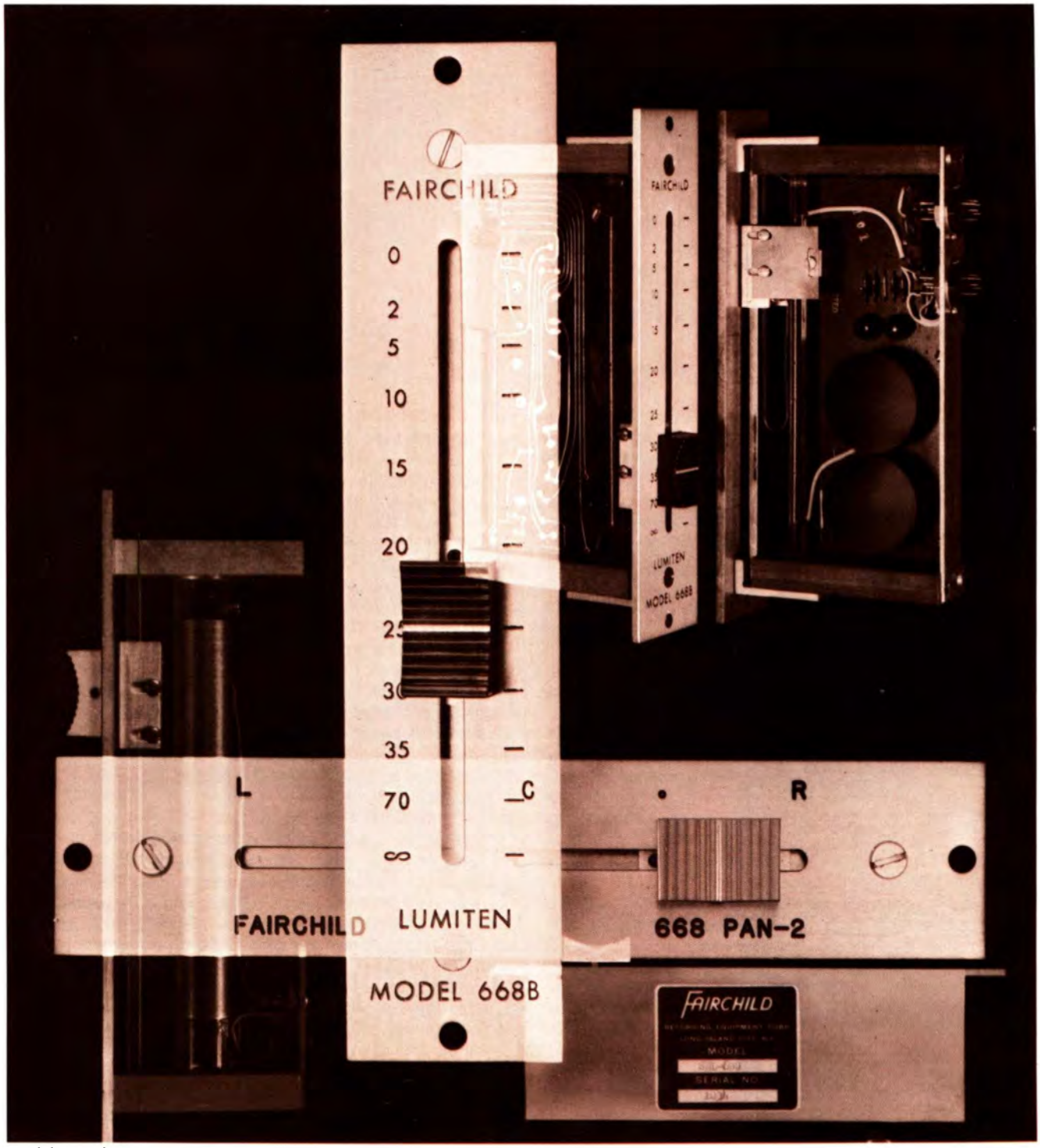
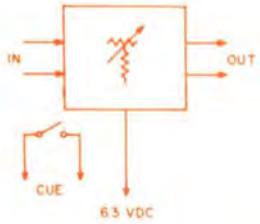
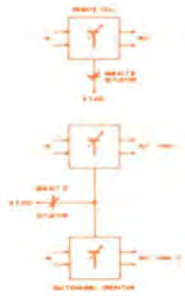
FAIRCHILD ATTENUATION SYSTEMS

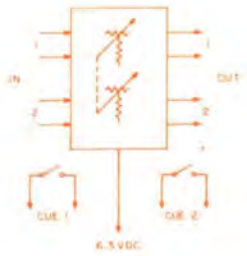
Now! Attenuation as silent as a beam of light. The FAIRCHILD attenuation systems described on these pages feature a revolutionary concept that has captured the imagination of audio engineers. There are no moving parts in the audio circuit to introduce noise. FAIRCHILD has used a variable intensity light, in conjunction with light sensitive cells thus eliminating moving parts from the audio circuit and thereby revolutionizing attenuator design. This new design—the FAIRCHILD LUMITEN concept—provides totally noise-free smooth attenuation. With FAIRCHILD LUMITENS it is now possible to control audio level through distant remote control. Remote control is accomplished running inexpensive unshielded wires carrying only minute DC current.

