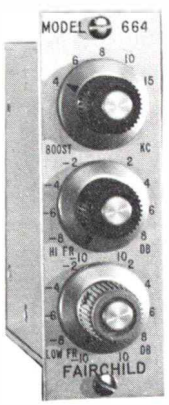
FAIRCHILD INTEGRA I THIN LINE SERIES MODEL 664 PROGRAM EQUALIZER & MODEL 665 EQUALIZER AMPLIFIER

In the recording field, the need for exaggerated or non-linear response in microphones and program channels is a constant production requirement today, in order to satisfy a producer's demand for something different in sound. In the field of acoustics, the need for response corrections of sound re-enforcement systems to complement hall acoustics has proven to be an expedient means of achieving intelligibility and/or other desired acoustical effects in a given hall. The MODEL 664 Equalizer is a basic equalizer that allows maximum flexibility to satisfy these needs. The device can be used in any application where response changes are required, including telephone line equalization.

The MODEL 664 Equalizer is designed around the thin line dimensions of the FAIRCHILD INTEGRA/series, 1-1/2" wide by 5-1/4" high by 5-1/2" deep. It has five high frequency accent positions: 4KC, 6KC, 8KC, 10KC and 15KC. Equalization is accomplished in five steps for each of these selected frequencies, culminating in a total equalization of 10 db. The high frequency response curve takes a haystack shape, which allows maximum effect with minimal equalization. This type of response curve minimizes trouble with excessive equalization of later stages of tape, disk or film transfer. High frequency roll-off is also available on the 664 at the rate of 6 db per octave, and the curves indicate the roll-off possible. The 664 contains a low frequency boost position, five steps, with a maximum of 10 db boost, and a complementary roll-off of lows is available as indicated in the curves.

If desired, the high frequency response of the 664 equalizer can be modified by the user, and instructions for modification are provided with the unit. The unit can be modified to provide 2, 3, 4, 5 and 7.5KC equalization points if so desired rather than 4, 6, 8, 10 and 15KC. All or only one of these equalization points can be obtained as desired by the user.

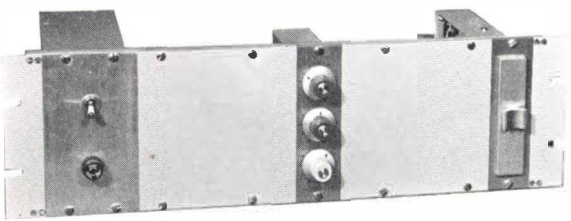
The Model 664 is a passive device with an insertion loss of 17 db. Its size permits mounting in a rack or right on the console. It can be used with conventional low impedance professional equipment and will accommodate input impedances up to 600 Ohms, and has an output impedance of 600 Ohms.



SPECIFICATIONS:

Input Impedance:	Up to 600 ohms
Output Impedance:	600 ohms
Insertion Loss (Model 664):	17 db
Recommended Input Levels:	+ 30 db to - 30dbm

(For specifications on the preamplifier supplied with the Model 665, see Technical Bulletin on the 662 Preamplifier.)



FAIRCHILD
SPECIFICATION SHEET

ARCHITECTS & ENGINEERS SPECIFICATIONS: Program Equalizer

The equalizer shall be 1-1/2" wide by 5-1/4" high by 5-1/2" deep. The unit shall have brushed aluminum, anodized, front panel with etched designations inscribed.

Control knob for equalization shall be located on the front plate. The device shall accommodate input impedances up to 600 ohms and its output impedance shall be 600 ohms. The insertion loss shall be no greater than 17 db and the device shall accommodate input levels from - 30 dbm to + 30 db.

The equalizer shall have 5 high frequency boost positions of 4, 6, 8, 10 and 15 KC. Equalization for each of these 5 positions shall be accomplished in 5 steps for a total equalization of 10 db at any one of the selected frequencies. Equalization shall be accomplished in only one frequency range at a time. High frequency roll-off of 6 db per octave shall be available, also provided in five steps. Design of the equalizer shall allow the user to change the high frequency boost points to 2, 3, 4, 5 and 7.5 KC if desired.

Low frequency equalization shall be included and shall provide 5 steps of equalization with a maximum boost of 12 bd at 80 cycles. The equalizer shall also be capable of providing low frequency roll-off in 5 steps, with minimum roll-off of 2 db at 80 cycles and maximum roll-off of 12 db at 80 cycles.

The equalizer shall be the FAIRCHILD INTEGRA/series MODEL 664.

