

RS-201

Two-Channel Belt-Pack

INSTRUCTION
and
SERVICE MANUAL



CLEAR-COM RS-201 BELT-PACK
OPERATION & SERVICE MANUAL

<u>Section</u>	<u>Page #</u>
I Introduction to the Belt-Pack.....	1
II Belt-Pack Set-Up	
Headset.....	1
System Interconnect.....	2
III Operation.....	4
IV Service.....	4
V Parts Listing.....	4
VI Specifications.....	5
VII Conversion from Stereo to Monaural.....	7
 <u>Illustrations</u>	
2-Channel Interconnect Cable.....	2
Interconnection with Model EC-6.....	3
EC-6 Schematic.....	3
RS-201 Block Diagram.....	5
RS-201 Schematic.....	9

CLEAR-COM MODEL RS-201 REMOTE BELT-PACK STATION
OPERATING AND SERVICE INFORMATION

I. INTRODUCTION TO THE RS-201 BELT-PACK

The RS-201 is a two-channel remote intercom station that is compatible with all Clear-Com equipment. The compact unit is housed in a rugged, "no-glare" matte black aluminum chassis that attaches to your belt with a sturdy stainless-steel clip.

The RS-201 accepts two separate intercom channels and allows program monitoring on a third listen-only "channel." Three volume controls and two mic on/off switches allow any talk/listen set-up at the ideal audio level.

Program/Intercom listen signals mix together at the unit and are fed to binaural headphones, in which the operator hears a different intercom channel from each side, and program

from both. The RS-201 is also available for use with a monoaural headset (single- or double-muff).

The RS-201 also includes controls for sidetone cancellation (one per intercom channel). They allow you to vary the level of your own voice as you hear it in the headset. They need only be set once, even if other stations subsequently join or leave the intercom system.

Because of the RS-201's low current draw and high bridging impedance, as many as 100 units may be connected in one system. However large the system, Clear-Com's contoured frequency response promises excellent speech intelligibility in high- and low-noise environments.

II. INSTALLATION OF THE RS-201

The Headset

The binaural headset connector in the RS-201 is an XLR, 6-pin male.

To insure proper level and performance, the headset should have the following characteristics:

Microphone type:	dynamic
Impedance:	150-250 ohms
Output Level:	-55 dB
Headphone type:	dynamic
Output Impedance:	300-2000 ohms

RS-201 headset connections are:

- Pin 1--mic ground
- Pin 2--mic hot
- Pin 3--headset ground
- Pin 4--headset, channel B
- Pin 5--headset, channel A
- Pin 6--headset ground

Note: Under NO circumstances should you ever connect mic ground and headset ground together!

If your RS-201 has been wired for operation with a standard monoaural Clear-Com headset, the connector is an XLR, 4-pin male. Headset characteristics should be the same as in the binaural type.

The monoaural headset connector pin-out is:

- Pin 1--mic common
- Pin 2--mic hot
- Pin 3--headphone common
- Pin 4--headphone hot

Again, NEVER connect mic ground and headphone ground together.

Interconnect Cable

The RS-201 connects to the intercom system with a single multi-pair cable. We recommend a rubber-insulated and jacketed type, such as Belden 8777 or the equivalent (22-gauge, three pairs). Plug the cable into the 6-pin female connector labelled "input."

The connector pin-out (input and extension) is:

- Pin 1: signal common
- Pin 2: DC, +28v
- Pin 3: Audio, Channel B
- Pin 4: Audio, Channel A
- Pin 5: Balanced Program
- Pin 6: Balanced Program

The 6-pin male connector labelled "extension" provides a loop-through inside the belt-pack, allowing you to "daisy-chain" many Stations along one stretch of cable.

To prevent shock hazard, ground loops, and noise pick-up, NEVER connect Pin 1 (common) directly to the station chassis. In addition, never connect Pin 1 to the shell of the cable.