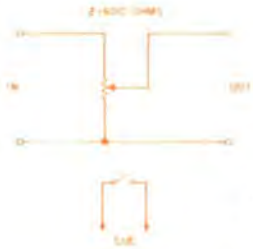
FAIRCHILD LUMITENS all use the same basic principle to effect attenuation. Depending on the model, FAIRCHILD LUMITENS consist of two or more light sources whose intensities are varied by an actuator. Two or more cadmium-sulfide cells (light-dependent resistors) face each light source. These cells change their resistance in relationship to the light striking them. The cells are in the audio circuit, so a change in light intensity changes resistance in the audio circuit thus accomplishing the desired variation of attenuation.











MODEL 668 II

MODEL 668 ACT

MODEL 668 ST II

MODEL SWL 600

THE MODEL 668 II SERIES is a vertical-type slide attenuator. The vertical design saves console space and simultaneously provides the operating engineer with a simple graphic indication of his settings.

LUMITEN OPERATION—The Model 668 II unit consists of a specially-wound voltage divider-actuator and an electronic board with light sources, photo sensitive cells, light tight compartments and all associated electronic circuits. The voltage-divider element rod, combined with the precious-metal contacts varies the bias on the lamp drive transistors, consequently changing intensity of the bulbs that illuminate the light dependent cells.

Five cells and two light sources are used in a single-channel LUMITEN. Circuit provides a maximum impedance deviation of 15% over the entire attenuation range of the device—0 to 125 dB (infinity).

The sliding mechanism has a pressure control so that slider feel can be adjusted to suit user preference.

The LUMITEN principle readily works for remote-control application. A basic actuator can be used to remotely vary one or several remote cell systems. Thus one control handles several channels with no change at all in attenuator feel.

All MODEL 668 LUMITENS require a 6.30V D.C. voltage supply. A MODEL 667D II power supply available from FAIRCHILD will power up to thirty units.

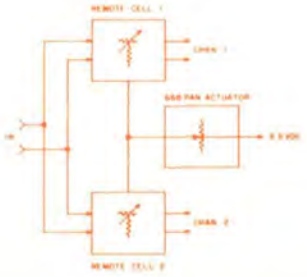
The MODEL 668 incorporates 7 pin connector at its base (two in the case of the stereo model). This connector carries audio and control voltage. (In the actuator-only models the unit receives only voltage. Audio is presented to the remote attenuation cell.)

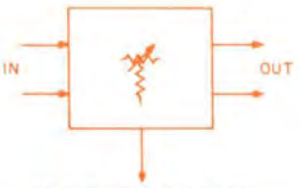
LUMITEN FADER—MODEL 668. An attenuator/fader of 600-ohm input and output impedance. Insertion loss is 3 DB. Resolution is infinite from 0-inf. CdS cells are in a modified ladder circuit providing constant impedance. The failure of any one light in a circuit would not result in an uncontrollable gain increase. Power Required: 6.3 V d.c., 100 mA; Frequency Response: d.c. to 100 kHz; Response Time: 0.1 sec. for full action. (A cue switch is available as an option.) MODEL 668-1 is identical to the 668 except that impedance is 150 ohms and insertion loss is 6 db.

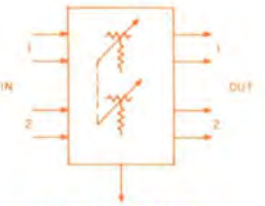
LUMITEN ACTUATOR— MODEL 668ACT. A basic in-line actuator designed to operate with any of the remote-controllable FAIRCHILD attenuator circuits. A single actuator can drive several 688RAB, 692 D1/D2, 688MC, or 688 RSB cards. Optional cue is available with A or B form contacts. Power Required: 6.3 V d.c., 40 mA.

MODEL 669ACT. Specifications and applications are identical to the Model 688ACT except that this is a rotary actuator.

