



DYNAMAX[®]
BROADCAST PRODUCTS BY FIDELIPAC[®]

INSTRUCTION MANUAL
ESD 10
Eraser/Splice Detector



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Eraser/Splice Detector

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TECHNICAL MANUAL

DYNAMAX
ESD10

ERASER/SPLICE DETECTOR

P/N 730-AO-016
Revision 2/89

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This equipment was manufactured under the following patent number:

4,583,669

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Fidelipac Corporation
Moorestown, New Jersey, U.S.A.

Printed in U.S.A.

CONGRATULATIONS!

You have purchased the most advanced NAB Tape Cartridge Eraser/Splice Detector ever built. It has been manufactured by Fidelipac, the company that first invented the endless loop tape cartridge.

HISTORY

In order to better understand the design advancements incorporated in the ESD10, a short discussion of prior art is in order.

DEGAUSSING TECHNIQUE

For many years, the only known method of erasing a tape cartridge was by degaussing. This involved passing the cartridge through an alternating magnetic field created by an electric coil. Although this method was effective, a variety of problems existed. First, the correct technique was necessary. Since the erasing process is invisible, it was impossible to determine that the cartridge was completely erased. Only by playing the bulk-erased cartridge all the way through was it possible to verify complete and thorough erasure.

HEAT & DUTY CYCLE

A second problem associated with degaussers is their duty cycle. All degaussing coils produce heat as a by-product. Without some type of thermal cutoff or special cooling system, a degaussing coil operated continuously will melt, ignite, or burn out.

POWER CONSUMPTION

Finally, there is the question of power consumption. Degaussing coils of sufficient strength to do a good job of erasing (even if your technique is poor) require substantial amounts of wattage. Some hand-held bulk degaussers draw 1000 watts of power from the AC line. The sudden inrush of this power can create transient spikes on the power line of more than 2000 volts. Line voltage variation created by degaussers can directly affect the phase stability of cartridge recording and playback machines with unregulated solenoid power supplies, and can expose unprotected equipment to substantial risk of transient line voltage damage.

And, needless to say, the degaussing coil is not capable of locating the splice in a cartridge.

THE FIRST ERASER/DETECTORS

The first combination automatic Eraser and Splice Detectors became available in the late 1970's. They resembled a cartridge machine, and contained the familiar degaussing coil mounted inverted under the tape deck. To move the tape through the magnetic field and thus provide smooth erasure, the machine played the cartridge while the degaussing coil was energized. To save time while searching for the splice, the cartridge was run at 25 to 29 inches per

second. As these devices proliferated, two problems became apparent: first, cartridges with longer tape loads occasionally jammed while being erased. This was due to friction created by the tape reel being forced to rotate at high speed while under the influence of a saturating magnetic field. In addition, tapes subjected to repeated erasure would stretch as the rotating pack of tape resisted movement under the influence of the erase field. This stretching contributed to shedding of the delicate oxide and lubricant coatings and distorted the edges of the tape, making stereo phasing more difficult, if not impossible. Second, the old problem of heat and duty cycle remained. Many of these devices burned out, causing costly damage. Users eventually learned not to erase too many cartridges consecutively to avoid overheating the coil.

In an attempt to solve these problems, a design change was made. A two-speed motor and appropriate switching was installed. This allowed the cartridge to rotate slowly during the erase cycle and then speed up for the splice locate function. Unfortunately, the advent of high-output low-noise cartridge tape and increased usage of longer, music-length cartridges tended to cancel out the improvement in design. The higher coercivity of high-output tapes, and the increased bulk of tape in music-length cartridges worked at odds with the basic design. Cartridges still jammed, and the gradual degradation of cart performance after repeated erasures was still a problem.

SPLICE FINDING & ADJUSTMENTS NEEDED

The splice locating mechanism often required adjustment. To work properly, a short metal shaft connected to the pressure roller armature rotated into close proximity to a small coil when the tape was being played. After the erase cycle was completed and the cartridge was at the fast-forward speed, any sudden change of position of the short metal shaft in relation to the coil would signal the passage of the splice. Although this system worked reliably when new, two adjustments had to be critically maintained: pressure roller parallelism and shaft-to-coil distance. Unfortunately, both adjustments varied as the pressure roller aged. And aging was accelerated by the heat of the deck, generated by the degaussing coil.

IS IT WORTH IT?

The principal reason for employing an eraser/splice detector in the first place is to obtain a cleaner sound from your cartridges. The cyclic, audible "thumping" of a poorly erased cartridge and the disturbing dropout and phase shift that occurs as the splice goes past the heads should be avoided at all costs.

ESD10 SOLVES PROBLEMS

Your new ESD10 was designed by expert engineers who are very familiar with the problems detailed above. In each case, the problem has been thoughtfully considered and solved. The ESD10 is quiet, cool, reliable, adjustment free, and erases tape better and more efficiently than ever thought possible.

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SECTION 1 GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains general, installation, operation and maintenance information for the DYNAMAX ESD10 Eraser/Splice Detector.

Section 1 is a general description of the ESD10 features, specifications, warranty and service information.

1.2 GENERAL DESCRIPTION

The ESD10 is designed to fully erase and/or locate the splice on NAB type A and AA tape cartridges. Erasure is accomplished by the use of two precision full-track erase heads which penetrate the cartridge and contact the tape at the front window openings of the cartridge. Each erase head is driven by its own power amplifier fed from a 200 kHz bias oscillator. Each erase head contains two erase gaps. This configuration provides, in effect, four erasures for each pass of the tape.

Erase depth is in excess of 85 dB below tape saturation and is totally free of cyclical subsonic modulation products. Residual tape noise is at a theoretical minimum, equal to that produced in the recording process when bias is applied to virgin tape. Erase heads are operated in the constant current mode to avoid any possibility of saturation and to provide extremely long-term stability.

Splice detection is provided by the same patented system utilized in the CTR100 Series of Cartridge Recorder/Reproducers. The additional thickness of the splice creates a momentary displacement in the position of the pressure roller. This "bounce" creates an AC emf pulse across the solenoid terminals. The pulse is detected and used to signal the presence of the splice. This system is unique and requires no adjustment once the machine has been set up.

The ESD10 may be simply programmed to detect splices without erasing. In this mode, the cartridge is rapidly advanced until the splice is first detected.

When in the erase mode, the cartridge is continuously erased until the splice is found the second time. This insures complete erasure of the cartridge. A short stop delay after locating the splice allows the erase bias to ramp down for pop-free operation. This stop delay is always present, whether erasing or not, in order to produce uniform splice placement. It eliminates the chance of recording a "pop" on the tape, even if the tape is stopped manually while in the erase mode.

1.2.1 Electronics

All active components are mounted on a single circuit board assembly, easily removed from the chassis. A second smaller circuit board is used for connections to front panel switches. A third circuit board is used for cartridge position sensing. All connections between circuit boards, power transformer, erase heads and motor are through connectors, facilitating easy servicing.

The power transformer utilizes a dual primary winding, permitting easy conversion from 110 to 220 VAC.

All integrated circuits are socketed for easy servicing. 15-volt CMOS logic is used throughout for RF immunity far in excess of that found in 5-volt devices. The solenoid operates on 24 volts, DC.

1.2.2 Mechanics

The transport is constructed around a precision-machined 1/2 inch thick nickel-plated aluminum deck plate for mechanical stability. A heavy-duty two-inch air damped solenoid is utilized with a chain driven pressure roller assembly. The solenoid is controlled with a two step constant voltage circuit to insure positive starts while reducing solenoid heat.

A. Pressure Roller

The pressure roller assembly includes a ball-bearing race which provides self alignment to the capstan shaft. This eliminates keystoneing due to roller wear or motor mispositioning and provides for maximum deflection of the roller when the splice appears.

B. Head Bridge

The ESD10 employs the same Head Bridge assembly used in the state-of-the-art CTR100 and CTR10 Series cartridge machines. Although azimuth adjustment of the erase heads is not critical, it is important that a precise height and zenith adjustment be set. The tape guides are an integral part of the Head Bridge and may be precisely adjusted in the vertical plane by turning one screw for each guide. This design has eliminated the need for tape guide holding screws along the front of the Head Bridge, resulting in an accurate front cartridge reference. The Head Bridge mounts to the transport with three screws and may be removed from the transport without upsetting previous head adjustments.

C. Cartridge Positioning System

This system is unique. It utilizes four molded rubber rollers in a canted design. These rollers place downward pressure on the cartridge edges and help to insure that the cartridge is aligned along the right cartridge edge guide. The familiar and often troublesome microswitch has been replaced with optical cartridge sensing.

1.2.3 ESD10 Specifications

A. Power

1. 117 +/- 10% or 234 +/- 10%
2. 50/60 Hz
3. 50 Watts maximum

B. Tape Speed

30 ips/60 Hz; 25 ips/50 Hz

C. Splice Density

Detects splicing tape of 1/2 mil or greater thickness

D. Erase Depth

85 dB or better, below tape saturation at 1 kHz.

E. Tape Capacity

NAB type A and AA tape cartridges

F. Ambient Operating Temperature

10 - 50 degrees C (50 - 122 degrees F)

G. Relative Humidity Operating Range

0 - 80 per cent (non-condensing)

H. Mounting

1. Tabletop standard.
2. Rackmount (requires optional RM-1S Rack Mount).
3. 3 units may be mounted in a single 19 inch rack.
4. The ESD10 generates no interfering erase field and can be mounted and operated adjacent to recording equipment and test tape storage.

I. Dimensions

1. 14.29 cm H x 15.24 cm W x 40.64 cm D
(5.625" H x 6" W x 16" D)
2. Rackmount requires only 3 rack units of height (13.34 cm/5.25 in.).

J. Shipping Information

1. 17.7 kg (17 lbs.)
2. 0.04 cu. m. (1.4 cu. ft.)
3. Carton Dimensions: 31.75 cm H x 31.75 cm W x 57.15 cm D
(12.5" H x 12.5" W x 22.5" D)

1.2.4 2 Year Limited Warranty

Fidelipac Corporation warrants that new equipment sold is free of defects in workmanship or material for a period of two years from date of shipment. This warranty applies only to the original user and excludes wear items such as bulbs, fuses, heads, rollers, etc. Warranty cards should be accurately completed in full and returned promptly to Fidelipac in order to register each original user. If warranty cards are not properly filed with our offices, claims may not be recognized. Other manufacturers' equipment, such as motors and heads, bear only those manufacturers' standard warranty and no other warranty. Warranty claims will be honored only if written notice is received by Fidelipac within thirty days after discovery of a defect, and prior to return of equipment to us. Our only obligation will be to refund the purchase price, or, at our option, to replace or repair the item or part FOB the factory or other designated location. Returned equipment must be adequately packed and insured to protect against shipping damage and delivered to our factory by prepaid transportation for inspection and testing.

This warranty is limited to normal and correct use and service of equipment, and is not valid if defects result from maltreatment, exposure, excessive moisture or heat, or operation under environmental or other conditions apart from those prescribed in the equipment instruction manual. Moreover, this warranty will be void if equipment is altered or repaired without specific written authorization by Fidelipac.

THE FULL EXTENT OF THE BUYER'S RIGHTS AND REMEDIES ARE STATED ABOVE. NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED, NOR IS ANY OTHER PRIVATE PARTY AUTHORIZED TO PROVIDE ANY ADDITIONAL GUARANTEE OR WARRANTY. FIDELIPAC CORPORATION DISCLAIMS ANY LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR FOR DAMAGES OR EXPENSE ARISING DIRECTLY OR INDIRECTLY FROM THE USE OF THIS EQUIPMENT, OR INABILITY TO USE IT, OR FOR ANY OTHER REASON.

SECTION 2 INSTALLATION

This section provides information on unpacking, inspection, installation and wiring.

2.1 UNPACKING AND INSPECTION

The ESD10 is shipped in a specially constructed packing carton to protect the equipment during transit. Carefully unpack the unit using care to avoid damage to the unit's finish. Check the contents of the packing carton for any damage that may have occurred during shipment. Notify the carrier of any damage. All packing material should be retained for inspection by the carrier. It is advisable to retain the carton for future use.

2.2 MOUNTING

The ESD10 is designed for table top mounting. An optional rack adapter and filler panels are available for mounting in a standard EIA 19" rack. The ESD10 is 5 1/4" high (without feet). It is 5.875" wide, allowing three machines to be installed side by side in a 19" rack opening.

When mounting the unit, allow sufficient space at the top, bottom and rear of the unit to permit a flow of cooling air. For this reason, desk mounted units should not have the feet removed. Ventilation holes in the top and bottom covers should not be obstructed.

2.3 WIRING

2.3.1 Connecting AC Power

Main AC power is connected to the unit through a power supply AC cable equipped with standard connectors. To attach the cable, simply insert the female plug at one end of the cable to the male AC power receptacle on the rear panel, being certain to press the connector well into the socket on the machine. The other end of the cable may be plugged into a standard AC outlet.

2.3.2 Power Conversion

The ESD10 is equipped with a universal power transformer capable of operating at 117 or 234 vac. See Schematic (750-A0-066/Nidec or 750-A0-067/Oriental) for power conversion wiring information. Early machines with Nidec motors only require a 50 Hz motor for operation at 50 Hz. All subsequent machines utilize the same motor for operation at either 50 or 60 Hz.

SECTION 3 OPERATION

This section describes functions and location of the ESD10 controls and indicators and provides specific instructions for proper operation.

3.1 PRE-OPERATING PROCEDURES

- A. Turn off the ESD10 rear panel power switch. Clean and demagnetize the components in the tape path.
- B. Make all required connections and complete all installation procedures before applying power to the unit.
- C. Turn on the rear panel power switch.
- D. Observe that pressing the ERASE switch on the front panel causes it to illuminate. Pressing it a second time causes the lamp to extinguish.

3.2 FRONT AND REAR PANELS - CONTROLS AND INDICATORS

- | | |
|-----------------|--|
| A. POWER Switch | Located on the rear panel of the unit. Used to turn AC power on and off. |
| B. ERASE Switch | A momentary toggle function. Used to enable or disable the ERASE function. |
| C. ERASE LAMP | Contained in the ERASE switch, this lamp indicates that the ERASE function has been enabled. If a cartridge is inserted and started while the ERASE lamp is illuminated, the cartridge will be erased prior to finding the splice. |

If a cartridge is inserted and started when the ERASE lamp is off, the cartridge will not be erased, but the splice will be located.

When in the ERASE and START mode, the ERASE lamp flashes to indicate that the splice has been sensed the first time.

- D. STOP Switch Used to stop all tape motion. Pressing the STOP switch while in the ERASE mode causes the bias oscillator drive to ramp down prior to stopping the tape. This prevents transient noise from appearing on a tape, even if the ERASE cycle is manually interrupted.
- E. READY Lamp Contained in the STOP switch. The READY lamp is on when the cartridge is properly loaded or when the cleaning switch is on. It indicates that the ESD10 is ready to start. The READY lamp will flash after the ERASE/SPLICE LOCATE or SPLICE LOCATE ONLY cycle has completed, or if the cartridge has been manually stopped.
- F. START Switch Used to start the ERASE/SPLICE LOCATE or SPLICE LOCATE ONLY cycle.
- G. START Lamp Contained in the START switch, this lamp indicates normal tape motion.
- H. Cleaning Switch Located in the front of the right cartridge edge guide. Screwdriver accessible from the front of the machine. When switched on (up position) the START switch is enabled when no cartridge is present. This allows the pressure roller to be engaged (by pressing the START switch) so that it may be easily cleaned. Also, diagnostics may be expediently performed.

3.3 NORMAL OPERATION

3.3.1 Splice Detection Without Erasure

- A. Ensure that the ERASE lamp is not lit. If it is, momentarily press the ERASE switch to extinguish the lamp.
- B. Insert the cartridge; note that the STOP switch illuminates.
- C. Press the START switch; note that the START switch illuminates.
- D. When the splice has been detected, the STOP switch will flash as a reminder that the cycle has been completed.

3.3.2 Splice Detection With Erasure

- A. Insure that the ERASE lamp is lit. If it is not, momentarily press the ERASE switch to illuminate the lamp.
- B. Insert the cartridge; note that the STOP switch illuminates.
- C. Press the START switch; note that the START switch illuminates.
- D. Erasing begins immediately and continues until the cartridge stops.
- E. The ERASE lamp flashes to indicate first detection of the splice. This indicates proper functioning of the ERASE cycle.
- F. The cycle is completed when the STOP lamp begins to flash. Note that the ERASE lamp is once again continously illuminated.

