

FAIRCHILD
PREAMP/ATTENUATOR/SWITCHER CARD
MODEL 692B & 692B/TX1

1 B692B/768

INSTRUCTION MANUAL



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FAIRCHILD MODEL 692B and 692B/TXI CARD

GENERAL

The FAIRCHILD Model 692B (and the 692B/TXI with transformer) is designed to perform the following functions: amplification, attenuation, switching and mixing.

The amplifier on the 692B card provides 66db of gain with input transformer. The attenuator provides attenuation range from zero to infinity. The switcher provides delegation of the signal into one or two channels, or into two existing channels. The mixing network mixes the signal into two selected channels.

The 692B card can be positioned remotely from the audio control board, and all functions of the card circuit can be actuated remotely. The card is designed to be used with a card rack for easy maintenance and inspection, and for simplicity in assembly.

With today's audio systems becoming more and more complex, the 692B card offers advantages not found in any other system. Superior performance of the circuits on the card and capability of remote operation makes this card the most desirable package available for audio installations today. Each function on the card appears on a separate pair of terminals and therefore each card can be used in more than one way and in different circuits.

CIRCUIT DESCRIPTION

AMPLIFIER

The amplifier on the 692B card is capable of maximum output of 18 dbm. The amplifier is Class AB, directly coupled with minimum of 18 db of negative feedback. The output stage is complementary symmetry circuit using silicon transistors exclusively. Amplifier is decoupled from the power supply for minimum interaction, with network consisting of one resistor and electrolytic. Also, to prevent inverted power polarity there is a diode in series with the power supply, preventing reversal of power polarity accidentally.

The power supply feeding the amplifier card should have ripple not higher than 1/2 mv rms for best S/N ratio. Gain of the amplifier is controlled by means of a potentiometer connected in the feedback loop, thereby reducing the distortion of the amplifier as the gain is decreased. The gain of the amplifier is varied over range of 29 db. Input transformer for the 692B is a well-shielded transformer capable of accepting levels as high as 0 dbm without overloading. The transformer is mounted directly on the card for minimum noise pickup and minimum high frequency loss. When mounting the 692B/TXI PRECAUTION should be exercised in locating it. Avoid mounting or locating the amplifier card near strong magnetic fields which can cause hum

pickup affecting the overall performance of the amplifier. When no transformer is used with the amplifier, it can be mounted anywhere without regard to any adjacent hum or magnetic fields.

ATTENUATOR

The attenuator on the 692B card is a constant input and output impedance, modified T circuit, available in 600 or 150 ohms. Nominal insertion loss of this circuit is 3 db for 600 ohms. The attenuator is noiseless and remote controllable.

Attenuation capabilities are attained through the use of cadmium sulphide resistors, controlled by extended life incandescent bulbs. The attenuator circuit is placed on the printed circuit board in a separate, light-tight compartment. Five cells are used in the attenuator providing a constant input and output impedance over the operating range. Light dependent resistors in the circuit are illuminated by two light sources which are driven by two transistors. Control of the transistors is accomplished through remote-located voltage divider, slider or rotary, depending on the requirement.

By following the attached schematic of the attenuator, one can see that there are three cells connected in series with the audio signal, and two cells connected in shunt. Series cells are under one light shield, and the shunt resistors are under the other. As one light source illuminating the three cells goes on, the light source which illuminates the two cells in shunt goes out providing small loss path for the audio signal. As the bias on the driving transistors changes, the bulb illuminating the three cells dims while the other bulb starts glowing, reducing the resistance of the shunt LDRs. At this time, attenuation of the signal starts increasing. As the process continues, attenuation increases until the center LDR goes into resistance range in the order of several megohms. Attenuation of the audio signal at that time becomes almost infinite. However, the impedance of the input and output circuits remains the same. Light sources for the attenuator are normally designed for 5,000 to 10,000 hours of continuous operation according to the manufacturer of the incandescent lamps, but for every 5% decrease in voltage across the bulb, life expectancy of the filament doubles. Operating a 6.3V bulb at 4.8V DC would produce life expectancy of this particular bulb of not less than 5 to 10 years of continuous operation. Since the life of the bulb is specified as "average", there is a certain percentage of bulbs that may burn out in less time than specified above.

RELAYS

The 692B card contains two reed relays controllable separately by external switches. Magnetic reed switch is one of the most reliable mechanical switches available on the market today. It can produce up to several millions of operations of switching without any contact bounce or failure. Both relays on the 692B card are of plug-in type, so that if any mechanical or electrical damage occurs the relay can be easily replaced by unplugging it and replacing with a new one.

Relays are Type A contacts normally opened. Input to the relays are joined at one point, providing delegation of the signal into

one of two channels, or two channels at the same time if so desired. Connected to the output of the relays are resistors for the mixing network. These resistors are normally adjusted for 600 ohm loads, however they can be any value on request - depending on the user's requirements. The coil of each relay is by-passed by diodes, providing adequate transient suppression.