FAIRCHILD MODEL 665 COMBINATION EQUALIZER - AMPLIFIER

To permit greater flexibility in installation and operation, a MODEL 665 equalizer system is available. The 665 combines the response capabilities of the 664 Equalizer with a solid state amplifier to eliminate the insertion of the 664 Equalizer. The 665 comes complete with its own power supply. Installation is simple and fast. The unit is rack-mountable. Dimensions are 5-1/4" x 19". The 665 is designed to accept input levels up to + 4 and will deliver the same level at its output as presented to its input. Additional gain (18DB) is available and a gain control is provided. There is ample space on the rack plate for the mounting of a VU meter.

NEW: Model 664NL (no loss) Program Equalizer. Same size as basic 664. Contains transistorized amplifier. Delivers +18dbm output with distortion .5%. Supply voltage 24V at 35 ma, or "14 dbm output with 18V supply voltage. Additional gain in amplifier design up to 33 db with internal transistor change. Unit as delivered unity gain.

SOME TYPICAL RESPONSE CURVES OF THE 664 EQUALIZER

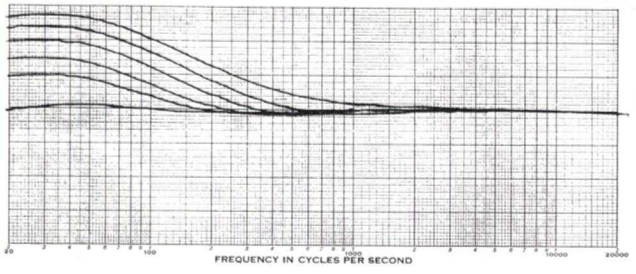


FIG. 1

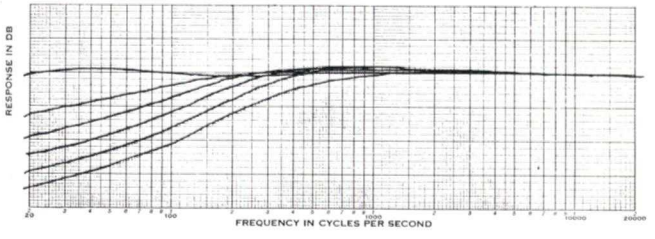


FIG. 2

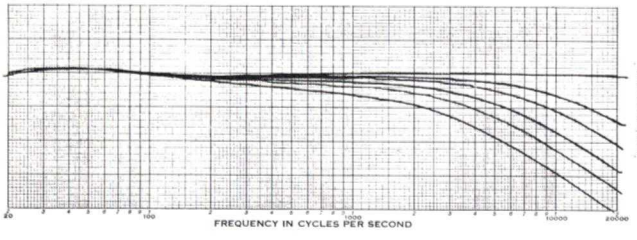


FIG. 3

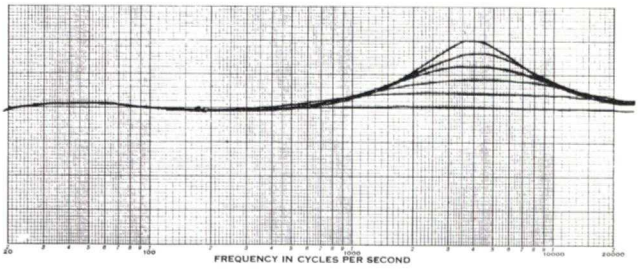


FIG. 4

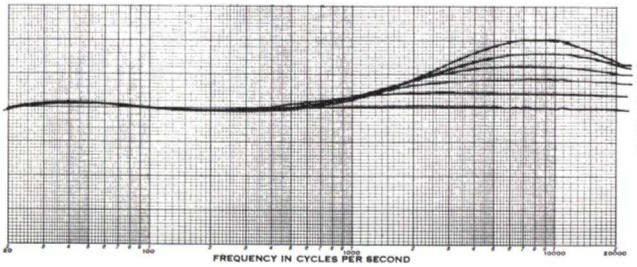


FIG. 5

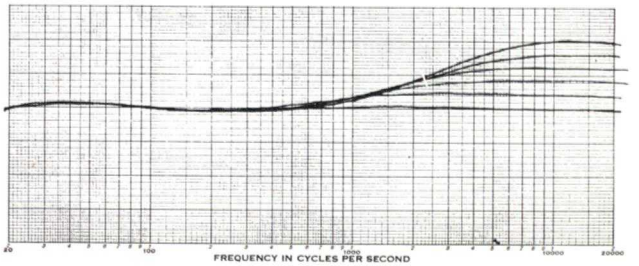


FIG. 6

FAIRCHILD
FAIRCHILD RECORDING EQUIPMENT CORP.
10-40 45th Avenue, Long Island City, New York 11101 / 212-784-6163