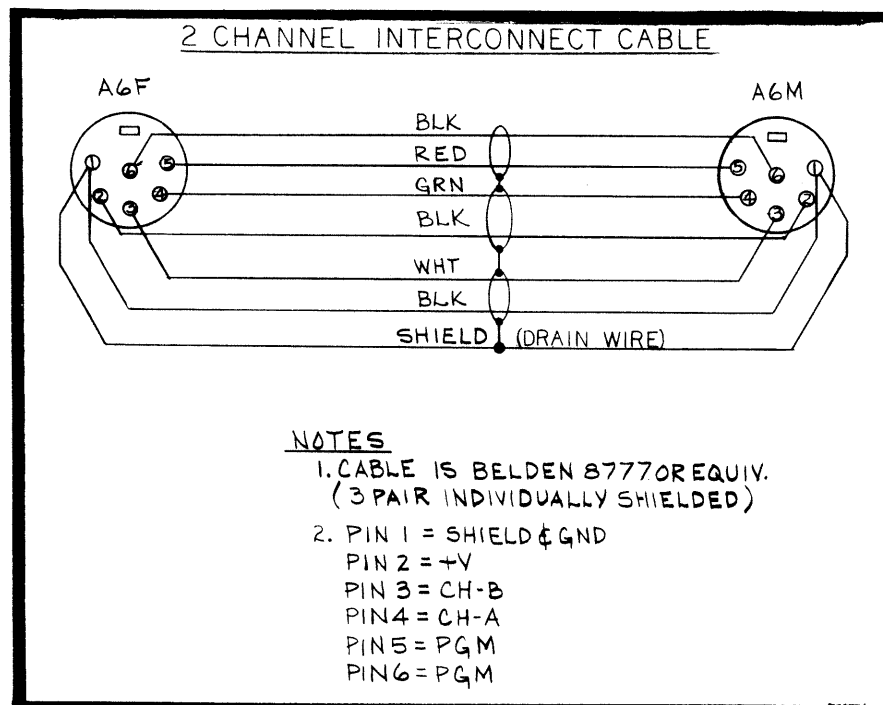
You may avoid using multi-pair cable and, instead, interconnect the RS-201 with the standard two-

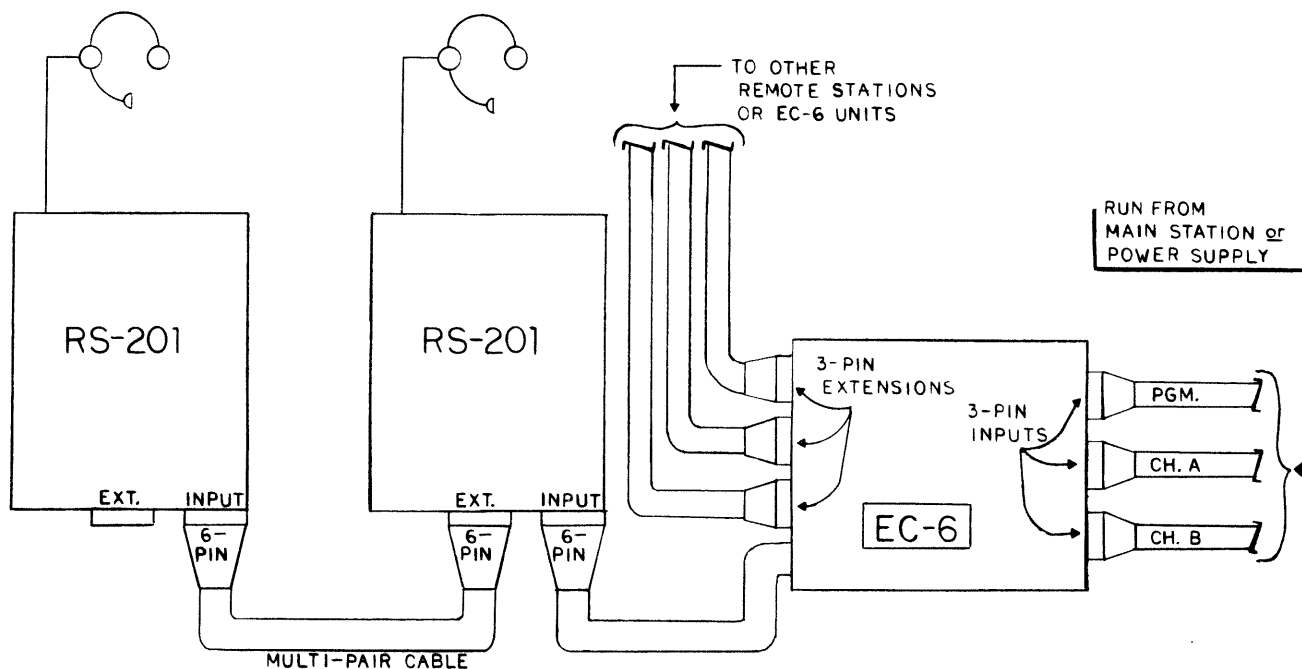
conductor mic cable extending from the Main Station/Power Supply. This is possible with Clear-Com's EC-6 Interface Device.