LUMITEN STEREO FADER—MODEL 668 ST II. A stereo attenuator fader. Two identical light-sensitive circuits are driven off one light source and internal actuator. All specifications are the same as the basic 688. Tracking of the two channels is within 0.5 dB. Separate stereo cut circuits are available as an option. MODEL 668-1ST II is a two-channel version of the 688-1 150-ohm model.







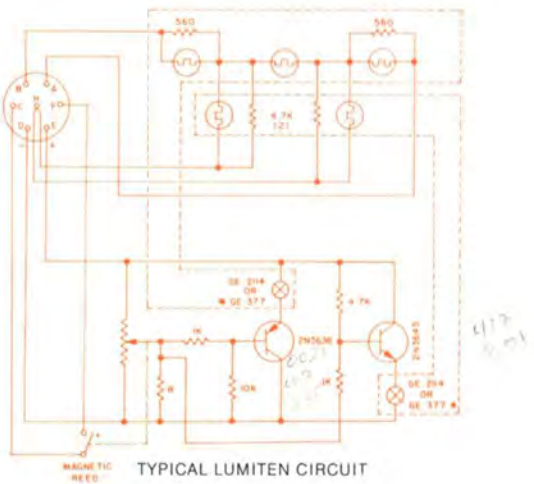
LUMITEN PAN POT ACTUATOR—MODEL 668 PAN-2. A horizontal in-line pan pot actuator designed to work with FAIRCHILD remote controlled cells (668RAC, 668RAB, 692 D1/D2) to produce the panning of signal from one channel to the other. A single actuator can drive up to two sets of remote controllable cells. Power Required: 6.3 V d.c. 180 mA.

MODEL 668 RAB

MODEL 668 RSB

NON-LUMITEN FADERS—MODEL SWL 600. A non-Lumiten basic slide fader. This is an in-line 600-ohm pad using wirewound attenuator element. Bifurcated Ney Alloy contacts. (Ney contacts are manufactured by the Ney Company, made out of a gold/silver/platinum alloy.) The SWL 600 is designed for low-noise audio gain adjustments. It terminates the source with a proper impedance of 600 ohms and is designed to feed impedances of 600 ohms or higher found in modern solid-state amplifiers or circuits. Attenuation is to infinity, resolution is better than 0.25 dB in the operating range. Output impedance varies 0-600 ohms. Required termination across output—none.

A magnetic reed switch for cue is available as an option. Adjustable slider feel. Designed for hi RF fields.



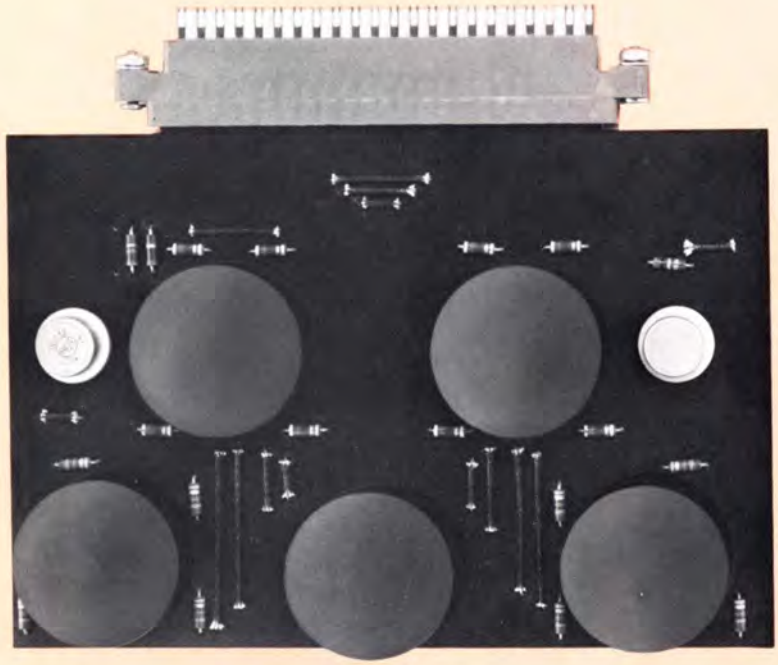
TYPICAL LUMITEN CIRCUIT

LUMITEN REMOTE ATTENUATOR BOARDS—FAIRCHILD supplies a series of circuit boards designed to complement the LUMITEN series actuators. All of the boards use LUMITEN circuits; that is, a group of light sources whose intensities are varied through the transistorized drivers by the remotely located slider or rotary voltage divider. These light sources face groups of ldr's. As the light intensity is changed, the ldr resistance varies. Since the ldr is actually in the audio circuit, it serves to provide the desired attenuation of a given signal.