FAIRCHILD PROGRAM EQUALIZERS

MODELS

664A-664B

664NL-NLS

INSTRUCTION MANUAL

6641B/969

FAIRCHILD RECORDING EQUIPMENT CORPORATION, 10-40 45th Avenue, Long Island City, N.Y. 11101, 212 784-6163

FAIRCHILD INTEGRA I SERIES

PROGRAM EQUALIZERS

FAIRCHILD MODEL 664A

The FAIRCHILD Model 664A Program Equalizer is a passive device designed to be connected into a 600 ohm circuit. No power supply is required. All connections appear at the rear of the unit on a miniature Jones barrier strip. The only connections are those to supply audio signal to and from the unit.

INSTALLATION

The MODEL 664A may be driven by a source impedance from 0 to 600 ohms. No adjustments or changes in input connections or strapping are required. The output of the 664A is designed to work into an impedance of 600 ohms, and can be operated into a bridging circuit on the equipment following if so required. In this case, the 600 ohm output of the 664A should be terminated with a 600 ohm resistor. In some cases where the 664A works into inductive loads, a lead out resistor (in the order of 180 ohms depending on the inductive load) may be required between the equalizer and the inductive load in order to maintain low end response characteristics of the equalizer.

CONNECTIONS:		
	Terminal 1	high input
	Terminal 2	low input
	Terminal 3	high output
	Terminal 4	low output

OPERATION

FIGS. 1 through 5 show some of the response curves obtainable with the 664A Program Equalizer. FIGS. 1 and 2 show the action of the low frequency equalizer only. FIG. 3 shows the high frequency rolloff characteristics. FIGS. 4, 5 and 6 show the boost curves available at 4, 8 and 15KC. The curves at 6 and 10KC are similar in nature.

SPECIFICATIONS

Input impedance	600 ohms
Output impedance	600 ohms
Insertion loss	17 db ± 2 db
Recommended input levels	+30 to -30 dbm

FAIRCHILD MODEL 664B

The FAIRCHILD MODEL 664B Program Equalizer is identical in all respects to the Model 664A except that equalization points have been modified to 2, 3, 4, 5 and 7.5KC accent positions, from the normally provided 4, 6, 8, 10 and 15KC equalization points. Any or all of these equalization positions can be obtained as desired by the user.

MODIFYING HI FREQUENCY ACCENT POSITIONS

The Model 664A comes with an 8 mhy coil shunted with a capacitor (capacitor values vary according to the frequency point desired). These capacitors can be found on the section of the board behind the high frequency switch deck. By changing value of the capacitors, the MODEL 664A can be provided with accent positions of 2, 3, 4, 5 and 7.5KC instead of 4, 6, 8, 10 and 15KC in the following manner:

	COL 1		COL 2
Change	.22	capacitor to	.82
	.082	capacitor to	.33
	.047	capacitor to	.22
	.033	capacitor to	.12
	.015	capacitor to	.086

As an alternative, the capacitors in COL 1 can be left intact and additional capacitors shunted across the original capacitors to obtain the values specified in COL 2.

FAIRCHILD MODELS 664NL and 664NLS (negative ground) PROGRAM EQUALIZERS

The MODELS 664NL and 664NLS (in A or B configuration) are no loss versions of the 664 equalizer. An amplifier has been added internally in the same basic packaging to compensate for the insertion loss of the equalizer. In addition to connecting the unit to the audio line, it requires DC power to operate. It can be fed with 18V DC or 24V DC at 10 ma, well filtered.

The amplifier in the 664NL equalizers has a basic gain of 33 db. It is placed after the equalizer circuitry with a 16 db pad between it and the equalizer, so that when the equalizer is fed line level, output from the amplifier will also be line level ±2 db. The output handling capability of the amplifier is +14dbm with an 18V DC supply and +18dbm with a 24V DC supply. Output impedance of the amplifier is 10 ohms and it can be fed into any impedance 150 ohms or higher. Noise and distortion of the unit are extremely low.