Housed in a matte-black aluminum box no bigger than the belt-pack, the EC-6 feeds program and intercom directly to the RS-201. The device contains three pairs of 3-pin input and extension connectors and a 20' multi-pair cable that ends in a 6-pin connector, which simply plugs into the RS-201. (See the enclosed EC-6 Schematic and the EC-6/RS-201 Connection Diagram.)

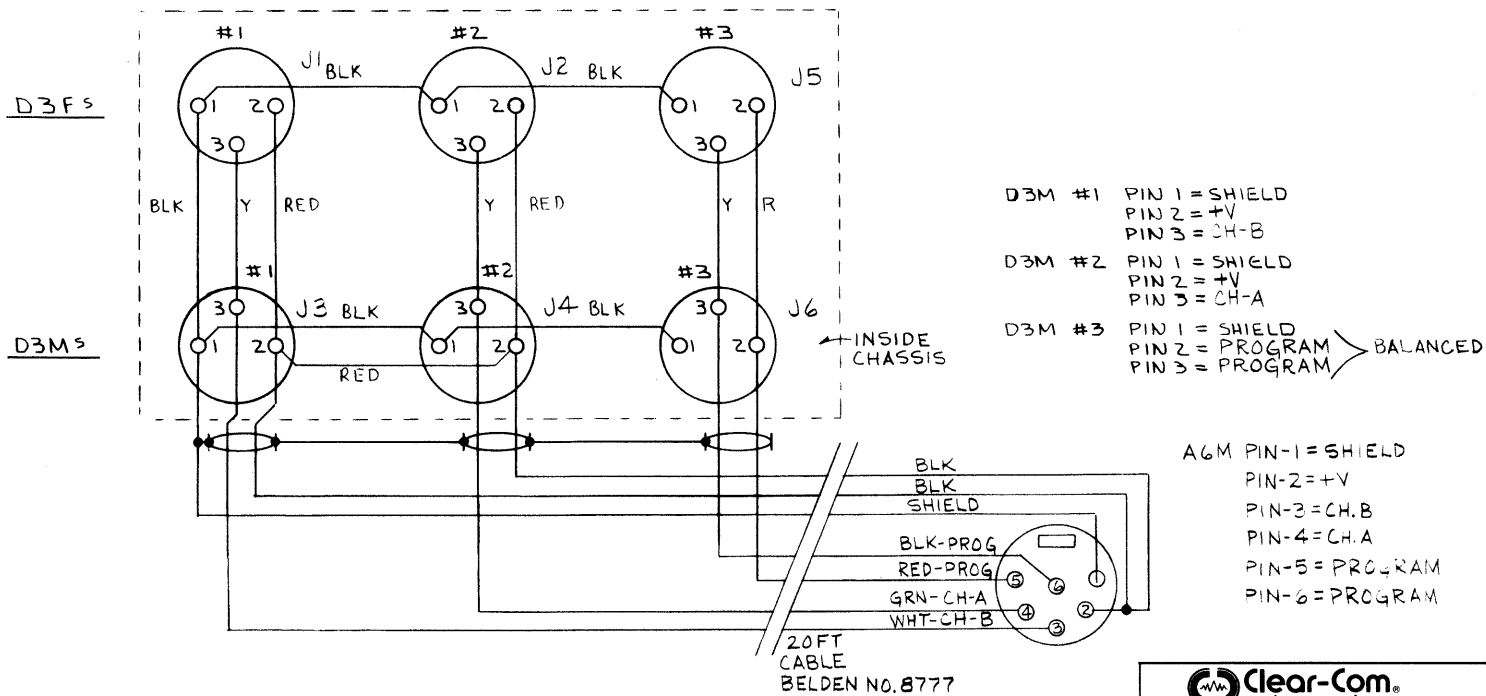
NOTE: If the RS-201 just receives an input for one channel, the operator must remain switched to that channel. Switching to the unused channel causes the station to experience oscillation. To avoid this occurrence, put a 200 ohm terminating resistor across the input connector pin of the unconnected channel. A second, easier solution is to employ the EC-6 for RS-201 interconnection.

