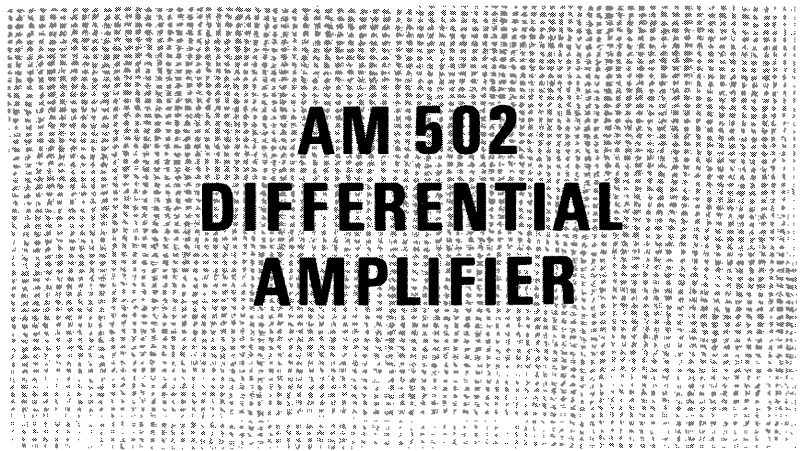


TEKTRONIX®



INSTRUCTION MANUAL

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97005

Serial Number _____

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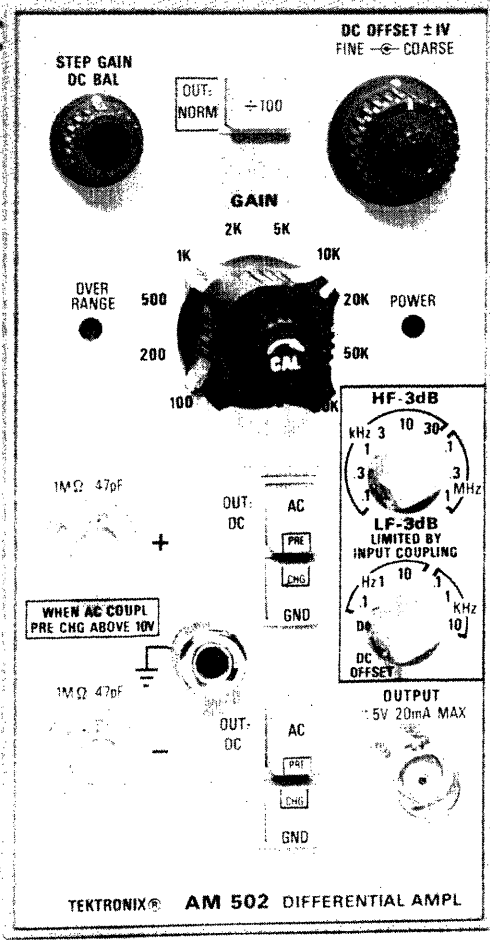
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OPERATING INSTRUCTIONS

INTRODUCTION

Instrument Description

The AM 502 is a DC-coupled differential amplifier with excellent common-mode rejection capabilities and high gain for low-voltage measurements. The DC OFFSET capability permits nulling up to one volt DC, so that low level, low frequency signals impressed on a DC level can be amplified without the degradation often introduced by AC input coupling.

High and low frequency -3 dB points can be selected at the front panel to suit the application. Signal inputs and outputs are available at the rear connector as well as at the front panel. A front-panel lamp indicates most over-range conditions of excessive input signal (either differential or common mode), excessive gain, or excessive offset.

Installation and Removal

The AM 502 is calibrated and ready for use when received. It operates in any compartment of a TM 500-Series Power Module. See the Power Module instruction manual for line voltage requirements and Power Module operation. Fig. 1-1 shows the AM 502 installation and removal procedure.

CAUTION

Turn the Power Module off before inserting the plug-in; otherwise, damage may occur to the plug-in circuitry.

Check that the AM 502 is fully inserted in the Power Module. Pull the PWR switch on the Power Module. The power light on the front panel should now be lit. The Controls, Connectors and Adjustments foldout page in Section 3 gives a complete description of the front panel controls.

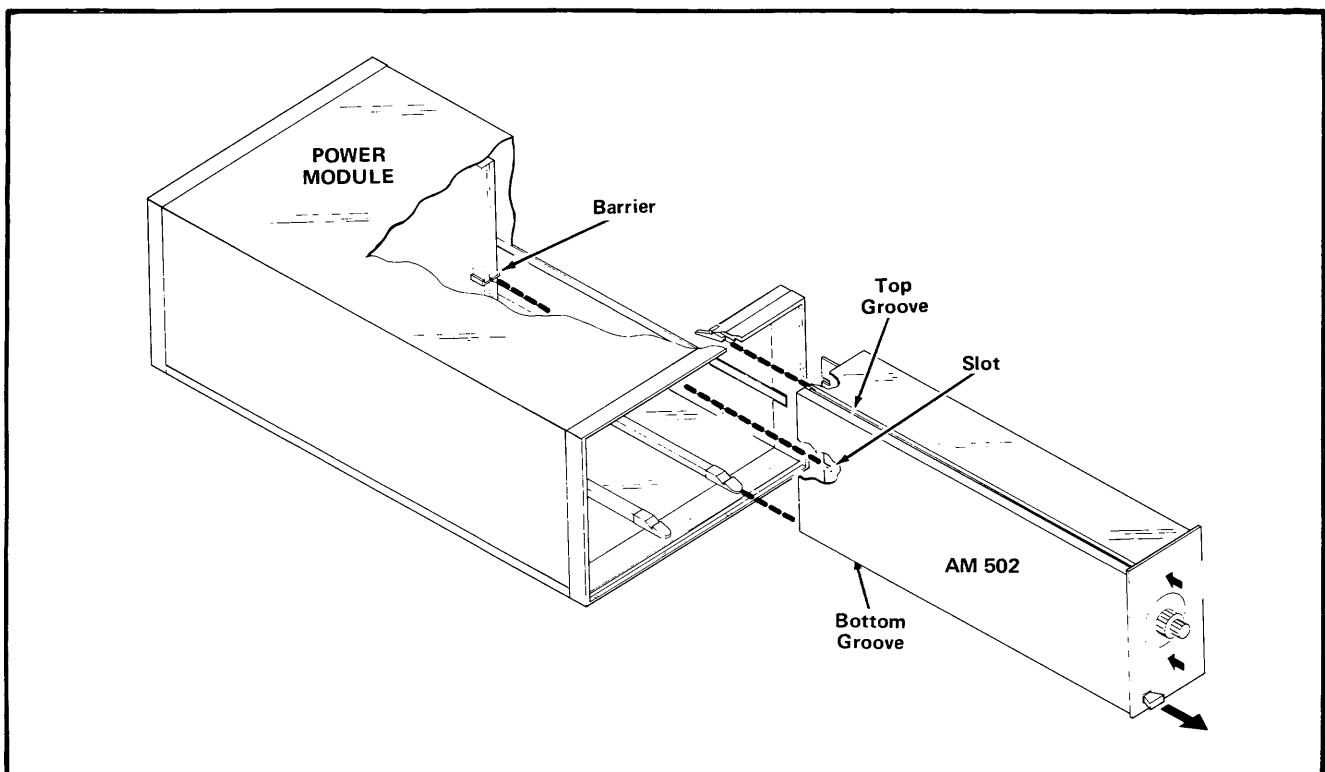


Fig. 1-1. AM 502 Installation and Removal.

INSTRUMENT OPERATION

Input Connections

Unshielded test leads can be used to connect the AM 502 to a signal source when a high-level, low-frequency signal is monitored at a low impedance point. However, when any of these factors is missing, it becomes increasingly important to use shielded signal cables. In all cases, the signal-transporting leads should be kept as short as practical.

When making single-ended input measurements (conventional amplifier operation), be sure to establish a common ground connection between the device under test and the AM 502. The shield of a coaxial cable is normally used for this purpose. Push the GND button for the input not connected to the device under test.

In some cases differential measurements require no common chassis ground connection, and therefore are less susceptible to interference by ground-loop currents.

Consider the change in the source operating characteristics due to loading by the signal input cables. The circuit at the input connectors can be represented by approximately $1\text{ M}\Omega$ to ground paralleled by approximately 47 pF . Two feet of $50\ \Omega$ coaxial cable increases the parallel capacitance by about 60 pF , which could be excessive in many situations. To minimize these effects, use a higher impedance cable or an attenuator probe.

Probes

Attenuator probes decrease the resistive-capacitive loading of a signal source. They also extend the measurement range of the AM 502 to substantially higher voltages. The Tektronix P6055 passive probe is designed specifically for differential applications. Some measurements require a higher resistance input to the AM 502, with very little source loading or signal attenuation. In such situations use a FET probe or the high-impedance input provision of the AM 502. Contact your Tektronix Representative for further information on probes.

High Impedance Input

To raise the internal input impedance of the AM 502 to about $200\text{ M}\Omega$, remove the connectors shown on the Controls and Adjustments foldout page. Make certain the attenuator is in the NORM mode. Signal source impedance now becomes an important factor. For example, a 100 pA gate current through $10\text{ M}\Omega$ produces a one-millivolt offset. This offset may result in significant error when small voltages are measured.

Input Overloading

When measuring unknown DC voltages, push the $\div 100$ button in, and start with the 100 position on the GAIN switch. Increase the GAIN switch setting and finally release the $\div 100$ pushbutton until a suitable output signal is obtained. If the input circuit of the AM 502 is overdriven, large amounts of current will flow, opening the protective fuses.

Output Connections

Make output connections using a BNC to Dual Binding Post connector (Tektronix part number 103-0035-00) or a coaxial cable with at least one BNC connector. To prevent current limiting in the output stage, do not load the output with less than $250\ \Omega$. Output current is limited to 20 mA .

Step Gain DC Balance

If this control is misadjusted, the DC output level will shift as the GAIN switch position is changed. Push both GND buttons and place the GAIN switch in the 100 position. Rotate the GAIN switch from stop to stop while adjusting the STEP GAIN DC BAL control for no DC shift at the OUTPUT terminal.

DC Offset Coarse and Fine

Use these controls to offset up to $\pm 1\text{ V}$ DC potential difference at the input connectors. The amplifier internal bias is changed to accomplish the offset. The differential rejection capabilities of the AM 502 are not affected. The LF -3 dB switch must be in the DC OFFSET position to activate these controls.

HF and LF Bandwidth Reduction

Use the HF -3 dB switch to reduce the upper bandwidth limit, as necessary, to improve the signal-to-noise ratio when using the AM 502 in low-frequency applications. The LF -3 dB control increases the lower bandwidth frequency. Use this control to reduce DC drift, when raising the lower bandwidth does not undesirably reduce the bandwidth for the signal being measured.

Pre-Charging

Use of this feature prevents surge currents, due to charging the AC coupling capacitor in the AM 502, from damaging the circuit under test. Before connecting the AM 502 to a signal containing a DC component, push the AC and GND buttons. Connect the input to the circuit under test. Wait about one second for the coupling capacitor to charge. Release the GND pushbutton and the coupling capacitor is charged to the value of the DC voltage to be measured.

Functions Available at Rear Connector

Signal out, and provisions for signal in connections, are available at the rear interface connector. See Fig. 1-2 for assignments. Signal in connections are not factory wired. If signal in connections are made, use coaxial cable. Connect one end to the pads as shown on the illustration, and the other end to the front panel BNC connector. The BNC connector need not be disconnected from the circuit.

The AM 502 has a slot between connectors 23 and 24. This identifies it as a member of the signal source family. A barrier in the corresponding position of the Power Module connector allows only signal source plug-ins to be used in that compartment. This protects the plug-in, should specialized connections be made to that compartment. Consult the Building A System section of the Power Module manual for further information.

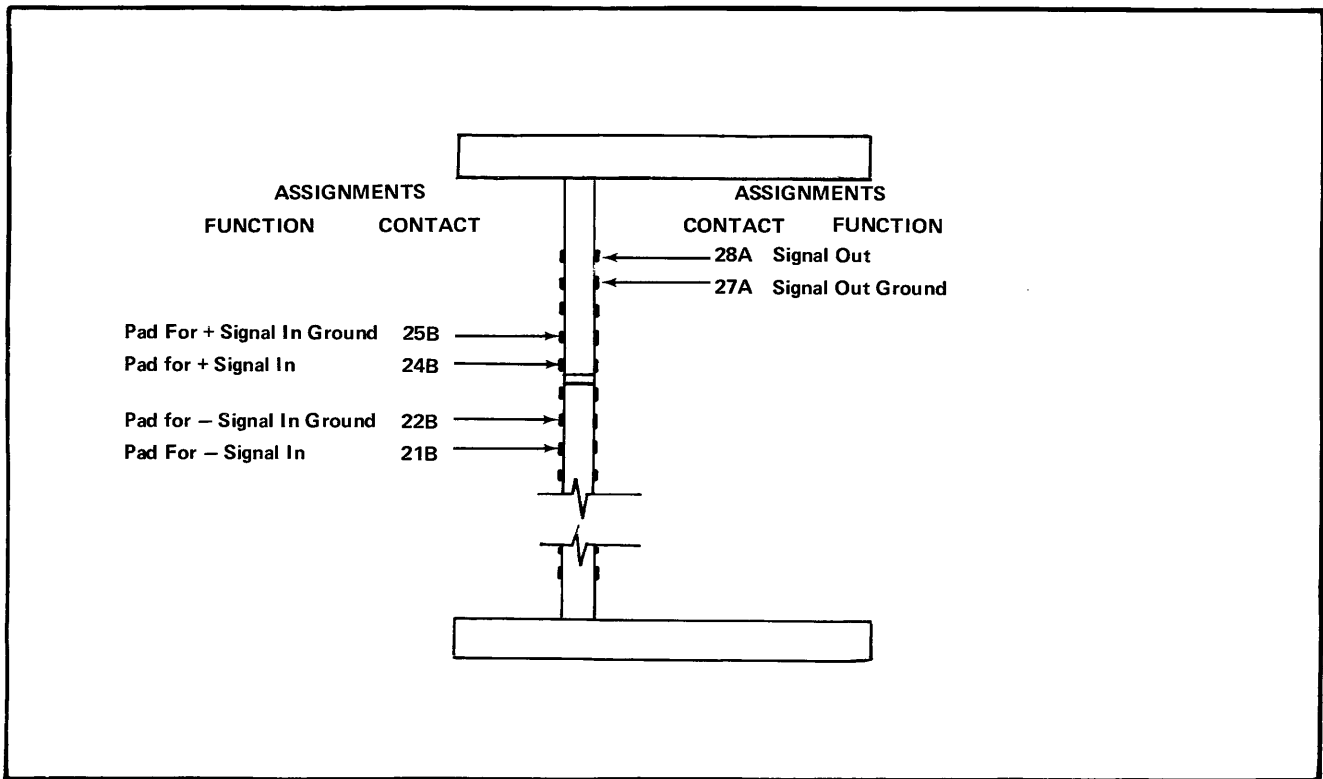


Fig. 1-2. Input-Output assignments for plug-in rear interface contacts.

MEASUREMENT TECHNIQUES

Single-Ended vs. Differential Measurements

Single-ended measurements often yield unsatisfactory results because of interference resulting from ground-loop currents between the AM 502 and the device under test. In other cases, it may be desirable to eliminate a DC voltage by means other than the use of a blocking capacitor, which could limit the low-frequency response. The limitations of single-ended measurements are effectively eliminated by using differential measurements. Fig 1-3 shows several useful examples of differential measurements.

Make differential measurements by connecting each input (+ input and - input) to selected points in the circuit under test. Since the chassis of the AM 502 need not be connected to the test circuit for differential measurements, there are few limitations to the selection of these test points. Do not exceed the maximum safe input voltages as shown in the specification section of this manual. Set the input coupling switches to the same position, AC or DC, depending on the measurements being made. In differential measurements, only the voltage difference between the two signals is amplified. Common mode signals (common in amplitude, frequency, and phase) are rejected.

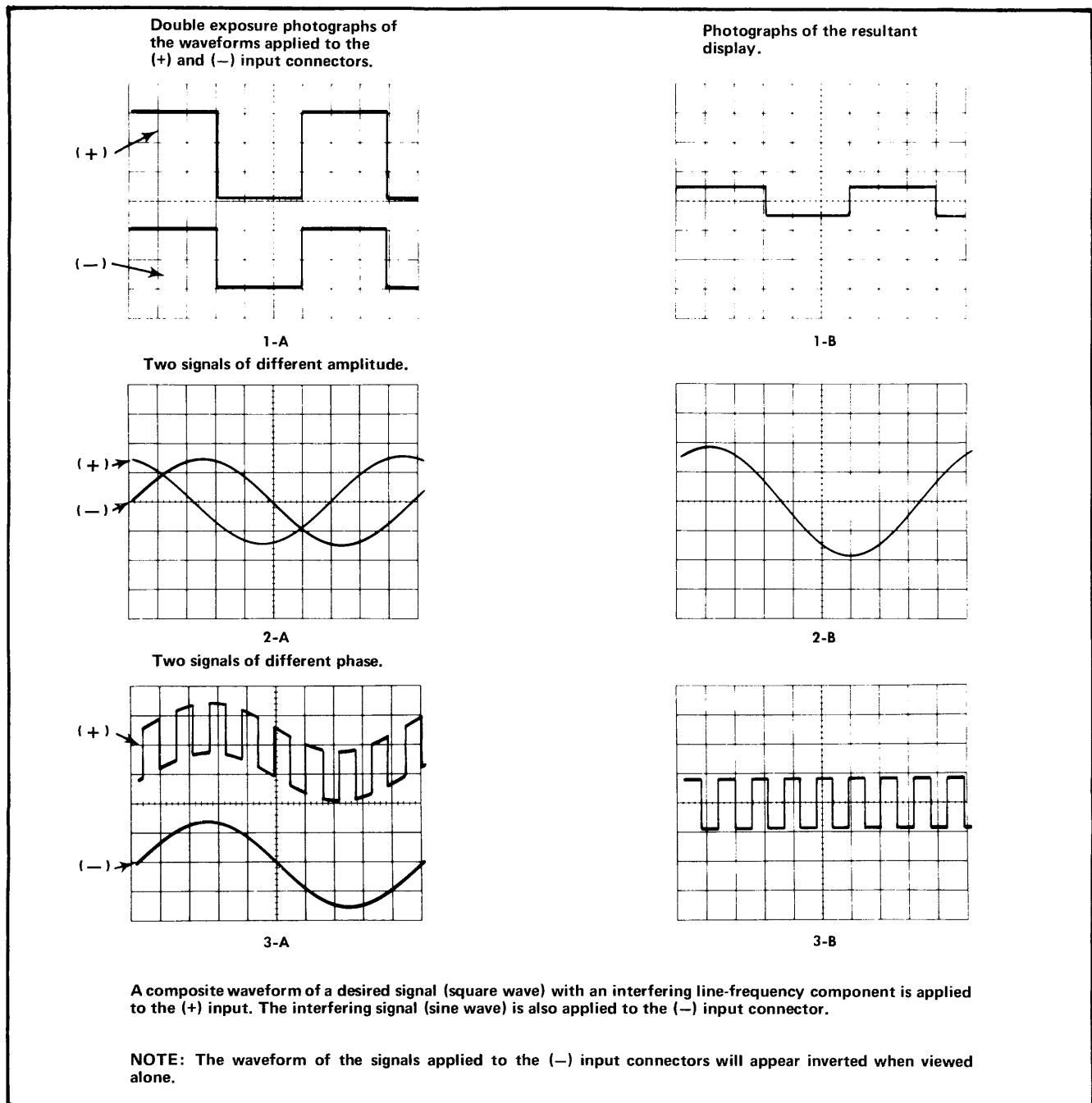


Fig. 1-3. Three examples of differential applications.

Common Mode Rejection Ratio

The ability of the AM 502 to reject common-mode signals is indicated by the common-mode rejection ratio (CMRR). For example, assume that a signal consists of unwanted 60 Hz at 10 volts peak to peak (common mode connected to both inputs), plus a desired signal at 1 mV peak to peak (differentially connected to one input). The AM 502 gain is set at 200. The output of the AM 502 shows the desired signal at an amplitude of 0.2 V

(1 mV X 200), and the 60 Hz signal is viewed at an amplitude of 0.02 V. The CMRR in this application is 100,000:1. This figure is calculated by multiplying the value of the common-mode signal (10 V) by the gain of the amplifier (200) for a product of 2000 V. This product is divided by the observed 60 Hz voltage at the output (0.02 V) and the result is the CMRR, 100,000:1. It would, of course, be impossible to view the 1 mV signal superimposed on the 60 Hz signal by using single input methods.