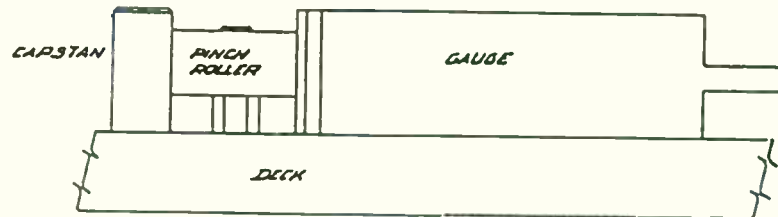
SECTION 4 MECHANICAL ADJUSTMENTS

Your ESD10 has been carefully adjusted at the factory prior to shipment. Normally, no further adjustment is required prior to operation.

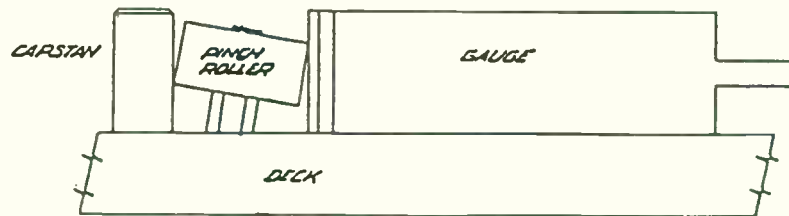
4.1 PRESSURE ROLLER/MOTOR SHAFT ALIGNMENT

The following adjustment is necessary if the motor has been removed. The adjustment should be checked anytime a new pressure roller is installed.

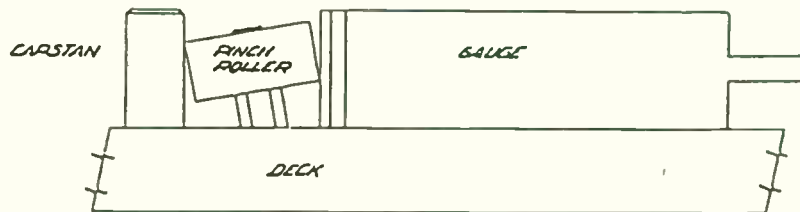
- A. Turn AC power switch and the cleaning switch on and start the machine.
- B. Place the tape guide, head alignment gauge (P/N 710-AO-001) near the pressure roller as shown. Check to see that the gauge is square with the roller. If not, stop the machine, loosen the motor mounting screws, gently move the motor, and retighten the motor screws. Start the machine and check roller alignment with the gauge. Repeat until the roller is square with the gauge. See figures below:



Motor in Correct Position
Figure 1A



Move Motor Back
Figure 1B



Move Motor Forward
Figure 1C

- C. Carefully tighten the motor mounting screws using care not to change the motor position.

4.2 SOLENOID PLUNGER ADJUSTMENT

The following adjustments are necessary if the solenoid has been removed:

- A. Loosen the locking nut on the solenoid plunger and turn the cleaning switch to the on position. Turn the AC power switch on.
- B. Start the machine without a cartridge.
- C. If the solenoid does not bottom (no audible noise), stop the machine and rotate the plunger 1/2 turn clockwise. If the solenoid hits bottom, go to step E.
- D. Repeat steps B and C until the solenoid bottoms.
- E. Stop the machine and rotate the plunger 1/4 turn counterclockwise.
- F. Start the machine.
- G. Repeat steps E and F until no audible noise is heard.
- H. Rotate the plunger an additional two (2) turns counterclockwise.
- I. Tighten the plunger locking nut and turn off the cleaning switch.

4.3 SOLENOID DAMPING ADJUSTMENT

The speed at which the solenoid engages and releases the pressure roller is determined by the air escape valve on the rear of the solenoid. The audible noise generated by the operation of the solenoid is proportional to the speed of the solenoid. The air escape valve may be adjusted by turning the screw at the rear of the solenoid. Turning the screw clockwise will restrict air flow and reduce audible solenoid noise.

4.4 CARTRIDGE GUIDANCE SYSTEM ALIGNMENT

Maximum system performance can only occur if the cartridge is consistently placed in the proper position each time it is inserted. There are three cartridge reference surfaces:

1. Deck Plate

The cartridge should lie flat on the deck plate. Downward pressure is applied along the left and right cartridge edge because the shell of the cartridge is the strongest along the left and right edges and the hold-down force serves to flatten, rather than warp the cartridge.

2. Head Bridge

When properly inserted, the front of the cartridge should seat squarely against the front of the head bridge. For this reason, tape guide screws, which vary widely and wear uneven indentations in the front of the cartridge, have been eliminated.

3. Right Cartridge Guide

When properly inserted, the cartridge should seat squarely against the right cartridge guide. Slight pressure along the left edge of the cartridge to hold it against the right cartridge guide is desirable.

While the deck plate point is fixed and not adjustable, the head bridge and the right cartridge guide interrelate and are adjusted together.

A. Refer to Figure 2 and scribe a cartridge as shown.

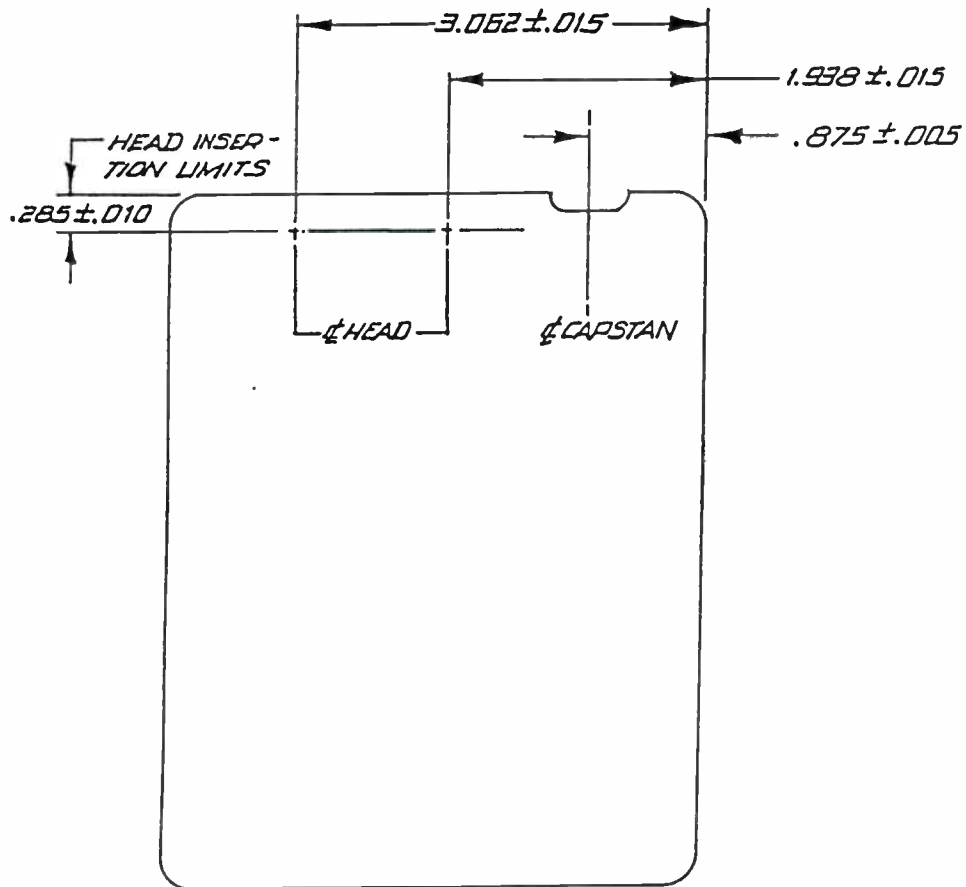


Figure 2

- B. Slowly insert the cartridge into the machine. If the scribed lines do not line up as shown, or if the cartridge does not seat squarely against the front of the Head Bridge and the right cartridge guide, realignment is necessary.
- C. Loosen (DO NOT REMOVE) the deck mounting screws on the right cartridge guide. Position the cartridge and right cartridge guide, while holding them tightly together, until the scribed capstan line is properly positioned. Be certain that the cartridge seats firmly and squarely against the front of the Head Bridge. Tighten the right cartridge guide screws while making certain that the cartridge guide does not move.
- D. As a final test, remove and re-insert the cartridge while holding the cartridge firmly against the right cartridge guide. The cartridge should seat squarely against the front of the Head Bridge and the scribed lines should be aligned above the center of the Head Bridge.

4.5 HEAD BRIDGE ADJUSTMENTS

Head Bridge adjustment includes setting the tracking height, zenith and azimuth on each head, and the tape guide height on each guide (Figure 3).

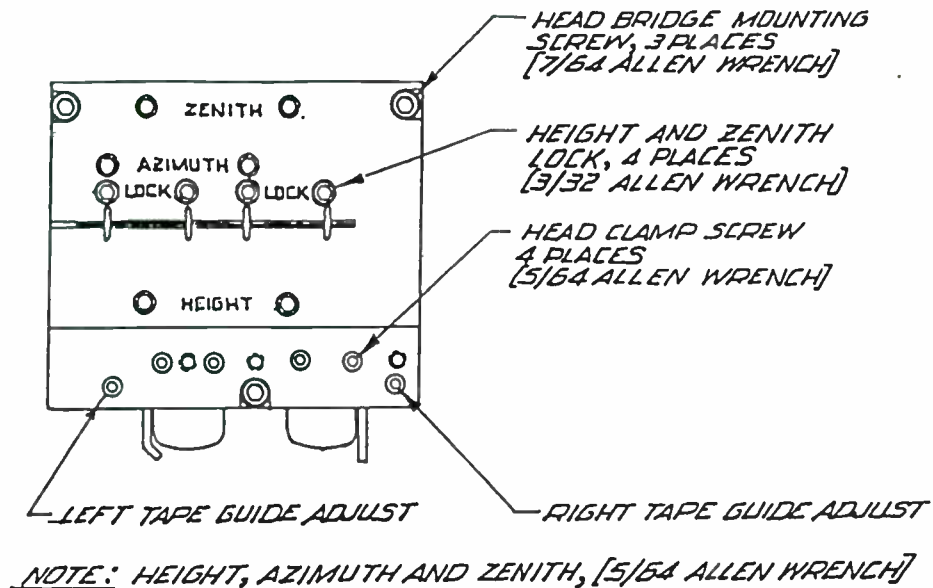


Figure 3

4.5.1 Height and Zenith Adjustment

- A. Turn on the cleaning switch.
- B. Loosen the height/zenith locking screws by turning them counterclockwise.
- C. Remove the cover and pressure pads from an old cartridge. Insert the cartridge in the machine and start the machine. Adjust the height adjustment so that the top and bottom edges of the erase head are visible above and below the top and bottom edges of the tape.
- D. Using the Tape Guide/Head Alignment Gauge (P/N 710-AO-001), turn the zenith adjustment until the front of the tape head is parallel to the front of the gauge. See figure 4.
- E. Repeat steps C and D until both height and zenith are correct.
- F. Repeat for the other tape head.
- G. Carefully and equally tighten the lock screws. Do not overtighten! Recheck the height and zenith adjustments and repeat steps C through F making necessary but slight corrections.

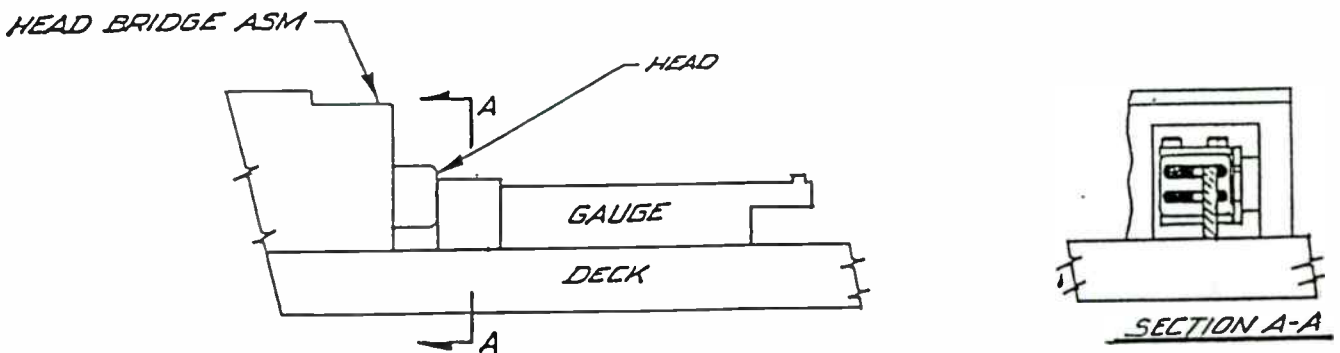


Figure 4

4.5.2 Tape Guide Adjustment

Using the Tape Guide/Head Alignment gauge, align the tape guides by turning the tape guide adjustment screw until the lower edge of the upper guide finger just contacts the tip of the height gauge. Repeat for the other guide. See figure 5.

NOTE: Worn guides may affect erasure performance. Guides should be checked periodically for signs of wear and replaced when necessary.

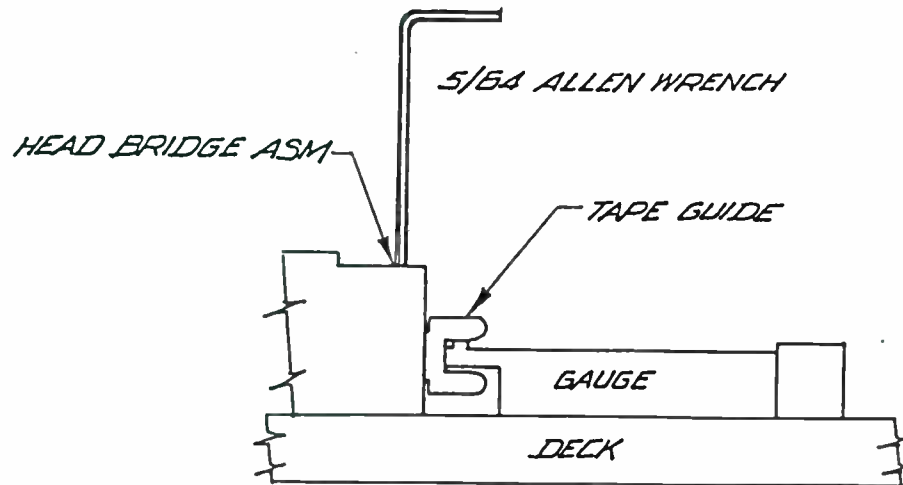


Figure 5

4.5.3 Head Azimuth Adjustment

Adjust each head azimuth screw such that the head azimuth is vertical. This is best done visually, as this adjustment is not critical.

4.6 **TAPE HEAD REPLACEMENT**

The tape heads are clamped into the head bracket. To remove a tape head, loosen the clamping screws and gently pull the head forward. Use care not to bend the pins when removing the leads from the tape head. Be certain not to reverse polarity of any connections when re-connecting the new head. When installing a new head, insert it into the clamp as far as possible and tighten the clamp screws. See Figure 3. After replacing the head, perform steps 4.5.1 and 4.5.3. Note: Erase heads typically require replacing if the coil has opened or shorted. See Section 5, Note D.

SECTION 5 ELECTRONIC ADJUSTMENTS

The ESD10 is set at the factory for optimum erasure performance. The only adjustment available in the unit is the erase bias level. There are two trim pots, one for each head. Normally, adjustment is not required unless erase heads are replaced. Proceed as follows:

- A. Connect an oscilloscope to Test Point TP1.
- B. Insert a cartridge, or turn on the cleaning switch.
- C. Turn on the ERASE function and press the START switch.
- D. Adjust R19 for a reading of 0.55 volts, peak-to-peak. This indicates that the head is operating.
- E. Repeat the adjustment using TP2 and R47.