CONNECTIONS

To install the 664NL unit into the circuit, the following connections are made:

TERMINAL 1 input - high side
2 power - negative side
3 output - high side
4 ground: input, output, power positive side

To install the 664NLS unit into the circuit, the following connections are made:

TERMINAL 1 input - high side
2 power - positive side
3 output - high side
4 ground: input, output, power negative side

The 664NL units cannot be connected into a balanced network unless balancing transformers are used (such as the UTC A20). The connections given above are for unbalanced circuit, 600 ohms impedance. An impedance of 600 ohms should feed the input of the 664NL units, and if impedance is lower a build-out resistance of 180 ohms or more should be used in series with the source to produce flat frequency response. If the input impedance is higher, termination of the input is required so that total impedance is 600 ohms.

If additional gain is required, the 16 db pad between the equalizer and amplifier can be removed. When the 16 db pad is removed, however, a 600 ohm resistor should be placed across the amplifier input for correct loading of the equalizer.

SPECIFICATIONS 664NL/NLS

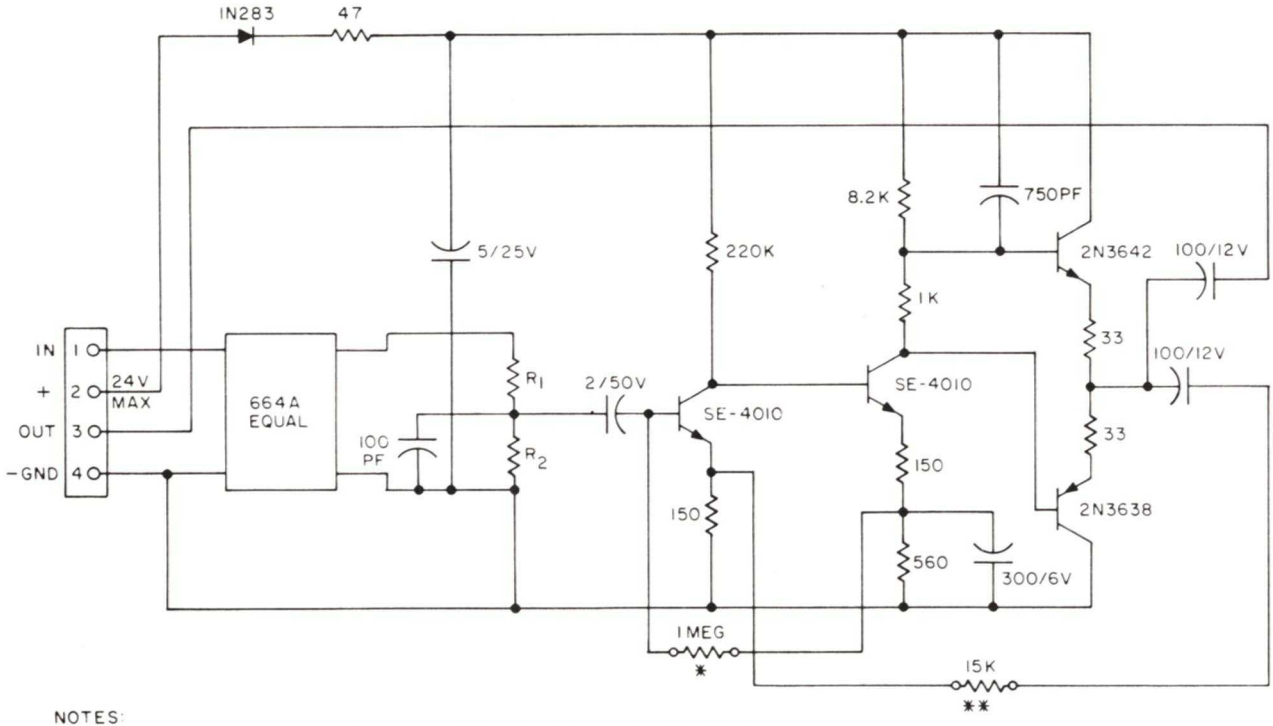
Gain	Unity. Amplifier gain 33 db nominal.
Frequency Response	Within 1.5 db 20 to 20KC. Amplifier within 1 db 15 to 50KC
Power Requirements	18V DC or 24V DC at 10 ma max (4 ma ideling)
Output	18dbm max with 24V DC supply
Distortion	1% max at max output. .15% at line level
Noise	126 db with respect to input
Output Impedance	10 ohms
Input Impedance	600 ohms (20K ohms amplifier input impedance)

WARRANTY

See standard warranty policy attached to and forming part of this manual. To validate warranty, complete and return the warranty registration card provided. If there is any question on this or any other FAIRCHILD professional product, please do not hesitate to contact our CUSTOMER SERVICE DEPARTMENT, FAIRCHILD RECORDING EQUIPMENT CORPORATION, 10-40 45th Avenue, Long Island City, New York 11101 (784-6163)

NOTE:

The 664 circuit is licensed and a schematic diagram has not been published. Diagram on the amplifier section, however, is included in this manual.