Degradation of CMRR

There are a number of factors which degrade common-mode rejection. The principal requirement for maximum

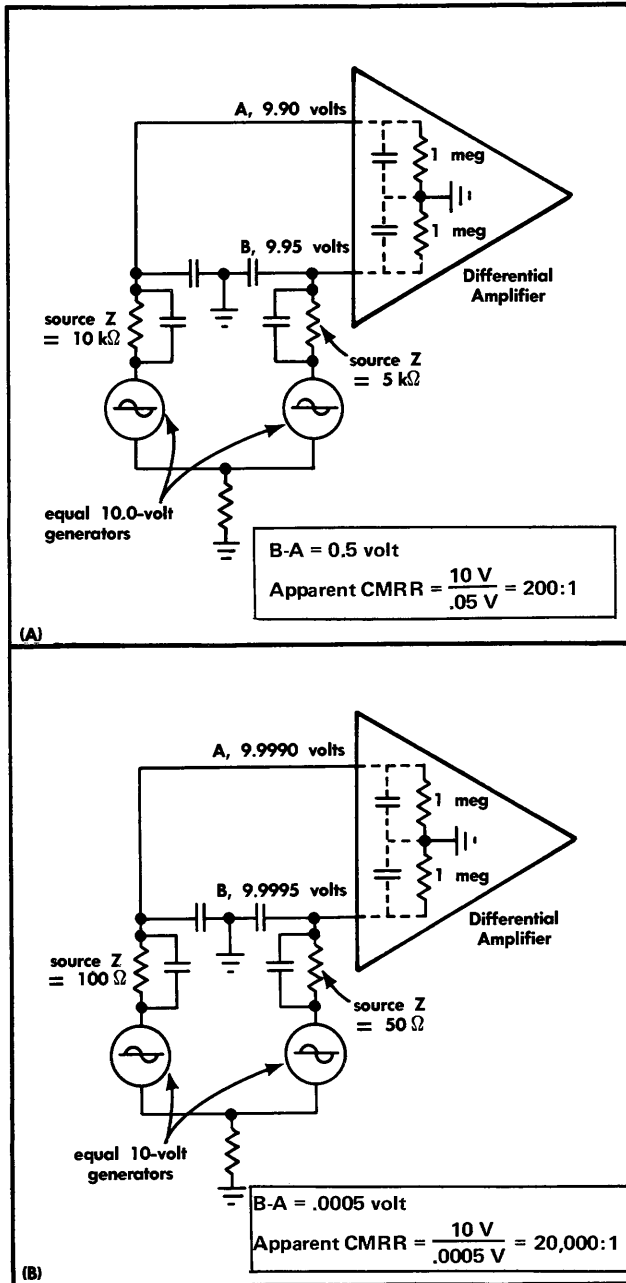


Fig. 1-4. Relationship of test point source impedance to the amplifier input impedance and the apparent CMRR caused by (A) large difference between test-point impedances and (B) low impedance test points.

rejection is for the common-mode signal to arrive at the input FET gates at the same phase and amplitude. A difference of only 0.01% in the attenuation ratios of the input attenuators will reduce the rejection ratio to 10,000 to 1. Also, any difference in source impedance will degrade the rejection ratio. Figs. 1-4 and 1-5 show CMRR degradation due to differences in source impedance. The frequency of the common mode signal also affects the CMRR. Generally, as the frequency of the input signal increases, the CMRR is more difficult to maintain.

The high frequency CMRR will also depend upon the signal source impedance, since various shunt capacitances between the source and the input gate must charge and discharge through that impedance.

Outside influences such as magnetic fields can also degrade the performance, particularly when low level signals are involved. Magnetic interference may be reduced by using identical signal transporting leads to the two inputs. Twist the two leads together over as much of their length as possible. Low-frequency measurements can be similarly protected by using a shielded cable that contains a twisted pair of conductors.

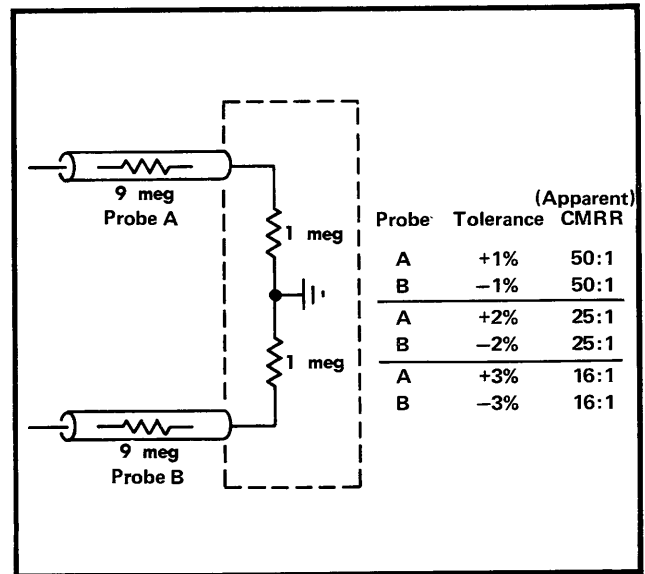


Fig. 1-5. Simplified input circuit and table showing the change in apparent CMRR due to 10X probes that are within 1, 2, and 3% of their attenuation values (with matched 1 MΩ resistors).

SPECIFICATIONS

Performance Conditions

The electrical characteristics are valid only if the AM 502 is calibrated at an ambient temperature between +20°C and +30°C and operated between 0°C and +50°C, unless otherwise noted.

ELECTRICAL CHARACTERISTICS

GAIN:

Normal Mode: 100 to 100,000 in a 1-2-5 sequence.
 ÷ 100 Mode: 1 to 1000 in a 1-2-5 sequence.
 Accuracy: All modes within 2%.

FREQUENCY RESPONSE:

Direct Coupled: With the GAIN control set to 20K (20,000) or less, the selectable HF -3 dB points are within 25% of the indicated setting.
 With the GAIN control set to 50K (50,000), the **maximum** HF -3 dB point is at least 500 kHz.
 With the GAIN control set to 100K (100,000), the **maximum** HF -3 dB point is at least 250 kHz.
 AC Coupled: LF -3 dB is 2 Hz, or less.

OUTPUT (Maximum rated):

Voltage Swing: ±5 V.
 Current: ± 20 mA.
 R_O: 5 Ω or less.
 Minimum Load Impedance: 250 Ω.

INPUT RC: 1 MΩ ±0.1% paralleled by ≈47 pF.

BANDWIDTH (Selectable):

HF -3 dB points: Selectable in 9 steps (1 - 3 sequence) from 100 Hz to 1 MHz (also limited by FREQUENCY RESPONSE at GAIN settings of 50K and 100K.
 LF -3 dB points: Selectable in 6 steps (1 - 10 sequence) from 0.1 Hz to 10 kHz when dc coupled. Each step within 25% of the indicated setting.

COMMON MODE:

Normal Mode:
 Range: ± 5 V.
 Rejection Ratio: 100 dB DC to 50 kHz, direct coupled with inputs shorted together

COMMON MODE (cont):

÷ 100 Mode

Range: ±50 V.

Rejection Ratio: 50 dB DC to 50 kHz direct coupled with ≤ 100 V p-p sine wave input.

DC OFFSET RANGE: ≥± 1 V.

MAXIMUM SAFE INPUT VOLTAGE:

Direct Coupled:

Normal Mode: 15 V (DC + Peak AC) to 5 MHz.

÷ 100 Mode: 350 V (DC + Peak AC).

AC Coupled:

350 V (DC + Peak AC) with coupling capacitor precharged.

MAXIMUM INPUT GATE CURRENT (each input):

50 pA at 25°C.

NOISE (Tangentially

Measured referred to input): 25 μV or less with 25 Ω or less source resistance, from 5 Hz to 1 MHz.

VOLTAGE DRIFT with TEMPERATURE (referred to input):

100 μV per °C.

VOLTAGE DRIFT with TIME (Referred to input):

≤10 μV (p-p) per minute
 ≤20 μV (p-p) per hour.

POWER CONSUMPTION:

6 Watts

ENVIRONMENTAL:

Temperature:

Operating: 0°C to +50°C

Storage: -40°C to +75°C

THEORY OF OPERATION

Introduction

Refer to the schematic diagrams and the block diagram, all located in the pullout pages at the back of this manual, for a complete understanding of the AM 502 circuit operation.

Input Coupling

In the DC mode, signals pass directly from the + and – input connectors to the $\div 100$ switch, which switches the $\div 100$ attenuators in or out of the circuit. In the AC mode, C10 and C20 are connected in series with the + and – inputs, respectively, as DC blocking capacitors. When C10 is being precharged, it is connected to ground through R10 (the same case exists for C20 and R20), and the input at the attenuator is grounded. R35, R38, C32, C34, C35, and C38 comprise the AC compensated $\div 100$ attenuator for the + input. C35 sets the input capacity in the attenuated mode. C30 sets the input capacitance in the normal mode. The – input attenuator and – input capacitance adjustments are identical with the + input. R40 adjusts for optimum DC CMRR when the AM 502 is operating in the $\div 100$ mode.

Input Overdrive Protection

F100, F200 and diode clamps CR108, CR109, CR208, and CR209 provide overdrive protection for Q121A and B at the ± 15 V level. The ± 15 V level is set by zeners VR438 and VR448 through isolation diodes CR438 and CR448. If the signal amplitude exceeds approximately 16.5 V, depending on duration of the excess voltage, the fuses will open.

Gate Current Compensation

Leakage current, associated with the gates of the Input FETs, through the input resistors, R100 and R200, develops an offset voltage at the input gates. At high gain settings, this offset drives the output into overrange. This leakage can be as high as 100 pA (at 25°C), although usually it is much less. (100 pA through 1 M Ω to ground will produce a DC offset of 100 μ V.) To compensate for this leakage current, the FET gates are returned to an adjustable, slightly negative voltage source through R106, R107, R206, R207, and variable R105 and R205.

Leakage current, associated with the input FET gates and the overdrive protection diodes, increases quite rapidly with temperature increase, approximately doubling every 10°C. To compensate for this temperature-dependent leak-

age, a temperature-sensitive current balancing network is included, using thermistors (RT104–RT203) as the sensing elements.

Preamp

The preamp circuit in the AM 502 is made up of two identical feedback amplifiers connected in a differential configuration. The overall gain of the preamp is approximately 42 to the output of Q152A and B.

The supply voltages for the preamp are obtained from a common power supply, which is bootstrapped to the input to improve common-mode rejection. The positive current source, Q410A and B, and Q416 and its associated circuitry, are one end of a divider string that provides the correct operating potentials for the stages in the preamp. The current sink at the bottom of the divider string is Q443. See Fig. 2-1. The current branches through parallel paths at the top of the string, and is summed back into the string via Q445. The difference in current magnitudes at the top and bottom of the string is absorbed by Q451.

Q422 A and B, Q426, and associated circuitry make up the negative current source for the input FETs. Since the current sources are very high impedances, both the negative and positive supplies 'float' with the common-mode signal swing of ± 5 volts. The common-mode signal is introduced into the supplies via Q451 in the positive supply, and via the common sources of the input FETs in the negative supply.

DC Offset

Q141 A and B, Q145 A and B, and DC OFFSET COARSE and FINE controls, R467 and R468 provide means to offset any differential DC component of the input signal. This allows observation of AC components while maintaining good differential capability.

R461, Coarse Step Gain DC Bal adjustment (on the switching diagram) provides current balance in the two sides of the amplifier on all positions of the LF -3 dB switch, except DC OFFSET.

Input Cross Neutralization

Stray capacitive coupling exists between components of the + and – input amplifiers of the preamp. If a signal is applied to the + input, capacitive coupling produces

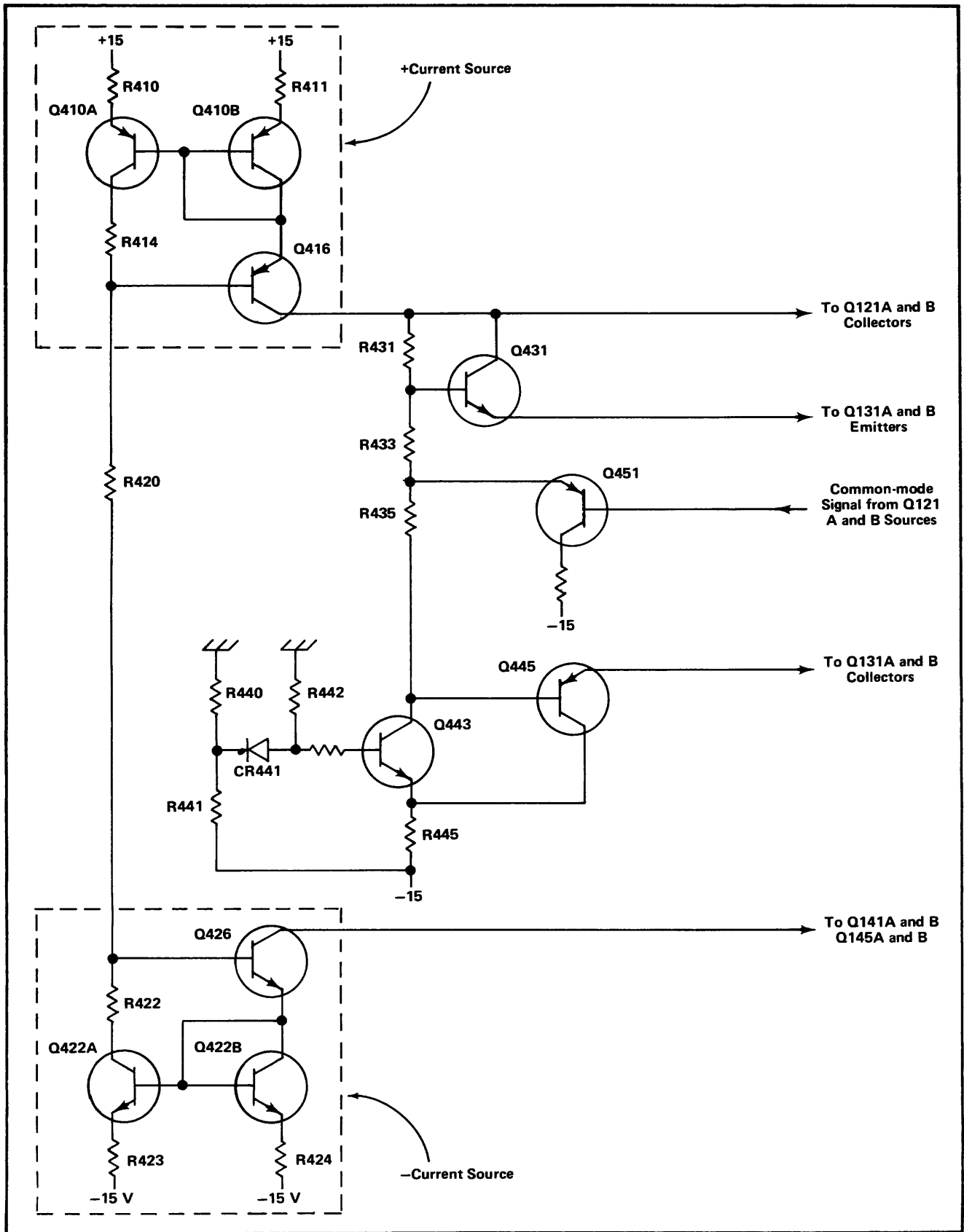


Fig. 2-1. + and - Current sources and divider.

undesirable currents in the – amplifier input. If there is any impedance between the – input and ground, the capacitive current produces a voltage across that impedance. This voltage across the – input impedance subtracts from the + input signal, producing an erroneous output.

C222 (connected in the – input amplifier) is adjusted to divert the undesirable capacitive current away from the input line, minimizing the unbalance. C122 performs the same function for signals applied to the + input.

High Frequency Common-Mode Balance

At higher frequencies, stray capacitances to ground at various points in the preamp begin to inject a significant differential current (as a result of common-mode signals) into the amplifier, producing a signal at the amplifier output. C150, connected from a common-mode signal point (the floating power supply) is adjusted to minimize this output current to extend the range of frequencies over which useful common-mode rejection can be obtained.

Preamp Output Stage

The final stage (Q152 A and B) of the preamp contributes a small amount of gain. Its primary function is to reduce the common-mode DC level to zero volts.

CR150 and CR250 rectify the input signal to drive the overrange detector circuitry. The diodes are normally conducting very slightly. When the input signal exceeds about 5 volts common-mode, the diodes turn on hard and drive the emitter of Q251 in the overrange detector circuit to light the OVERRANGE indicator.

STEP GAIN DC BAL, R158, provides a balance which prevents output DC level shift when the GAIN switch is rotated through its gain setting positions.

LF –3 dB POINT Selector

This switch selects the low frequency –3 dB point of the amplifier by switching series RC networks between the output of Q152 and the input of Q162. The selector has a range of 0.1 Hz through 10 kHz in decade steps.

Gain Switching Amplifier

The Gain Switching Amplifier is a differential feedback amplifier having a gain range of 0.48 to 480. The gain is changed by switching values of resistance between Q162 A and B sources. This amplifier configuration has high

open-loop gain in the differential mode, while offering very low common-mode gain.

R161, Step Gain AC Bal, balances the bias voltages of Q164 A and Q164 B.

Q167 and Q267 serve two functions. The base-emitter junctions of these transistors serve as reverse-bias protection for Q168 and Q268. When the stage gain is excessive, the output signal at Q167-Q267 drives the overrange indicator circuitry to indicate a differential overrange condition.

HF –3 dB POINT Selector

This switch selects the high frequency point by switching shunt capacitance across the output of the gain switching stage. The selector has a range of 100 Hz through 1 MHz in multiples of 1 and 3.

Variable Gain Stage

This stage is a feedback amplifier having a gain of approximately ten in the calibrated variable position (switch S178 closed) and a gain of approximately four with R178 set at maximum resistance (S178 open).

R269 corrects for current imbalance introduced by the previous stage (bias balancing Q164 A and B). With Q171A and Q171B source voltages identical, rotating the front-panel VARIABLE control causes no shift of the DC output level.

CR181 and CR281 act as peak detectors, providing a signal to the overrange detector circuit (Q501 emitter). A swing greater than +6 volts on the collectors of Q181 or Q281 will give an overrange indication.

The common-mode level is detected at the junction of R175-R275, and is compared to ground by the comparator Q195-Q196. The comparator output is fed back to Q171A and B via Q269 to maintain the R178-R278 junction at zero volts.

The single-ended output of the variable gain stage is fed to the unity gain trans-impedance output amplifier.

Output Amplifier

The output amplifier provides a ± 5 -volt differential swing with a 0-volt DC level. The output R_O is approximately 2Ω . The output amplifier is short circuit protected to ground and to the power supply. If the current in R571

Theory of Operation—AM 502

causes the voltage at Q571B collector to fall far enough below the level of Q555 emitter, CR555 conducts, taking current from Q555 (the current source for Q561A), reducing the drive to Q571B, thus limiting the output current.

Overrange Indicator

When any of the three input transistors, Q501, Q511, or Q521, is turned on by an overrange signal from the amplifier, a turn-on current is supplied to Q532 base.

Q532 and Q541 comprise a monostable multivibrator which has a minimum on time of approximately 200 ms; thus, the indicator lamp is held on for a minimum of 200 ms, regardless of the duration of the overrange signal.

Power Supplies

Regulation of the ± 15 V is accomplished through operational amplifiers in the AM 502. These operational

amplifiers control the current to the unit through series-pass transistors located in the power module. The inputs of both integrated circuits seek common levels by varying the current supplied to the unit. Should the power supply load increase, pin 2 of U990, (in the -15 V supply) goes more positive, causing pin 6 to go more negative. This action increases current flow in the series-pass transistor and restores the voltage to the initial level. The $+15$ V supply operates in the same manner, except that the polarities are different.

Should the current increase to a level that the voltage drop across R970 is great enough to cause Q990 to conduct, current is taken from the series-pass transistor until it is turned off. This action limits the current available to the amplifier, should an overload or short circuit occur.

The minus supply is referenced to the $+15$ V; the positive supply is referenced through VR910 to $+9$ V.

DIAGRAMS, PARTS LISTS, AND ILLUSTRATIONS

Symbols and Reference Designators

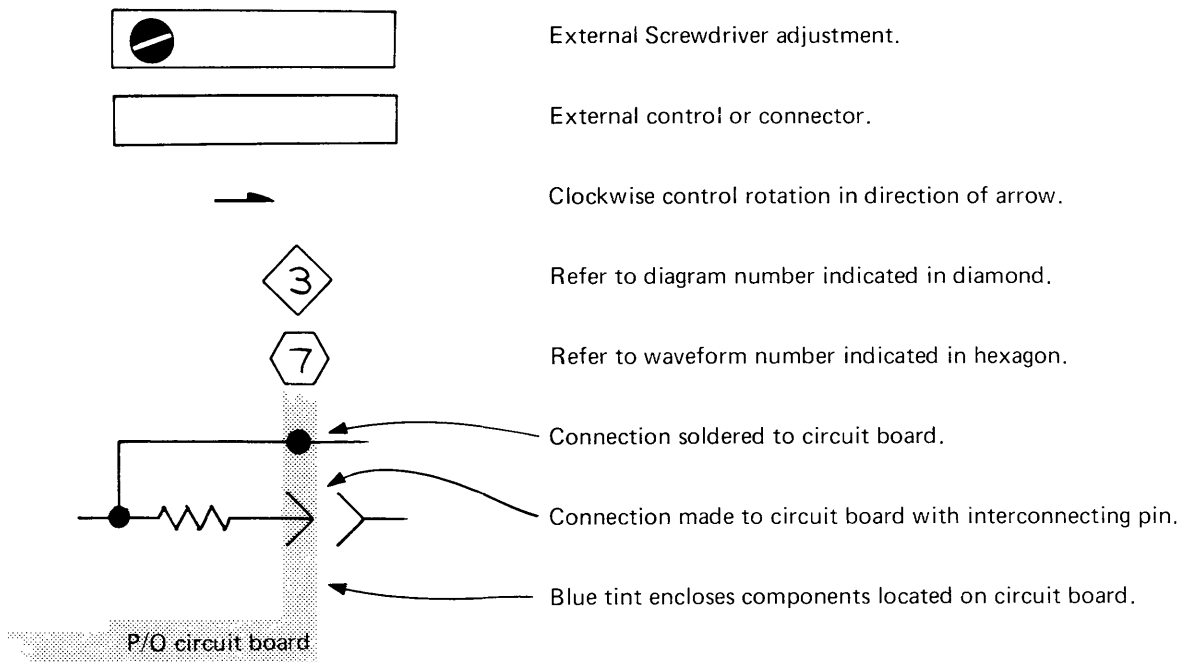
Electrical components shown on the diagrams are in the following units unless noted otherwise:

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

Symbols used on the diagrams are based on ANSI Y32.2 – 1970.