SECTION 6 CIRCUIT DESCRIPTION

U2C and U2D are connected to form the start/stop flip flop. In a similar manner U3B and U3A form the stop flash flip flop. U4-3 goes low when no cartridge is in place or momentarily at power up. This resets both flip flops (U2-11 and U3-4 high). U2B inhibits commands from the start switch when U4-3 is low or the stop switch is pushed. Prior to starting a cartridge U2-11, U3-4, U4-4 and U5-11 are high. Inserting a cartridge (U4-3 high) allows current from U5-11 to turn on the stop lamp. With U4-3 high U2B will now pass start commands and change the state of both flip flops. U2-10 goes high and turns on the start lamp. U3-4 goes low which allows pulses from U11-2 to reach U4-4. When the machine stops (from a splice or the stop switch) the start/stop flip flop is reset while the stop flash flip flop is not. This results in the pulses from U4-4 reaching U5-11 and flashing the stop lamp. Removing the cartridge resets the flip flop and when a new cartridge is inserted, the stop lamp does not flash.

U9A is a monostable which outputs a short pulse whenever the erase button is pushed and the machine is in the stop mode (U2-11 low). U10 is configured as a divide by 2 which results in U10-1 changing states from each pulse applied to U10-3. When U10-1 is high (erase function enabled) and the machine is in the stop mode (U2-10 low, U5-3 low, U3-10 high, U4-10 high, U5-4 high), Q5 turns on and illuminates the erase lamp.

U9-6 goes momentarily high when a splice is detected. U12-1 goes high and if the machine is not in the erase mode, U6-3 will go low, and U5-10 will go low stopping the machine. If the machine is in the erase mode, U12-1 will go high, U3-10 will go low and pulses from U11-2 will control Q5 flashing the erase lamp. U6A inhibits U12-1 from stopping the machine. When the splice is detected a second time, U12-13 goes high, U6-10 and U5-10 go low stopping the machine. U12-1 and U12-13 are reset to the low state when the machine stops.

Transistors Q14, Q15 & Q16 control the solenoid. When the machine is started, U2-10 and U3-11 go high. U4-11 momentarily goes high turning on Q14 & Q16 which connects the solenoid between the +24 and -15 volt supplies. When C55 charges, Q14 & Q16 turn off. Q15 remains on and the solenoid is now connected between the +24 volt supply (through R58) and ground. This results in a fast start and then a reduction of pressure roller pressure for splice finding. When a splice is found, U4-11 momentarily goes high again which resets the solenoid and allows the splice to be located a second time.

U13 and related components detect and amplify emf pulses generated by the solenoid when the plunger moves due to a splice passing between the capstan and pressure roller. U13-7 goes negative when a splice is detected resulting in the collector of Q9 going high. U6B inhibits a splice signal from reaching U9 when the machine is first started.

U1A and U1B form a 200 kHz wein bridge oscillator. U1A is the oscillating element with R2, R7, C1 & C2 setting the operating frequency. U1B and Q1 form an AGC which stabilizes the output of U1A. R3 & R4 determine the output amplitude of the oscillator.

U8, Q12 & Q13 amplify the output from U1A and drive erase head number 1. C34 & C35 series resonate the erase head providing additional erase voltage. Erase head current as set by R19 is sampled across R24 and is fed back to U8 resulting in constant current operation.

The drive circuit for erase head number 2 is identical to the circuit for head number 1.

Transistor Q7 controls FET Q2 (the 200 kHz gate) which allows the 200 kHz signal to reach the erase heads only when the machine is in the erase & start mode. In addition Q7 controls the bias ramp down (Via Q2) at the end of the erase cycle for pop free operation. Capacitor C56 keeps the solenoid energized (and the tape moving) while the bias ramps down.

D8, D9, D10 & D11 form a bi-polar full wave rectifier. The D.C. is filtered by C17 & C32 and then regulated to +15 and -15 volts by VR3 & VR2. D4, D5, D6 & D7 form a full wave bridge rectifier. The D.C. is filtered by C5 and regulated to +24 volts by VR1.

U11 divides the A.C. line frequency and supplies the pulses which flash the stop and erase lamps.

Relay K1 powers the motor only when a cartridge is in place.

SECTION 7 MAINTENANCE

Advanced technology incorporated into the design of the ESD10 such as modular electronics, permanently lubricated solenoid plunger and capstan motor bearings, self-aligning pressure roller, and solid state optical sensing permit operation of the device with a minimum of maintenance.

Most of the maintenance which is required consists of routine cleaning and routine alignment checks.

The frequency of maintenance is dependent upon a number of factors; i.e., type and condition of tape used, duty cycle of operation, overall frequency of use, and general ambient conditions. Therefore, the following list contains suggested service intervals for typical maintenance operations. Actual service intervals should be determined by the user.

7.1 NORMAL PREVENTIVE MAINTENANCE - CHECKS AND ADJUSTMENTS

7.1.1 As Required

- A. Clean heads, pressure roller, capstan and tape guides using only Isopropyl Alcohol or a freon cleaner such as Miller-Stephenson Freon TF. Use of other cleaning fluids may damage the heads.

7.1.2 Monthly

- A. Check guides and pressure roller for wear; adjust or replace as necessary.
- B. Degauss heads. Be certain to turn off AC power when degaussing.

7.1.3 Every Six Months

- A. Overall cleaning.
- B. Check solenoid linkage for proper operation and verify solenoid adjustment lock nut is tight.

7.1.3 Yearly

- A. Check electrical alignment.
- B. Check head alignment.

7.2 NORMAL PREVENTIVE MAINTENANCE - TOOLS AND TEST EQUIPMENT NEEDED

- A. 5/64" Allen hex wrench for head adjustments
- B. 3/32" Allen hex wrench for head locks
- C. 3/8" open end wrenches for solenoid adjustments
- D. Electrical shop tools
- E. HG-1 Head Height/Zenith Gauge

7.3 RELAMPING

Switch indicator lamps are rated at 50,000 hours. In addition, these lamps are derated by the normal diode drop inherent in the switching transistors and a current limiting resistor. Should replacement be necessary, proceed as follows:

- A. Pull off the switch button.
- B. Using a lamp removal tool, or a needle-nose pliers taped to avoid damaging the bulb, pull the bulb straight out.
- C. Reverse the procedure to install a new bulb.

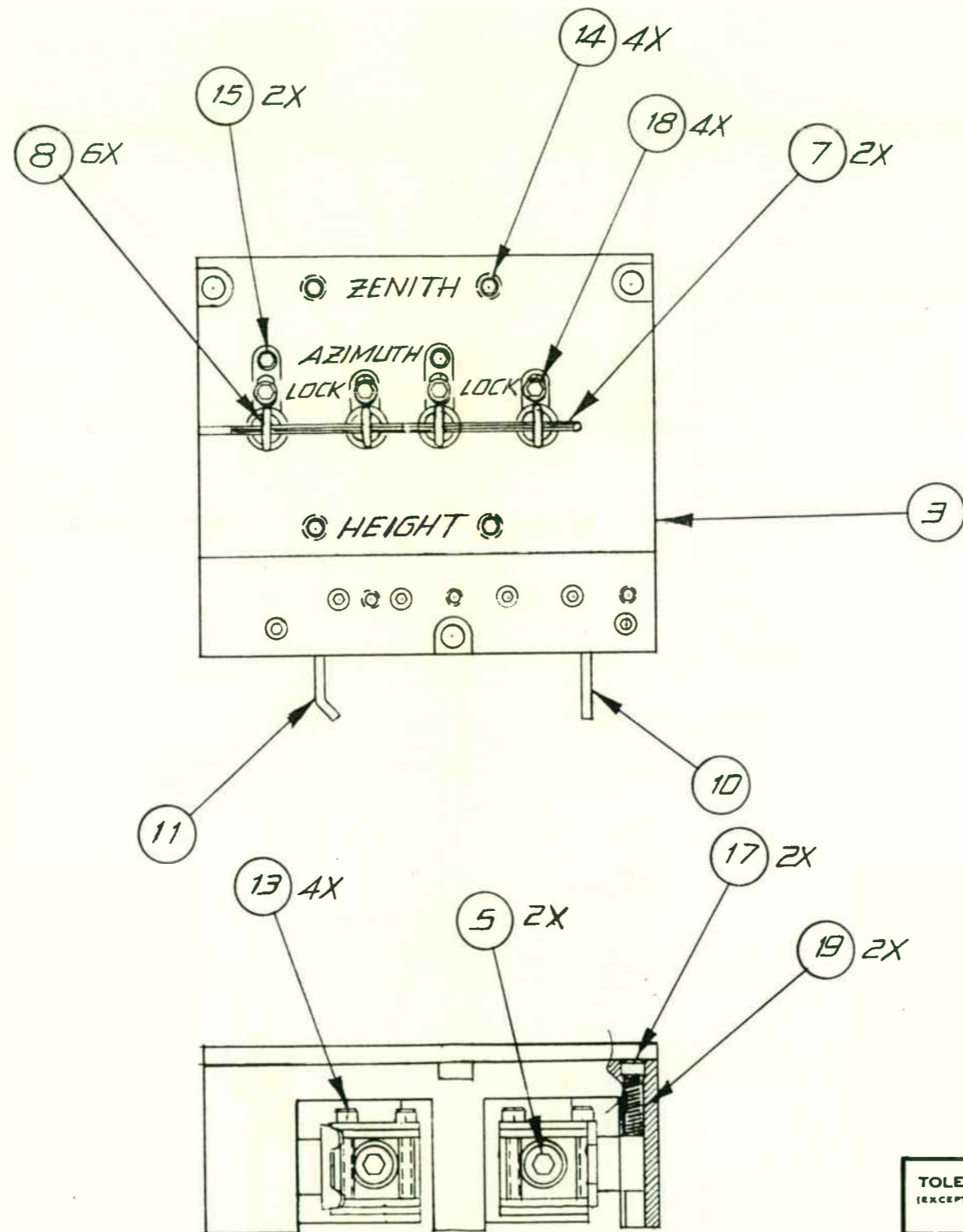
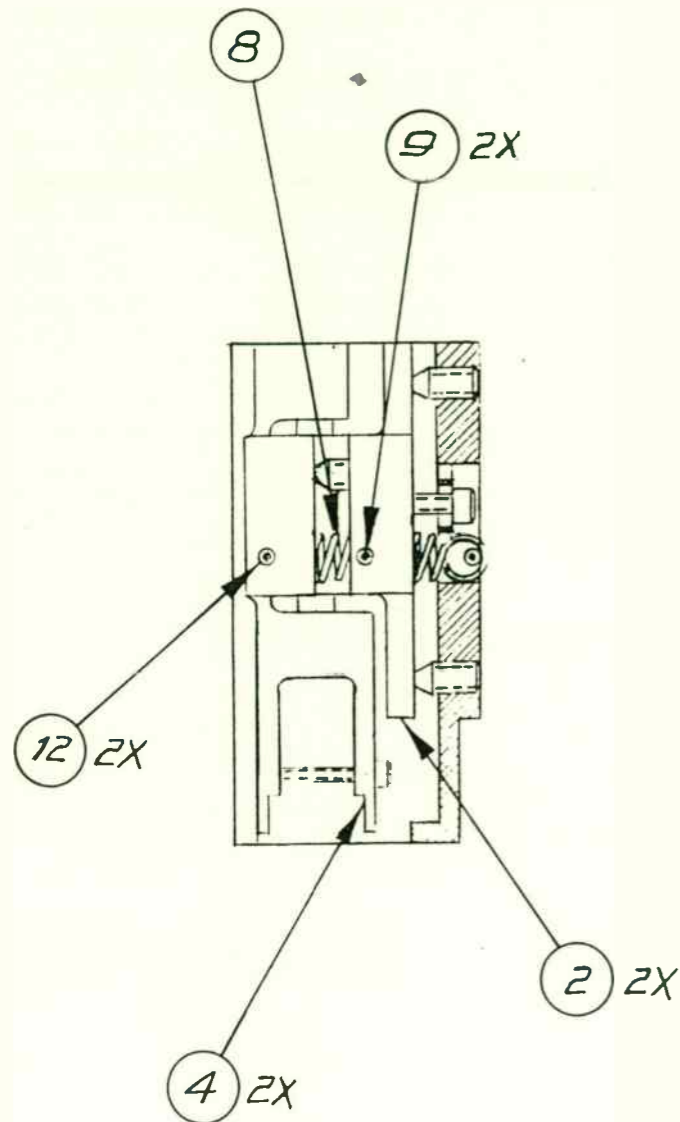
S I N G L E L E V E L B I L L O F M A T E R I A L S

FOR PARENT ITEM NUMBER 827-BO-000

HEAD BRIDGE ASSEMBLY

ITEM NUMBER	DESCRIPTION	QTY	SEQ
532-DO-000	MOUNTING BLOCK	2	2
532-DO-001	HEAD BRIDGE	1	3
532-CO-002	HEAD CLAMP	2	4
5Z5-14-832	SHOULDER SCREW 3/16 X 1 1/4	2	5
5B4-12-078	ROLL PIN 5/64 X 1 1/8 STL PL	2	7
5E1-AO-000	SPRING EXTENSION HEAD BRIDGE	6	8
5B4-10-078	ROLL PIN 5/64 X 1 STEEL PLATED	2	9
5AB-AO-002	TAPE GUIDE STRAIGHT	1	10
5AB-AO-001	TAPE GUIDE CURVED	1	11
5B4-08-078	ROLL PIN 5/64 X 1/2 PL	2	12
6Y2-0A-256	SCREW SOC H.C. 2-56 X 5/8 BLK	4	13
6W2-06-832	SCREW SET SOC 8-32 X 3/8 CP	4	14
6W2-08-832	SCREW SET SOC C.P. 8-32 X 1/2	2	15
6Y2-10-256	SCREW SOC H.C. 2-56 X 1 BLK	2	17
6Y2-06-440	SCREW SH 4-40X3/8 BL	4	18
5E2-04-148	SPRING COMP .1480 X 1/4	2	19

DATE	SYM	REVISION RECORD	AUTH.	DR.	CK.



TOLERANCES (EXCEPT AS NOTED)	FIDELIPAC CORP. MOORESTOWN, N.J.		
DECIMAL	SCALE	DRAWN BY <i>[Signature]</i>	
±	~	APPROVED BY	
FRACTIONAL	TITLE HEAD BRIDGE ASSEMBLY		
±	DATE	DRAWING NUMBER	
±	5 AUG 84	827-BD-000	

S I N G L E L E V E L B I L L O F M A T E R I A L S

FOR PARENT ITEM NUMBER 827-AO-025 RIGHT BRACKET ASM CTR10

ITEM NUMBER	DESCRIPTION	QTY	SEQ
703-AO-000	TEFLON TAPE, 1" WIDE	0	0
543-DO-007	BRACKET CART HOLD DOWN RIGHT	1	1
5E2-AO-002	SPRING, CART HOLD DOWN	1	2
5B2-AO-010	SPACER 1/4 X 3/8 #4 NYLON	1	3
5B2-AO-011	SPACER 1/4 X 1/2 RD NYLON #4	1	4
687-03-440	SCREW RD SL 4-40 X 3/16 NYLON	2	5
687-08-440	SCREW RH SLOT 4-40 X 1/2 NYLON	3	6
807-AO-061	CART READY PWA	1	7
5AB-DO-003	BEARING HOLD DOWN SHAFT	2	8