Each of the circuits is assembled on a black, glass-epoxy printed-circuit board. The board mounts in an appriate p.c. edge connector with all wiring done to the connector. The light sources are GE377 bulbs. They are in plug-in mounts and permit easy replacement without disturbing the adjustment of the cells.

Several cards may be controlled by a single actuator. In this case, the boards are simply connected to the actuator and the 6.3 V supply in parallel at their connectors. No special attention is necessary to the mounting position except to avoid positions that place the board near intense heat sources.

Caution should be exercised in connecting audio grounds. Improper wiring will result in limited amount of attenuation.



MODEL 668 MC

MODEL 668RAB. A remote attenuator circuit, packaged on a compact plug-in p.c. card. Input and output impedances are constant. Both 600-ohm and 150-ohm systems are available. A connector is included as are plug-in bulbs, and a transistor drive. Power Required: 6.3 V d.c., 60 ma (with actuator 110MA); Frequency Response: d.c. to 100 kHz; Response Time: 0.1 sec. for full action.

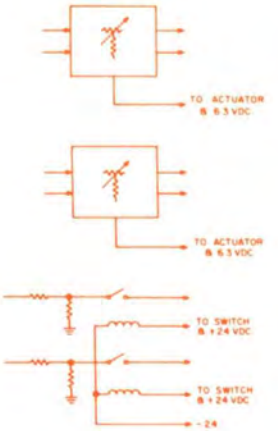
MODEL 668RAC. Similar in performance to the 668RAB card except that the circuit is mounted in a plug-in can that plugs into a standard 9-pin miniature socket. It is listed for replacement purposes, though it is discontinued.

MODEL 668RSB. A remote stereo attenuator board with both attenuator circuits driven off common light sources—even though the circuits themselves are separate. This procedure eliminates any possibility of drift between channels.

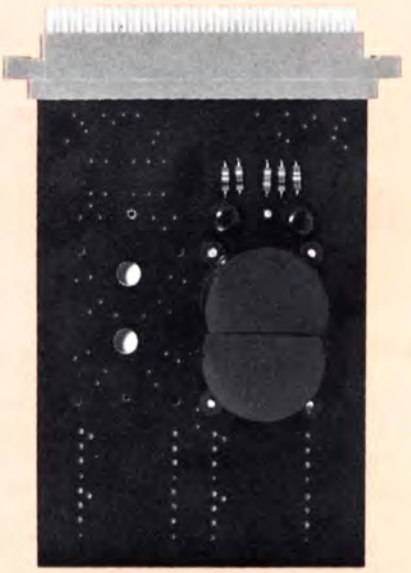
Electronic characteristics are the same as the 668 ST II stereo attenuator.

MODEL 668MC. This card is a master-control attenuator card with four channels. All four are actuated by light sources common to all channels. Each channel is separate with immeasurable crosstalk. Five LDR's of each channel face separate light sources, each common to all 4 channels. This assures perfect tracking between all 4 channels despite possible bulb failures and minimizing this effect.

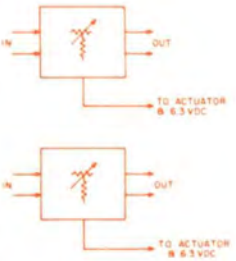
Several cards can be driven by a single actuator for multichannel circuit operation. Electrical characteristics are the same as the 668 II attenuator, except—Power Required: 6.3 V d.c., 160 mA.



MODEL 692 C



MODEL 692 D1

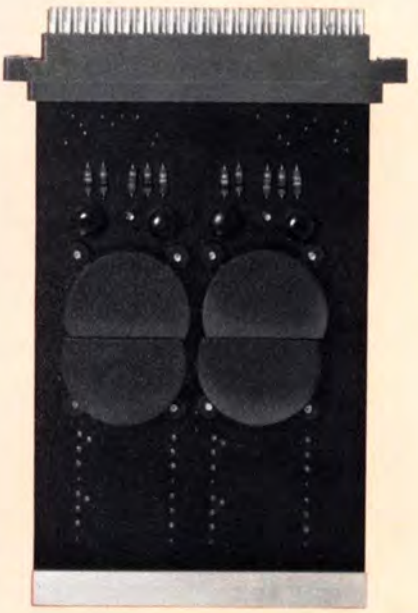


MODEL 692 SERIES. These circuits are mounted on INTEGRA II cards. The circuits of the boards are similar to the 668 II attenuators.