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

The following special symbols are used on the diagrams:



REPLACEABLE ELECTRICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000 Part first added at this serial number
00X Part removed after this serial number

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

| | | | |
|--------|----------------------|----------|-----------------|
| ACTR | ACTUATOR | PLSTC | PLASTIC |
| ASSY | ASSEMBLY | QTZ | QUARTZ |
| CAP | CAPACITOR | RECP | RECEPTACLE |
| CER | CERAMIC | RES | RESISTOR |
| CKT | CIRCUIT | RF | RADIO FREQUENCY |
| COMP | COMPOSITION | SEL | SELECTED |
| CONN | CONNECTOR | SEMICOND | SEMICONDUCTOR |
| ELCTLT | ELECTROLYTIC | SENS | SENSITIVE |
| ELEC | ELECTRICAL | VAR | VARIABLE |
| INCAND | INCANDESCENT | WW | WIREWOUND |
| LED | LIGHT EMITTING DIODE | XFMR | TRANSFORMER |
| NONWIR | NON WIREWOUND | XTAL | CRYSTAL |

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

| MFR.CODE | MANUFACTURER | ADDRESS | CITY,STATE,ZIP |
|----------|---|-------------------------------------|--|
| 00853 | SANGAMO ELECTRIC CO., S. CAROLINA DIV. | P. O. BOX 128 | PICKENS, SC 29671 |
| 01002 | GENERAL ELECTRIC CO., INDUSTRIAL AND POWER CAPACITOR PRODUCTS DEPT. | JOHN ST. 1201 2ND ST. SOUTH | HUDSON FALLS, NY 12839 MILWAUKEE, WI 53204 |
| 01121 | ALLEN-BRADLEY CO. | | |
| 01295 | TEXAS INSTRUMENTS, INC., SEMICONDUCTOR GROUP | P. O. BOX 5012 ROUTE 202 | DALLAS, TX 75222 SOMERVILLE, NY 08876 |
| 02735 | RCA CORP., SOLID STATE DIVISION | | |
| 03508 | GENERAL ELECTRIC CO., SEMI-CONDUCTOR PRODUCTS DEPT. | ELECTRONICS PARK | SYRACUSE, NY 13201 |
| 04713 | MOTOROLA, INC., SEMICONDUCTOR PRODUCTS DIV. | 5005 E. MCDOWELL RD. | PHOENIX, AZ 85036 |
| 07263 | FAIRCHILD SEMICONDUCTOR, A DIV. OF FAIRCHILD CAMERA AND INSTRUMENT CORP. | 464 ELLIS ST. 12515 CHADRON AVE. | MOUNTAIN VIEW, CA 94042 HAWTHORNE, CA 90250 |
| 07910 | TELEDYNE SEMICONDUCTOR | | |
| 11237 | CTS KEENE, INC. | | PASO ROBLES, CA 93446 |
| 12040 | NATIONAL SEMICONDUCTOR CORP. | COMMERCE DRIVE | DANBURY, CT 06810 |
| 17537 | LAMPS, INC., DIV. OF MARCO-OAK INC. DELETED, REPLACED BY: 87034 | | |
| 21845 | SOLITRON DEVICES, INC., TRANSISTOR DIV. | 1177 BLUE HERON BLVD. | RIVIERA BEACH, FL 33404 |
| 24931 | SPECIALTY CONNECTOR CO., INC. | 3560 MADISON AVE. | INDIANAPOLIS, IN 46227 |
| 50157 | N. L. INDUSTRIES, INC., ELECTRONICS DEPT. | P. O. BOX 787 | MUSKEGON, MI 49443 NORTH ADAMS, MA 01247 |
| 56289 | SPRAGUE ELECTRIC CO. | | |
| 71400 | BUSSMAN MFG., DIVISION OF MCGRAW- EDISON CO. | 2536 W. UNIVERSITY ST. | ST. LOUIS, MO 63107 |
| 71590 | CENTRALAB ELECTRONICS, DIV. OF GLOBE-UNION, INC. | 5757 N. GREEN BAY AVE. | MILWAUKEE, WI 53201 |
| 72982 | ERIE TECHNOLOGICAL PRODUCTS, INC. | 644 W. 12TH ST. | ERIE, PA 16512 |
| 73138 | BECKMAN INSTRUMENTS, INC., HELIPOT DIV. | 2500 HARBOR BLVD. | FULLERTON, CA 92634 |
| 74970 | JOHNSON, E. F., CO. | 299 10TH AVE. S. W. | WASECA, MN 56093 |
| 75042 | TRW ELECTRONIC COMPONENTS, IRC FIXED RESISTORS, PHILADELPHIA DIVISION | 401 N. BROAD ST. | PHILADELPHIA, PA 19108 |
| 78488 | STACKPOLE CARBON CO. | | ST. MARYS, PA 15857 |
| 80009 | TEKTRONIX, INC. | P. O. BOX 500 | BEAVERTON, OR 97077 |
| 80294 | BOURNS, INC., INSTRUMENT DIV. | 6135 MAGNOLIA AVE. | RIVERSIDE, CA 92506 |
| 81483 | INTERNATIONAL RECTIFIER CORP. | 9220 SUNSET BLVD. | LOS ANGELES, CA 90069 |
| 90201 | MALLORY CAPACITOR CO., DIV. OF P. R. MALLORY CO., INC. | 3029 E. WASHINGTON ST. | INDIANAPOLIS, IN 46206 |
| 91637 | DALE ELECTRONICS, INC. | P. O. BOX 609 | COLUMBUS, NB 68601 |
| 91836 | KINGS ELECTRONICS CO., INC. | 40 MARBLEDALE ROAD | TUCKAHOE, NY 10707 |

Electrical Parts List—AM 502

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|--------------------------------------|----------|------------------|
| A1 | 670-2733-00 | | | CKT BOARD ASSY:MAIN | 80009 | 670-2733-00 |
| C10 | 295-0155-00 | | | CAP.,MATCHED:TWO 0.1UF,10%,600V | 80009 | 295-0155-00 |
| C20 | | | | | | |
| C28 | 281-0663-00 | | | CAP.,FXD,CER DI:10.4PF,1%,500V | 72982 | 374-005COG01049F |
| C30 | 281-0081-00 | | | CAP.,VAR,AIR DI:1.8-13PF,375VDC | 74970 | 189-6-5 |
| C32 | 281-0081-00 | | | CAP.,VAR,AIR DI:1.8-13PF,375VDC | 74970 | 189-6-5 |
| C34 | 281-0645-00 | | | CAP.,FXD,CER DI:8.2PF,+/-0.25PF,500V | 72982 | 374-011COH0829C |
| C35 | 281-0081-00 | | | CAP.,VAR,AIR DI:1.8-13PF,375VDC | 74970 | 189-6-5 |
| C38 | 283-0626-00 | | | CAP.,FXD,MICA D:1800PF,5%,500V | 00853 | D195E182J0 |
| C48 | 381-0663-00 | | | CAP.,FXD,CER DI:10.4PF,1%,500V | 72982 | 374005COG1049F |
| C50 | 281-0081-00 | | | CAP.,VAR,AIR DI:1.8-13PF,375VDC | 74970 | 189-6-5 |
| C52 | 281-0081-00 | | | CAP.,VAR,AIR DI:1.8-13PF,375VDC | 74970 | 189-6-5 |
| C54 | 281-0645-00 | | | CAP.,FXD,CER DI:8.2PF,+/-0.25PF,500V | 72982 | 374-011COH0829C |
| C55 | 281-0081-00 | | | CAP.,VAR,AIR DI:1.8-13PF,375VDC | 74970 | 189-6-5 |
| C58 | 283-0626-00 | | | CAP.,FXD,MICA D:1800PF,5%,500V | 00853 | D195E182J0 |
| C107 | 283-0005-00 | | | CAP.,FXD,CER DI:0.01UF,+100-0%,250V | 72982 | 8131-250651103P |
| C122 | 281-0093-00 | B010100 | B039999 | CAP.,VAR,CER DI:5.5-18PF | 72982 | 538-011COP092R |
| C122 | 281-0092-00 | B040000 | | CAP.,VAR,CER DI:9-35PF | 72982 | 538-011E2P094R |
| C131 | 281-0612-00 | | | CAP.,FXD,CER DI:5.6PF,+/-0.5PF,500V | 72982 | 374-001COH0569D |
| C146 | 283-0177-00 | | | CAP.,FXD,CER DI:1UF,+80-20%,25V | 72982 | 8131N039651105Z |
| C150 | 281-0114-00 | | | CAP.,VAR,AIR DI:1.3-5.4PF,750V | 74970 | 189-0352-075 |
| C164 | 281-0523-00 | | | CAP.,FXD,CER DI:100PF,+/-20PF,350V | 72982 | 301-000U2M0101M |
| C176 | 281-0618-00 | | | CAP.,FXD,CER DI:4.7PF,+/-0.5PF,200V | 72982 | 374-001COH0479D |
| C195 | 281-0518-00 | | | CAP.,FXD,CER DI:47PF,+/-9.4PF,500V | 72982 | 301-000U2J0470M |
| C207 | 283-0005-00 | | | CAP.,FXD,CER DI:0.01UF,+100-0%,250V | 72982 | 8131-250651103P |
| C222 | 281-0093-00 | B010100 | B039999 | CAP.,VAR,CER DI:5.5-18PF | 72982 | 538-011COP092R |
| C222 | 281-0092-00 | B040000 | | CAP.,VAR,CER DI:9-35PF | 72982 | 538-011E2P094R |
| C231 | 281-0612-00 | | | CAP.,FXD,CER DI:5.6PF,+/-0.5PF,500V | 72982 | 374-001COH0569D |
| C264 | 281-0523-00 | | | CAP.,FXD,CER DI:100PF,+/-20PF,350V | 72982 | 301-000U2M0101M |
| C276 | 281-0618-00 | | | CAP.,FXD,CER DI:4.7PF,+/-0.5PF,200V | 72982 | 374-001COH0479D |
| C431 | 290-0527-00 | | | CAP.,FXD,ELCTLT:15UF,20%,20V | 90201 | TDC156M020NLF |
| C433 | 290-0527-00 | | | CAP.,FXD,ELCTLT:15UF,20%,20V | 90201 | TDC156M020NLF |
| C435 | 290-0527-00 | | | CAP.,FXD,ELCTLT:15UF,20%,20V | 90201 | TDC156M020NLF |
| C438 | 283-0177-00 | | | CAP.,FXD,CER DI:1UF,+80-20%,25V | 72982 | 8131N039651105Z |
| C443 | 290-0527-00 | | | CAP.,FXD,ELCTLT:15UF,20%,20V | 90201 | TDC156M020NLF |
| C448 | 283-0177-00 | | | CAP.,FXD,CER DI:1UF,+80-20%,25V | 72982 | 8131N039651105Z |
| C450 | 281-0613-00 | | | CAP.,FXD,CER DI:10PF,+/-1PF,200V | 72982 | 374-001COG0100F |
| C470 | 283-0594-00 | | | CAP.,FXD,MICA D:0.001UF,1%,100V | 00853 | D151F102F0 |
| C471 | 283-0594-00 | | | CAP.,FXD,MICA D:0.001UF,1%,100V | 00853 | D151F102F0 |
| C472 | 285-0809-00 | | | CAP.,FXD,PLSTC:1UF,10%,50V | 56289 | LP66A1A105K |
| C473 | 285-0809-00 | | | CAP.,FXD,PLSTC:1UF,10%,50V | 56289 | LP66A1A105K |
| C490 | 281-0511-00 | | | CAP.,FXD,CER DI:22PF,+/-2.2PF,500V | 72982 | 301-000COG0220K |
| C491 | 281-0721-00 | | | CAP.,FXD,CER DI:72PF,5%,500V | 72982 | 301-000P3K720J |
| C493 | 283-0604-00 | | | CAP.,FXD,MICA D:304PF,2%,300V | 00853 | D153F3040G0 |
| C494 | 283-0594-00 | | | CAP.,FXD,MICA D:0.001UF,1%,100V | 00853 | D151F102F0 |
| C495 | 285-0627-00 | | | CAP.,FXD,PLSTC:0.0033UF,5%,100V | 56289 | 410P33251 |
| C496 | 285-0598-00 | | | CAP.,FXD,PLSTC:0.01UF,5%,100V | 01002 | 61F10AC103 |
| C497 | 285-0702-00 | | | CAP.,FXD,PLSTC:0.033UF,5%,100V | 56289 | 410P111 |
| C498 | 285-0703-00 | | | CAP.,FXD,PLSTC:0.1UF,5%,100V | 56289 | 410P112 |
| C499 | 285-0633-00 | | | CAP.,FXD,PLSTC:0.22UF,20%,200V | 56289 | 410P22491 |
| C530 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| C536 | 290-0534-00 | | | CAP.,FXD,ELCTLT:1UF,20%,35V | 56289 | 196D105X0035HA1 |

Electrical Parts List—AM 502

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|--------|---|----------|-----------------|
| C552 | 281-0511-00 | | | CAP.,FXD,CER DI:22PF,+/-2.2PF,500V | 72982 | 301-000COG0220K |
| C560 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| C570 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| C910 | 290-0512-00 | | | CAP.,FXD,ELCTLT:22UF,20%,15V | 56289 | 196D226X0015KA1 |
| C922 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| C924 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| C926 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| C930 | 290-0527-00 | | | CAP.,FXD,ELCTLT:15UF,20%,20V | 90201 | TDC156M02ONLF |
| C942 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| C960 | 290-0527-00 | | | CAP.,FXD,ELCTLT:15UF,20%,20V | 90201 | TDC156M02ONLF |
| C964 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| C966 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| C968 | 283-0111-00 | | | CAP.,FXD,CER DI:0.1UF,20%,50V | 72982 | 8131N075651104M |
| CR108 | 152-0323-00 | | | SEMICOND DEVICE:SILICON,35V,100MA | 03508 | SE365 |
| CR109 | 152-0323-00 | | | SEMICOND DEVICE:SILICON,35V,100MA | 03508 | SE365 |
| CR131 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR150 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR181 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR208 | 152-0323-00 | | | SEMICOND DEVICE:SILICON,35V,100MA | 03508 | SE365 |
| CR209 | 152-0323-00 | | | SEMICOND DEVICE:SILICON,35V,100MA | 03508 | SE365 |
| CR231 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR250 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR281 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR438 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR441 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR448 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR531 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR555 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR558 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR560 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR561 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR570 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| CR571 | 152-0141-02 | | | SEMICOND DEVICE:SILICON,30V,150MA | 07910 | 1N4152 |
| DS50 | 150-0107-00 | | | LAMP,INCAND:12V,0.04A,T-1 | 17537 | 227 |
| DS900 | 150-0107-00 | | | LAMP,INCAND:12V,0.04A,T-1 | 17537 | 227 |
| F100 | 159-0024-00 | | | FUSE,CARTRIDGE:3AG,0.06A,250V,FAST BLOW | 71400 | AGC1-16 |
| F200 | 159-0024-00 | | | FUSE,CARTRIDGE:3AG,0.06A,250V,FAST BLOW | 71400 | AGC1-16 |
| J10 | 131-0955-00 | | | CONNECTOR,RCPT,:BNC,FEMALE | 24931 | 28JR200-1 |
| J15 | 129-0103-00 | | | POST,BDG,ELEC:ASSEMBLY | 80009 | 129-0103-00 |
| J20 | 131-0955-00 | | | CONNECTOR,RCPT,:BNC,FEMALE | 24931 | 28JR200-1 |
| J550 | 131-0818-00 | | | CONNECTOR,RCPT,:BNC,FEMALE | 91836 | KC19-153BNC |
| L164 | 108-0409-00 | | | COIL,RF:17.5UH | 80009 | 108-0409-00 |
| L264 | 108-0409-00 | | | COIL,RF:17.5UH | 80009 | 108-0409-00 |
| L416 | 276-0507-00 | | | SHIELDING BEAD,:0.6UH | 78488 | 57-0180-7D |
| L426 | 276-0507-00 | | | SHIELDING BEAD,:0.6UH | 78488 | 57-0180-7D |
| L445 | 276-0507-00 | | | SHIELDING BEAD,:0.6UH | 78488 | 57-0180-7D |
| Q121A,B | 151-1027-00 | | | TRANSISTOR:SILICON,JFE,N-CHAN | 80009 | 151-1027-00 |
| Q131A,B | 151-0261-00 | | | TRANSISTOR:SILICON,PNP,DUAL | 12040 | NS7410 |
| Q136 | 151-1025-00 | | | TRANSISTOR:SILICON,JFE,N-CHANNEL | 01295 | SBA8129 |
| Q141A,B | 151-0176-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 04713 | SD555 |
| Q145A,B | 151-0261-00 | | | TRANSISTOR:SILICON,PNP,DUAL | 12040 | NS7410 |

| Ckt No. | Tektronix Part No. | Serial/Model No. | | Name & Description | Mfr | |
|---------|--------------------|------------------|---------|---------------------------------------|-------|-----------------|
| | | Eff | Dscont | | Code | Mfr Part Number |
| Q152A,B | 153-0586-00 | | | TRANSISTOR:SILICON,PNP,PAIR | 80009 | 153-0586-00 |
| Q162A,B | 151-1036-00 | | | TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL | 21845 | FD1551 |
| Q164A,B | 153-0586-00 | | | TRANSISTOR:SILICON,PNP,PAIR | 80009 | 153-0586-00 |
| Q167 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q168 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q171A,B | 151-1029-00 | | | TRANSISTOR:SILICON,JFE,N-CHANNEL,DUAL | 01295 | SFB8823 |
| Q181 | 151-0188-00 | | | TRANSISTOR:SILICON,PNP | 04713 | 2N3906 |
| Q185 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q195 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q196 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q236 | 151-1025-00 | | | TRANSISTOR:SILICON,JFE,N-CHANNEL | 01295 | SBA8129 |
| Q267 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q268 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q269 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q281 | 151-0188-00 | | | TRANSISTOR:SILICON,PNP | 04713 | 2N3906 |
| Q285 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q410A,B | 153-0586-00 | | | TRANSISTOR:SILICON,PNP,PAIR | 80009 | 153-0586-00 |
| Q416 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q422A,B | 153-0587-00 | | | TRANSISTOR:SILICON,NPN,PAIR | 80009 | 153-0587-00 |
| Q426 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q431 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q443 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q445 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q451 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q501 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q511 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q521 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q532 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q540 | 151-0260-00 | | | TRANSISTOR:SILICON,NPN | 02735 | 2N5189 |
| Q541 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q555 | 151-0220-00 | | | TRANSISTOR:SILICON,PNP | 80009 | 151-0220-00 |
| Q558 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q561A,B | 151-0307-00 | | | TRANSISTOR:SILICON,PNP,DUAL | 07263 | SP13404 |
| Q571A,B | 151-0309-00 | | | TRANSISTOR:SILICON,NPN,DUAL | 07263 | SP13378 |
| Q910 | 151-0301-00 | B010100 | B040389 | TRANSISTOR:SILICON,PNP | 04713 | 2N2907A |
| Q910 | 151-0302-00 | B040390 | | TRANSISTOR:SILICON,NPN | 04713 | 2N2222A |
| Q940 | 151-0334-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0334-00 |
| Q942 | 151-0190-00 | | | TRANSISTOR:SILICON,NPN | 80009 | 151-0190-00 |
| Q990 | 151-0302-00 | B010100 | B040289 | TRANSISTOR:SILICON,NPN | 04713 | 2N2222A |
| Q990 | 151-0301-00 | B040390 | | TRANSISTOR:SILICON,PNP | 04713 | 2N2907A |
| R10 | 315-0105-00 | | | RES.,FXD,CMPSN:1M OHM,5%,0.25W | 01121 | CB1055 |
| R20 | 315-0105-00 | | | RES.,FXD,CMPSN:1M OHM,5%,0.25W | 01121 | CB1055 |
| R30 | 322-0687-07 | | | RES.,FXD,FILM:100.5M OHM,0.1%,0.25W | 91637 | MFF1421C10053B |
| R35 | 322-0624-07 | | | RES.,FXD,FILM:990K OHM,0.1%,0.25W | 75042 | CEBT0-9903B |
| R38 | 321-0289-03 | | | RES.,FXD,FILM:10K OHM,0.25%,0.125W | 75042 | CEAT2-1002C |
| R40 | 311-1566-00 | | | RES.,VAR,NONWIR:200 OHM,20%,0.50W | 73138 | 91A-200R0M |
| R50 | 322-0687-07 | | | RES.,FXD,FILM:100.5M OHM,0.1%,0.25W | 91637 | MFF1421C10053B |
| R55 | 322-0624-07 | | | RES.,FXD,FILM:990K OHM,0.1%,0.25W | 75042 | CEBT0-9903B |
| R58 | 321-0289-03 | | | RES.,FXD,FILM:10K OHM,0.25%,0.125W | 75042 | CEAT2-1002C |
| R103 | 321-0281-00 | | | RES.,FXD,FILM:8.25K OHM,1%,0.125W | 75042 | CEAT0-8251F |
| R105 | 311-1559-00 | | | RES.,VAR,NONWIR:10K OHM,20%,0.50W | 73138 | 91A-10001M |
| R106 | 315-0107-00 | | | RES.,FXD,CMPSN:100M OHM,5%,0.25W | 01121 | CB1075 |
| R107 | 315-0107-00 | | | RES.,FXD,CMPSN:100M OHM,5%,0.25W | 01121 | CB1075 |