S I N G L E L E V E L B I L L O F M A T E R I A L S

FOR PARENT ITEM NUMBER 827-AO-026

ASM DECK CTR10

ITEM NUMBER	DESCRIPTION	QTY	SEQ
621-03-440	SCREW P.H. PHIL 4-40 X 3/16 PL	1	0
531-DO-002	DECK PLATE CTR 10 AND 100 "A"	1	1
5B8-EO-002	SHAFT HORIZONTAL	1	4
5B8-AO-001	SHAFT VERTICAL BALL BEARING	1	5
60C-11-600	L'WASHER I.T. #6	3	7
5B3-AO-001	RETAINER RING 3/16 SHAFT	4	8
5AA-BO-002	SPROCKET SOLENOID	1	9
5B4-AO-000	HEADED SPIRAL PIN 1/16 X 3/4	1	10
5A0-AO-000	CHAIN SPROCKET .1475 PITCH ST	1	11
320-AO-000	SOLENOID	1	13
526-AO-000	STUD SOLENOID	1	14
600-20-032	NUT SOLENOID 10-32 STL PL	1	15
60C-11-000	L'WASHER I.T. #10	3	16
827-AO-025	RIGHT BRACKET ASM CTR10	1	17
827-AO-063	LEFT BRKT ASM "A"	1	18
621-08-032	SCREW PH PHIL 10-32X.5 SP	2	19
621-05-632	SCREW P.H. PHIL 6-32 X 5/16 PL	2	21
621-06-632	SCREW P.H. PHIL 6-32 X 3/8 ZP	1	22
5A3-AO-000	ROLLER CART HOLD DOWN	4	23
5B8-AO-003	SHAFT CART HOLD DOWN FRONT A	1	24
5E2-AO-002	SPRING, CART HOLD DOWN	1	25
5A8-DO-003	BEARING HOLD DOWN SHAFT	2	26
525-BO-000	SHIELD DECK	1	29
827-AO-065	ACTUATOR/"A" REAR SHAFT ASM	1	34
621-03-256	SCREW P.H. PHIL 2-56 X 3/16 ZP	1	35
60C-11-200	L'WASHER I.T. #2	1	36
621-04-440	SCREW P.H. PHIL 4-40 X 1/4 SP	2	37
5E1-BO-001	SPRING EXTENSION SWITCH	1	38
5E1-AO-002	SPRING EXTENSION SOLENOID	1	39
601-07-002	WASHER .50 X .252 X .01 SS	2	40
601-07-000	WASHER .31 X .191 X .025 SS	4	41
5A1-AO-001	FOOT SOLENOID STOP	1	42
543-DO-008	ACTUATOR CART	1	43
415-AO-011	HOUSING MTA 100 2 COND	1	44
700-AO-001	GLUE EASTMAN 910 OR EQUIV.	1	45
601-07-001	WASHER .53 X .13 X .05 SS	1	46
543-BO-011	STOP ACTUATOR	1	48
621-05-440	SCREW P.H. PHIL 4-40 X 5/16 PL	1	49

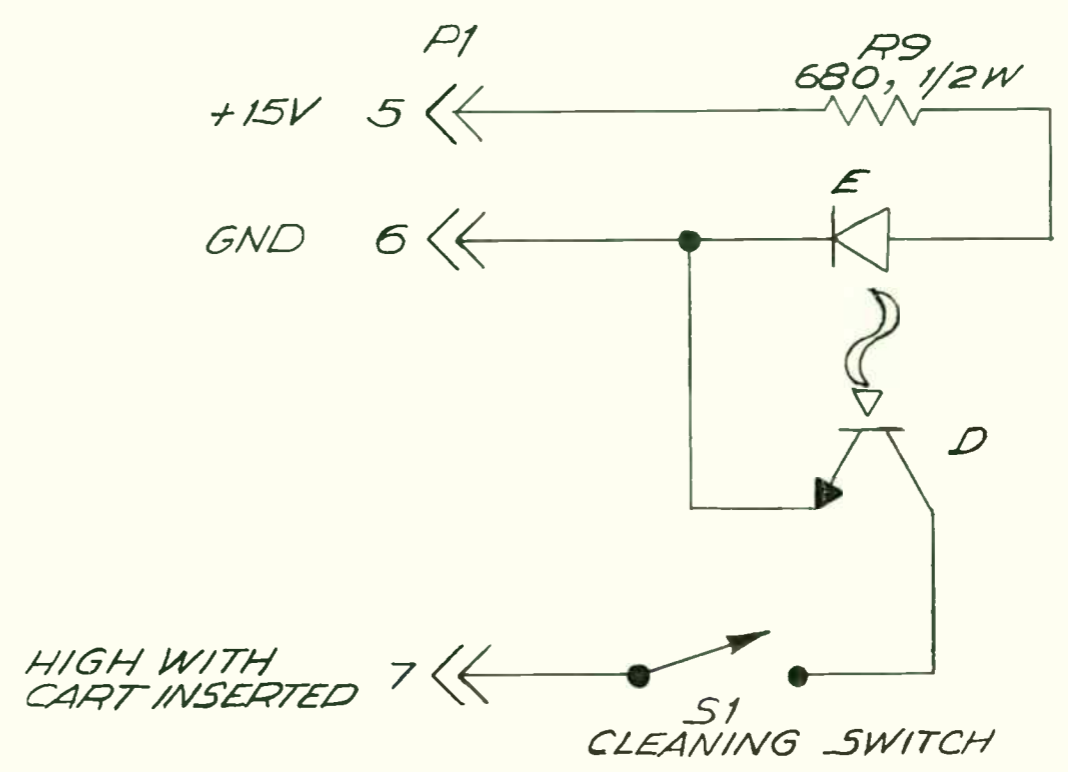
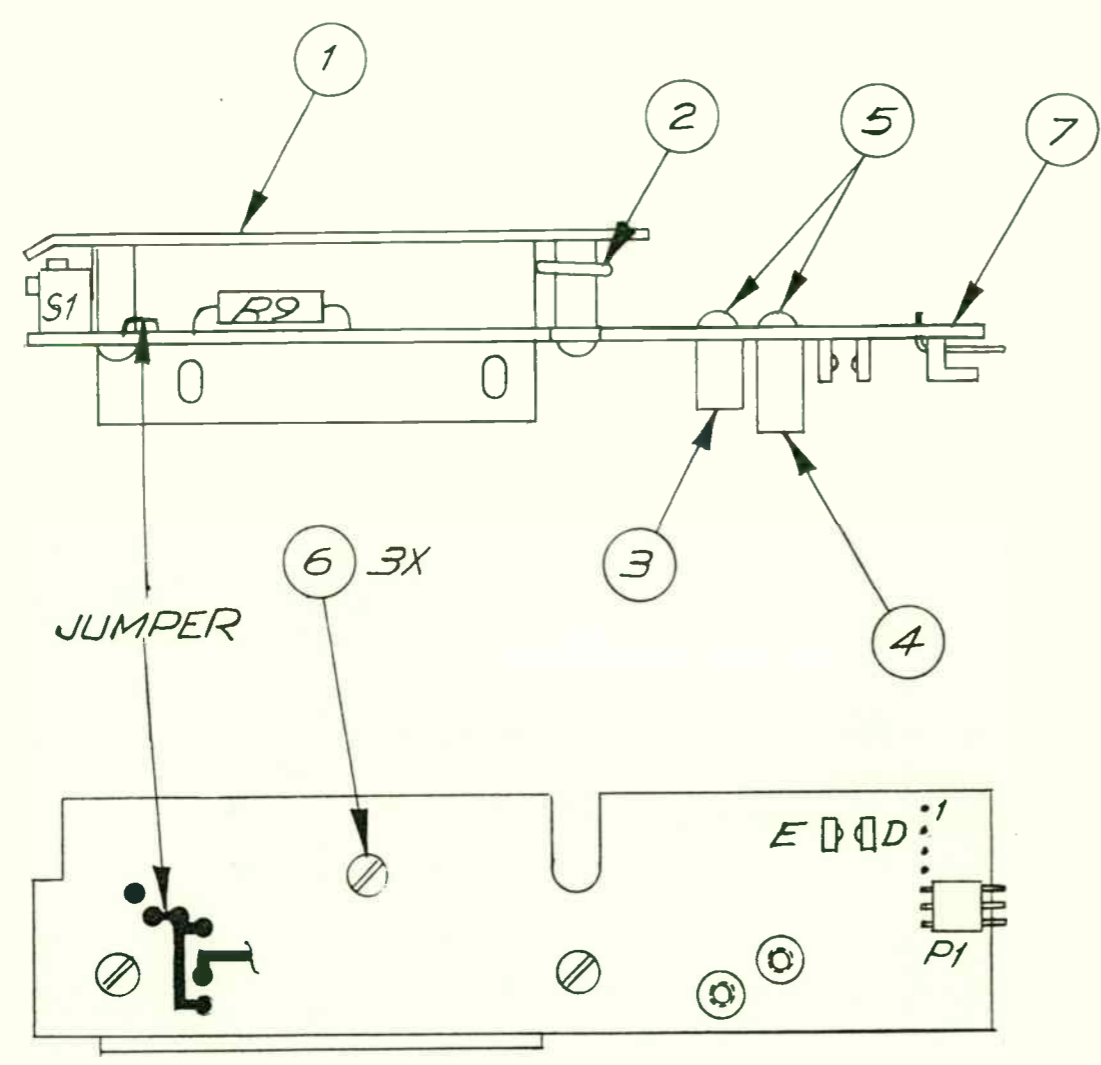
S I N G L E L E V E L B I L L O F M A T E R I A L S

FOR PARENT ITEM NUMBER 827-AO-027

ESD 10 FRONT PANEL ASM

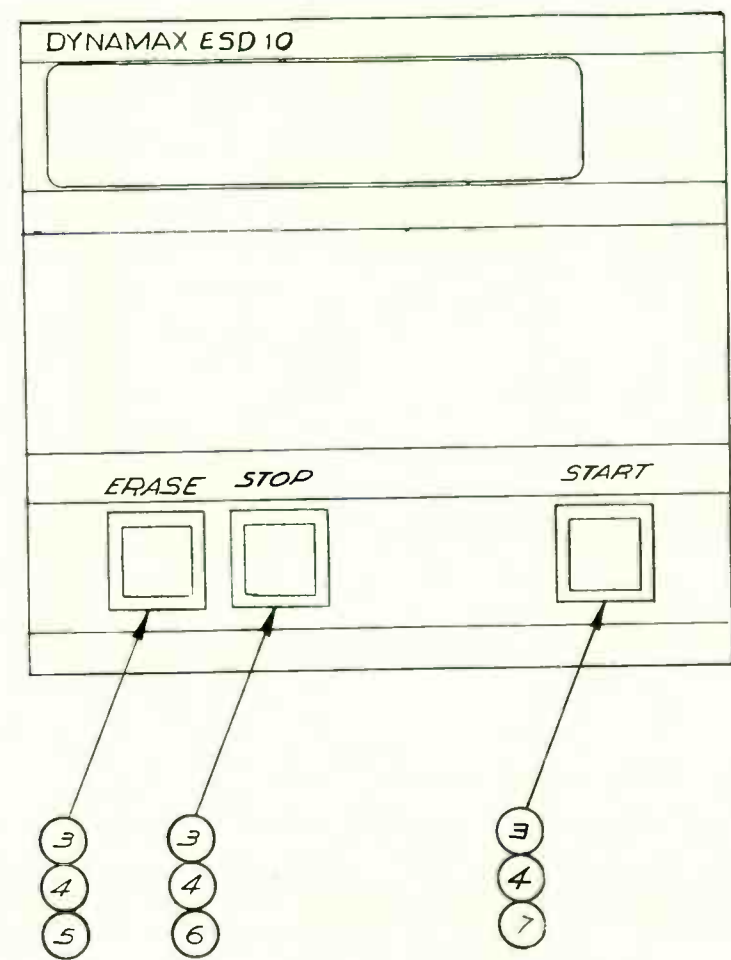
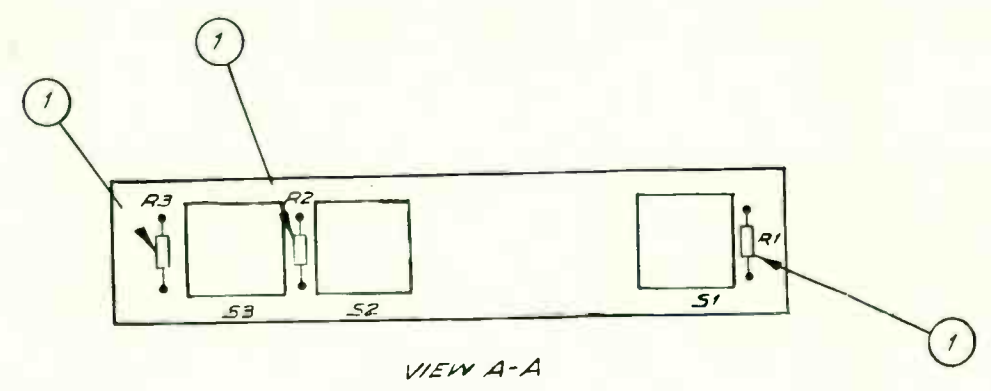
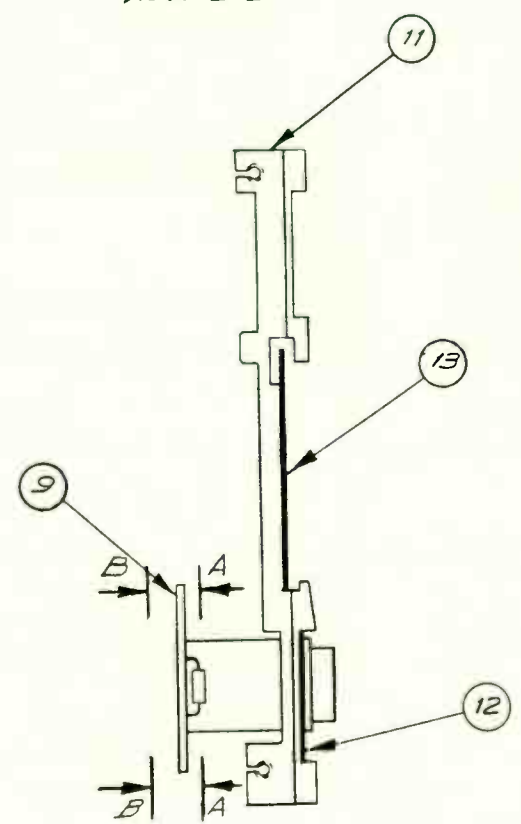
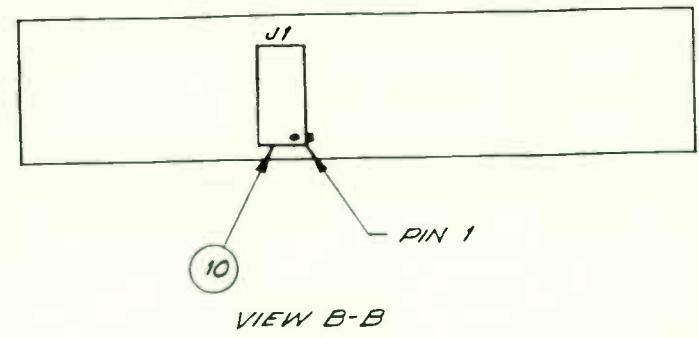
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110-22-130	13 1/4W 5% CF RES	3	1	R1,2,3
260-AO-001	LAMP 382	3	3	S1,2,3
364-AO-005	SWITCH PUSH BUTTON LIGHTED	3	4	S1,2,3
364-AO-009	LENS, SWITCH, YELLOW	1	5	S3
364-AO-007	LENS - SWITCH RED	1	6	S2
364-AO-008	LENS SWITCH GREEN	1	7	
407-AO-085	PCB, SWITCH P	1	9	
410-AO-003	SOCKET DIP 16 PIN	1	10	J1
532-AO-009	FRONT PANEL ESD 10	1	11	
581-AO-003	OVERLAY FRONT PANEL SWITCH A	1	12	
581-AO-012	FRT PANL OVERLAY, CTR10, BLANK P	1	13	

DATE	SYM	REVISION RECORD	AUTH.	DR.	CK.