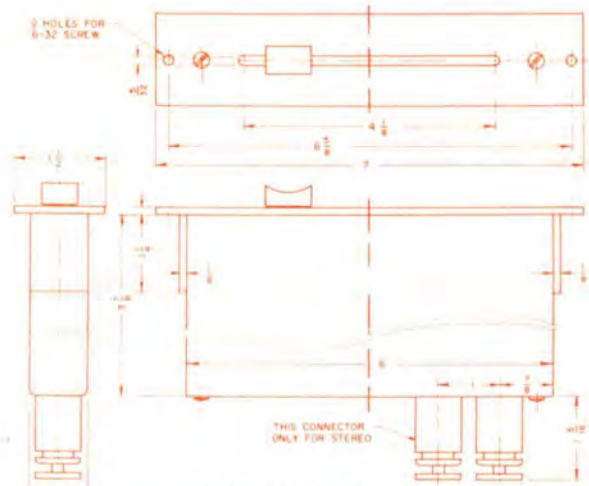
MODEL 692C. A remotely operated combined attenuator and switcher on a single INTEGRA II card. The card consists of two 600 ohm or 150 ohm LUMITEN remote attenuation cells, and two sets of s.p.s.t. reed switches with resistive networks. The attenuator cells have transistor drives to work with remotely located actuators. The reed switches are actuated by feeding current through coils from a remotely located activator switches and power source. Power Required: attenuator—6.3 V d.c., 60 mA each; switches—24 V d.c., 6 mA each.

MODEL 692 D1. A single remote attenuator cell on an INTEGRA II series board. There are no switches or mixing networks. Electrical characteristics are the same as the 668RAB attenuator card. Designed to complement 692 series in a system design.

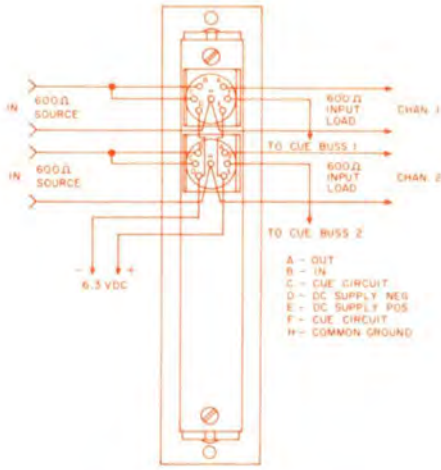
MODEL 692 D2. This INTEGRA II card has two independent attenuator/fader circuits. It requires two remote actuators for control. Electrical characteristics are the same as a 668 II attenuator. Also can be used with 668 PAN actuator as a pan pot.



MODEL 692 D2



DIMENSIONAL DRAWING



TYPICAL WIRING

FAIRCHILD ATTENUATION SYSTEMS

FAIRCHILD SOUND EQUIPMENT CORPORATION

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

FAIRCHILD MODEL 692DAT
INTEGRA II 692 SERIES
DOUBLE AUTO-TEN CARD

FAIRCHILD MODEL 692 DAT

The Fairchild Model 692DAT card contains two signal activated gate, auto-ten circuits designed to supplement Integra II component series. Two completely independent auto-ten sections, each containing 2 CDS Cells located next to individual light sources offers design flexibility and compactness not available until now.

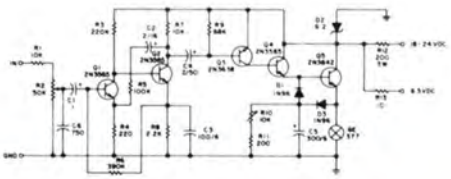
Unlike any other gated amplifier circuits, the auto-ten performs soft switching by using smooth and fast resistance change of CDS cells, which are actuated by fast incandescent plug-in bulbs. The new circuit offers very well defined threshold point with resolution of 1 db. The lowest threshold setting provides action from signals as low as -40 dbm. Two separate threshold controls are mounted on a board with provision to use external controls. Release time for the gating action can be either fixed or variable. Proper strapping of the connector terminals offers 3 release time constance ranging from 0.3 seconds to 7 seconds. The use of external rheostat will enable the user to vary the release time continuously over the same range.

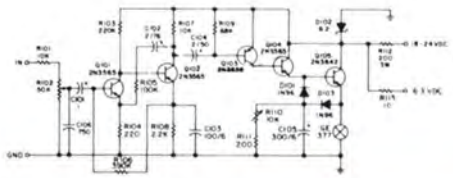
Uses of the 692DAT board include gating of audio lines to eliminate unwanted low level signals (noise) or changing the gain of the lines, either by signals transmitted to same or from other sources. CDS cells activated by the light source vary their resistance over the range from 50 ohms when fully illuminated, to tenths of megohms when in complete darkness. Any place in the circuit where a variable resistor of this type would perform the function, this resistor can be substituted by the 692DAT, which will perform the same function automatically. Cells can be bypassed using fixed resistors restricting the range over which the resistance will change. This will allow control of the attenuation of the circuit anywhere from 0 db and higher.