Electrical Parts List—AM 502

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|-------------------|--------------------|----------------------|---------|--------------------------------------|----------|-----------------|
| R120 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 01121 | CB1015 |
| R121 | 321-0222-00 | | | RES.,FXD,FILM:2K OHM,1%,0.125W | 75042 | CEATO-2001F |
| R122 | 315-0512-00 | | | RES.,FXD,CMPSN:5.1K OHM,5%,0.25W | 01121 | CB5125 |
| R125 | 321-0114-00 | | | RES.,FXD,FILM:150 OHM,1%,0.125W | 75042 | CEATO-1500F |
| R126 | 321-0927-07 | | | RES.,FXD,FILM:125 OHM,0.1%,0.125W | 91637 | MFF1816C125ROB |
| R131 | 321-0251-00 | | | RES.,FXD,FILM:4.02K OHM,1%,0.125W | 75042 | CEATO-4021F |
| R136 | 321-0199-06 | | | RES.,FXD,FILM:1.15K OHM,0.25%,0.125W | 75042 | CEAT9-1151C |
| R137 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 01121 | CB1015 |
| R141 | 321-0813-07 | | | RES.,FXD,FILM:495 OHM,0.1%,0.125W | 75042 | CEAT9-4950B |
| R145 | 321-0353-00 | | | RES.,FXD,FILM:46.4K OHM,1%,0.125W | 75042 | CEATO-4642F |
| R146 | 321-0272-00 | | | RES.,FXD,FILM:6.65K OHM,1%,0.125W | 75042 | CEATO-6651F |
| R152 | 321-0222-00 | | | RES.,FXD,FILM:2K OHM,1%,0.125W | 75042 | CEATO-2001F |
| R154 | 321-0225-06 | | | RES.,FXD,FILM:2.15K OHM,0.25%,0.125 | 75042 | CEAT9-2151C |
| R155 | 321-0154-00 | B010100 | B039999 | RES.,FXD,FILM:392 OHM,1%,0.125W | 75042 | CEATO-3920F |
| R155 | 321-0150-00 | B040000 | | RES.,FXD,FILM:357 OHM,1%,0.125W | 75042 | CEATO-3570F |
| R157 | 315-0564-00 | | | RES.,FXD,CMPSN:560K OHM,5%,0.25W | 01121 | CB5645 |
| R158 | 311-0467-00 | | | RES.,VAR,NONWIR:100K OHM,20%,0.50W | 11237 | 41334 |
| R159 | 311-1567-00 | B010100 | B039999 | RES.,VAR,NONWIR:100 OHM,20%,0.50W | 73138 | 91A-100ROM |
| R159 | 311-1566-00 | B040000 | | RES.,VAR,NONWIR:200 OHM,20%,0.50W | 73138 | 91A-200ROM |
| R160 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 01121 | CB1025 |
| R161 | 311-1564-00 | | | RES.,VAR,NONWIR:500 OHM,20%,0.50W | 73138 | 91A-500ROM |
| R162 | 321-0240-00 | | | RES.,FXD,FILM:3.09K OHM,1%,0.125W | 75042 | CEATO-3091F |
| R164 | 321-0309-00 | | | RES.,FXD,FILM:16.2K OHM,1%,0.125W | 75042 | CEATO-1622F |
| R166 | 321-0143-00 | | | RES.,FXD,FILM:301 OHM,1%,0.125W | 75042 | CEATO-3010F |
| R168 | 321-0224-00 | | | RES.,FXD,FILM:2.1K OHM,1%,0.125W | 75042 | CEATO-2101F |
| R170 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 01121 | CB1025 |
| R171 | 321-0277-00 | | | RES.,FXD,FILM:7.5K OHM,1%,0.125W | 75042 | CEATO-7501F |
| R173 | 321-0239-07 | | | RES.,FXD,FILM:3.01K OHM,0.1%,0.125W | 75042 | CEAT9-3011B |
| R175 | 321-0289-07 | | | RES.,FXD,FILM:10K OHM,0.1%,0.125W | 75042 | CEAT9-1002B |
| R176 | 321-1267-03 | | | RES.,FXD,FILM:5.97K OHM,0.25%,0.125W | 75042 | CEAT2-5971C |
| R177 | 321-0147-00 | | | RES.,FXD,FILM:332 OHM,1%,0.125W | 75042 | CEATO-3320F |
| R178 ¹ | 311-1494-00 | | | RES.,VAR,NONWIR:2K OHM,10%,1W | 01121 | 11M187 |
| R181 | 321-0187-00 | | | RES.,FXD,FILM:866 OHM,1%,0.125W | 75042 | CEATO-8660F |
| R184 | 321-0297-00 | | | RES.,FXD,FILM:12.1K OHM,1%,0.125W | 75042 | CEATO-1212F |
| R185 | 321-0236-00 | | | RES.,FXD,FILM:2.8K OHM,1%,0.125W | 75042 | CEATO-2801F |
| R191 | 311-1555-00 | | | RES.,VAR,NONWIR:100K OHM,20%,0.5W | 73138 | 91A-10002M |
| R193 | 315-0474-00 | | | RES.,FXD,CMPSN:470K OHM,5%,0.25W | 01121 | CB4745 |
| R195 | 315-0512-00 | | | RES.,FXD,CMPSN:5.1K OHM,5%,0.25W | 01121 | CB5125 |
| R196 | 315-0682-00 | | | RES.,FXD,CMPSN:6.8K OHM,5%,0.25W | 01121 | CB6825 |
| R198 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 01121 | CB4725 |
| R205 | 311-1559-00 | | | RES.,VAR,NONWIR:10K OHM,20%,0.50W | 73138 | 91A-10001M |
| R206 | 315-0107-00 | | | RES.,FXD,CMPSN:100M OHM,5%,0.25W | 01121 | CB1075 |
| R207 | 315-0107-00 | | | RES.,FXD,CMPSN:100M OHM,5%,0.25W | 01121 | CB1075 |
| R220 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 01121 | CB1015 |
| R221 | 321-0222-00 | | | RES.,FXD,FILM:2K OHM,1%,0.125W | 75042 | CEATO-2001F |
| R222 | 315-0512-00 | | | RES.,FXD,CMPSN:5.1K OHM,5%,0.25W | 01121 | CB5125 |
| R225 | 321-0114-00 | | | RES.,FXD,FILM:150 OHM,1%,0.125W | 75042 | CEATO-1500F |
| R226 | 321-0927-07 | | | RES.,FXD,FILM:125 OHM,0.1%,0.125W | 91637 | MFF1816C125ROB |
| R231 | 321-0251-00 | | | RES.,FXD,FILM:4.02K OHM,1%,0.125W | 75042 | CEATO-4021F |
| R236 | 321-0199-06 | | | RES.,FXD,FILM:1.15K OHM,0.25%,0.125W | 75042 | CEAT9-1151C |
| R237 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 01121 | CB1015 |
| R241 | 321-0813-07 | | | RES.,FXD,FILM:495 OHM,0.1%,0.125W | 75042 | CEAT9-4950B |
| R245 | 321-0353-00 | | | RES.,FXD,FILM:46.4K OHM,1%,0.125W | 75042 | CEATO-4642F |

¹Furnished as a unit with S178.

Electrical Parts List—AM 502

| Ckt No. | Tektronix Part No. | Serial/Model No. | | Name & Description | Mfr | |
|---------|--------------------|------------------|---------|--|-------|-----------------|
| | | Eff | Dscont | | Code | Mfr Part Number |
| R246 | 321-0272-00 | | | RES.,FXD,FILM:6.65K OHM,1%,0.125W | 75042 | CEATO-6651F |
| R252 | 321-0222-00 | | | RES.,FXD,FILM:2K OHM,1%,0.125W | 75042 | CEATO-2001F |
| R254 | 321-0225-06 | | | RES.,FXD,FILM:2.15K OHM,0.25%,0.125 | 75042 | CEAT9-2151C |
| R255 | 321-0154-00 | B010100 | B039999 | RES.,FXD,FILM:392 OHM,1%,0.125W | 75042 | CEATO-3920F |
| R255 | 321-0150-00 | B040000 | | RES.,FXD,FILM:357 OHM,1%,0.125W | 75042 | CEATO-3570F |
| R260 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 01121 | CB1025 |
| R261 | 321-0239-00 | | | RES.,FXD,FILM:3.01K OHM,1%,0.125W | 75042 | CEATO-3011F |
| R262 | 321-0240-00 | | | RES.,FXD,FILM:3.09K OHM,1%,0.125W | 75042 | CEATO-3091F |
| R264 | 321-0309-00 | | | RES.,FXD,FILM:16.2K OHM,1%,0.125W | 75042 | CEATO-1622F |
| R266 | 321-0143-00 | | | RES.,FXD,FILM:301 OHM,1%,0.125W | 75042 | CEATO-3010F |
| R268 | 321-0224-00 | | | RES.,FXD,FILM:2.1K OHM,1%,0.125W | 75042 | CEATO-2101F |
| R269 | 311-1564-00 | | | RES.,VAR,NONWIR:500 OHM,20%,0.50W | 73138 | 91A-500ROM |
| R270 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 01121 | CB1025 |
| R271 | 321-0277-00 | | | RES.,FXD,FILM:7.5K OHM,1%,0.125W | 75042 | CEATO-7501F |
| R273 | 321-0239-07 | | | RES.,FXD,FILM:3.01K OHM,0.1%,0.125W | 75042 | CEAT9-3011B |
| R276 | 321-1267-03 | | | RES.,FXD,FILM:5.97K OHM,0.25%,0.125W | 75042 | CEAT2-5971C |
| R277 | 321-0147-00 | | | RES.,FXD,FILM:332 OHM,1%,0.125W | 75042 | CEATO-3320F |
| R284 | 321-0314-00 | | | RES.,FXD,FILM:18.2K OHM,1%,0.125W | 75042 | CEATO-1822F |
| R285 | 321-0236-00 | | | RES.,FXD,FILM:2.8K OHM,1%,0.125W | 75042 | CEATO-2801F |
| R410 | 321-0068-00 | | | RES.,FXD,FILM:49.9 OHM,1%,0.125W | 75042 | CEATO-49R90F |
| R411 | 321-0068-00 | | | RES.,FXD,FILM:49.9 OHM,1%,0.125W | 75042 | CEATO-49R90F |
| R414 | 315-0680-00 | | | RES.,FXD,CMPSN:68 OHM,5%,0.25W | 01121 | CB6805 |
| R420 | 322-0238-00 | | | RES.,FXD,FILM:2.94K OHM,1%,0.25W | 75042 | CEBTO-2941F |
| R421 | 321-0274-00 | | | RES.,FXD,FILM:6.98K OHM,1%,0.125W | 75042 | CEATO-6981F |
| R422 | 315-0470-00 | | | RES.,FXD,CMPSN:47 OHM,5%,0.25W | 01121 | CB4705 |
| R423 | 321-0068-00 | | | RES.,FXD,FILM:49.9 OHM,1%,0.125W | 75042 | CEATO-49R90F |
| R424 | 321-0068-00 | | | RES.,FXD,FILM:49.9 OHM,1%,0.125W | 75042 | CEATO-49R90F |
| R431 | 321-0182-00 | | | RES.,FXD,FILM:768 OHM,1%,0.125W | 75042 | CEATO-7680F |
| R433 | 321-0179-00 | | | RES.,FXD,FILM:715 OHM,1%,0.125W | 75042 | CEATO-7150F |
| R435 | 321-0233-00 | | | RES.,FXD,FILM:2.61K OHM,1%,0.125W | 75042 | CEATO-2611F |
| R436 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 01121 | CB4725 |
| R438 | 315-0222-00 | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 01121 | CB2225 |
| R440 | 321-0268-00 | | | RES.,FXD,FILM:6.04K OHM,1%,0.125W | 75042 | CEATO-6041F |
| R441 | 321-0247-00 | | | RES.,FXD,FILM:3.65K OHM,1%,0.125W | 75042 | CEATO-3651F |
| R442 | 321-0400-00 | | | RES.,FXD,FILM:143K OHM,1%,0.125W | 75042 | CEATO-1433F |
| R443 | 315-0471-00 | | | RES.,FXD,CMPSN:470 OHM,5%,0.25W | 01121 | CB4715 |
| R445 | 321-0218-00 | | | RES.,FXD,FILM:1.82K OHM,1%,0.125W | 75042 | CEATO-1821F |
| R446 | 315-0472-00 | | | RES.,FXD,CMPSN:4.7K OHM,5%,0.25W | 01121 | CB4725 |
| R448 | 315-0222-00 | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 01121 | CB2225 |
| R450 | 315-0222-00 | | | RES.,FXD,CMPSN:2.2K OHM,5%,0.25W | 01121 | CB2225 |
| R451 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 01121 | CB1015 |
| R460 | 321-0229-00 | | | RES.,FXD,FILM:2.37K OHM,1%,0.125W | 75042 | CEATO-2371F |
| R461 | 311-1566-00 | | | RES.,VAR,NONWIR:200 OHM,20%,0.50W | 73138 | 91A-200ROM |
| R462 | 321-0229-00 | | | RES.,FXD,FILM:2.37K OHM,1%,0.125W | 75042 | CEATO-2371F |
| R464 | 321-0204-00 | | | RES.,FXD,FILM:1.3K OHM,1%,0.125W | 75042 | CEATO-1301F |
| R466 | 315-0105-00 | | | RES.,FXD,CMPSN:1M OHM,5%,0.25W | 01121 | CB1055 |
| R467 | 311-1057-00 | | | RES.,VAR,NONWIR:5K OHM,3%,1%,LIN,10 TURN | 80294 | 3540S-420-502 |
| R468 | 311-0887-00 | | | RES.,VAR,NONWIR:50K OHM,10%,0.50W | 80009 | 311-0887-00 |
| R470 | 316-0155-00 | | | RES.,FXD,CMPSN:1.5M OHM,10%,0.25W | 01121 | CB1551 |
| R471 | 316-0155-00 | | | RES.,FXD,CMPSN:1.5M OHM,10%,0.25W | 01121 | CB1551 |
| R474 | 321-0408-00 | | | RES.,FXD,FILM:174K OHM,1%,0.125W | 75042 | CEATO-1743F |
| R475 | 321-0408-00 | | | RES.,FXD,FILM:174K OHM,1%,0.125W | 75042 | CEATO-1743F |
| R478 | 321-0303-00 | | | RES.,FXD,FILM:14K OHM,1%,0.125W | 75042 | CEATO-1402F |

Electrical Parts List—AM 502

| Ckt No. | Tektronix Part No. | Serial/Model No. Eff | Dscont | Name & Description | Mfr Code | Mfr Part Number |
|---------|--------------------|----------------------|---------|------------------------------------|----------|-----------------|
| R479 | 321-0303-00 | | | RES.,FXD,FILM:14K OHM,1%,0.125W | 75042 | CEAT0-1402F |
| R480 | 321-0289-03 | | | RES.,FXD,FILM:10K OHM,0.25%,0.125W | 75042 | CEAT2-1002C |
| R481 | 321-0816-07 | | | RES.,FXD,FILM:5K OHM,0.1%,0.125W | 75042 | CEAT9-5001B |
| R482 | 321-0222-03 | | | RES.,FXD,FILM:2K OHM,0.25%,0.125W | 75042 | CEAT22KC |
| R483 | 321-0193-03 | | | RES.,FXD,FILM:1K OHM,0.25%,0.125W | 75042 | CEAT2-1001C |
| R484 | 321-0612-03 | | | RES.,FXD,FILM:500 OHM,0.25%,0.125W | 75042 | CEAT2-5000C |
| R485 | 321-0126-03 | | | RES.,FXD,FILM:200 OHM,0.25%,0.125% | 75042 | CEAT2-200ROC |
| R486 | 321-0097-03 | | | RES.,FXD,FILM:100 OHM,0.25%,0.125% | 91637 | MFF1816G100ROC |
| R487 | 321-0751-06 | | | RES.,FXD,FILM:50 OHM,0.25%,0.125W | 75042 | CEAT9-50R00C |
| R488 | 321-0030-02 | | | RES.,FXD,FILM:20 OHM,0.5%,0.125W | 75042 | CEAT2-20R00D |
| R489 | 321-0001-01 | | | RES.,FXD,FILM:10 OHM,0.5%,0.125W | 75042 | CEAT0-10R00D |
| R501 | 316-0225-00 | | | RES.,FXD,CMPSN:2.2M OHM,10%,0.25W | 01121 | CB2251 |
| R503 | 321-0452-00 | | | RES.,FXD,FILM:499K OHM,1%,0.125W | 75042 | CEAT0-4993F |
| R504 | 321-0423-00 | | | RES.,FXD,FILM:249K OHM,1%,0.125W | 75042 | CEAT0-2493F |
| R507 | 315-0473-00 | | | RES.,FXD,CMPSN:47K OHM,5%,0.25W | 01121 | CB4735 |
| R510 | 315-0104-00 | | | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 01121 | CB1045 |
| R511 | 315-0104-00 | | | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 01121 | CB1045 |
| R513 | 315-0104-00 | | | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 01121 | CB1045 |
| R521 | 316-0276-00 | | | RES.,FXD,CMPSN:27M OHM,10%,0.25W | 01121 | CB2761 |
| R523 | 321-0423-00 | | | RES.,FXD,FILM:249K OHM,1%,0.125W | 75042 | CEAT0-2493F |
| R524 | 321-0452-00 | | | RES.,FXD,FILM:499K OHM,1%,0.125W | 75042 | CEAT0-4993F |
| R531 | 315-0224-00 | | | RES.,FXD,CMPSN:220K OHM,5%,0.25W | 01121 | CB2245 |
| R532 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R533 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R536 | 315-0104-00 | | | RES.,FXD,CMPSN:100K OHM,5%,0.25W | 01121 | CB1045 |
| R541 | 315-0681-00 | | | RES.,FXD,CMPSN:680 OHM,5%,0.25W | 01121 | CB6815 |
| R542 | 315-0103-00 | | | RES.,FXD,CMPSN:10K OHM,5%,0.25W | 01121 | CB1035 |
| R550 | 315-0682-00 | | | RES.,FXD,CMPSN:6.8K OHM,5%,0.25W | 01121 | CB6825 |
| R551 | 315-0153-00 | | | RES.,FXD,CMPSN:15K OHM,5%,0.25W | 01121 | CB1535 |
| R552 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 01121 | CB1025 |
| R553 | 315-0682-00 | | | RES.,FXD,CMPSN:6.8K OHM,5%,0.25W | 01121 | CB6825 |
| R555 | 315-0302-00 | | | RES.,FXD,CMPSN:3K OHM,5%,0.25W | 01121 | CB3025 |
| R558 | 315-0302-00 | | | RES.,FXD,CMPSN:3K OHM,5%,0.25W | 01121 | CB3025 |
| R559 | 315-0202-00 | | | RES.,FXD,CMPSN:2K OHM,5%,0.25W | 01121 | CB2025 |
| R560 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 01121 | CB1015 |
| R561 | 315-0181-00 | | | RES.,FXD,CMPSN:180 OHM,5%,0.25W | 01121 | CB1815 |
| R562 | 307-0104-00 | | | RES.,FXD,CMPSN:3.3 OHM,5%,0.25W | 01121 | CB33G5 |
| R570 | 315-0101-00 | | | RES.,FXD,CMPSN:100 OHM,5%,0.25W | 01121 | CB1015 |
| R571 | 315-0181-00 | | | RES.,FXD,CMPSN:180 OHM,5%,0.25W | 01121 | CB1815 |
| R572 | 307-0104-00 | | | RES.,FXD,CMPSN:3.3 OHM,5%,0.25W | 01121 | CB33G5 |
| R900 | 304-0102-00 | B010100 | B029999 | RES.,FXD,CMPSN:1K OHM,10%,1W | 01121 | GB1021 |
| R900 | 303-0511-00 | B030000 | | RES.,FXD,CMPSN:510 OHM,5%,1W | 01121 | GB5115 |
| R910 | 315-0821-00 | | | RES.,FXD,CMPSN:820 OHM,5%,0.25W | 01121 | CB8215 |
| R915 | 321-0285-00 | | | RES.,FXD,FILM:9.09K OHM,1%,0.125W | 75042 | CEAT0-9091F |
| R916 | 321-0268-00 | | | RES.,FXD,FILM:6.04K OHM,1%,0.125W | 75042 | CEAT0-6041F |
| R920 | 307-0105-00 | | | RES.,FXD,CMPSN:3.9 OHM,5%,0.25W | 01121 | CB39G5 |
| R922 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%,0.25W | 01121 | CB1005 |
| R924 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%,0.25W | 01121 | CB1005 |
| R926 | 315-0100-00 | | | RES.,FXD,CMPSN:10 OHM,5%,0.25W | 01121 | CB1005 |
| R940 | 307-0106-00 | | | RES.,FXD,CMPSN:4.7 OHM,5%,0.25W | 01121 | CB47G5 |
| R942 | 315-0102-00 | | | RES.,FXD,CMPSN:1K OHM,5%,0.25W | 01121 | CB1025 |
| R945 | 315-0912-00 | | | RES.,FXD,CMPSN:9.1K OHM,5%,0.25W | 01121 | CB9125 |
| R946 | 315-0622-00 | | | RES.,FXD,CMPSN:6.2K OHM,5%,0.25W | 01121 | CB6225 |

ADJUSTMENTS

Services Available

Tektronix Inc. provides complete instrument repair and adjustment at local Field Service Centers and at the Factory Service Center. Contact your local Tektronix Field Office or representative for further information.

Test Equipment

For calibration of the AM 502, the following equipment is required:

Oscilloscope with vertical deflection factor of 100 mV/Div to 10 V/Div and bandwidth of at least 2 MHz, Tektronix 5100 or 5400 series or equivalent.

Square-wave generator with 1 kHz output frequency, output amplitude variable from +1 V to +5 V, Tektronix type FG 501 or equivalent.

Constant amplitude sine-wave generator, output amplitude at least 15 V P-P and frequency of 50 kHz, Tektronix type FG 501 or equivalent.

Standard amplitude calibrator with 5 mV output, Tektronix Calibration Fixture 067-0502-01 or equivalent.

Termination, 50 Ω , BNC connectors, Tektronix part number 011-0049-01 or equivalent.

Attenuator, 10X, BNC connectors, Tektronix part number 011-0059-01 or equivalent.

Dual Input Connector, BNC connectors, Tektronix part number 067-0525-00 or equivalent.

Input Normalizer, 47 pF, Tektronix part number 067-0541-00.

Coaxial Cable, 50 Ω , BNC connector, Tektronix part number 012-0057-01 or equivalent.

Preparation

The AM 502 can be operated either fully installed in a TM 500 Series Power Module, or connected to the Power Module via a flexible plug-in extender (Tektronix part number 067-0645-01). Remove the Power Module cabinet to make adjustments when the AM 502 is calibrated inside the Power Module. All adjustments are located on the left side of the board. Make adjustments at an ambient temperature between +20°C and +30°C.

1. Adjust Step Gain AC Balance

Set the LF -3 dB to the 10 Hz position and the HF -3 dB to the .1 KHz position. Make certain that the \div 100 pushbutton is out. Connect the test oscilloscope vertical input, DC coupled at 1.0 V/Div., to the AM 502 output. Push both GND pushbuttons. While rotating the GAIN switch from stop to stop, adjust R161, Step Gain AC Bal, for no output DC level change. Return the GAIN switch to the 100 position.

2. Adjust Variable Gain DC Balance

Using the same control settings as in the previous step, adjust R269, Var Gain DC Bal, for no output DC level change while rotating the CAL knob from stop to stop. Return the CAL knob to the fully CW detent position.

3. Adjust Output DC Level

Without changing the AM 502 control positions from those in the previous step, obtain a ground reference on the test oscilloscope in the 1.0 V/Div vertical deflection position. Adjust R191, Output DC Level, to the previously established zero reference level.