PERFORMANCE SPECIFICATIONS - Amplifier

GAIN - without transformer 22 db - 51 db continuously variable
 - with transformer 36 to 66 db

INPUT IMPEDANCE - without transformer 100,000 ohms
 - with transformer 200 ohms

FREQUENCY RESPONSE Flat 20-20,000 \pm .5 db

DISTORTION THD (total harmonic distortion) at 17 $\frac{1}{2}$ dbm out .35% (line level distortion .1% or less)

NOISE w/max Gain - without transformer 125 db input noise with open input
 - with transformer primary shorted 139 db input noise

POWER REQUIREMENTS 24V at 6 ma max

OUTPUT IMPEDANCE 3 ohms

RECOMMENDED LOAD IMPEDANCE 150 ohms or higher inductive or non-inductive

MAX POWER HANDLING CAPABILITY +18 dbm without transformer
 +20 dbm with transformer (step up from 150 ohms to 600 ohms sec)

- Attenuator

INPUT & OUTPUT IMPEDANCE 600 ohms or 150 ohms (on request)

CIRCUIT Unbalanced T - nominally constant impedance. Impedance variation \pm 15%

INSERTION LOSS 3 db at 600 ohms. 7 db at 150 ohms.

POWER REQUIREMENTS 6.3V at 16ma with high impedance actuator, 110 ma with slide actuator

TRACKING ACCURACY \pm 2 db within first 35 db of attenuation

ATTENUATION 0 to infinity (-125db min.)

- Switcher

CONTACTS Two A type, normally open contact circuit; each relay separately controlled via external feed. Each relay can be operated independently of the other.

POWER REQUIREMENTS 24V at 6 ma per relay

LIFE EXPECTANCY Several millions of operations, depending on current (10,000,000 min. with current less than 1 ma)

(Switcher cont'd)

POWER HANDLING CAPABILITY	30 dbm voltages not exceeding 50V.
RESPONSE TIME	Less than 1 millisecond
	- <u>Mixing Network</u>
TYPE	Bridging or matching depending on application
NETWORK IMPEDANCE	Bridging - 7000 ohms into mixing network
INPUT IMPEDANCE	560 ohms

MOUNTING

The 692B card is designed to mount into a rack frame. 16 units can be accommodated in a 19" rack space using the Model 692RM rack mount. If only one or two units are to be mounted, single card holders (692SCH) 5 1/4" high by 1 1/2" wide are also available for rack frame mounting so that other FAIRCHILD equipment can be located adjacent to the cards.

CONNECTIONS

TERMINAL 1	+24V DC for relays
2	Relays 1 - 24V DC
3	N.C.
4	Mixing net 2
5	Mixing net 1 - output
6	Common input to both relays
7	Attenuator ground for input/output
8	Attenuator output - high
9	-6.5V DC
10	Actuator - slider
11	+6.3V DC
12	Attenuator input - high
13	-24V and amplifier ground
14	N.C.
15	Amplifier output - high
16	N.C.
17	N.C.
18	N.C.
19	Amplifier input - low
20	Amplifier input - high
21	N.C.
22	+24V DC - amplifier

WARRANTY & SERVICE POLICY

See standard warranty policy attached to and forming a 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 the factory: FAIRCHILD SOUND EQUIPMENT CORPORATION, 10-40 45th Avenue, Long Island City, New York 11101.

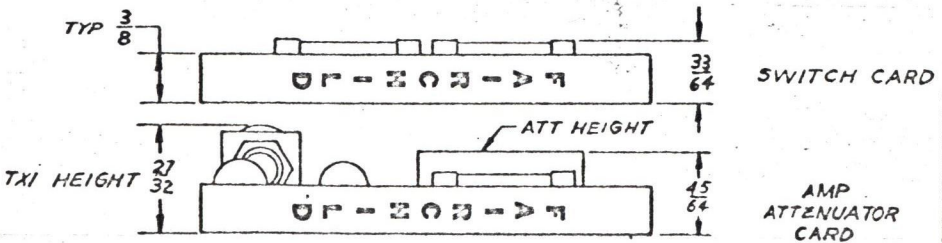
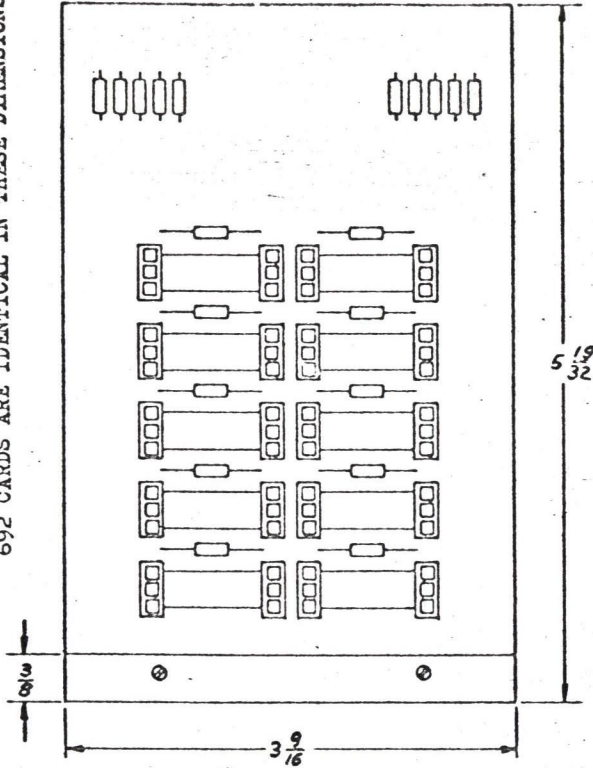
DRAWINGS: Schematic diagram B96187
Mounting dimension outline

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INTEGRA II PC BOARD MOUNTING DIMENSIONS

AUDIO SWITCHER CARD USED AS AN
EXAMPLE FOR LENGTH & WIDTH. ALL
692 CARDS ARE IDENTICAL IN THESE DIMENSIONS.



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