CIRCUIT DESCRIPTION

The circuit of the 692DAT consists of two sets of amplifiers-drivers designed with silicon transistors to drive the light source from audio signals. The light of the bulb affects the cadmium sulfide cells (CDS) which are in a completely separate circuit.

FAIRCHILD
SPECIFICATION SHEET





The first two stages of the amplifier circuit are designed to amplify incoming audio signals. This circuit consists of transistors Q-1 and Q-2. The output of the second stage feeds amplified signal to Q-3 which is biased to off condition. Any incoming signal is rectified by this stage and converted into pulsating DC. These pulses are then fed into bootstrap circuit consisting of transistors Q-4 and Q-5. The Q-5 in its emitter circuit has plug-in bulb #GE-377, which is located in the light tight compartment or housing. Base of the Q-5 is connected through diode D-1 to the release time circuit. Change in the release time is effected by varying resistor R-10. The threshold control is R2, which selects the level at which the circuit will trigger in order to make this adjustment externally or should be left in open position and remote potentiometer should be used to adjust the threshold. Resistors R-12 and R-13 allow operation of the circuit from 6.3 volts power supply or 18 to 24 volts. Zener diode D-2 maintains voltage regulation.

SPECIFICATIONS

Minimum level for triggering:	-40 db
Maximum level into CDS cells:	200 mW or (+20 dbmaudio)
Frequency response of sensing circuit:	20 Hz to 20 Khz ±1 db
Frequency response of CDS cells:	dc to 100 khz flat
Distortion:	Immeasurable
Response time:	Min. 3 m secs
Release time:	Variable from .03 seconds to 7 seconds
Power requirements:	6.3 to 24 volts DC 70 ma per section
Size:	3-5/16 X 5-1/2"
Bulbs:	GE-377 (2)
Input impedance:	10K bridging

MOUNTING

The 692DAT card can be rack mounted using Fairchild 692 RM capable of accepting 16 Integra II cards. If single card is to be used, single card holder Model 692SCH in conjunction with 662RM will mount the card in the rack using 5-1/4 inches of vertical space and 1-1/2 width.

The 692DAT card can be incorporated into any system which has power supply voltage from 6.3 to 24 volts. Any Fairchild power supply can power the card.

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

Technical Bulletin

FAIRCHILD
MODEL 663

FAIRCHILD RECORDING EQUIPMENT CORP. • [illegible]

FAIRCHILD MODEL 663 COMPACT COMPRESSOR

The MODEL 663 COMPRESSOR, through the use of advanced technology, offers the recording and broadcast industry the possibility of employing a compressor on every microphone or program channel due to its compact size: 1½" x 7" x 4½". With these dimensions, the 663 is no larger than many slide-type attenuators, and because of this unique size can be located conveniently above each microphone mixing position. The 663 has a compact compressor meter as part of its design.

No longer is it necessary to have a whole channel under the same amount of level control. The 663 allows the mixer to select the correct amount for each particular microphone and instruments being used, rather than arbitrarily limiting or compressing several microphones with one time constant and amount of control (compression). This was previously necessary because of the expense of the control equipment and its size. Both these barriers are eliminated with the 663.

The 663 employs the exclusive FAIRCHILD compression cell with its attendant advantages of no distortion despite the amount of compression, and no noise or thumps generated by the compression circuit. The compression cell is activated by a miniature transistorized sensing amplifier, but only the compression cell is part of the regular audio circuit. The transistorized amplifier does not pass audio program, it only samples the audio program and then activates the compression cell to the desired degree of compression. This cell cannot introduce distortion or noise. The 663 compresses the signal fed into it. In itself, it is a no gain device. It does not take a signal, amplify it and then compress it – it only compresses the signal fed into it. This has the advantage of not changing the signal-to-noise ratios of the basic system. The 663 has a compression capability at 600 ohm impedance of up to 20 db, offering a wide latitude of control and effects.

The 663 is designed and calibrated for 600 ohm line impedance, but will also accommodate impedances from 150 to 1000 ohms, at wide variety of input levels from –35 dbm to +25 dbm.

The unit can be powered by either 6.3 AC or 9 VDC at 70 ma. The 663 has an attack time of 3 milliseconds and the added flexibility of a variable release time from 300 milliseconds to 7 seconds. A variable threshold control is also provided allowing control over the point at which level control occurs.

The 663 has other outstanding features of real value to the user. The compression cell of the 663 can actually be remotely located from the unit. In this way levels from the microphone preamp can be controlled right at the input to the preamp even though the 663 itself is located in or near the mixing console. This is a real operating PLUS that prevents overload from high level capacitor type microphones that, when used in close mike techniques, can overload the preamp at its very input. Transformerless balanced compressors available on request for mic input compression or balanced lines in general.