4. Adjust Coarse Step Gain DC Balance

Set the LF -3 dB to the DC position, the GAIN at 10 k, and the STEP GAIN DC BAL to midrange. Set the test oscilloscope vertical deflection factor at 1 V/Div and obtain a ground reference. Leave the other controls as in the previous step. Adjust R461, Coarse Step Gain DC Bal, for zero volts (within one volt) on the test oscilloscope.

5. Adjust + Input Gate Leakage Current Compensation

Connect the 50 Ω termination to the + Input of the AM 502 and set the GAIN to the 1 K position. Make certain that both AC pushbuttons are depressed. Set the test oscilloscope for a deflection sensitivity of 100 mV/Div and position the trace to the graticule center. Adjust R105, + Input Gate Leakage Current Comp, for minimum trace shift while alternately depressing and releasing the + GND pushbutton.

6. Adjust - Input Gate Leakage Current Compensation

Move the termination to the - input and make certain that the + input GND pushbutton is depressed. Both AC pushbuttons must be depressed. Leave the other controls as in the previous step. Adjust R205, - Input Gate Leakage Current Comp, for minimum trace shift while alternately depressing and releasing the - GND pushbutton. Release both AC pushbuttons.

7. Adjust Input Cross Neutralization

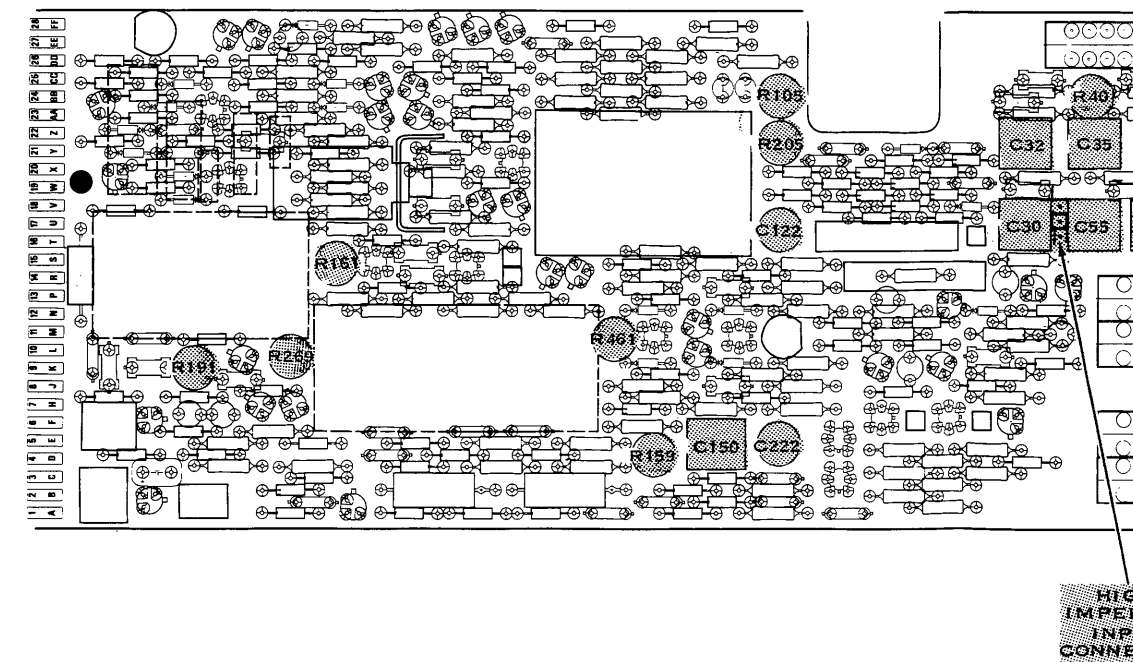
Set the GAIN to the 100 position and the HF -3 dB to 1 MHz. The LF -3 dB switch must be in the DC position. Connect the function generator (set for square-wave output, centered around ground, 1 ms period) through the 10X attenuator and 50 Ω termination to the + input of the AM 502. Release the + input GND pushbutton and make certain that the - input GND pushbutton is in and the AC pushbutton is out. Set the test oscilloscope for a vertical deflection factor of 1 V/Div, and a horizontal deflection factor of .2 ms/Div. Adjust the amplitude of the square-wave generator for a test oscilloscope display of four divisions. While pushing and releasing the - input GND pushbutton, adjust C222, + Input Cross Neutralization, for a similar-looking upper front corner on the square wave in both positions of the GND pushbutton. Change the input connection to the - input, release the - input GND button, and repeat the procedure using the + input GND pushbutton and adjusting C222, - Input Cross Neutralization adjustment.

8. Adjust I

Using the + input GND pushbutton and the - input GND pushbutton released. In both positions, maintain focus. Adjust C51, Input Cross Neutralization, looking up and down. Press the normalizer and press the procedure, best looking.

9. Adjust A

Remove the vertical deflection pushbutton and adjust the amplitude.



ADJUSTMENTS

5. Adjust + Input Gate Leakage Current Compensation

Connect the $50\ \Omega$ termination to the + Input of the AM 502 and set the GAIN to the 1 K position. Make certain that both AC pushbuttons are depressed. Set the test oscilloscope for a deflection sensitivity of 100 mV/Div and position the trace to the graticule center. Adjust R105, + Input Gate Leakage Current Comp, for minimum trace shift while alternately depressing and releasing the + GND pushbutton.

6. Adjust - Input Gate Leakage Current Compensation

Move the termination to the - input and make certain that the + input GND pushbutton is depressed. Both AC pushbuttons must be depressed. Leave the other controls as in the previous step. Adjust R205, - Input Gate Leakage Current Comp, for minimum trace shift while alternately depressing and releasing the - GND pushbutton. Release both AC pushbuttons.

7. Adjust Input Cross Neutralization

Set the GAIN to the 100 position and the HF -3 dB to 1 MHz. The LF -3 dB switch must be in the DC position. Connect the function generator (set for square-wave output, centered around ground, 1 ms period) through the 10X attenuator and $50\ \Omega$ termination to the + input of the AM 502. Release the + input GND pushbutton and make certain that the - input GND pushbutton is in and the AC pushbutton is out. Set the test oscilloscope for a vertical deflection factor of 1 V/Div, and a horizontal deflection factor of .2 ms/Div. Adjust the amplitude of the square-wave generator for a test oscilloscope display of four divisions. While pushing and releasing the - input GND pushbutton, adjust C222, + Input Cross Neutralization, for a similar-looking upper front corner on the square wave in both positions of the GND pushbutton. Change the input connection to the - input, release the - input GND button, and repeat the procedure using the + input GND pushbutton and adjusting C222, - Input Cross Neutralization adjustment.

8. Adjust Input Capacitance

Using the same setup as described in the previous step, add the 47 pF Normalizer between the $50\ \Omega$ termination and the - input on the AM 502. Push the + input GND pushbutton. Make certain the - input GND pushbutton is released. Increase the square-wave generator output to maintain four divisions of display on the test oscilloscope. Adjust C50, - Input Comp (Normal), for the flattest looking upper front corner on the square wave. Change the normalizer to the + input, release + input GND pushbutton, and press the - input GND pushbutton. Repeat the procedure, adjusting C30, + Input Comp (Normal), for the best looking upper front corner.

9. Adjust Attenuator Compensation

Remove the 10X attenuator. Set the test oscilloscope vertical deflection factor to .1 V/Div. Depress the ÷ 100 pushbutton, and adjust the square-wave generator output amplitude for a four division display. Make certain the -

input GND pushbutton is in. Alternately adjust C35, + Attn Input Cap, and C32, + Attn Comp, for the best looking upper front corner and flattest top on the square wave display. Change the normalizer to the - input, release the - input GND and push the + input GND pushbutton. Repeat the procedure adjusting C55, - Attn Input Cap and C52, - Attn Comp for the best looking upper front corner and flattest top on the square wave. Remove the signal from the - input.

10. Adjust Attenuator Common Mode Rejection Ratio

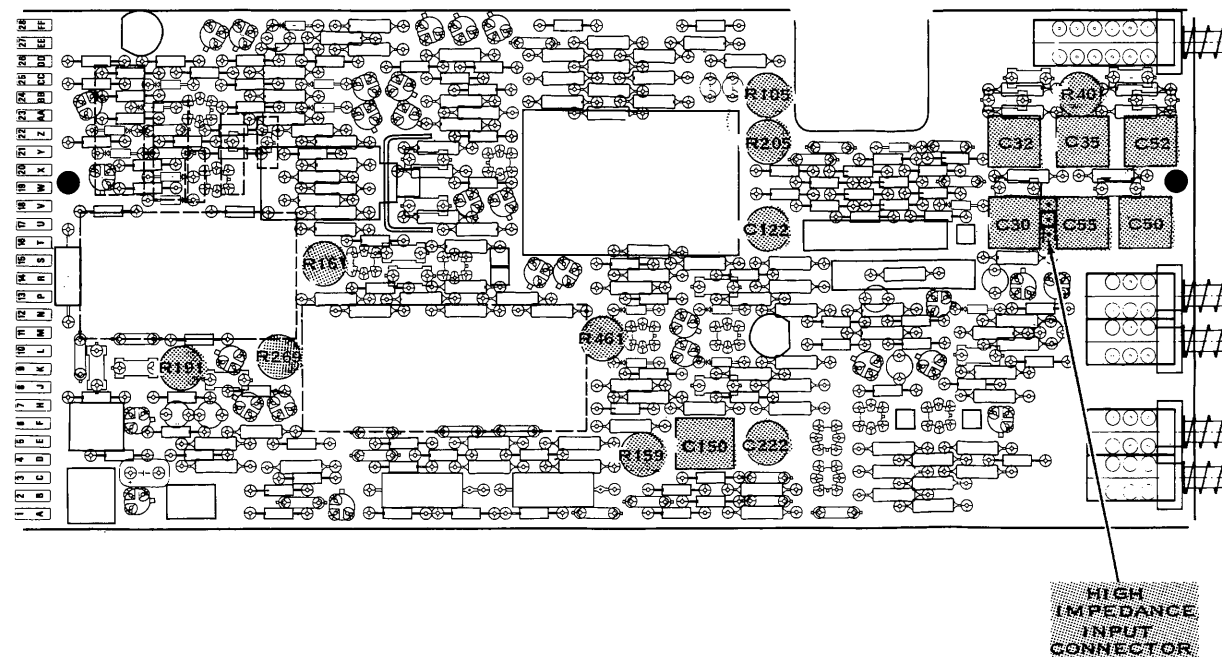
Make certain the ÷ 100 pushbutton is in, and the AC and GND pushbuttons for both channels are out. Set the GAIN switch at 10 K. Remove the $50\ \Omega$ termination and normalizer. Apply a 10 V P-P 1 kHz square wave through the dual input cable to both inputs of the AM 502. Connect the test oscilloscope, set for 2 V/Div vertical deflection, to the output of the AM 502. Adjust R140 Attn DC CMRR, for minimum display amplitude. Remove the square wave from the input of the AM 502 and connect a 50 kHz 10 V P-P sine wave to both input connectors through the dual input cable. Check that the C34, + Attn Comp, and C52, - Attn Comp, are set for minimum display amplitude. Remove the sine wave from the input.

11. Adjust Amplifier Gain

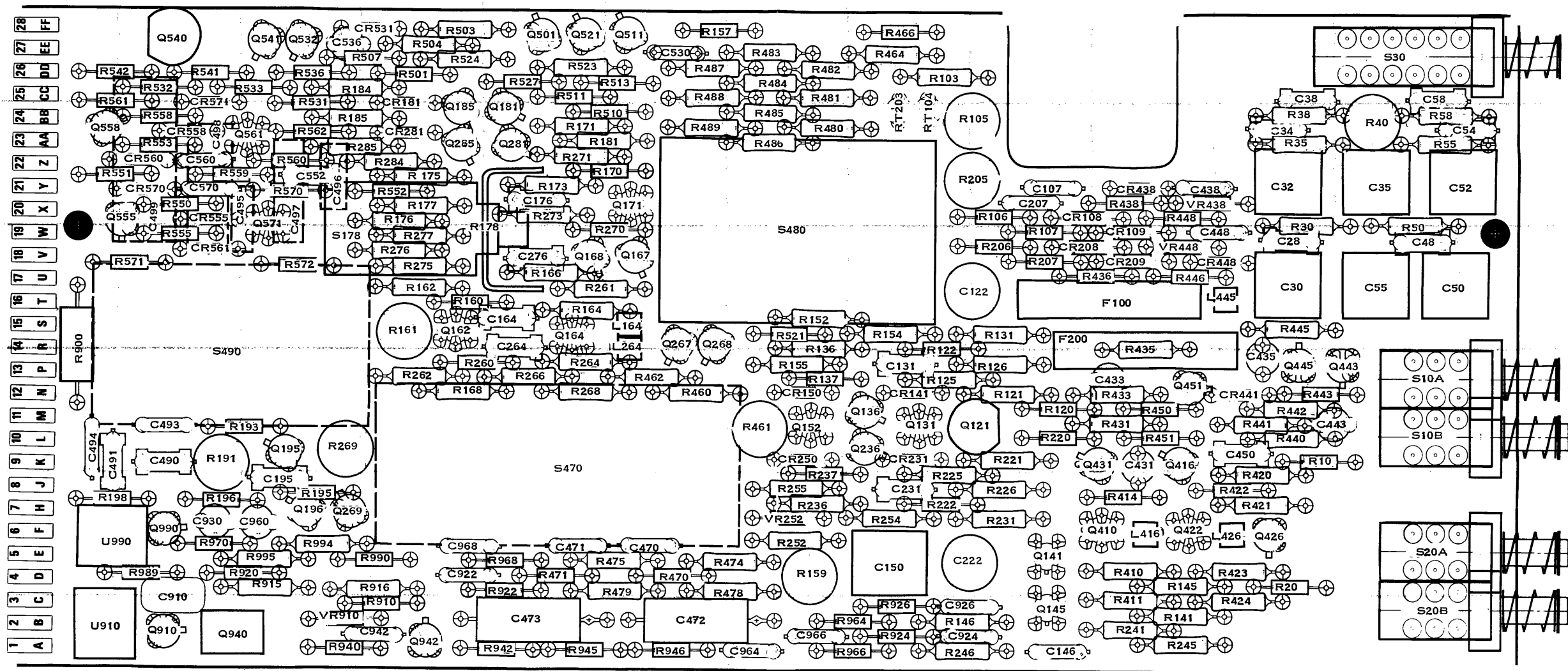
Set the GAIN switch to the 1 K position. Release the ÷ 100 pushbutton. Connect the Standard Amplitude Calibrator set for an output of 5 mV to the AM 502 + input connector. Make certain the + input AC and GND pushbuttons are out. Push the - input GND pushbutton. Check that the HF -3 dB is in the 1 MHz position and the LF -3 dB switch is in the 0.1 Hz position. Connect the test oscilloscope to the OUTPUT connector, and set the vertical deflection factor at 1 V/Div. Adjust R159, Gain Cal, for exactly five divisions of vertical deflection on the test oscilloscope.

12. Adjust High Frequency CMRR

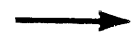
Connect the sine wave generator through a coaxial cable to the dual input connector. Set the frequency at 50 KHz and the amplitude at 10 V P-P. Connect the dual input connector to both inputs of the AM 502. Release both AC and GND pushbuttons. Set the gain switch to 100 and the LF -3 dB switch to DC. Connect the output of the AM 502 to the test oscilloscope, set for a vertical deflection factor of 20 mV/Div, and a horizontal deflection factor of 20 μ s/Div. Adjust C150, HF CMRR, for minimum amplitude displayed on the test oscilloscope.