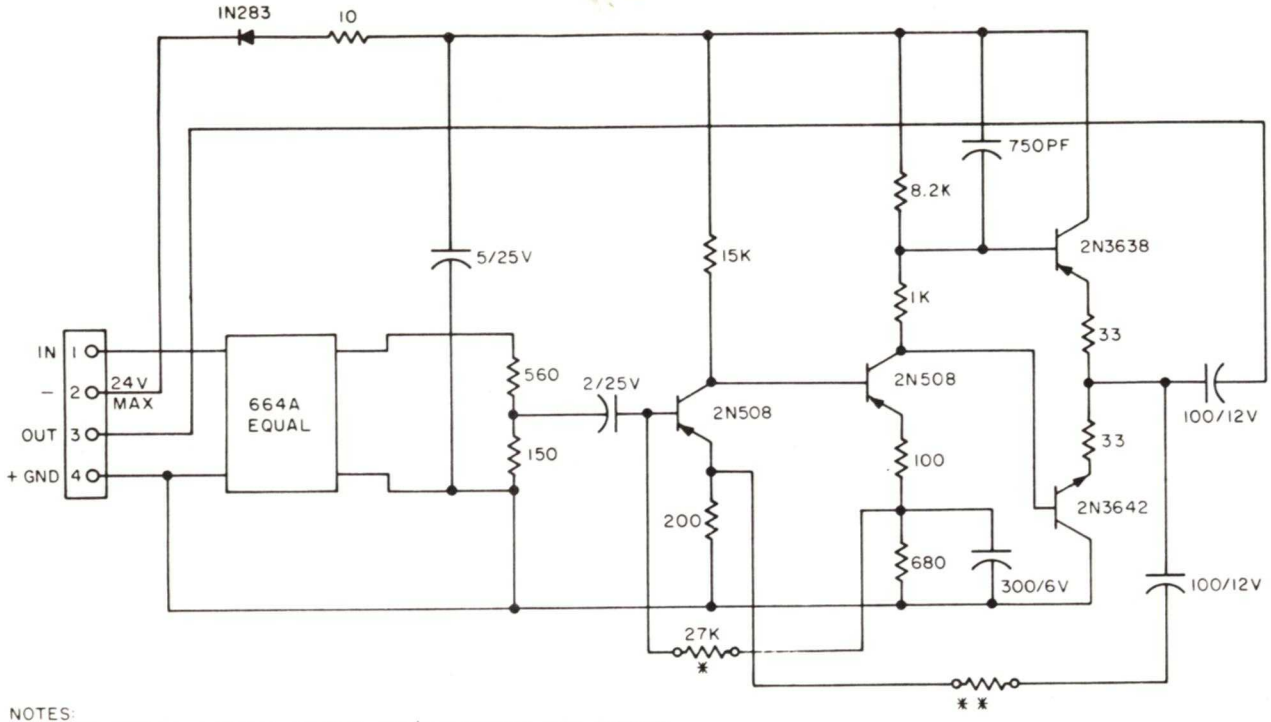


NOTES:

1. * - TO BE SELECTED AT FINAL ASS'Y - APPROX. 1 MEG TO 68K.
2. ** - FEEDBACK RESISTOR - 15K FOR DB OF GAIN.
3. UNLESS OTHERWISE SPECIFIED
   ALL RESISTORS ARE IN OHMS, 1/4 W.
   ALL CAPACITORS ARE IN MFD.
4. R_1 & R_2 TO BE SELECTED FOR DESIRED AMOUNT OF LOSS ($R_1 + R_2$ = 600 OHMS ± 20%).

664-NLS SCHEMATIC DIAGRAM

A-96128



NOTES:

1. * - TO BE SELECTED AT FINAL ASS'Y - APPROX. 27K TO 68K.
2. ** - FEEDBACK RESISTOR - 8.2K FOR 33DB OF GAIN.
3. UNLESS OTHERWISE SPECIFIED
   ALL RESISTORS ARE IN OHMS, 1/4W.
   ALL CAPACITORS ARE IN MFD.