Added flexibility in the 663 allows another channel to trigger the compression of the unit. This can be particularly helpful in many types of stereo recording where extreme separation effects are demanded and where these effects are fast and not easily controlled by the mixing personnel.

SPECIFICATIONS

Frequency Response:	Flat, ± 1.5 db from 20 to 20KC
Maximum Compression:	20 db in a 600 ohm circuit
Input Impedance:	150 ohms to 1000 ohms
Load Impedance:	600 ohms or higher. Will work into a resistive or inductive load.
Insertion Loss	3 db.
Power Requirements:	6.3Vac or 9VDC at 70 ma
Controls:	Threshold, release, and meter adjustment; release time adjustable from 300 milliseconds to 7 seconds.
Distortion:	None introduced.
Noise Level:	Unit does not introduce noise.
Metering:	VU meter showing amount of compression.
Size:	1½" x 7" x 4½"
Weight:	1¼ lbs.
Finish:	Front panel – clear anodized brushed aluminum.
Connections:	All vital circuits appear on barrier strip at back of compressor.

MODEL 663NL (no loss) compressor. Same size as basic 663. Contains transistorized amplifier to make up normal loss introduced by compression action with additional gain up to 14 db. Delivers +17 dbm output with supply voltage of 24V at 70 ma. Unbalanced input and output. Positive or negative grounds available.

663ST – stereo version of the 663 compressor. Triggers from either channel, compressing both channels simultaneously an equal amount. Maintains stereo balance even with large amounts of compression. Triggers at -25 dbm with separation 40 db between channels.

ISSUE 1
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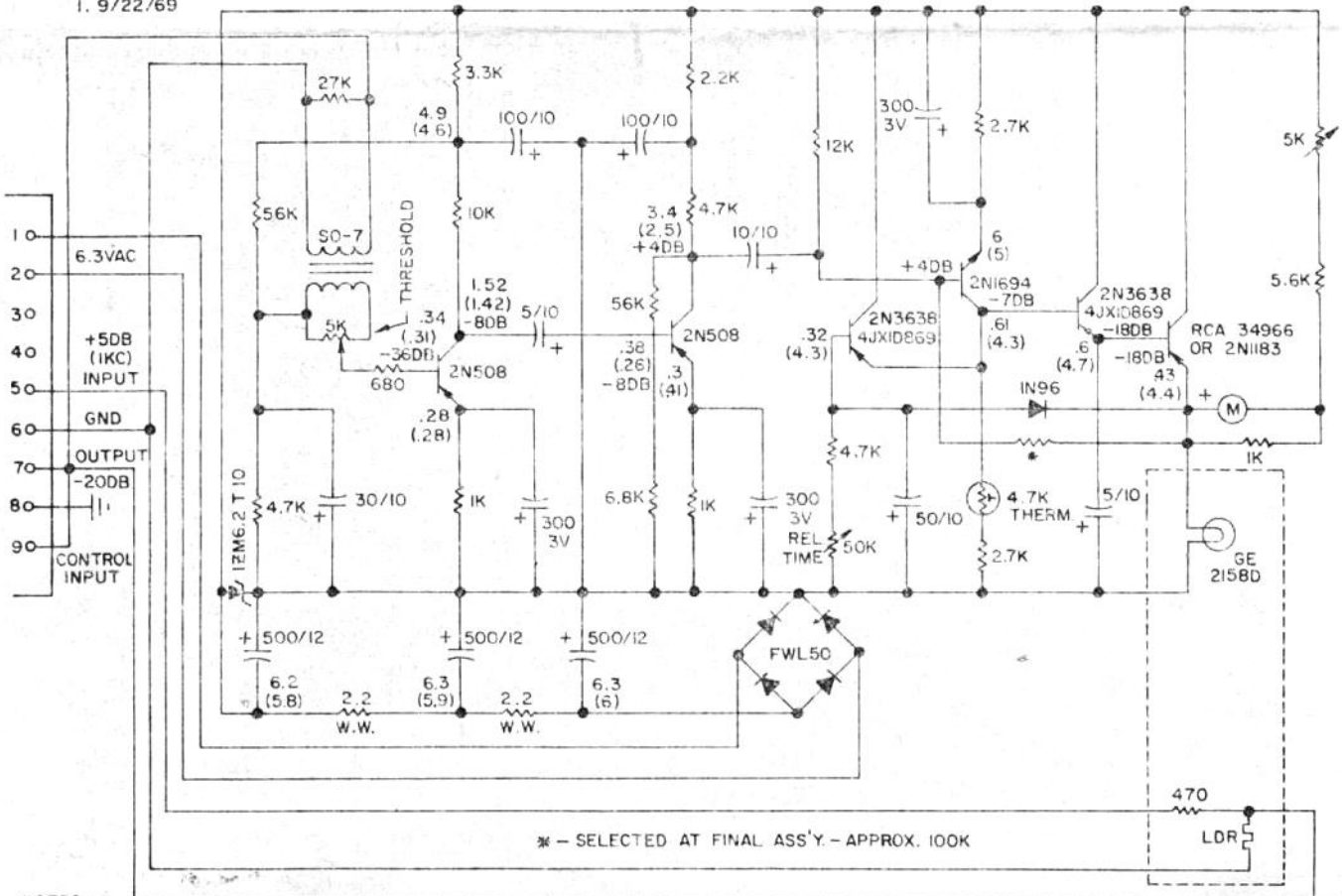