TOLERANCES (EXCEPT AS NOTED)	FIDELIPAC CORP MOORESTOWN, NJ		
DECIMAL ± ~	CTR10/ESD 10	SCALE ~	DRAWN BY #
FRACTIONAL ± ~	TITLE BRACKET ASM RIGHT		
ANGULAR ± ~	DATE	DRAWING NUMBER 827-A0-025	

DATE	BY	REVISION	RECORD	AUTH	DR	CK



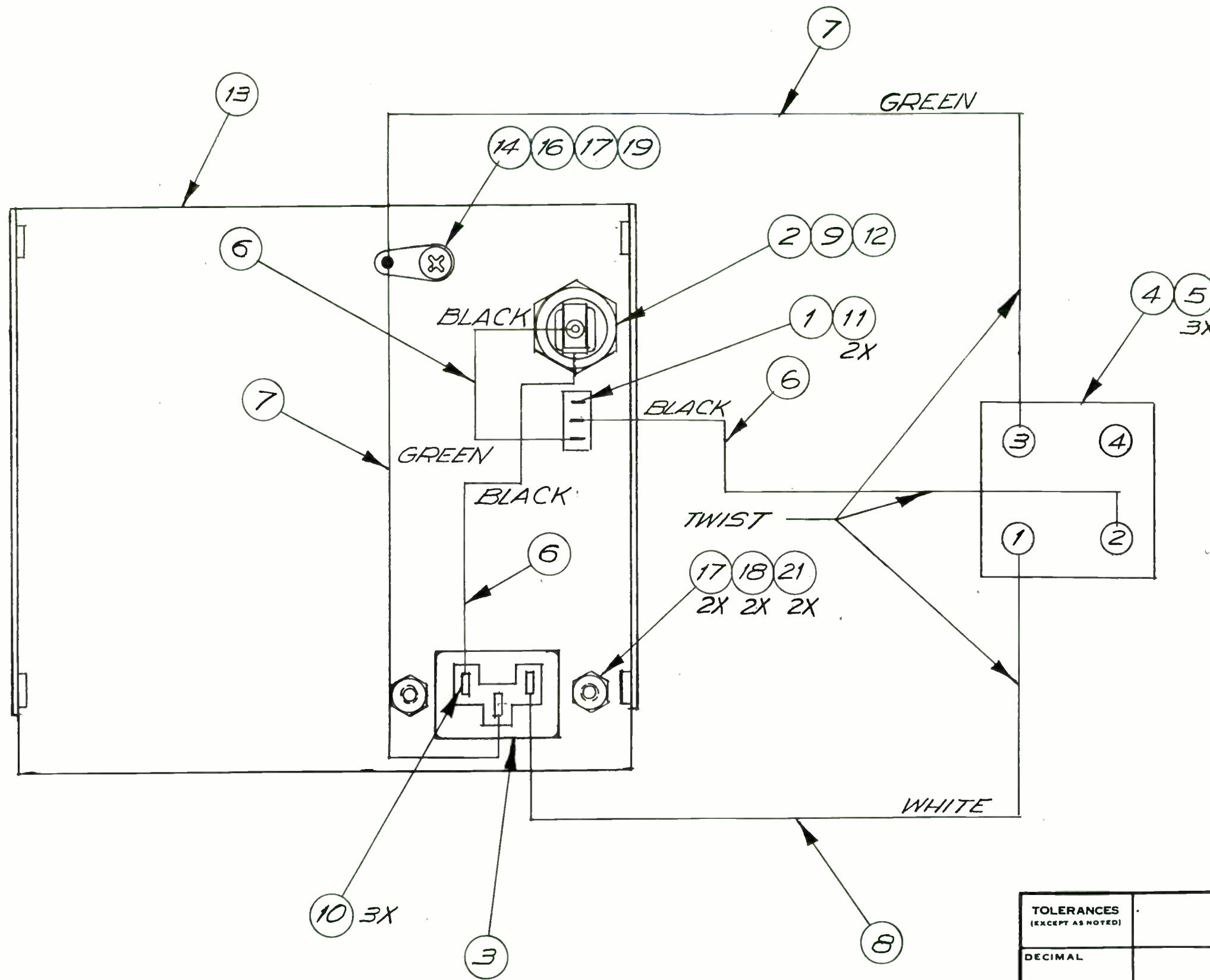
TOLERANCES (UNLESS OTHERWISE SPECIFIED)		FIDELIFAC CORR. MOORESTOWN, N.J.	
DECIMAL		SCALE	DRAWN BY
FRACTIONAL			APPROVED BY
ANGULAR		DATE	TITLE FRONT PANEL, ASM ESD 10
		DRAWING NUMBER	827-AO-027

FOR PARENT ITEM NUMBER 827-AO-029

ESD 10 REAR PANEL ASM

ITEM NUMBER	DESCRIPTION	QTY	SEQ
360-AO-001	SWITCH TOGGLE	1	1
371-AO-001	FUSE 1A SLO BLO	1	2
413-AO-000	CONNECTOR AC 3 PIN RECEP.	1	3
415-AO-014	HOUSING, 4 PIN MR	1	4
414-AO-007	TERMINAL, MR	3	5
423-A2-20N	WIRE STRANDED 22 AWG BLACK	12	6
423-A2-25N	WIRE STRANDED 22 AWG GREEN	12	7
423-A2-29N	WIRE STRANDED 22 AWG WHITE	12	8
430-AO-000	FUSE HOLDER PANEL MOUNT 3AG	1	9
44S-AO-000	TUBING HEAT SHRINK 3/16	2	10
44S-AO-001	TUBING HEAT SHRINK 1/8	1	11
44S-AO-002	TUBING HEAT SHRINK 3/4	1	12
541-CO-039	REAR PANEL ESD10	1	13
5A2-AO-006	GROUND LUG	1	14
600-33-632	NUT THUMB 6-32	1	16
601-20-632	NUT HEX 6-32 STEEL PLATE	3	17
60C-11-600	L'WASHER I.T. #6	2	18
621-08-632	SCREW PH PHL 6-32 X 1/2 LG STL	1	19
621-06-632	SCREW P.H. PHIL 6-32 X 3/8 ZP	2	21

DATE	SYM	REVISION RECORD	AUTH.	DR.	CK.

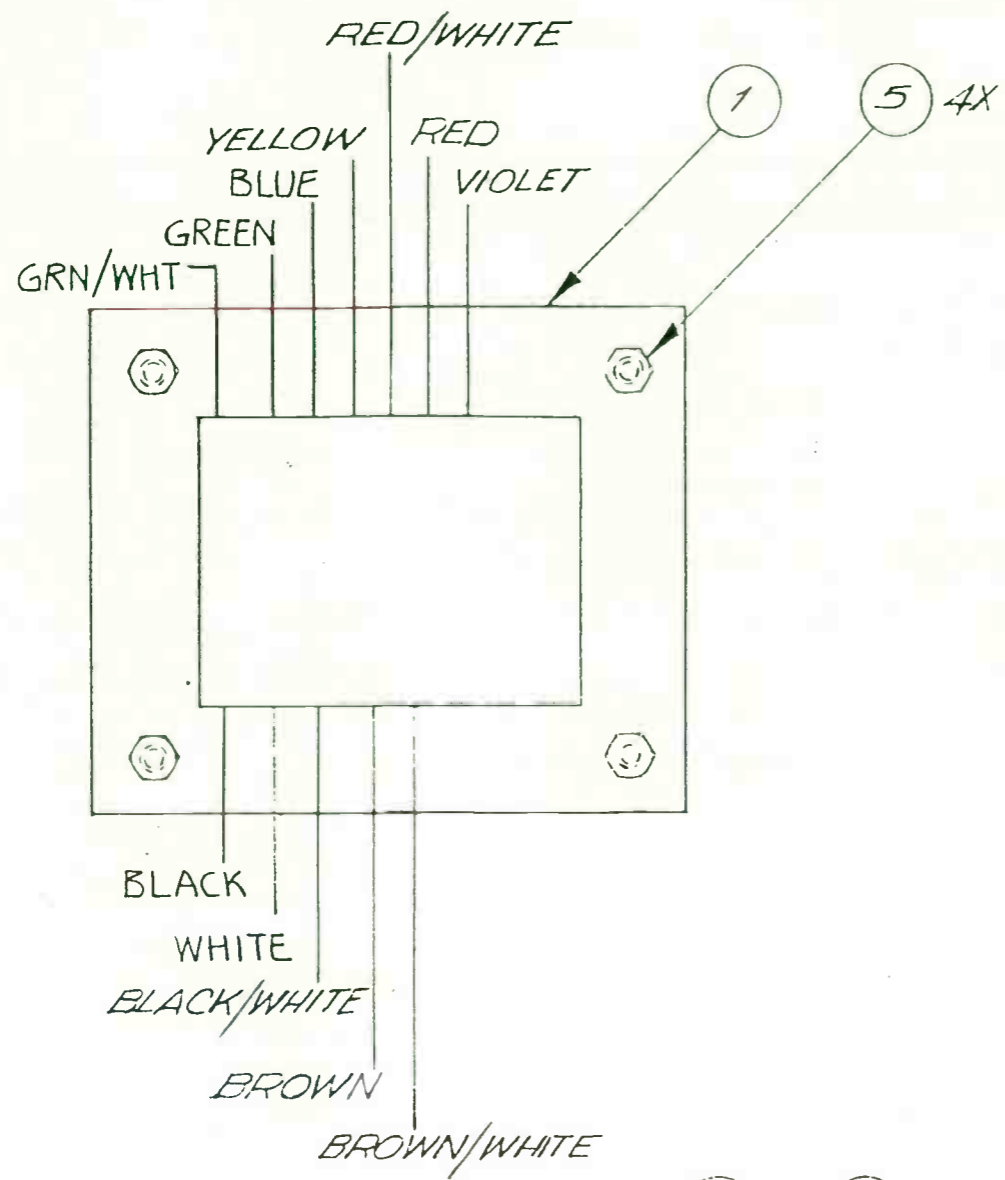


TOLERANCES (EXCEPT AS NOTED)		FIDELIPAC CORP MOORESTOWN N.J.	
DECIMAL	± ~	SCALE	DRAWN BY <i>[Signature]</i>
FRACTIONAL	± ~	TITLE	APPROVED BY <i>[Signature]</i>
ANGULAR	± ~	DATE	7 APRIL 86
		DRAWING NUMBER	827-AO-029

S I N G L E L E V E L B I L L O F M A T E R I A L S
FOR PARENT ITEM NUMBER 827-BO-030 ESD 10 TRANSFORMER ASM

ITEM NUMBER	DESCRIPTION	QTY	SEQ
44S-AO-001	TUBING HEAT SHRINK 1/8	1	0
311-AO-008	TRANSFORMER CTR100, ESD10	1	1
415-AO-015	HOUSING, 12 PIN MR	1	2
414-AO-007	TERMINAL, MR	12	3
423-A2-23N	WIRE, STRANDED, 22 AWG, ORN	2	4
5B2-AO-015	SPACER TRANSFORMER	4	5

DATE	SYM	REVISION RECORD	AUTH	DR.	CK.
3/8/82	B	REVISED PER OOB XFMR	DJF		



110 V

PIN NO.	COLOR
1	YELLOW
2	RED/WHITE
3	BROWN/WHITE
4	RED
5	BLACK/WHITE
6	BROWN
7	GREEN
8	
9	
10	BLUE
11	VIOLET
12	BLACK

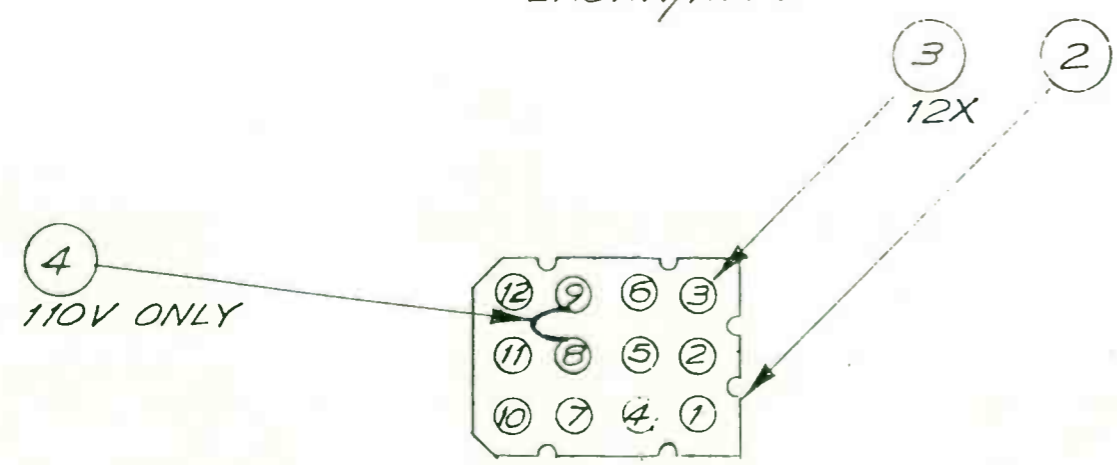
BLK
BLK
JUMPER

220 V

PIN NO.	COLOR
1	YELLOW
2	RED/WHITE
3	BROWN/WHITE
4	RED
5	
6	BROWN
7	GREEN
8	
9	BLACK/WHITE
10	BLUE
11	VIOLET
12	BLACK

NOTES:

1. ALL LEADS TO BE 11 INCHES LONG.
2. TWIST LEADS.



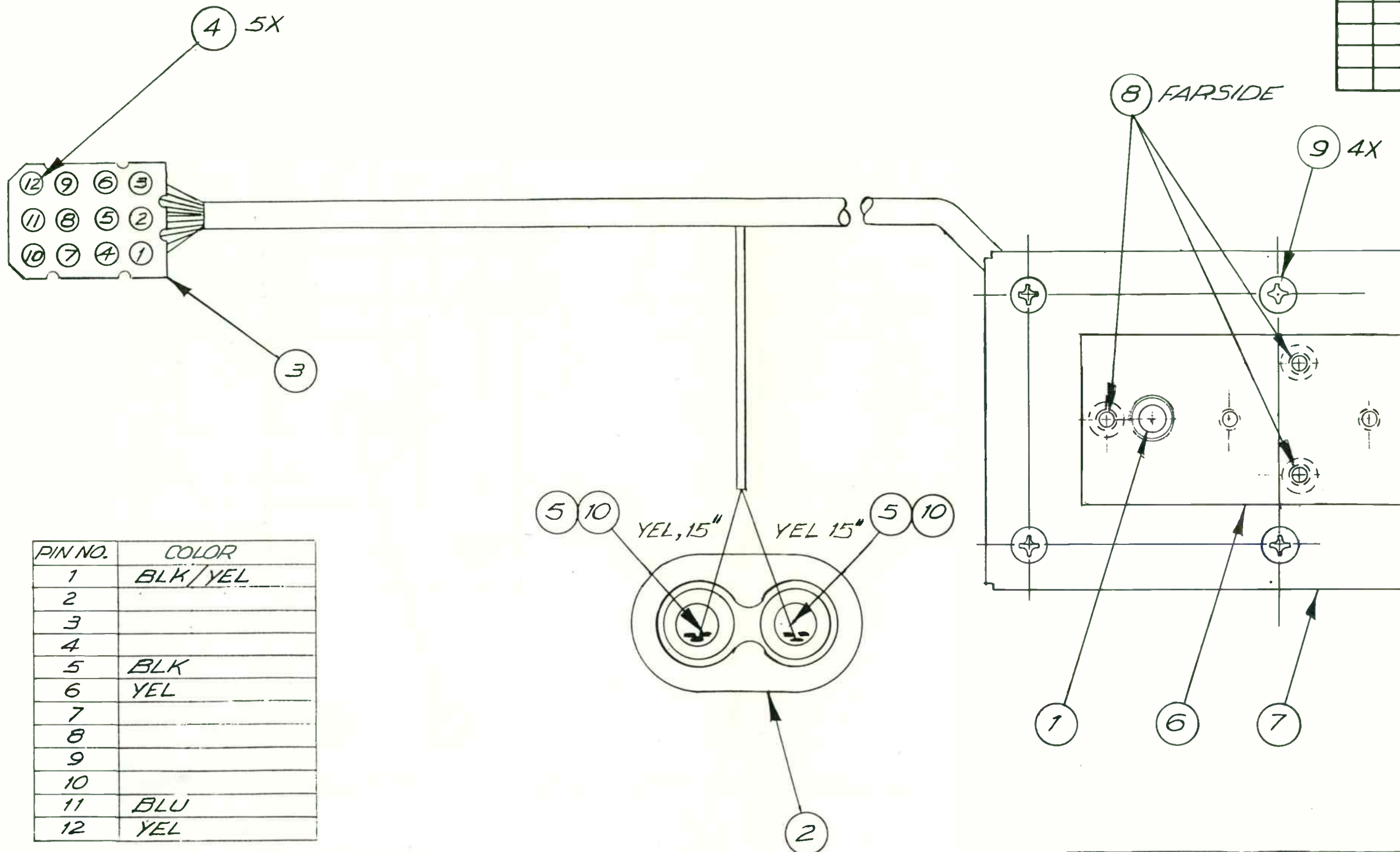
TOLERANCES (EXCEPT AS NOTED)	FIDELIPAC CORP. MOORESTOWN, N.J.		
DECIMAL		SCALE	DRAWN BY <i>JF</i>
± ~		~	APPROVED BY
FRACTIONAL	TITLE TRANSFORMER ASM, ESD 10		
± ~	DATE 20 NOV 85	DRAWING NUMBER 827-B0-030	
ANGULAR	± ~		

S I N G L E L E V E L B I L L O F M A T E R I A L S

FOR PARENT ITEM NUMBER 827-AO-031 MOTOR ASM ESD 10

ITEM NUMBER	DESCRIPTION	QTY	SEQ
323-AO-005	ESD 10 MOTOR	1	1
0A2-A4-205	CAPACITOR, 2 UF, 300 VAC	1	2
415-AO-015	HOUSING, 12 PIN MR	1	3
414-AO-007	TERMINAL, MR	5	4
423-A2-24N	WIRE STRANDED 22 AWG YELLOW	30	5
530-BO-000	SPACER, MOTOR ESD 10	1	6
543-AO-014	MOTOR MOUNT ESD 10	1	7
645-06-032	SCREW FL PHIL 10-32 X 3/8 SS	3	8
621-05-832	SCREW, 8-32 X 5/16, PH, PHL	4	9
44S-AO-000	TUBING HEAT SHRINK 3/16	1	10

DATE	SYM	REVISION RECORD	AUTH.	DR.	CK.