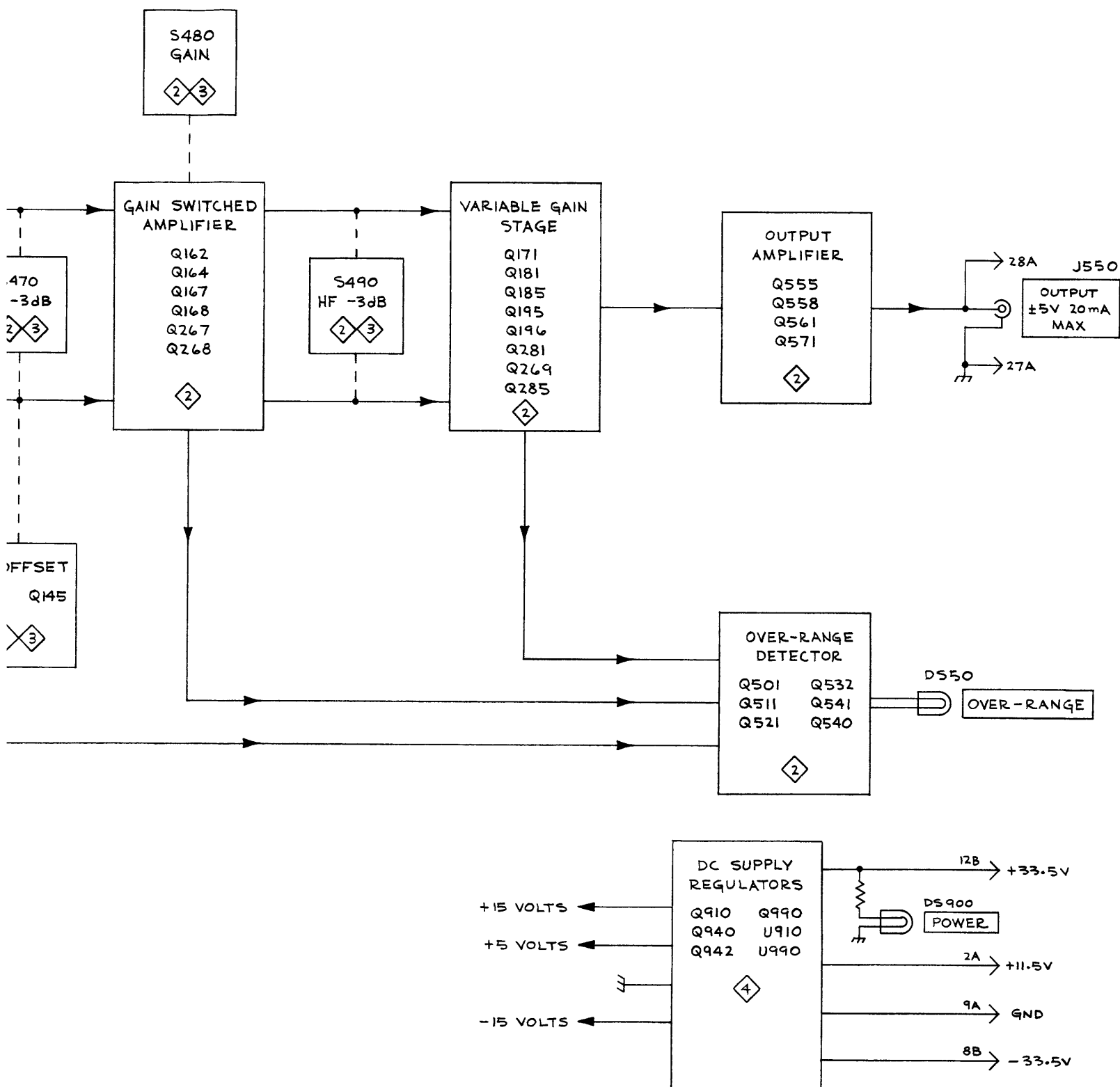


PARTS LOCATION GRID



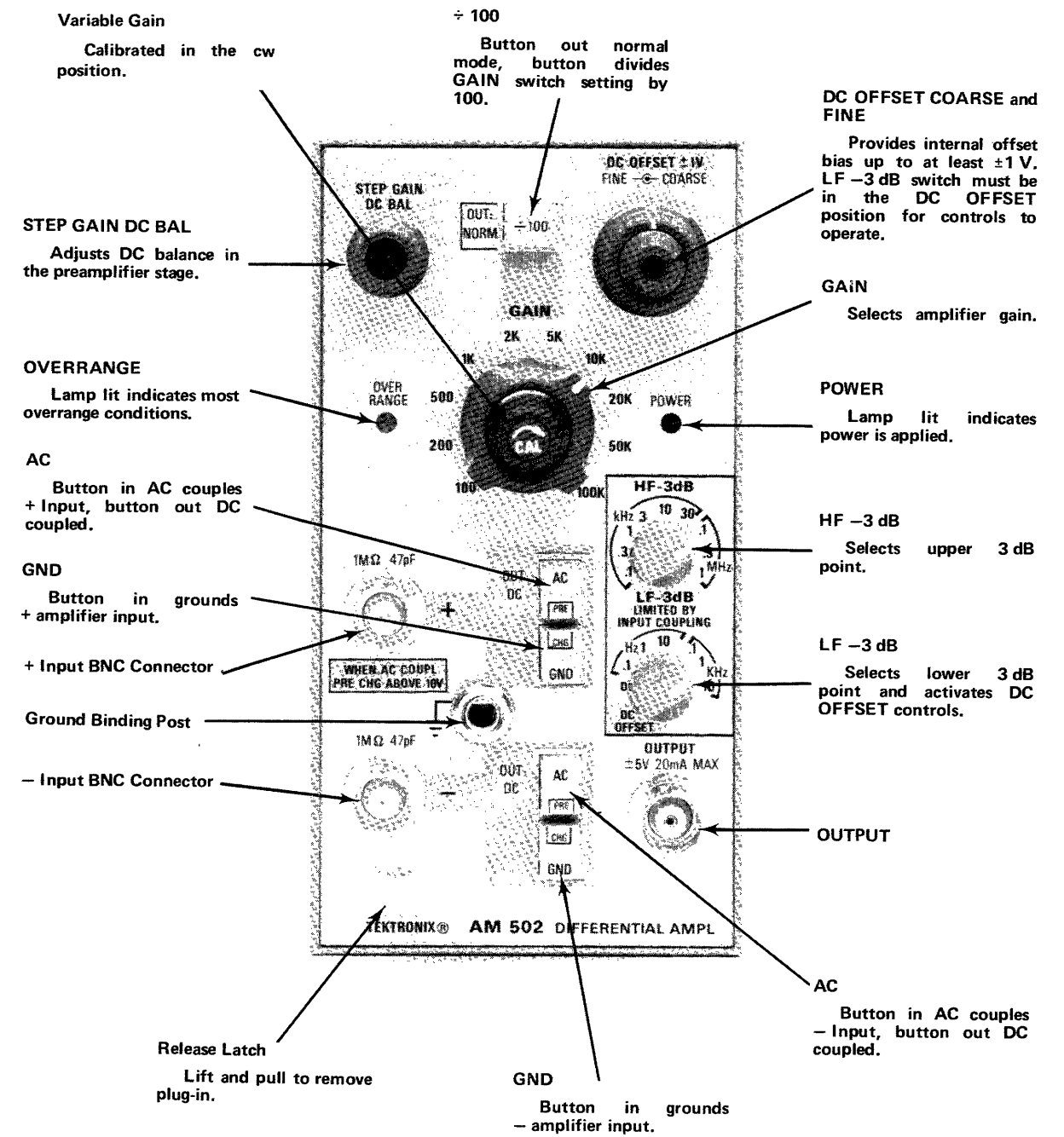
| CKT NO | GRID LOC | CKT NO |
|--------|----------|--------|
| C28 | K3 | CR108 |
| C30 | K3 | CR109 |
| C32 | K2 | CR141 |
| C34 | K2 | CR150 |
| C35 | L2 | CR181 |
| C38 | K1 | CR208 |
| C48 | L3 | CR209 |
| C50 | L3 | CR231 |
| C54 | M2 | CR250 |
| C55 | L3 | CR281 |
| C58 | L1 | CR438 |
| C107 | I2 | CR441 |
| C122 | I3 | CR448 |
| C131 | H4 | CR531 |
| C146 | I6 | CR555 |
| C150 | H5 | CR558 |
| C164 | E3 | CR560 |
| C176 | E2 | CR561 |
| C195 | C5 | CR570 |
| C207 | I2 | CR571 |
| C222 | I5 | |
| C231 | H5 | F100 |
| C264 | E4 | F200 |
| C276 | E3 | |
| C431 | J4 | L164 |
| C433 | J4 | L264 |
| C435 | K4 | L416 |
| C438 | J2 | L426 |
| C443 | L4 | L445 |
| C448 | K3 | |
| C450 | K4 | Q121 |
| C470 | F5 | Q131 |
| C471 | E5 | Q136 |
| C472 | F6 | Q141 |
| C473 | E6 | Q145 |
| C490 | B4 | Q152 |
| C491 | A4 | Q162 |
| C493 | B4 | Q164 |
| C494 | A4 | Q167 |
| C495 | C2 | Q168 |
| C496 | C2 | Q171 |
| C497 | C2 | Q181 |
| C498 | B2 | Q185 |
| C499 | B2 | Q195 |
| C530 | F1 | Q196 |
| C536 | C1 | Q236 |
| C552 | C2 | Q267 |
| C560 | B2 | Q268 |
| C570 | B2 | Q269 |
| C910 | B6 | Q281 |
| C922 | D5 | Q285 |
| C924 | H6 | Q410 |
| C926 | H6 | Q416 |
| C930 | B5 | Q422 |
| C942 | D6 | Q426 |
| C960 | C5 | Q431 |
| C964 | G6 | Q443 |
| C966 | G6 | Q445 |
| C968 | D5 | Q451 |



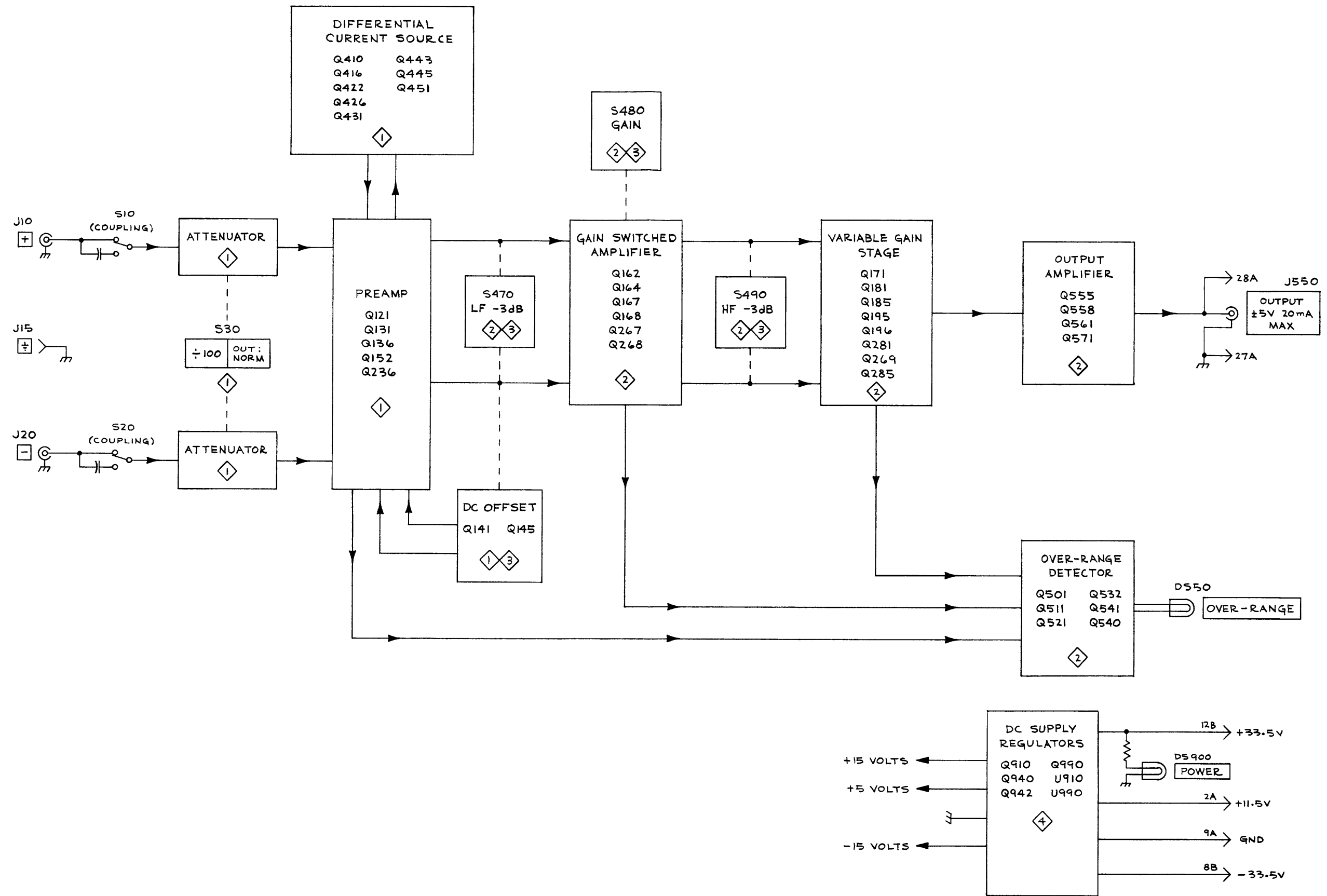


Block Diagram DEH 0573

CONTROLS AND CONNECTORS



BLOCK DIAGRAM

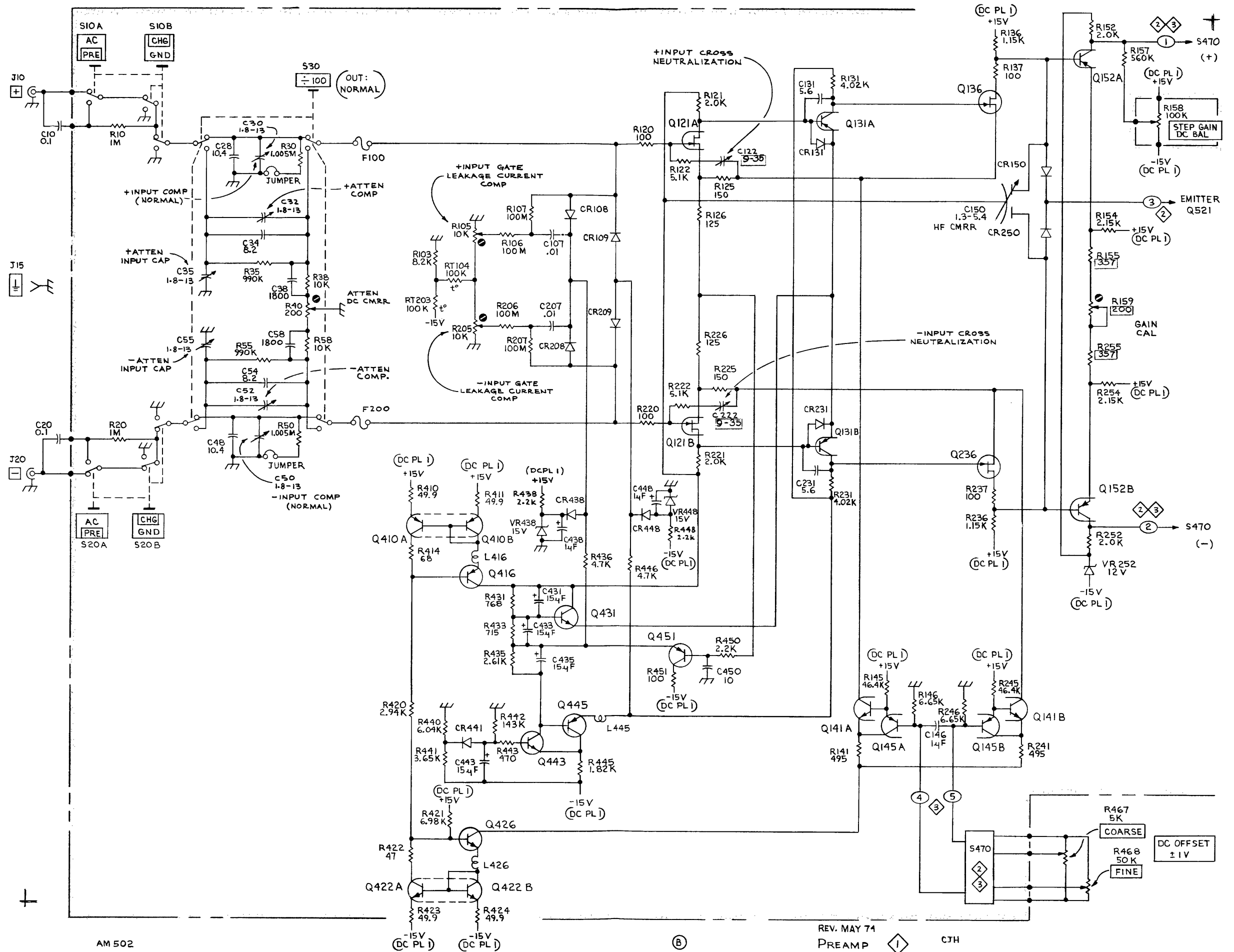


AM502

Ⓐ

BLOCK DIAGRAM DEH 0573

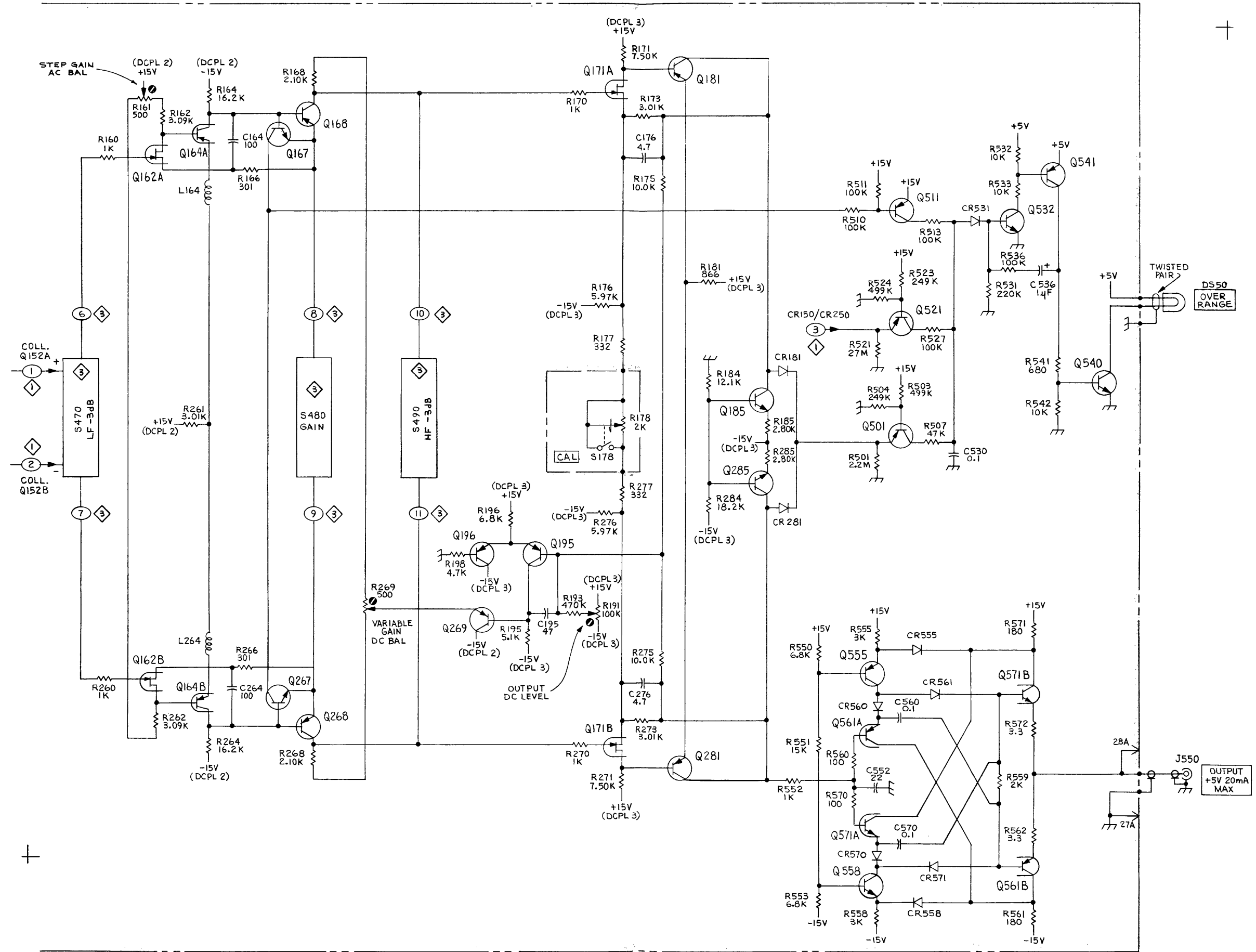
Ⓐ

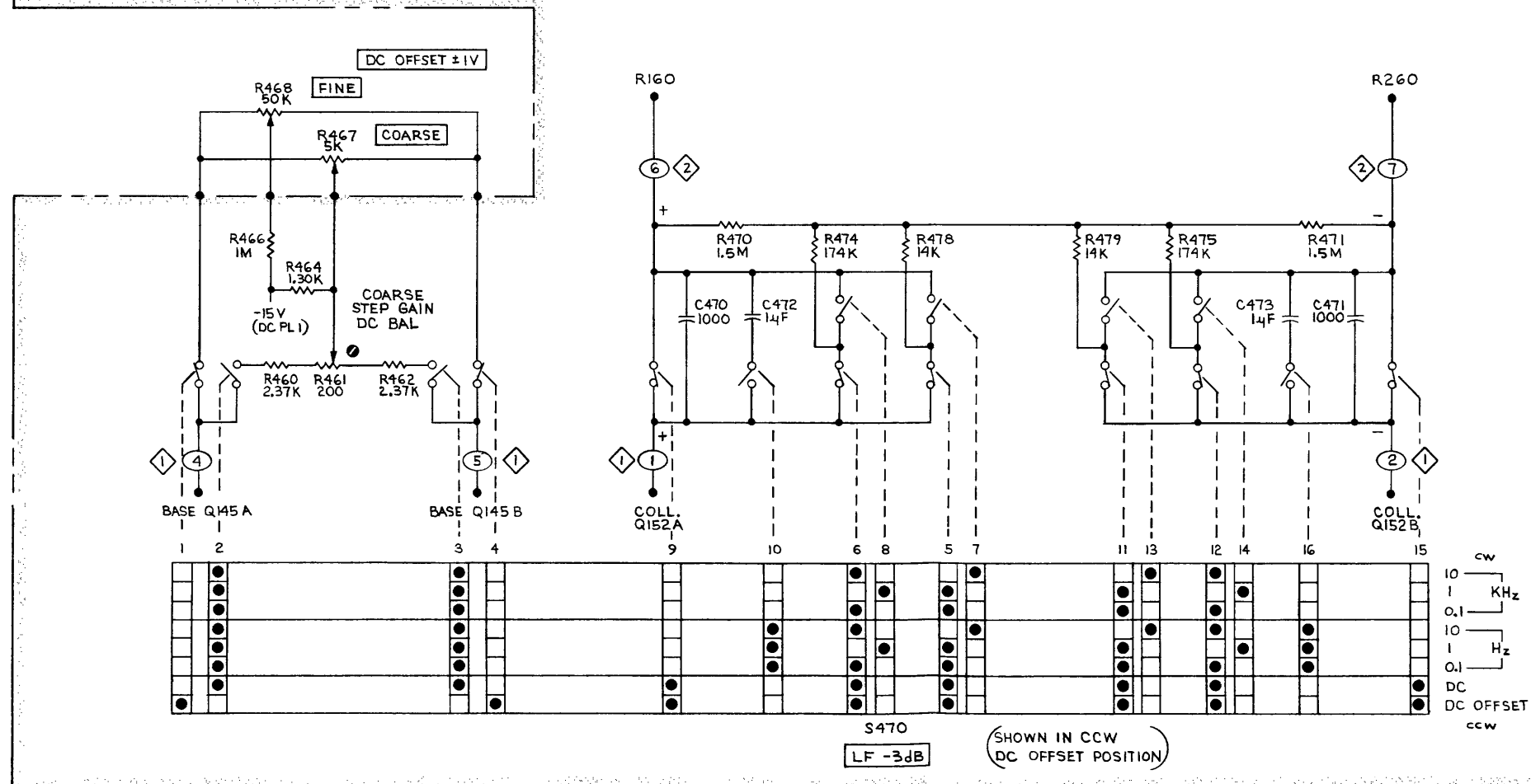
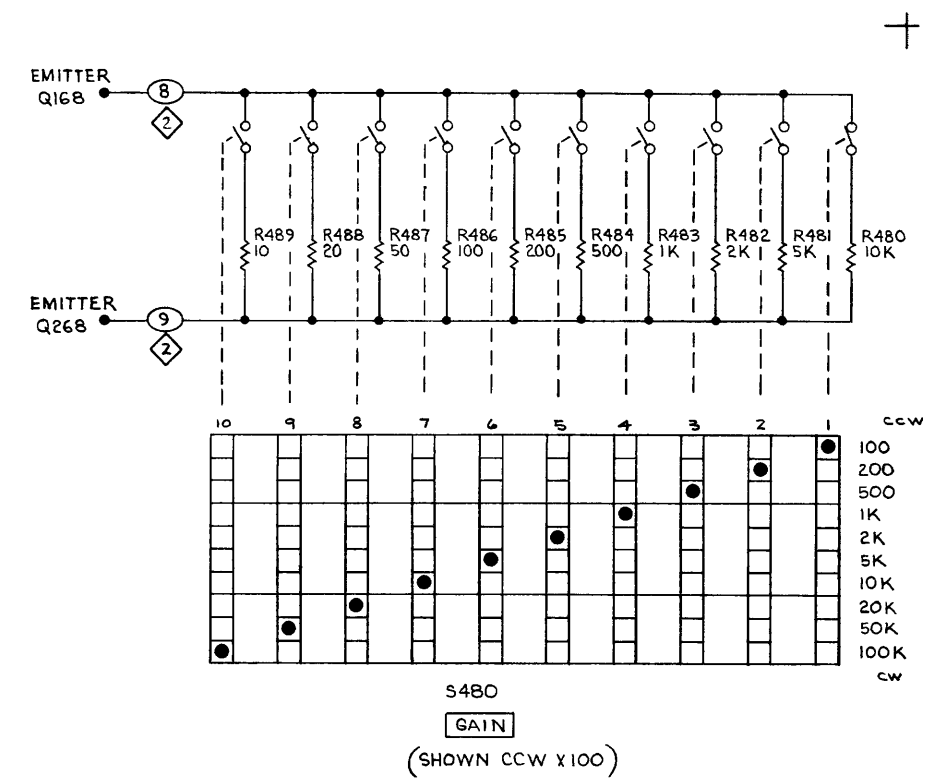
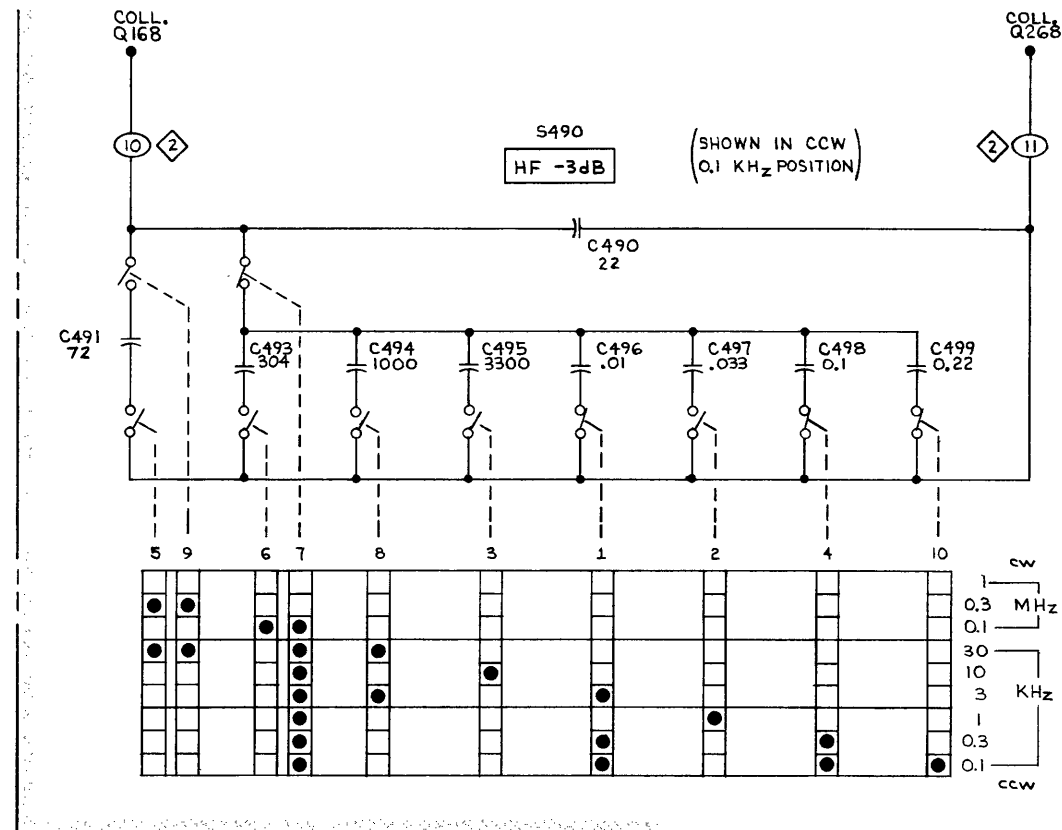