NOTES:

1 - ALL CAPACITORS IN MFD, UNLESS OTHERWISE SPECIFIED
2 - ALL RESISTORS IN OHMS, 1/4W UNLESS OTHERWISE SPECIFIED
3 - 20,000 Ω/VOLT METER USED
4 - ALL DC VOLTAGES NEG. WITH RESPECT TO GND.
4 - DC WITH SIG. = NUMBER WITH PARENTHESIS
5 - AC SIG. = NUMBER FOLLOWED BY "DB"
6 - DC = NUMBER
5 - DC WITH SIG. - THRESH OLD CONT. MIN. POS.
6 - AC SIG. - THRESHOLD CONT. MIN. POS. (20DB OF COMPRESSION)

663 COMPRESSOR SCHEMATIC (FIG. 5)

A-96081

ROBINS BROADCAST & SOUND EQUIPMENT CORP.
A ROBINS INDUSTRIES CORPORATION
75 AUSTIN BLVD., COMMACK, N. Y. 11725
(516) 543-5200

ROTARY SLIDER* ATTENUATORS

The ALL NEW ROBINS [redacted] ROTARY-SLIDER* attenuator has been engineered to meet the need for a low cost, yet reliable slide fader suitable for use in today's professional audio mixing consoles.

The advantages of a sealed rotary attenuator are effectively combined with the convenience of linear motion. Unique in its' design, the RS1000 functions equally well for either monaural or stereo applications, as it contains two rotary resistive elements, driven by a common slide mechanism.

The use of high quality audio taper variable resistors insures accurate, uniform attenuation characteristics, and close tracking between stereo channels. The "pots" themselves are sealed, and are thereby dust, dirt and "coffee" proof.

The mechanical design of the working mechanism is simplified and rugged to insure trouble free, continuous duty without the maintenance normally required with other type faders. Smooth, quiet operation is assured, as is long term stability and essentially infinite resolution. As for noise, transient resistance changes are extremely small initially and even less after normal use.

The RS1000 ROTARY-SLIDER attenuators are now available in ROBINS [redacted] Professional Audio Consoles and as separate components. They will replace most conventional slide faders in existing audio consoles.

FEATURES

- **Two SEALED Resistive Elements**
- **Excellent tracking and stability**
- **Smooth, quiet operation**
- **Functions for STEREO or MONO**
- **Essentially Infinite Resolution**
- **Simple, sturdy construction**

*Patent Applied for

SPECIFICATIONS

Impedance . . . . . 1000 ohms ± 10%, audio taper. (See note)
Working range [attenuation] . 65 dB (55 dB with cue).
Slide travel . . . . . A full 4".
Tracking . . . . . ±1 dB each element.
Max. Power [continuous] . . . . 0.5 watt at 70° C.
Max Voltage . . . . . 350V rms or D.C. continuous working voltage.
Temperature . . . . . -65° F to +165° F
Dimensions . . . . . 7"L. x 1 3/8"W x 2"D.
Cue Switch . . . . . SPDT micro switch, with detent.
Escutcheon . . . . . Etched scale, brushed aluminum finish. 7"L x 1½"W.
Knob [included] . . . . . Plastic, slide type, 1/8" shaft dia. (available in colors)

NOTE: Other standard impedance values and tapers available on special order, for applications such as panning, and D.C. remote controls.

MODEL	DESCRIPTION
F66815	ATTENUATOR
F66816	ATTENUATOR WITH CUE SWITCH
F66817	ESCUTCHEON PANEL
F66818	ATTENUATOR 10,000 OHMS
F66819	ATTENUATOR 10,000 OHMS W/CUE SWITCH