PIN NO.	COLOR
1	BLK/YEL
2	
3	
4	
5	BLK
6	YEL
7	
8	
9	
10	
11	BLU
12	YEL

TOLERANCES (EXCEPT AS NOTED)		FIDELIPAC CORP. MOORESTOWN, N.J.	
DECIMAL	± ~	SCALE	DRAWN BY
FRACTIONAL	± ~	APPROVED BY	
ANGULAR	± ~	TITLE MOTOR ASM, ESD10, ORIENTAL	
DATE		DRAWING NUMBER 827-A0-031	

S I N G L E L E V E L B I L L O F M A T E R I A L S

FOR PARENT ITEM NUMBER 847-BO-011

ESD 10 TOP ASM

ITEM NUMBER	DESCRIPTION	QTY	SEQ
581-AO-007	OVERLAY LOGO FRONT PANEL	1	0
621-08-632	SCREW PH PHL 6-32 X 1/2 LG STL	1	0
807-BO-110	ESD 10 PWA	1	0
827-AO-027	ESD 10 FRONT PANEL ASM	1	0
827-AO-029	ESD 10 REAR PANEL ASM	1	0
827-AO-031	MOTOR ASM ESD 10	1	0
827-BO-000	HEAD BRIDGE ASSEMBLY	1	0
827-BO-030	ESD 10 TRANSFORMER ASM	1	0
541-DO-022	SIDE PANEL LEFT	1	1
541-DO-023	SIDE PANEL RIGHT	1	2
827-BO-002	PINCH ROLLER BALL BEARING	1	6
42C-AO-001	RIBBON CABLE ASSEMBLY	1	7
5B3-AO-001	RETAINER RING 3/16 SHAFT	1	8
340-AO-005	HEAD ERASE FULL TRK	2	10
555-AO-000	CAPACITOR BRACKET, ESD 10	1	15
621-OC-032	SCREW P.H. PHIL 10-32 X 3/4 SP	2	19
645-04-632	SCREW FL PHIL 6-32 X 1/4 SP	11	20
645-04-832	SCREW FL PHIL 8-32 X 1/4 SS	4	21
645-06-032	SCREW FL PHIL 10-32 X 3/8 SS	2	22
645-06-632	SC FH PH 6-32 X 3/8 SS	6	23
601-20-632	NUT HEX 6-32 STEEL PLATE	2	24
60C-11-600	L'WASHER I.T. #6	2	26
837-BO-001	PLAY HEAD CABLE S	1	27
827-AO-026	ASM DECK CTR10	1	28
837-AO-011	ASM READY CABLE CTR10	1	37
601-07-000	WASHER .31 X .191 X .025 SS	2	41
603-02-124	WAVY WASHER	2	47

S I N G L E L E V E L B I L L O F M A T E R I A L S
 FOR PARENT ITEM NUMBER 857-BO-011 ESD 10 FINAL ASM

ITEM NUMBER	DESCRIPTION	QTY	SEQ
847-BO-011	ESD 10 TOP ASM	1	0
867-AO-004	ESD 10 SHIPPING ASM	1	0
621-08-632	SCREW PH PHL 6-32 X 1/2 LG STL	2	1
541-CO-016	TOP COVER "A"	1	2
541-BO-024	BOTTOM COVER	1	3
621-03-632	SCREW P.H. PHIL 6-32 X 3/16 PL	2	4
621-05-632	SCREW P.H. PHIL 6-32 X 5/16 PL	4	5
60C-11-600	L'WASHER I.T. #6	6	6
5A1-AO-000	RUBBER FOOT	4	7
563-AO-000	BUTTON TOP COVER	2	8
5B2-AO-014	SPCR SS 1/4"ODX3/16"LGX.140"ID	2	11
605-07-000	WASHER 1/4 ID X 3/8 OD SS	2	12
601-00-600	#6 FLAT WASHER STEEL PLATE	2	25

S I N G L E L E V E L B I L L O F M A T E R I A L S
FOR PARENT ITEM NUMBER 867-AO-004 ESD 10 SHIPPING ASM

ITEM NUMBER	DESCRIPTION	QTY	SEQ
730-AO-016	INSTRUCTION BOOK ESD 10	1	0
720-AO-000	SHIPPING CARTON A	1	1
727-AO-000	END CAP "A" EPS	2	3
427-AO-001	POWER CORD	1	4
582-AO-007	IDENTIFICATION LABEL	1	9

FIDELIPAC

S I N G L E L E V E L B I L L O F M A T E R I A L S

FOR PARENT ITEM NUMBER 807-BO-110 ESD 10 PWA

ITEM NUMBER	DESCRIPTION	QTY	SEQ	DESIGNATION/LOCATION
110-22-153	15K 1/4W 5% CF RES	1	1	R1
110-22-103	10K 1/4W 5% CF RES	7	2	R3, 14, 25, 31, 33, 44, 49
110-22-334	330K 1/4W 5% CF RES	2	3	R4, 34
110-22-104	100K 1/4W 5% CF RES	10	4	R5, 9, 10, 11, 18, 26, 32, 37, 40, 50
110-22-621	RES, 620 OHM, 1/4W, 5%, CF	1	5	R8
110-22-392	3.9K 1/4W 5% CF RES	5	6	R12, 15, 17, 53
110-22-105	1M 1/4W 5% CF RES	4	7	R6, 21, 30, 36
110-22-473	47K 1/4W 5% CF RES	1	8	R22
110-22-10A	1 OHM 1/4W 5% CF RESISTOR	2	9	R24, 48
110-22-152	1.5K 1/4W 5% CF RES	1	10	R27
110-22-184	180K 1/4W 5% CF RES	1	11	R16
110-22-122	1.2K 1/4W 5% CF RES	2	12	R20, 35
110-22-474	470K 1/4W 5% CF RES	1	13	R38
110-22-472	4.7K 1/4W 5% CF RES	3	14	R39, 57, 59
110-22-332	3.3K 1/4W 5% CF RES	3	15	R28, 51, 55
110-22-333	33K 1/4W 5% CF RESISTOR	2	16	R52, 56
120-20-68N	6.81K RES 1/4W 1% MF RES	1	17	R2
120-20-68J	681 OHM 1/4W 1% MF RES	1	18	R7
110-32-101	100 1/2W 5% CF RES	1	19	R23
100-32-100	RESISTOR 10 OHM 1/2W, 5%, CC	1	20	R45
13T-33-502	5K H TRIM	2	21	R19, 47
150-82-500	50 5W 5% WW RES	1	22	R58
176-11-104	100K RESISTOR NETWORK	1	23	RM1
031-A3-102	1000PF S CAP	1	24	C1
031-A3-101	100PF S CAP	1	25	C2
011-A5-106	10UF 50V E CAP	5	26	C4, 8, 25, 26, 55
011-A5-478	4700UF 50V E CAP	3	27	C5, 17, 32
006-A4-102	CAPACITOR, 001, 1000, 10	2	28	C6, 7
041-A3-103	CAP .01/63/5	1	29	C9
011-A5-105	1UF 50V E CAP	6	30	C3, 10, 22, 23, 33, 53
041-A4-104	.1UF 63V F CAP	7	31	C11, 14, 16, 24, 45, 46, 54
006-A6-103	.01UF 25V D CAP	10	32	C12, 13, 18, 19, 20, 21, 38, 39, 40, 52
011-A8-107	100UF 25V E CAP	8	33	C27, 31, 41, 42, 43, 44, 48, 49
041-A4-224	.22UF 63V F CAP	1	34	C28
041-A4-474	.47UF 63V F CAP	1	35	C30
041-A3-332	.0033 UF CAP	2	36	C34, 36
041-A3-222	CAP .0022/63/5	2	37	C35, 37
011-A5-107	100UF 35V E CAP	1	38	C47
281-A0-000	TRANSIENT ABSORBER, 240V	1	39	C51
011-A5-475	4.7UF 50V E CAP	2	40	C15, 16
031-A3-220	22PF S CAP	1	41	C29
200-A0-000	1N4148 DIODE	11	42	D1, 3, 12, 13, 15, 17, 18, 19, 21, 22, 28
201-A0-003	DIODE 1N5404	8	43	D4, 5, 6, 7, 8, 9, 10, 11
204-A0-003	1N4734A DIODE	1	44	D14
201-A0-000	1N4005 DIODE	6	45	D2, 16, 20, 23, 24, 25
204-A0-005	DIODE, ZENER, 27V, 1N4750A	1	46	D26
204-A0-006	DIODE, ZENDER 18V	1	47	D27
210-A0-002	GES5816 TRANSISTOR	6	48	Q3, 4, 5, 6, 7, 8
220-A0-000	TRANSISTOR P FET P1086E	2	49	Q1, 2
210-A0-003	2N4403 TRANSISTOR	1	50	Q9
211-A0-006	MJE3055T TRANSISTOR	2	51	Q10, 12

SINGLE LEVEL BILL OF MATERIALS

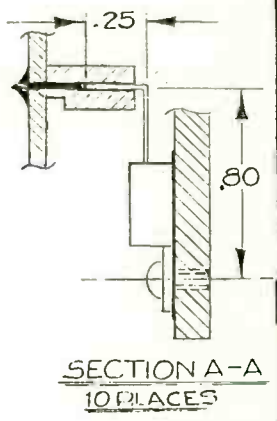
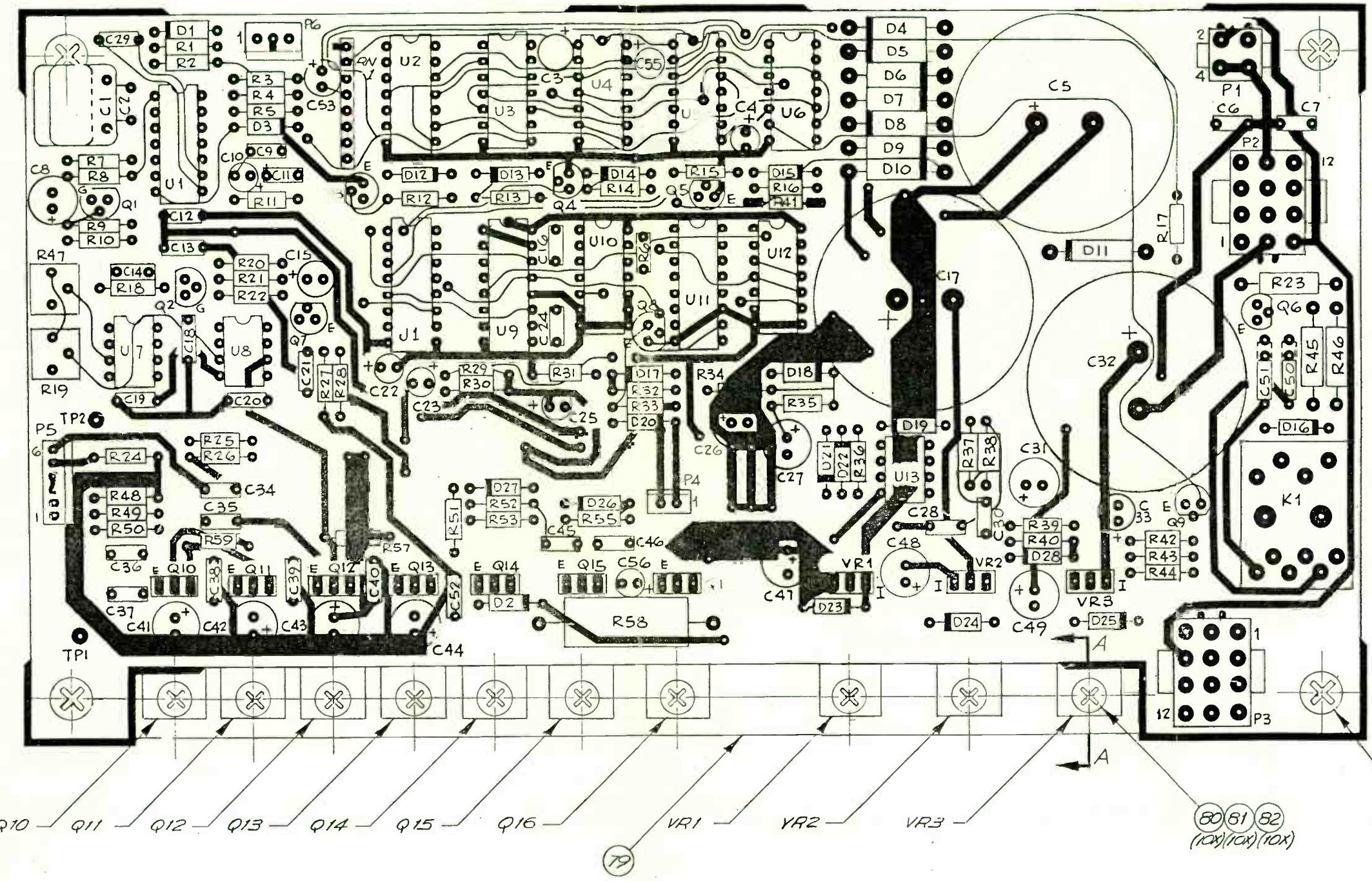
FOR PARENT ITEM NUMBER 807-BO-110

ESD 10 PWA

ITEM NUMBER	DESCRIPTION	QTY	SEQ	DESIGNATION/LOCATION
211-AO-005	MJE2955T TRANSISTOR	2	52	Q11, 13
211-AO-002	TRANSISTOR NPN TIP120	2	53	Q14, 15
211-AO-004	D45E2 TRANSISTOR	1	54	Q16
230-AO-013	78HV24CU 24 VOLT REGULATOR	1	55	VR1
230-AO-014	LM7915CT 15 VOLT REGULATOR	1	56	VR2
230-AO-012	LM7815CT 15 VOLT REGULATOR	1	57	VR3
230-AO-001	5533 DUAL OP-AMP IC	1	58	U1
231-AO-032	4011 IC (NATIONAL ONLY)	3	59	U2, 3, 6
231-AO-046	4071 IC	1	60	U4
231-AO-028	4081 IC	1	61	U5
230-AO-016	LM318N IC	2	62	U7, 8
231-AO-027	4528 IC (NATIONAL ONLY)	1	63	U9
231-AO-023	4040 IC	1	64	U11
231-AO-034	4013 IC (NATIONAL ONLY)	2	65	U10, 12
230-AO-009	LM358 IC (NATIONAL ONLY)	1	66	U13
410-AO-001	SOCKET DIP 8 PIN	3	67	U7, 8, 13
410-AO-002	SOCKET DIP 14 PIN	8	68	U1, 2, 3, 4, 5, 6, 10, 12
410-AO-003	SOCKET DIP 16 PIN	3	69	J1, U9, 11
351-AO-000	RELAY, DPDT, 12V, PLUG IN	1	70	K1
411-AO-000	SOCKET, RELAY	1	71	K1
411-AO-001	CLIP, SOCKET, RELAY	1	72	K1
407-BO-110	ESD10 PCB	1	73	
416-AO-018	HEADER, 4 PIN MR	1	74	P1
416-AO-006	12 PIN MR HEADER	2	75	P2, 3
416-AO-015	HEADER .079 6 POS	1	76	P5
416-AO-008	HEADER MTA 100 2 POS	1	77	P4
416-AO-009	HEADER MTA 100 3 POS	1	78	P6
541-AO-040	HEAT SINK ESD10	1	79	
440-AO-000	INSULATOR TO 220 SIL PAD	10	80	Q10, 11, 12, 13, 14, 15, 16, VR1, 2, 3
607-O1-124	WASHER SHOULDER	10	81	
621-O3-440	SCREW P.H. PHIL 4-40 X 3/16 PL	10	82	
621-OC-632	SCREW 6-32 X 3/4 PH PHL STL PL	4	83	
420-AO-002	16 AWG BUS WIRE	2	84	TP1, TP2
410-AO-009	SOCKET TRANSISTOR	10	85	Q10, 11, 12, 13, 14, 15, 16, VR1, 2, 3
110-22-154	150K 1/4W 5% CF RES	1	86	R29
110-22-102	1K 1/4W 5% CF RES	2	87	R42, 43
110-22-223	22K 1/4W 5% CF RES	1	88	R41