After routing cable from the Main Station/Power Supply and connecting it to the RS-201, plug in the headset and turn up the volume. The Station is now ready to operate.





PORTABLE SYSTEM:
2-CHANNEL INTERCONNECTION
WITH EC-6



Clear-Com
intercom systems

SCHEMATIC
EC-6

SCALE	SIZE	DRAWING NO.
	B	EC-6-SCD-B-3
DO NOT SCALE DRAWING		SHEET 5 F 1

III. OPERATING CONTROLS

The controls on the RS-201 are very straight-forward. The toggle switches labelled Mic On-Off/A and On-Off/B control the headset talk function for each channel.

Use the two Volume knobs to vary the audio level of each channel heard in your headset.

The Volume Pgm. knob on the bottom of the belt-pack adjusts the program level heard in the headset.

The RS-201 contains two Sidetone adjustments, one for each channel. These controls vary the amount of your voice as heard in your headset, and are located on the side of the belt-pack in unmarked holes. The hole closer to the top of the belt-pack is for Channel A, and the bottom hole is for Channel B. Adjust each one in the same manner.

IV. SERVICE

Should the RS-201 require service, remove the PC Board as follows:

- 1) Remove the four screws on the back cover of the belt-pack.
- 2) Remove knob and nut from each Volume control.
- 3) Remove nut from each Mic On/Off switch.
- 4) Remove the two flat-head screws that hold the PC Board to the chassis.

The Sidetone controls are set at the factory to be about 6 dB lower than incoming signals; re-setting them does not affect the level of incoming or outgoing signals. To re-adjust sidetone for Channel A:

- 1) plug in your headset,
- 2) turn ON the Channel A mic (the Channel B mic should be OFF),
- 3) insert any small-bladed screwdriver into the associated hole and engage the internal trimpot,
- 4) turn up the Channel A Volume all the way, and
- 5) start talking to yourself while slowly turning the screwdriver. A null point will be found where you can barely hear yourself; the proper setting is anywhere to the left of the null.

Adjust Channel B sidetone the same way, but through the bottom hole. Be sure the Channel A mic is OFF.

- 5) Unplug the two red connector headers, and de-solder the blue and the black headset connector wires on the PC Board.
- 6) Gently remove PC Board from the chassis.

When re-installing the PC Board, reverse the above procedure. Make sure the two rubber bumpers are on the inside of the chassis, as they provide proper shock mounting.