664-NL SCHEMATIC DIAGRAM

A-96118

SOME TYPICAL RESPONSE CURVES OF THE 664 EQUALIZER

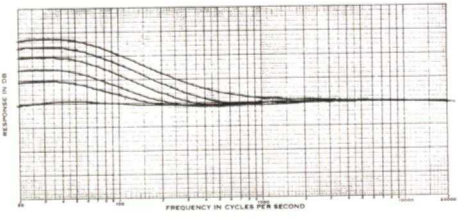


FIG. 1

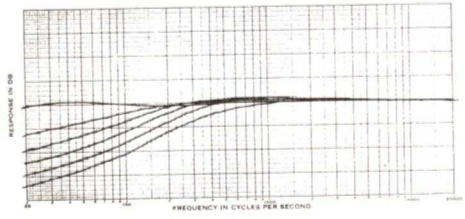


FIG. 2

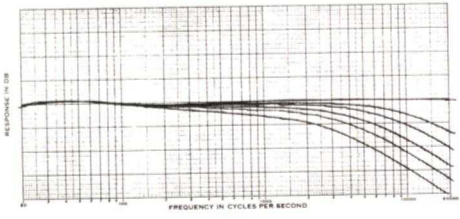


FIG. 3

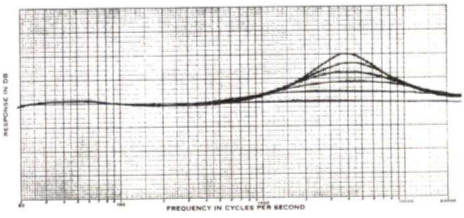


FIG. 4

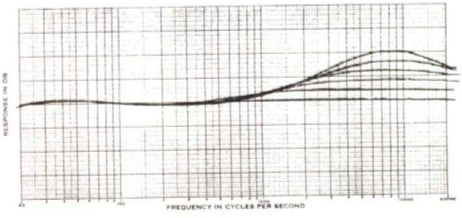


FIG. 5

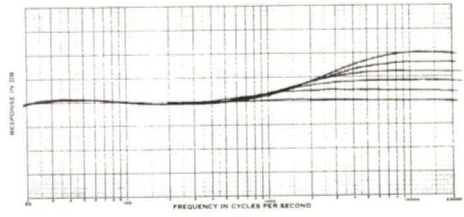
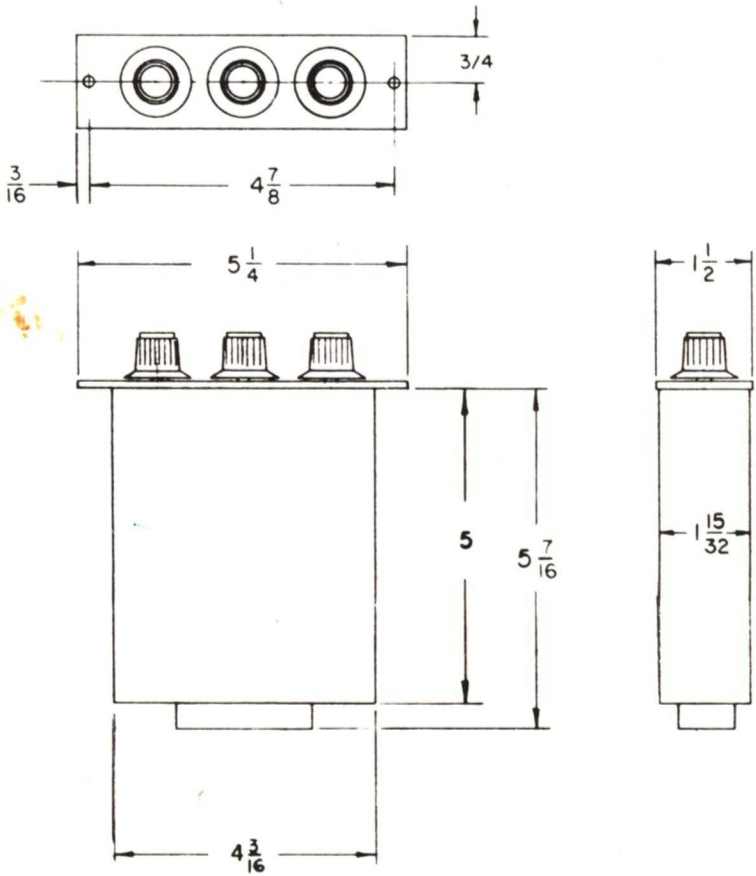


FIG. 6



664NL/664NLS,664A MOUNTING DIMENSIONS