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REVISIONS				
ZONE	NO	DESCRIPTION	DATE	APPROVED
	1	See Drawg 750-BO-065	1-27-66	



Q10 Q11 Q12 Q13 Q14 Q15 Q16 VR1 VR2 VR3 (80)(81)(82) (10X)(10X)(10X) (83)

- NOTES:
1. POSITION COMPONENTS FOR BEST READABILITY OF COMPONENT INFORMATION AT ASSEMBLY.
 2. MAX HEIGHT OF SOLDER JOINTS TO BE $\frac{1}{16}$.
 3. FLUX MUST BE THOROUGHLY REMOVED FROM BOTH SIDES OF P.C. BOARD AFTER COMPONENTS HAVE BEEN SOLDERED.
 4. FOR SCHEMATIC SEE DWG. 750-BO-065
 5. FOR PARTS LISTS SEE DWG. PL. _____

MATERIAL	DRAWN J.T.	DATE 3-17-66	FIDELIPAG Corp.		
	CHECKED				ASSEMBLY DWG SPLICE FINDER BD.
	APPROVED		SIZE C	CODE IDENT NO 807-BO-110	
	APPROVED		APPROVED	SCALE 2:1	REV NO

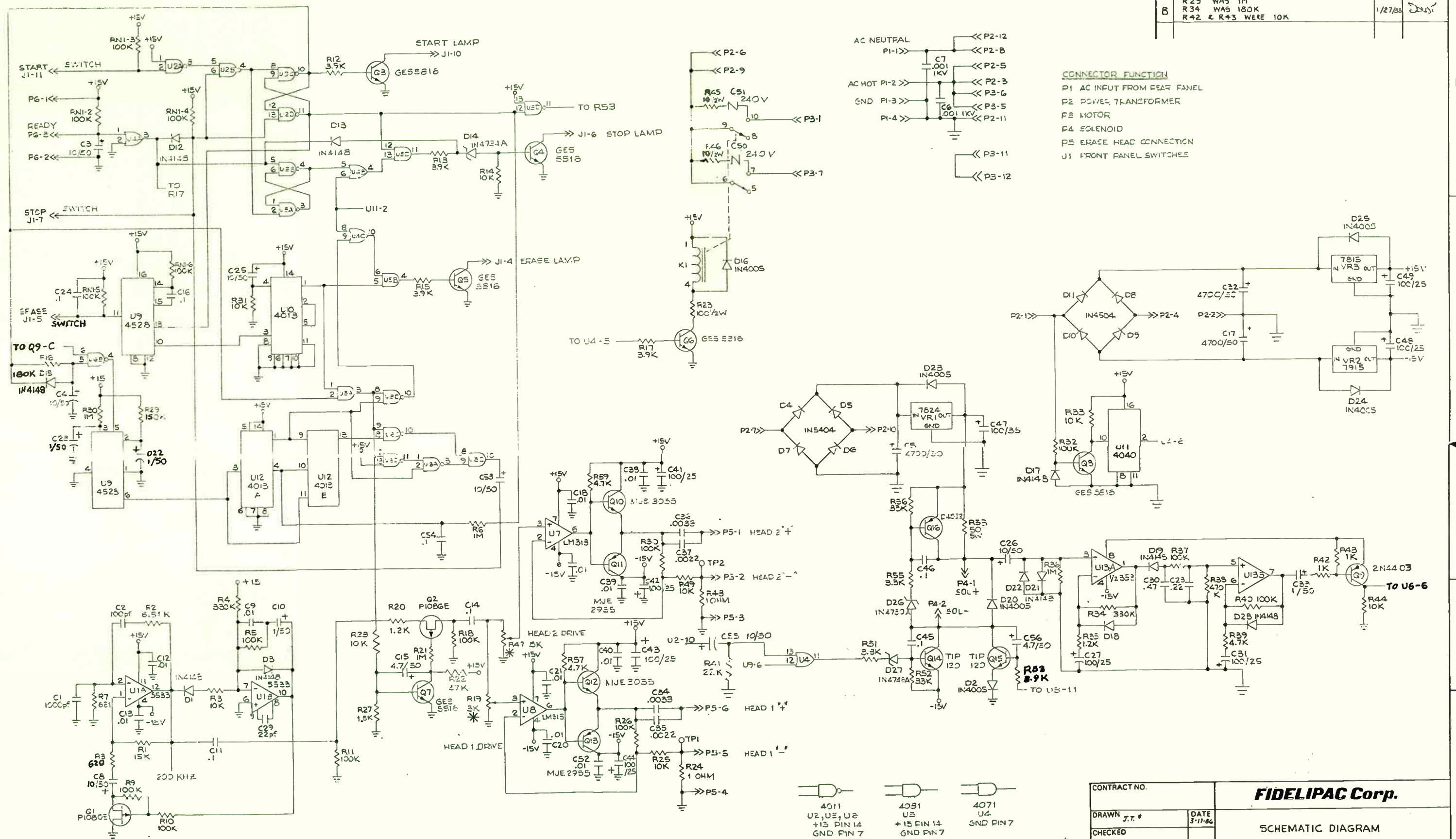
REVISIONS

LTR	DESCRIPTION	DATE	APPROVED
B	R23 WAS 1M R34 WAS 180K R42 & R43 WERE 10K	1/27/86	J.T.

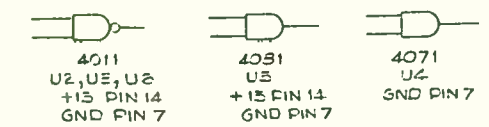
REV B C50, C51 TO 2NR, R41 TO 22K

CONNECTOR FUNCTION

- P1 AC INPUT FROM REAR PANEL
- P2 POWER TRANSFORMER
- F2 MOTOR
- F4 SOLENOID
- P5 ERASE HEAD CONNECTION
- J1 FRONT PANEL SWITCHES

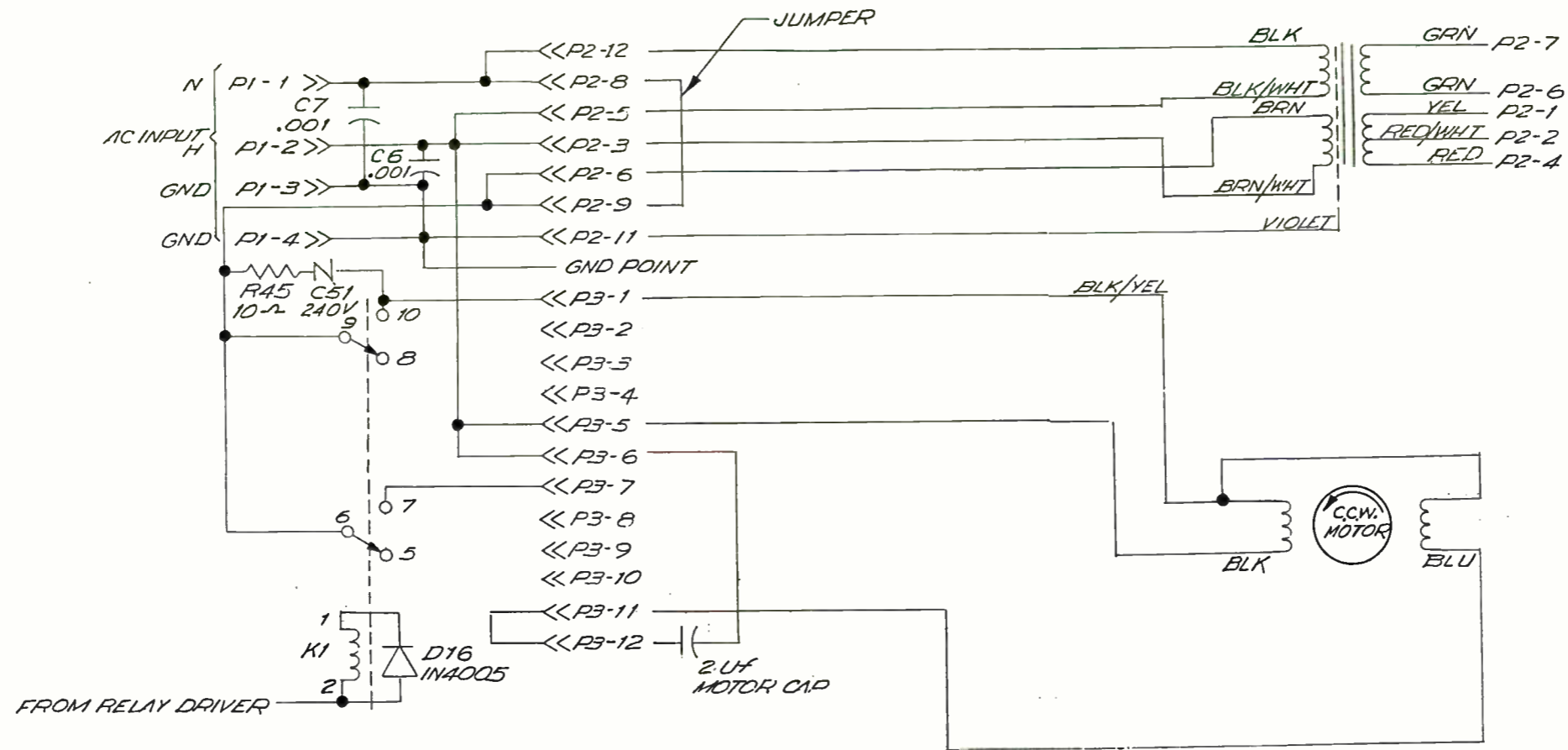


NOTE:
 * ADJUST R19 FOR .55V P-P AT TP1.
 * REPEAT USING R47 AND TP2 WHILE IN ERASE MODE.



CONTRACT NO.		FIDELIPAC Corp.	
DRAWN J.T.	DATE 3-17-86		
CHECKED		SCHEMATIC DIAGRAM SPLICE FINDER BOARD - ESD 10	
APPROVED		SIZE CODE IDENT NO. D	750-80-065
SCALE -		SHEET 1 OF 1	

DATE	BY	REVISION RECORD	AUTH	DR	CK



NOTES:

1. FOR 220V OPERATION, REMOVE JUMPER (P2-8 TO P2-9);
MOVE BLK/WHT TRANSFORMER WIRE FROM P2-5 TO P2-9.
2. K1 SHOWN IN MOTOR OFF MODE (K1 NOT ENERGIZED).

TOLERANCES (EXCEPT AS NOTED)		FIDELIPAC CORR MOORESTOWN, N.J.	
DECIMAL	~	SCALE	DRAWN BY <i>JF</i>
FRACTIONAL	~	APPROVED BY	
ANGULAR	~	TITLE SCHEMATIC ESDIO MOTOR AND TRANSFORMER, ORIENTAL, 110V, 50/60W	
DATE	9 JUNE 86	DRAWING NUMBER 750-B0-067	



DYNAMAX

BROADCAST PRODUCTS BY FIDELIPAC

Fidelipac Corporation


P.O. Box 808

Moorestown, NJ 08057 USA

Phone: 609-235-3900

FAX: 609-235-7779


ADDENDUM



In our continuing effort to improve our products, this machine includes a newly designed Head Bridge Assembly which offers greater stability in addition to simplified head alignment. Please disregard the following technical manual sections and use the procedures contained in this Addendum:

CTR100 Series	Sections 4.5 thru 4.6.4
CTR10 Series	Sections 4.5 thru 4.6.4
ESD10	Sections 4.5 thru 4.5.3

In addition, please replace the Bill of Materials and the mechanical drawings for the Head Bridge Assembly with the ones included with this addendum.



CTR100 Series
CTR10 Series
ESD10
Revised 12/91

TAPE GUIDE ALIGNMENT

Using the Tape Guide/Head Alignment gauge, align the tape guides by turning the tape guide adjustment screw so that the inside edge of the upper guide finger just contacts the top of the height gauge (see drawing 750-A0-440 sheet 2). Repeat for the other guide(s). **Note:** there are normally 2 Tape Guides on each unit, however, an optional Center Tape Guide is available.

NOTE: Worn guides may seriously affect stereo phase performance. Guides should be checked periodically for signs of wear and replaced when necessary.

HEAD ALIGNMENT

The Head Bridge includes alignment in four axes; Height, Azimuth, Zenith, and Insertion.

Remove the machines outer cover, permitting access to the Head Block.

NEVER FORCE HEAD ALIGNMENT SCREWS

INSERTION

To adjust Insertion for most common cartridges, insert a Fidelipac Model 328 Head Insertion Gauge cartridge into the machine.

Adjust Tape Heads for equal penetration within limits of scribe marks on cartridge cover as viewed from directly above.

HEIGHT & ZENITH

Loosen the .050" Allen head locking screws on each side of the head block 1/4 turn.

Height and Zenith alignments should be performed with the machine turned off.

As shown in drawing 750-A0-440 sheet 2, place a HG-1 Head Height & Zenith Gauge against the head to be aligned.

Using a Phillips screwdriver, adjust the Height alignment screw such that the top edge of the top track pole piece is aligned with the top of the HG-1.

Using a Phillips screwdriver, adjust the Zenith alignment screw such that the vertical front surfaces of the head and HG-1 are parallel.

Recheck both Height and Zenith alignments.

Repeat the above procedure for the second head.

Retighten both head locking screws.

BE SURE TO DEMAGNETIZE THE HEADS BEFORE USING THE MACHINE.

NOTE: Head Height will be peaked during electronic adjustment.

AZIMUTH

Azimuth alignment is normally performed during reproduce and record alignments.

A 5/64" Allen head driver is required to adjust the Height alignment screws.

NOTE: Stereo Azimuth alignments are most easily accomplished using either a dual trace oscilloscope in the dual trace "chop" display mode, or a good quality phase meter.

MONO REPRODUCE AZIMUTH

While playing the "Set Azimuth" portion of a standard Spot Frequency Alignment Cartridge, adjust Play Azimuth for a peak signal at the audio output of the machine.

MONO RECORD AZIMUTH [Recorder Only]

Load a blank cartridge into the machine. Inject a 16 kHz signal at nominal level into the audio input and enter Record mode. Adjust Record Azimuth for a peak signal at the audio output of the machine.

STEREO REPRODUCE AZIMUTH

While playing the "Set Azimuth" portion of a standard Spot Frequency Alignment Cartridge, adjust Play Azimuth for both peak and in phase signals at the audio outputs of the machine.

STEREO RECORD AZIMUTH [Recorder Only]

Load a blank cartridge into the machine. Inject a 16 kHz signal at nominal level into both audio inputs and enter Record mode. Adjust Record Azimuth for both peak and in phase signals at the audio outputs of the machine.