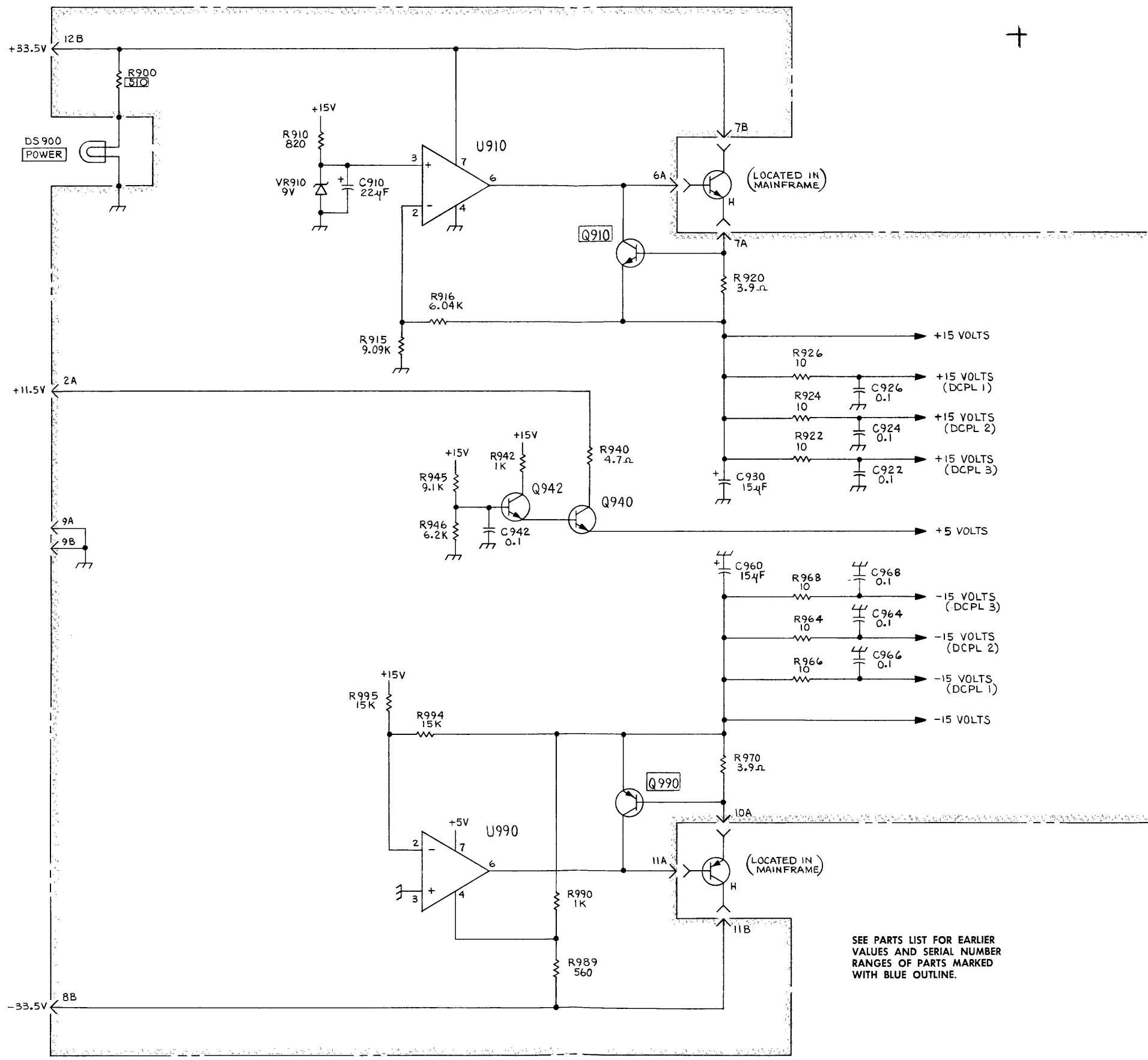
AM 502

REV. MAY 71
PREAMP

CJH







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

REPLACEABLE MECHANICAL PARTS

PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

SPECIAL NOTES AND SYMBOLS

X000 Part first added at this serial number
00X Part removed after this serial number

FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

```

1 2 3 4 5           Name & Description
Assembly and/or Component
Attaching parts for Assembly and/or Component
    --- * ---
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
    --- * ---
Parts of Detail Part
Attaching parts for Parts of Detail Part
    --- * ---
  
```

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol --- * --- indicates the end of attaching parts.

Attaching parts must be purchased separately, unless otherwise specified.

ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

ABBREVIATIONS

| | | | | | | | |
|-------|--------------------|---------|-----------------------|----------|----------------------|---------|-----------------|
| " | INCH | ELCTRN | ELECTRON | IN | INCH | SE | SINGLE END |
| # | NUMBER SIZE | ELEC | ELECTRICAL | INCAND | INCANDESCENT | SECT | SECTION |
| ACTR | ACTUATOR | ELCLTL | ELECTROLYTIC | INSUL | INSULATOR | SEMICON | SEMICONDUCTOR |
| ADPTR | ADAPTER | ELEM | ELEMENT | INTL | INTERNAL | SHLD | SHIELD |
| ALIGN | ALIGNMENT | EPL | ELECTRICAL PARTS LIST | LPHLDR | LAMPHOLDER | SHLDR | SHOULDERED |
| AL | ALUMINUM | EQPT | EQUIPMENT | MACH | MACHINE | SKT | SOCKET |
| ASSEM | ASSEMBLED | EXT | EXTERNAL | MECH | MECHANICAL | SL | SLIDE |
| ASSY | ASSEMBLY | FIL | FILLISTER HEAD | MTG | MOUNTING | SLFLKG | SELF-LOCKING |
| ATTEN | ATTENUATOR | FLEX | FLEXIBLE | NIP | NIPPLE | SLVG | SLEEVING |
| AWG | AMERICAN WIRE GAGE | FLH | FLAT HEAD | NON WIRE | NOT WIRE WOUND | SPR | SPRING |
| BD | BOARD | FLTR | FILTER | OBD | ORDER BY DESCRIPTION | SQ | SQUARE |
| BRKT | BRACKET | FR | FRAME or FRONT | OD | OUTSIDE DIAMETER | SST | STAINLESS STEEL |
| BRS | BRASS | FSTNR | FASTENER | OVH | OVAL HEAD | STL | STEEL |
| BRZ | BRONZE | FT | FOOT | PH BRZ | PHOSPHOR BRONZE | SW | SWITCH |
| BSHG | BUSHING | FXD | FIXED | PL | PLAIN or PLATE | T | TUBE |
| CAB | CABINET | GSKT | GASKET | PLSTC | PLASTIC | TERM | TERMINAL |
| CAP | CAPACITOR | HDL | HANDLE | PN | PART NUMBER | THD | THREAD |
| CER | CERAMIC | HEX | HEXAGON | PNH | PAN HEAD | THK | THICK |
| CHAS | CHASSIS | HEX HD | HEXAGONAL HEAD | PWR | POWER | TNSN | TENSION |
| CKT | CIRCUIT | HEX SOC | HEXAGONAL SOCKET | RCPT | RECEPTACLE | TPG | TAPPING |
| COMP | COMPOSITION | HLCPS | HELICAL COMPRESSION | RES | RESISTOR | TRH | TRUSS HEAD |
| CONN | CONNECTOR | HLEXT | HELICAL EXTENSION | RGD | RIGID | V | VOLTAGE |
| COV | COVER | HV | HIGH VOLTAGE | RLF | RELIEF | VAR | VARIABLE |
| CPLG | COUPLING | IC | INTEGRATED CIRCUIT | RTNR | RETAINER | W/ | WITH |
| CRT | CATHODE RAY TUBE | ID | INSIDE DIAMETER | SCH | SOCKET HEAD | WSHR | WASHER |
| DEG | DEGREE | IDENT | IDENTIFICATION | SCOPE | OSCILLOSCOPE | XFMR | TRANSFORMER |
| DWR | DRAWER | IMPLR | IMPELLER | SCR | SCREW | XSTR | TRANSISTOR |

CROSS INDEX MFR. CODE NUMBER TO MANUFACTURER

| MFR.CODE | MANUFACTURER | ADDRESS | CITY,STATE,ZIP |
|----------|---|----------------------|-----------------------------|
| 02107 | SPARTA MFG. CO. | ROUTE NO. 2, BOX 128 | DOVER, OH 44622 |
| 12327 | FREEWAY CORP. | 9301 ALLEN DR. | CLEVELAND, OH 44125 |
| 22526 | BERG ELECTRONICS, INC. | YOUK EXPRESSWAY | NEW CUMBERLAND, PA 17070 |
| 23499 | GAVITT WIRE AND CABLE, DIVISION OF RSC INDUSTRIES, INC. | 455 N. QUINCE ST. | ESCONDIDO, CA 92025 |
| 24931 | SPECIALTY CONNECTOR CO., INC. | 3560 MADISON AVE. | INDIANAPOLIS, IN 46227 |
| 45722 | USM CORP., PARKER-KALON FASTENER DIV. | 1 PEEKAY DRIVE | CLIFTON, NJ 07014 |
| 70276 | ALLEN MFG. CO. | P. O. DRAWER 570 | HARTFORD, CT 06101 |
| 71159 | BRISTOL SOCKET SCREW, DIV. OF AMERICAN CHAIN AND CABLE CO., INC. | 40 BRISTOL ST. | WATERBURY, CT 06720 |
| 71785 | TRW ELECTRONIC COMPONENTS, CINCH CONNECTOR OPERATIONS | 1501 MORSE AVE. | ELK GROVE VILLAGE, IL 60007 |
| 73743 | FISCHER SPECIAL MFG. CO. | 446 MORGAN ST. | CINCINNATI, OH 45206 |
| 74445 | HOLO-KROME CO. | 31 BROOK ST. WEST | HARTFORD, CT 06110 |
| 78189 | ILLINOIS TOOL WORKS, INC. SHAKEPROOF DIVISION | ST. CHARLES ROAD | ELGIN, IL 60120 |
| 78471 | TILLEY MFG. CO. | 900 INDUSTRIAL RD. | SAN CARLOS, CA 94070 |
| 79136 | WALDES, KOHINOOR, INC. | 47-16 AUSTEL PLACE | LONG ISLAND CITY, NY 11101 |
| 79807 | WROUGHT WASHER MFG. CO. | 2100 S. O BAY ST. | MILWAUKEE, WI 53207 |
| 80009 | TEKTRONIX, INC. | P. O. BOX 500 | BEAVERTON, OR 97077 |
| 82647 | TEXAS INSTRUMENTS, INC., CONTROL PRODUCTS DIV. | 34 FOREST ST. | ATTLEBORO, MA 02703 |
| 83385 | CENTRAL SCREW CO. | 2530 CRESCENT DR. | BROADVIEW, IL 60153 |
| 91836 | KINGS ELECTRONICS CO., INC. | 40 MARBLEDALE ROAD | TUCKAHOE, NY 10707 |
| 97464 | INDUSTRIAL RETAINING RING CO. | 57 CORDIER ST. | IRVINGTON, NJ 07111 |

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Qty | Name & Description | | | | | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|--------------------------------|-----|--|---|---|---|---|-------------|------------------|
| | | | | 1 | 2 | 3 | 4 | 5 | | |
| 1-1 | 337-1399-01 | | 2 | SHLD,ELECTRICAL:SIDE | | | | | 80009 | 337-1399-01 |
| -2 | 366-0494-00 | | 1 | KNOB:GRAY WITH SETSCREW | | | | | 80009 | 366-0494-00 |
| | 213-0153-00 | | 1 | . SETSCREW:5-40 X 0.125 INCH,HEX SOC STL | | | | | 74445 | OBD |
| -3 | 366-1518-00 | B010100 B040799 | 1 | KNOB:GRAY WITH SETSCREW | | | | | 80009 | 366-1518-00 |
| | 213-0153-00 | B010100 B040799 | 1 | . SETSCREW:5-40 X 0.125 INCH,HEX SOC STL | | | | | 74445 | OBD |
| | 366-1084-00 | B040800 B049999 | 1 | KNOB:GRAY WITH SETSCREW | | | | | 80009 | 366-1084-00 |
| | 213-0725-00 | B040800 B049999 | 1 | . SETSCREW:3-48 X 0.94",HEX,SOC STL | | | | | 70276 | OBD |
| | 366-1023-00 | B050000 | 1 | KNOB:GRAY PLASTIC | | | | | 80009 | 366-1023-00 |
| | 213-0246-00 | B050000 | 1 | . SETSCREW:5-40 X 0.093 INCH LONG,HEX SOC | | | | | 71159 | OBD |
| -4 | 366-1101-00 | | 1 | KNOB:GRAY WITH SETSCREW | | | | | 80009 | 366-1101-00 |
| | 213-0153-00 | | 1 | . SETSCREW:5-40 X 0.125 INCH,HEX SOC STL | | | | | 74445 | OBD |
| -5 | 366-1317-00 | | 1 | KNOB:RED WITH SETSCREW | | | | | 80009 | 366-1317-00 |
| | 213-0153-00 | | 1 | . SETSCREW:5-40 X 0.125 INCH,HEX SOC STL | | | | | 74445 | OBD |
| -6 | 366-1001-00 | | 1 | KNOB:GRAY WITH SETSCREW | | | | | 80009 | 366-1001-00 |
| | 213-0153-00 | | 2 | . SETSCREW:5-40 X 0.125 INCH,HEX SOC STL | | | | | 74445 | OBD |
| -7 | 366-1163-00 | | 2 | KNOB:LIGHT GRAY WITH SETSCREW | | | | | 80009 | 366-1163-00 |
| | 213-0153-00 | | 1 | . SETSCREW:5-40 X 0.125 INCH,HEX SOC STL | | | | | 74445 | OBD |
| -8 | 366-1257-11 | | 2 | PUSH BUTTON:GRAY--AC PRE | | | | | 80009 | 366-1257-11 |
| -9 | 366-1257-12 | | 2 | PUSH BUTTON:GRAY--CHG GND | | | | | 80009 | 366-1257-12 |
| -10 | 366-1489-31 | | 1 | PUSH BUTTON:GRAY--DIVIDE 10 | | | | | 80009 | 366-1489-31 |
| -11 | 426-0681-00 | | 5 | FR,PUSH BUTTON:GRAY PLASTIC | | | | | 80009 | 426-0681-00 |
| -12 | 214-1840-00 | | 1 | PIN,KNOB SECRG: | | | | | 80009 | 214-1840-00 |
| -13 | 366-1422-01 | | 1 | KNOB:LATCH 80009 366-1422-01 | | | | | | |
| -14 | 129-0103-00 | | 1 | POST,BDG,ELEC:ASSEMBLY | | | | | 80009 | 129-0103-00 |
| | | | | (ATTACHING PARTS) | | | | | | |
| -15 | 210-0455-00 | | 1 | NUT,PLAIN,HEX.:0.25-28 X 0.375 INCH,BRASS | | | | | 73743 | 3089-402 |
| -16 | 210-0223-00 | | 1 | TERMINAL,LUG:0.25 INCH DIA,SE | | | | | 78189 | 2101-14-03-2520N |
| | | | | - - - * - - | | | | | | |
| | | | | POST ASSEMBLY INCLUDES: | | | | | | |
| | 200-0103-00 | | 1 | . NUT,PLAIN,KNURL:0.25-28 X 0.375"OD BRASS | | | | | 80009 | 200-0103-00 |
| | 129-0077-00 | | 1 | . STUD,SHOULDERED:0.938 INCH LONG,BRASS | | | | | 80009 | 129-0077-00 |
| -17 | 131-0955-00 | | 2 | CONNECTOR,RCPT,:BNC,FEMALE | | | | | 24931 | 28JR200-1 |
| -18 | 131-0818-00 | | 1 | CONNECTOR,RCPT,:BNC,FEMALE | | | | | 91836 | KC19-153BNC |
| -19 | 384-1221-00 | B010100 B049999 | 1 | EXTENSION SHAFT:0.081 DIA X 3.0 INCH L,SST | | | | | 80009 | 384-1221-00 |
| | 384-0415-01 | B050000 | 1 | EXTENSION SHAFT:3.18 L X 0.08 OD STL | | | | | 80009 | 384-0415-01 |
| -20 | | | 1 | RESISTOR,VARIABLE:(SEE R468 EPL) | | | | | | |
| | | | | (ATTACHING PARTS) | | | | | | |
| -21 | 210-0583-00 | | 1 | NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS | | | | | 73743 | 2X20319-402 |
| -22 | 210-0940-00 | | 1 | WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL | | | | | 79807 | OBD |
| | | | | - - - * - - | | | | | | |
| -23 | | | 1 | RESISTOR,VARIABLE:(SEE R158 EPL) | | | | | | |
| | | | | (ATTACHING PARTS) | | | | | | |
| -24 | 210-0583-00 | | 1 | NUT,PLAIN,HEX.:0.25-32 X 0.312 INCH,BRS | | | | | 73743 | 2X20319-402 |
| -25 | 210-0940-00 | | 1 | WASHER,FLAT:0.25 ID X 0.375 INCH OD,STL | | | | | 79807 | OBD |
| | | | | - - - * - - | | | | | | |
| -26 | 358-0378-00 | | 2 | BUSHING,SLEEVE:PRESS MOUNT | | | | | 80009 | 358-0378-00 |
| -27 | 358-0029-00 | | 1 | BSHG,MACH.THD:HEX,0.375-32 X 0.438"LONG | | | | | 80009 | 358-0029-00 |
| | | | | (ATTACHING PARTS) | | | | | | |
| -28 | 210-0590-00 | | 1 | NUT,PLAIN,HEX.:0.375 X 0.438INCH,STL | | | | | 73743 | 2X28269-402 |
| -29 | 210-0978-00 | | 1 | WASHER,FLAT:0.375 ID X 0.50 INCH OD STL | | | | | 78471 | OBD |
| | | | | - - - * - - | | | | | | |
| -30 | 333-1711-00 | | 1 | PANEL,FRONT:AM502 | | | | | 80009 | 333-1711-00 |
| -31 | 214-1513-01 | | 1 | LCH,PLUG-IN RET: | | | | | 80009 | 214-1513-01 |
| | | | | (ATTACHING PARTS) | | | | | | |
| -32 | 213-0254-00 | | 1 | SCR,TPG,THD CTG:2-56X0.25"100 DEG,FLH STL | | | | | 45722 | OBD |
| | | | | - - - * - - | | | | | | |
| -33 | 200-0935-00 | | 2 | BASE,LAMPHOLDER:0.29 OD X 0.19" L,BK PLSTC | | | | | 80009 | 200-0935-00 |
| -34 | 378-0602-01 | | 1 | LENS,LIGHT:AMBER | | | | | 80009 | 378-0602-01 |
| -35 | 378-0602-00 | | 1 | LENS,LIGHT:GREEN | | | | | 80009 | 378-0602-00 |
| -36 | 352-0157-00 | | 2 | LAMPHOLDER:WHITE PLASTIC | | | | | 80009 | 352-0157-00 |
| -37 | 386-2529-00 | B010100 B049999 | 1 | SUBPANEL,FRONT:PLASTIC | | | | | 80009 | 386-2529-00 |