V. PARTS LISTING

<u>Part #</u>	<u>Description</u>	<u>Qty.</u>	<u>Reference Designator</u>
710037	Remote Station PC Module	1	---
210004	Headset Connector, D6M	1	J1
210063	Input Connector, D6F	1	J2
210004	Extension Connector, D6M	1	J3
510034	Switch Assembly, 2-pos.	2	S1/S2
240015	Knob, black, 1/2" w/1/8" shaft	3	P3/P4/P5
470020	Volume Pot. Assembly	3	"
250041	Belt-clip, stainless-steel	1	---

VI. RS-201 SPECIFICATIONS

AMPLIFIER DESIGN:

Solid-state, integrated circuit amplifiers. Current-limited and short-circuit-protected, with reverse polarity protection.

MICROPHONE PRE-AMPLIFIER

Mic Input: 200-1000 ohms
 Mic Pre-amp Gain: 30 dB adjustable
 Max Input Before Clipping: -26 dB
 Freq. Response: 200-12k Hz, ± 5 dB

HEADPHONE AMPLIFIER (Ch. A & B)

Load Impedance Range: 300-2k ohms
 Output Level: +20 dBm,
 26 volts p-p @ 600 ohms

Output

Impedance Range: 150-600 ohms
 Distortion: <0.1% THD @ 1 kHz
 Amplifier Gain: 40 dB
 Freq. Response: 150-18k Hz, ± 2 dB

CONNECTORS

Headset: (1) 6-pin male, D6M
 Line: (1) D6M, (1) D6F, 6-pin

GENERAL

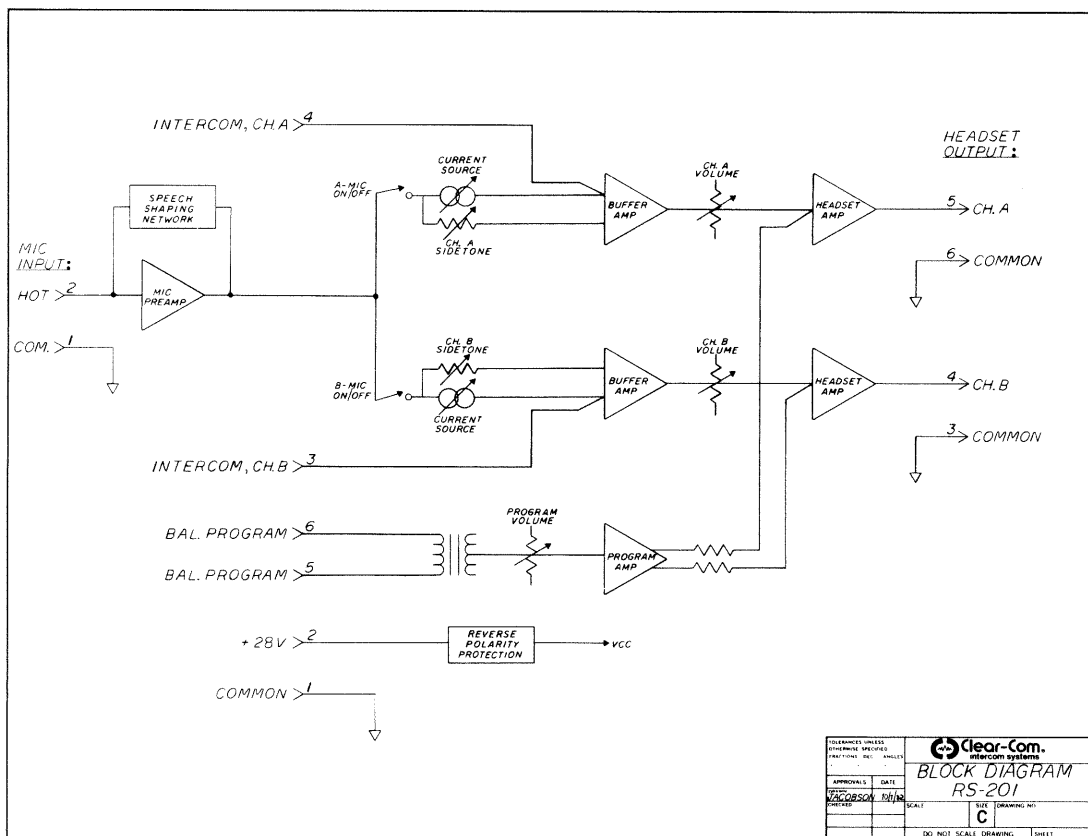
Line Impedance: 15k ohms bridging
 200 ohms
 Line Level: -15 dB nominal
 Sidetone Adjust: 35 dB null to
 full on (both channels)
 Signal-to-Noise: 75 dB
 Equiv. Input Noise: -118 dB
 Power Requirements: 15 ma quiescent
 40 ma short-circuit
 VDC Range: 12-32v, 28v nominal