HEAD BRIDGE ASSEMBLY 827-C0-401

DESCRIPTION	QTY	DESIGNATOR	PART NUMBER
BEARING BLOCK	2	M3	501-A0-400
HEAD LOCKING BLOCK	2	M7	501-A0-402
HEAD SHAFT	2	M4	502-B0-400
HEAD BRIDGE	1	M1	512-C0-400
HEIGHT ZENITH BEAM	2	M2	570-A0-400
HEAD CLAMP	2	M5	570-B0-401
THRUST PLATE	2	M6	570-B0-402
AZIMUTH BEAM	2	M9	571-B0-405
TAPE GUIDE CURVED	1	M21	5AB-A0-001
TAPE GUIDE STRAIGHT	1	M20	5AB-A0-002
BALL 3/16	2	M8	5B6-A0-400
SPRING COMP .1480 X 1/4	2	M22	5E2-04-148
SPRING, ZENITH BEAM	4	M10	5E2-A0-400
SPRING, AZIMUTH	2	M11	5E2-A0-401
SPRING, PENETRATION	2	M12	5E2-A0-402
FLAT WASHER SS .187 OD	2	M19	605-00-231
SCREW FL PHIL 4-40 X 1/4 SS	4	M17	645-A0-440
SCREW, 4-40X1/2 1820 FHP BLK	4	M14	64H-08-440
SCREW, 4-40X3/8 PBH STL	4	M15	681-06-440
SCREW, 4-40X5/16 SHS BLK	2	M18	6G2-05-440
SCREW SH 4-40X3/8 BL	2	M23	6Y2-06-440
SCREW SOC H.C. 2-56 X 1 BLK	4	M13	6Y2-10-256
SCREW SOC H.C. 2-56 X 5/8 BLK	4	M16	6Y2-0A-256
# 4 FLAT WASHER, STEEL PLATE	4	M24	601-00-400

ALL ADJUSTING / LOCKING SCREWS
 SOCKET HEAD 5/64

AZIMUTH ADJUSTMENT
 SCREWS
 ZENITH ADJUSTMENT SCREWS

INSERTION
 ADJUSTMENT
 SCREWS
 USE FIDELIPAC HEAD
 INSERTION GAGE NO. 328

HEAD BRIDGE (SOC. HD. 7/64)
 MTG. SCREW (SOC. HD. 7/64)
 HEIGHT ADJUSTMENT SCREWS

TAPE GUIDE ADJUSTMENT
 SCREWS

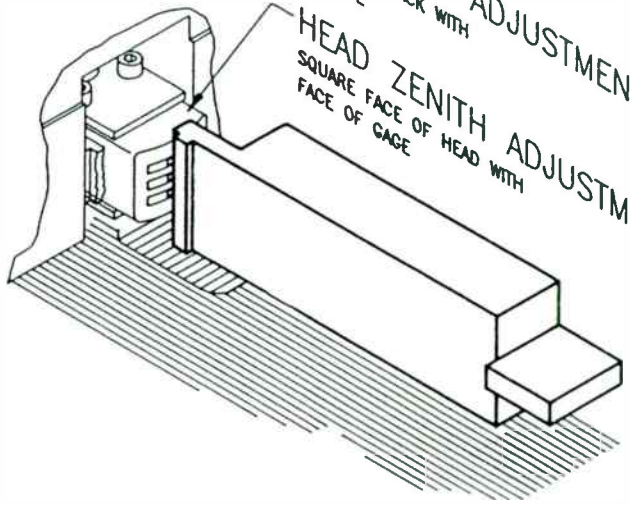
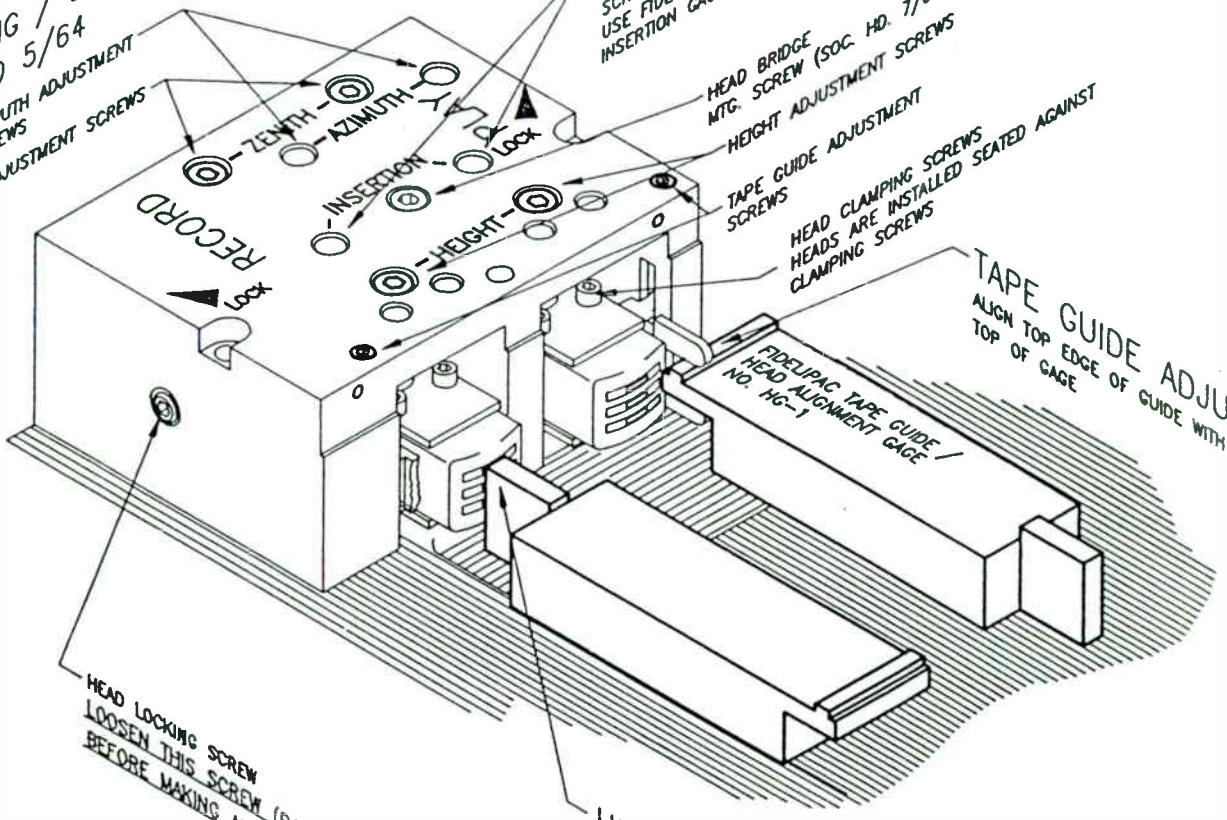
HEAD CLAMPING SCREWS
 HEADS ARE INSTALLED SEATED AGAINST
 CLAMPING SCREWS

TAPE GUIDE ADJUSTMENT
 ALIGN TOP EDGE OF GUIDE WITH
 TOP OF GAGE

HEAD LOCKING SCREW
 LOOSEN THIS SCREW (BOTH SIDES)
 BEFORE MAKING ANY ADJUSTMENTS

HEAD HEIGHT ADJUSTMENT
 ALIGN TOP OF TRACK WITH
 TOP OF GAGE

HEAD ZENITH ADJUSTMENT
 SQUARE FACE OF HEAD WITH
 FACE OF GAGE

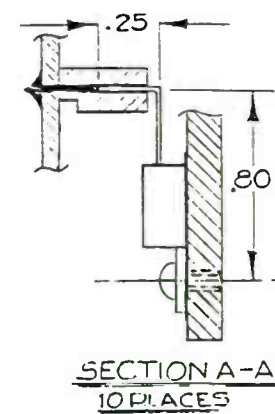
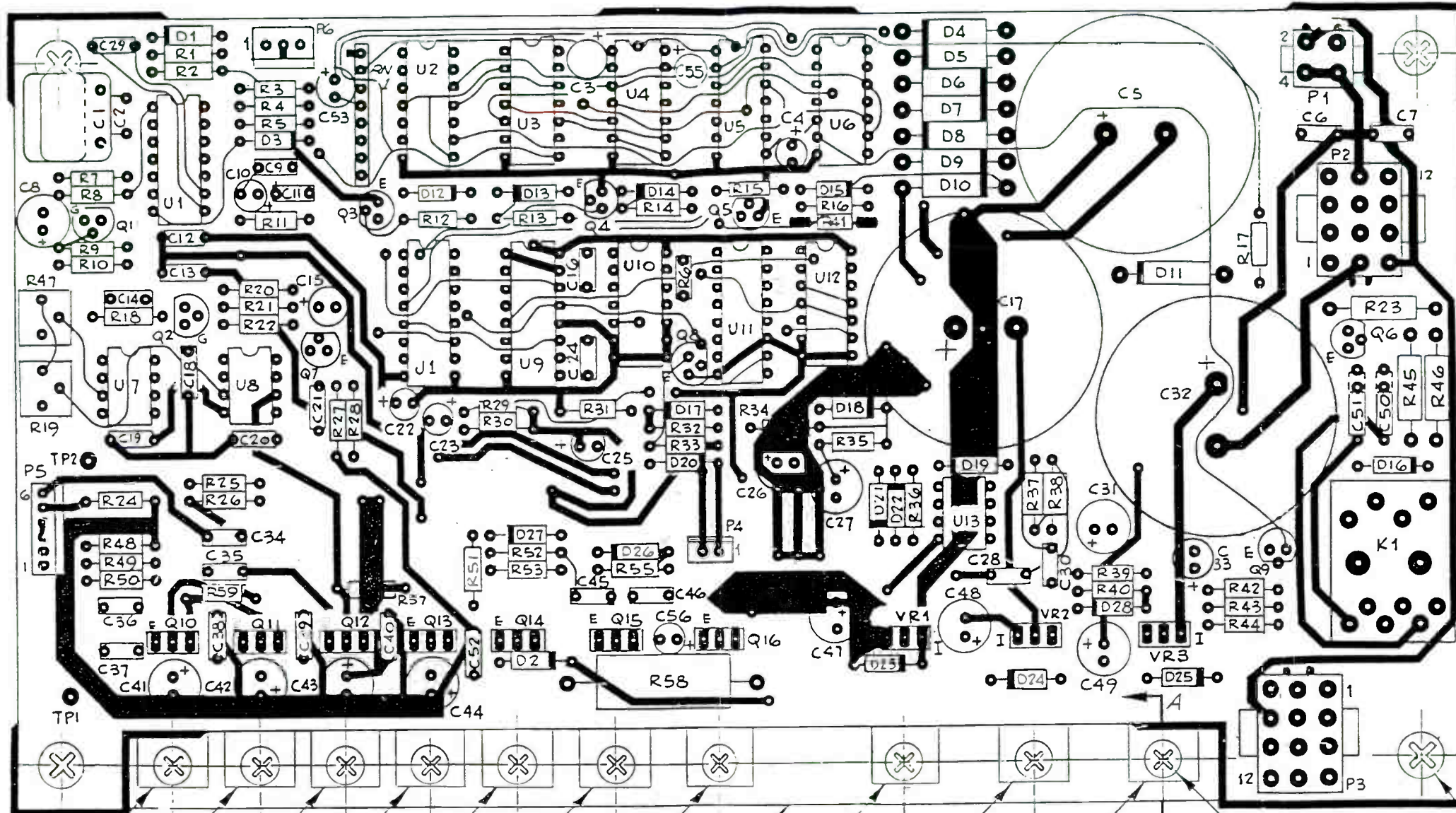


MECHANICAL ALIGNMENT LOCATIONS

DWG. NO.	750-B0-440	APPR	T.W.
SHEET	2 OF 2	ISSUE DATE	2/6/91

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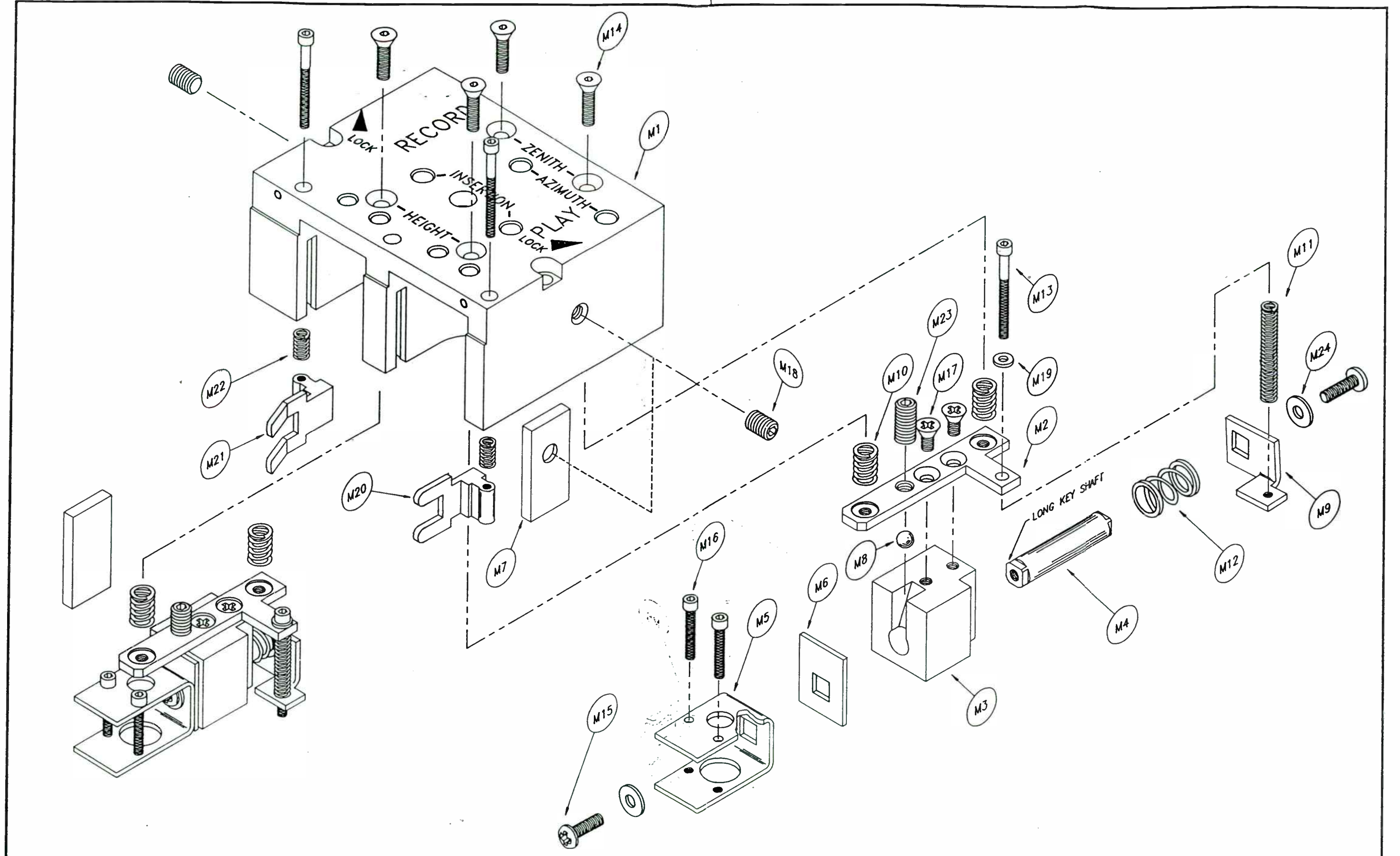
REVISIONS				
ZONE	NO	DESCRIPTION	DATE	APPROVED
	1	See Divy 750-B0-065	1-27-69	



Q10 Q11 Q12 Q13 Q14 Q15 Q16 VR1 VR2 VR3 (80)(81)(82) (10X)(10X)(10X) 83

- NOTES:
1. POSITION COMPONENTS FOR BEST READABILITY OF COMPONENT INFORMATION AT ASSEMBLY.
 2. MAX HEIGHT OF SOLDER JOINTS TO BE $\frac{1}{16}$.
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 4. FOR SCHEMATIC SEE DWG. 750-B0-065.
 5. FOR PARTS LISTS SEE DWG. PL.

MATERIAL	DRAWN J.T.	DATE 3-17-66	FIDELIPAC Corp.	
	CHECKED			
	APPROVED		SIZE C	CODE IDENT. NO. 807-B0-110
	APPROVED		SCALE 2:1	REV NO



MODEL NOS. ALL MODELS	ASSEMBLY HEAD BRIDGE	DWG. NO. 827-D0-401	APPR. J.J.W.	FIDELIPAC CORP. MOORESTOWN, N.J.	THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF FIDELIPAC CORPORATION. NO USE, DISCLOSURE OR REPRODUCTION OF ANY PART THEREOF MAY BE MADE WITHOUT PRIOR WRITTEN PERMISSION.
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