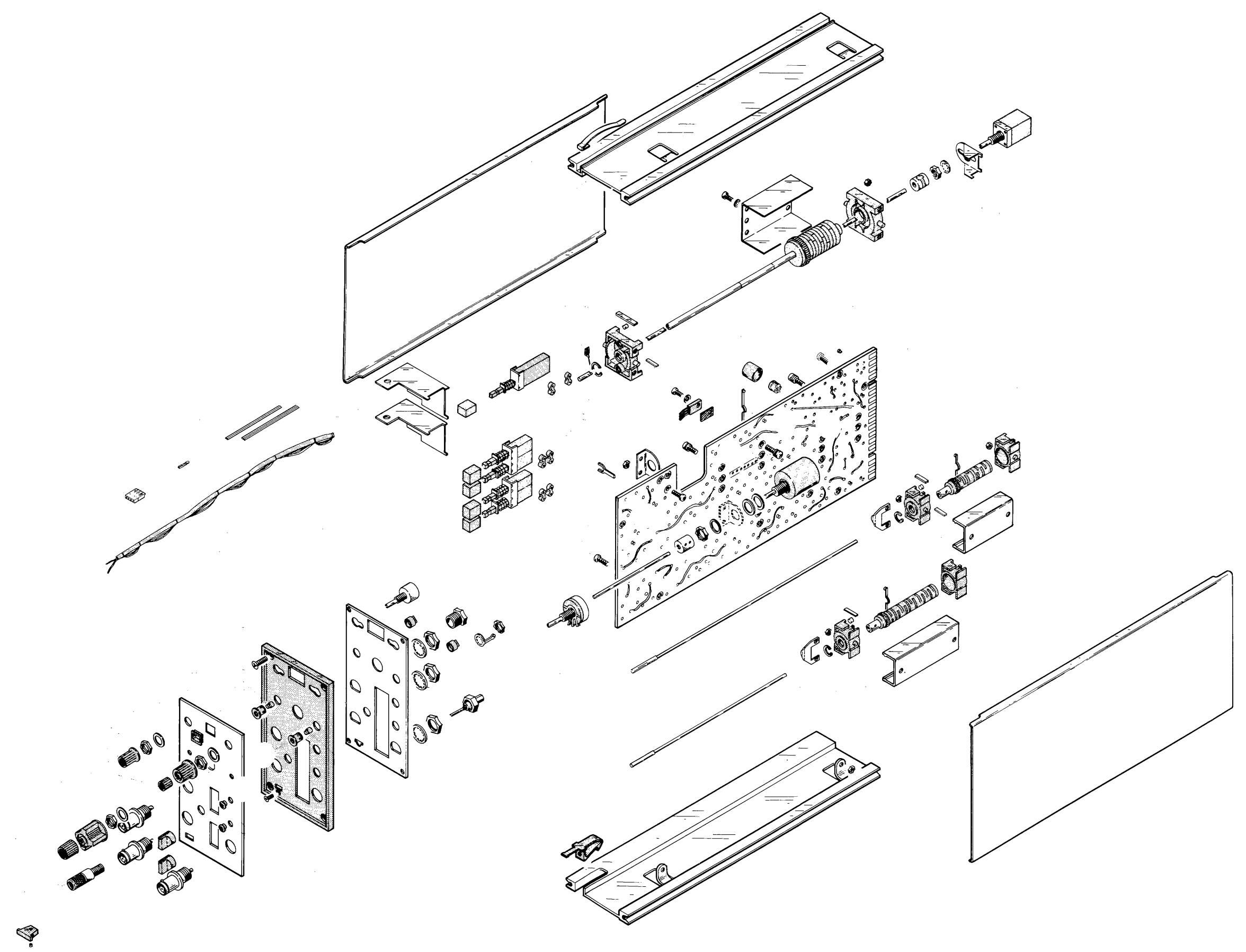
Mechanical Parts List—AM 502

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff | No. Dscont | Qty | 1 2 3 4 5 | | | | | Name & Description | Mfr Code | Mfr Part Number |
|------------------|--------------------|----------------------|------------|-----|-----------|--|--|--|--|--|----------|------------------|
| | | | | | | | | | | | | |
| 1- | 386-2529-01 | B050000 | | 1 | | | | | | SUBPANEL,FRONT:PLASTIC | 80009 | 386-2529-01 |
| | | | | | | | | | | (ATTACHING PARTS) | | |
| -38 | 213-0229-00 | | | 4 | | | | | | SCR,TPG,THD FOR:6-20X0.375 100 DEG,FLH STL | 83385 | OBD |
| | | | | | | | | | | - - - * - - - | | |
| -39 | 337-1782-00 | B010100 | B049999 | 1 | | | | | | SHLD,ELECTRICAL:FRONT SUBPANEL | 80009 | 337-1782-00 |
| | 337-1782-01 | B050000 | | 1 | | | | | | SHLD,ELECTRICAL:FRONT SUBPANEL | 80009 | 337-1782-01 |
| -40 | 214-1061-00 | | | 1 | | | | | | SPRING,GROUND:FLAT | 80009 | 214-1061-00 |
| -41 | 426-0725-00 | | | 1 | | | | | | FR SECT,PLUG-IN:TOP | 80009 | 407-0725-00 |
| | | | | | | | | | | (ATTACHING PARTS) | | |
| -42 | 213-0146-00 | | | 2 | | | | | | SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL | 83385 | OBD |
| | | | | | | | | | | - - - * - - - | | |
| -43 | 426-0724-00 | | | 1 | | | | | | FR SECT,PLUG-IN:BOTTOM | 80009 | 407-0724-00 |
| | | | | | | | | | | (ATTACHING PARTS) | | |
| -44 | 213-0146-00 | | | 1 | | | | | | SCR,TPG,THD FOR:6-20 X 0.313 INCH,PNH STL | 83385 | OBD |
| -45 | 211-0012-00 | | | 1 | | | | | | SCREW,MACHINE:4-40 X 0.375 INCH,PNH STL | 83385 | OBD |
| -46 | 210-0406-00 | | | 1 | | | | | | NUT,PLAIN,HEX.:4-40 X 0.188 INCH,BRS | 73743 | 2X12161-402 |
| | | | | | | | | | | - - - * - - - | | |
| -47 | 376-0039-00 | | | 1 | | | | | | CPLG,SHAFT RIGI:0.438 INCH LONG W/SETSCREW | 80009 | 376-0039-00 |
| | 213-0075-00 | | | 2 | | | | | | SETSCREW:4-40 X 0.094 INCH,HEX SOC STL | 70276 | OBD |
| -48 | - - - - - | | | 1 | | | | | | CKT BOARD ASSY:--MAIN(SEE EPL) | | |
| | - - - - - | | | - | | | | | | CKT BOARD ASSY INCLUDES: | | |
| -49 | - - - - - | | | 1 | | | | | | TRANSISTOR:(SEE Q940 EPL) | | |
| | - - - - - | | | - | | | | | | TRANSISTOR INCLUDES: | | |
| -50 | 210-1122-00 | | | 1 | | | | | | WASHER,LOCK:DISHED,0.12 ID X 0.375"OD,STL | 78189 | OBD |
| -51 | 210-0910-00 | | | 1 | | | | | | WASHER,NONMETAL:0.188 ID X 0.313"OD,TEFLON | 02107 | 1704B863 |
| -52 | 131-0604-00 | | | 36 | | | | | | CONTACT,ELEC:CAM SWITCH | 80009 | 131-0604-00 |
| -53 | 136-0252-04 | B010100 | B030294 | 72 | | | | | | SOCKET PIN CON:0.188 INCH LONG | 22526 | 75060-001 |
| | 136-0252-04 | B030295 | | 56 | | | | | | SOCKET PIN CON:0.188 INCH LONG | 22526 | 75060-001 |
| | 136-0514-00 | B030295 | | 2 | | | | | | SOCKET,PLUG-IN:MICROCIRCUIT,8 CONTACT | 82647 | C93802 |
| -54 | 200-0687-01 | | | 1 | | | | | | COV,TRANSISTOR: | 80009 | 200-0687-01 |
| -55 | 136-0235-00 | | | 1 | | | | | | SOCKET,SEMICON:6 PIN | 71785 | 133-96-12-062 |
| -56 | - - - - - | | | 1 | | | | | | RESISTOR,VARIABLE:(SEE R467 EPL) | | |
| | | | | | | | | | | (ATTACHING PARTS) | | |
| -57 | 210-0583-00 | | | 1 | | | | | | NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS | 73743 | 2X20319-402 |
| -58 | 210-0046-00 | | | 1 | | | | | | WASHER,LOCK:INTL,0.261 ID X 0.40" OD,STL | 78189 | 1214-05-00-0541C |
| -59 | 210-1025-00 | | | 2 | | | | | | WASHER,FLAT:0.50 ID X 0.312 INCH OD,BRS | 12327 | OBD |
| | | | | | | | | | | - - - * - - - | | |
| -60 | 407-1337-00 | | | 1 | | | | | | BRACKET,RES,MTG: | 80009 | 407-1337-00 |
| | | | | | | | | | | (ATTACHING PARTS) | | |
| -61 | 211-0008-00 | | | 2 | | | | | | SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL | 83385 | OBD |
| -62 | 210-0551-00 | | | 2 | | | | | | NUT,PLAIN,HEX:4-40 X 0.25 INCH,STL | 83385 | OBD |
| | | | | | | | | | | - - - * - - - | | |
| -63 | 337-1883-00 | | | 2 | | | | | | SHLD,ELECTRICAL: | 80009 | 337-1883-00 |
| -64 | 260-1207-00 | | | 2 | | | | | | SWITCH,PUSH:DOUBLE | 80009 | 260-1207-00 |
| -65 | 361-0385-00 | | | 8 | | | | | | SPACER,SLEEVE:GREEN,0.164 INCH LONG | 80009 | 361-0385-00 |
| -66 | 260-1209-00 | | | 1 | | | | | | SWITCH,PUSH:SINGLE | 80009 | 260-1209-00 |
| -67 | 361-0383-00 | | | 2 | | | | | | SPACER,SLEEVE:CHARCOAL,0.330 INCH LONG | 80009 | 361-0383-00 |
| -68 | 344-0154-00 | | | 4 | | | | | | CLIP,ELECTRICAL:FUSEHOLDER | 80009 | 344-0154-00 |
| -69 | 384-0173-00 | | | 1 | | | | | | EXTENSION SHAFT:6.438 INCHES LONG | 80009 | 384-0173-00 |
| -70 | 384-0348-01 | | | 1 | | | | | | EXTENSION SHAFT:9.161 INCHES LONG | 80009 | 384-0348-01 |
| | 263-1004-00 | | | 1 | | | | | | ACTUATOR ASSY:(S470) | 80009 | 263-1004-00 |
| | | | | | | | | | | (ATTACHING PARTS) | | |
| -71 | 211-0116-00 | | | 4 | | | | | | SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS | 83385 | OBD |
| | | | | | | | | | | - - - * - - - | | |
| | - - - - - | | | - | | | | | | ACTUATOR ASSY INCLUDES: | | |
| -72 | 200-1598-00 | | | 1 | | | | | | COVER,CAM SW: | 80009 | 200-1598-00 |
| -73 | 354-0219-00 | | | 1 | | | | | | RING,RETAINING: | 79136 | 5103-25-MD-R |
| -74 | 401-0155-00 | | | 1 | | | | | | BEARING,CAM SW:FRONT | 80009 | 401-0155-00 |
| -75 | 131-0840-00 | | | 1 | | | | | | CONTACT,ELEC:GROUNDING | 80009 | 131-0840-00 |
| -76 | 214-1704-01 | | | 2 | | | | | | SPRING,FLAT:CAM SW DETENT,0.008 INCH THK | 80009 | 214-1704-01 |
| -77 | 214-1127-00 | | | 2 | | | | | | ROLLER,DETNET:0.125 OD X 0.125"LONG,SST | 80009 | 214-1127-00 |
| -78 | 105-0498-00 | | | 1 | | | | | | DRUM,CAM SWITCH: | 80009 | 105-0498-00 |
| -79 | 401-0156-00 | | | 1 | | | | | | BEARING,CAM SW:REAR | 80009 | 401-0156-00 |
| -80 | 210-0406-00 | | | 4 | | | | | | NUT,PLAIN,HEX:4-40 X 0.187 INCH,BRS | 73743 | 2X12161-402 |

Mechanical Parts List—AM 502

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. Eff Dscont | Qty | 1 2 3 4 5 | Name & Description | Mfr Code | Mfr Part Number |
|------------------------|-----------------------|--------------------------------|-----|-----------|--|-------------|------------------|
| 1- | 263-1003-00 | | 1 | | ACTUATOR ASSY: (S490) (ATTACHING PARTS) | 80009 | 263-1003-00 |
| -81 | 211-0116-00 | | 4 | | SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS - - - * - - - | 83385 | OBD |
| - | - - - - - | | - | | ACTUATOR ASSY INCLUDES: | | |
| -82 | 200-1597-00 | | 1 | | COVER,CAM SW: | 80009 | 200-1597-00 |
| -83 | 354-0219-00 | | 1 | | RING,RETAINING: | 79136 | 5103-25-MD-R |
| -84 | 401-0155-00 | | 1 | | BEARING,CAM SW:FRONT | 80009 | 401-0155-00 |
| -85 | 131-1248-00 | | 1 | | CONTACT,ELEC:GROUNDING | 80009 | 131-1248-00 |
| -86 | 214-1704-00 | | 1 | | SPRING,FLAT:CAM SW DETENT,0.006 INCH THK | 80009 | 214-1704-00 |
| -87 | 214-1704-01 | | 1 | | SPRING,FLAT:CAM SW DETENT,0.008 INCH THK | 80009 | 214-1704-01 |
| -88 | 214-1127-00 | | 2 | | ROLLER DETENT:0.125 OD X 0.125"LONG,SST | 80009 | 214-1127-00 |
| -89 | 105-0502-00 | | 1 | | DRUM,CAM SWITCH: | 80009 | 105-0502-00 |
| -90 | 401-0156-00 | | 1 | | BEARING,CAM SW:REAR | 80009 | 401-0156-00 |
| -91 | 210-0406-00 | | 4 | | NUT,PLAIN,HEX:4-40 X 0.187 INCH,BRS | 73743 | 2X12161-402 |
| | 263-1005-00 | | 1 | | ACTUATOR ASSY: (S480) (ATTACHING PARTS) | 80009 | 263-1005-00 |
| -92 | 211-0116-00 | | 4 | | SCR,ASSEM WSHR:4-40 X 0.312 INCH,PNH BRS - - - * - - - | 83385 | OBD |
| - | - - - - - | | - | | ACTUATOR ASSY INCLUDES: | | |
| -93 | 200-1596-00 | | 1 | | COVER,CAM SW: (ATTACHING PARTS) | 80009 | 200-1596-00 |
| -94 | 211-0008-00 | | 4 | | SCREW,MACHINE:4-40 X 0.25 INCH,PNH STL | 83385 | OBD |
| -95 | 210-0004-00 | | 4 | | WASHER,LOCK:INTL,0.12 ID X 0.26"OD,STL | 78189 | 1204-00-00-0541C |
| -96 | 210-0406-00 | | 3 | | NUT,PLAIN,HEX:4-40 X 0.188 INCH,BRS | 73743 | 2X12161-402 |
| -97 | 131-0963-00 | | 1 | | CONTACT,ELEC:GROUNDING - - - * - - - | 80009 | 131-0963-00 |
| -98 | 354-0391-00 | | 1 | | RING,RETAINING: | 97464 | 3100-43-CD |
| -99 | 401-0081-02 | | 1 | | BEARING,CAM SW:FRONT | 80009 | 401-0081-02 |
| -100 | 214-1139-03 | | 1 | | SPRING,FLAT:CAM SW DETENT,0.010 INCH THK | 80009 | 214-1139-03 |
| -101 | 214-1139-02 | | 1 | | SPRING,FLAT:CAM SW DETENT,0.008 INCH THK | 80009 | 214-1139-02 |
| -102 | 214-1127-00 | | 2 | | ROLLER,DETENT:0.125 OD X 0.125"LONG,SST | 80009 | 214-1127-00 |
| -103 | 105-0503-00 | | 1 | | DRUM,CAM SWITCH: | 80009 | 105-0503-00 |
| -104 | 401-0115-00 | | 1 | | BEARING,CAM SW:REAR | 80009 | 401-0115-00 |
| | 210-0406-00 | | 3 | | NUT,PLAIN,HEX:4-40 X 0.188 INCH,BRS | 73743 | 2X12161-402 |
| | 131-0963-00 | | 1 | | CONTACT,ELEC:GROUNDING | 80009 | 131-0963-00 |
| -105 | 384-1220-00 | | 1 | | EXTENSION SHAFT:8.038 INCHES LONG | 80009 | 384-1220-00 |
| -106 | 376-0029-00 | | 1 | | CPLG,SHAFT,RIGI: | 80009 | 376-0029-00 |
| | 213-0075-00 | | 2 | | SETScrew:4-40 X 0.094 INCH,HEX SOC STL | 70276 | OBD |
| -107 | - - - - - | | 1 | | RESISTOR,VARIABLE:(SEE R178/S178 EPL) (ATTACHING PARTS) | | |
| -108 | 210-0583-00 | | 1 | | NUT,PLAIN,HEX:0.25-32 X 0.312 INCH,BRS | 73743 | 2X20319-402 |
| -109 | 210-0046-00 | | 1 | | WASHER,LOCK:INTL,0.261 ID X 0.40"OD,STL | 78189 | 1214-05-00-0541C |
| -110 | 407-0803-00 | | 1 | | BRACKET,RES MTG: - - - * - - - | 80009 | 407-0803-00 |
| -111 | 175-0825-00 | | FT | | WIRE,ELECTRICAL:2 WIRE RIBBON | 23499 | TEK-175-0825-00 |
| -112 | 175-0826-00 | | FT | | WIRE,ELECTRICAL:3 WIRE RIBBON | 23499 | TEK-175-0826-00 |
| -113 | 131-0707-00 | | 4 | | CONNECTOR,TERM:0.50 INCH LONG(22-26 AWG) | 22526 | 47439 |
| -114 | 352-0162-02 | | 1 | | HOLDER,TERM CON:4 WIRE(RED) | 80009 | 352-0162-02 |
| -115 | 179-2028-00 | | 1 | | WIRING HARNESS:MAIN | 80009 | 179-2028-00 |

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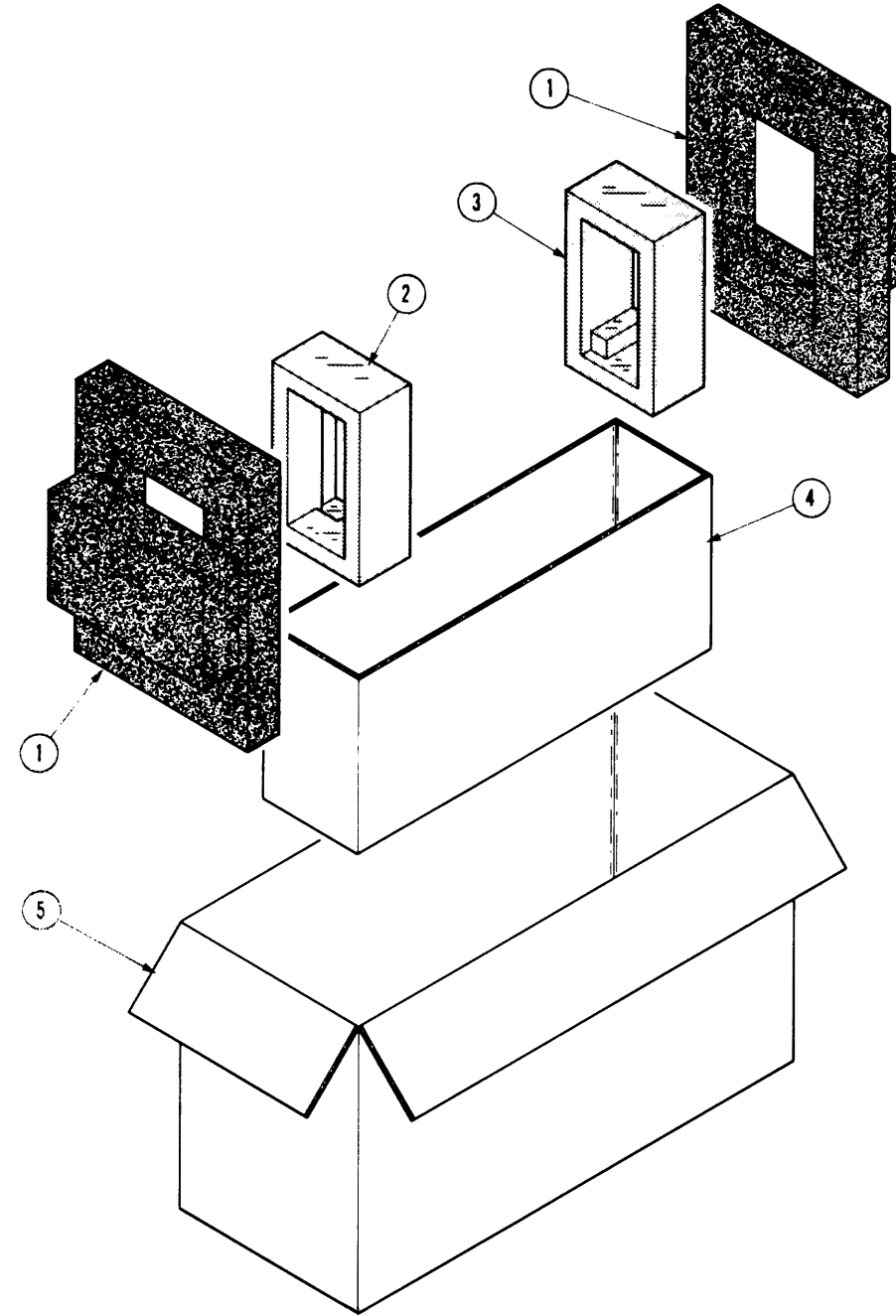
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ACCESSORIES

| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | Name & Description | | | | | Mfr Code | Mfr Part Number |
|------------------|--------------------|------------------|--------|-----|---------------------|---|---|---|---|----------|-----------------|
| | | Eff | Dscont | | 1 | 2 | 3 | 4 | 5 | | |
| 070-1582-00 | | | | 1 | MANUAL, INSTRUCTION | | | | | 80009 | 070-1582-00 |

REPACKAGING



| Fig. & Index No. | Tektronix Part No. | Serial/Model No. | | Qty | Name & Description | | | | | Mfr Code | Mfr Part Number |
|------------------|--------------------|------------------|--------|-----|---|---|---|---|---|----------|-----------------|
| | | Eff | Dscont | | 1 | 2 | 3 | 4 | 5 | | |
| 2- | 065-0151-00 | | | 1 | CARTON ASSEMBLY: | | | | | 80009 | 065-0151-00 |
| - | - | | | - | CARTON ASSEMBLY INCLUDES: | | | | | | |
| -1 | 004-0282-00 | | | 2 | FRAME: PLASTIC FOAM | | | | | 80009 | 004-0282-00 |
| -2 | 004-0243-00 | | | 1 | PAD, CUSHIONING: FRONT | | | | | 80009 | 004-0243-00 |
| -3 | 004-0242-00 | | | 1 | PAD, CUSHIONING: REAR | | | | | 80009 | 004-0242-00 |
| -4 | 004-1093-00 | | | 1 | PAD, CUSHIONING: 13.375 X 3.25 X 5.625" | | | | | 80009 | 004-1093-00 |
| -5 | 004-0612-00 | | | 1 | CARTON: 16.50 X 6.625 X 9.125 INCHES | | | | | 80009 | 004-0612-00 |