PROGRAM INPUT

Freq. Response: 50-18k Hz, ± 1 dB
 Input Impedance: 15k ohms bridging
 Channel A: Transformer-isolated
 Level: -8 dB for max output

PHYSICAL CHARACTERISTICS

Dimensions: 5 1/2 x 3 3/4 x 1 1/2"
 Weight: 16 oz.
 Ambient Operating
 Temperature: 0-60° C (32-140° F)
 Humidity: 0-90% relative humidity



RS-201 BELT-PACK STATION
CONVERSION FROM STEREO TO MONOAUROAL

Clear-Com now offers the RS-201 in the "stereo" version only, which provides a binaural headset connector--an XLR, male, 6-pin Switchcraft type. If you require **monoaural** operation of the RS-201, using a standard 4-pin male headset connector, then take the following steps (refer to diagram, other side):

- 1) Remove the 4 Philips-head screws from the rear panel, and pull off the chassis cover.
- 2) Locate the only 4-pin terminal strip (plastic) and unplug it (if you're holding the belt-pack so the operating controls are "up," the terminal strip is located in the upper right corner of the PC board, beneath the volume controls).
- 3) Locate the wires extending from the 6-pin headset connector; unsolder the black wire and the blue wire from the PC Board at Pads 1 and 2 (the PC Board has numbers printed on it to identify these pads).
- 4) Unscrew the 6-pin headset connector from the chassis, and remove it (along with the wires and the terminal strip).
- 5) Add a jumper to the solder bridge pads on the PC Board; these two pads are located next to the 4559 chip, near the transformer. The jumper brings together the two intercom channels (refer to schematic in Operation Manual).
- 6) Prepare a 4-pin, male connector (D4M, Switchcraft-type) for installation. In addition to the connector, you'll need:
 - one black wire, 1.5" long
 - one blue wire, 1.5" long
 - one orange wire, 3" long
 - one black wire, 3" long
 - one capacitor, 100 pF, 1kV (remove and re-use the one that's connected to the D6M headset connector)
 - one 4-pin terminal strip ("housing") (or cut wires off of the terminal strip you removed from the board, and re-wire it as explained in Step 9).

Connect: 1.5" black wire to D4M Pin 1 (mic common)
1.5" blue wire to D4M Pin 2 (mic hot)
3" black wire to D4M Pin 3 (headphone common)
3" orange wire to D4M Pin 4 (headphone hot)
capacitor goes between D4M Pin 1 and ground

- 7) Insert D4M connector and wires through chassis hole; screw the connector into place.
- 8) Solder the 1.5" black wire to PC Board Pad 1;
Solder the 1.5" blue wire to PC Board Pad 2.
- 9) Connect 3" black wire to terminal strip Pin 3;
Connect 3" orange wire to terminal strip Pin 4.
(terminal strip Pins 1 and 2 have no connections)

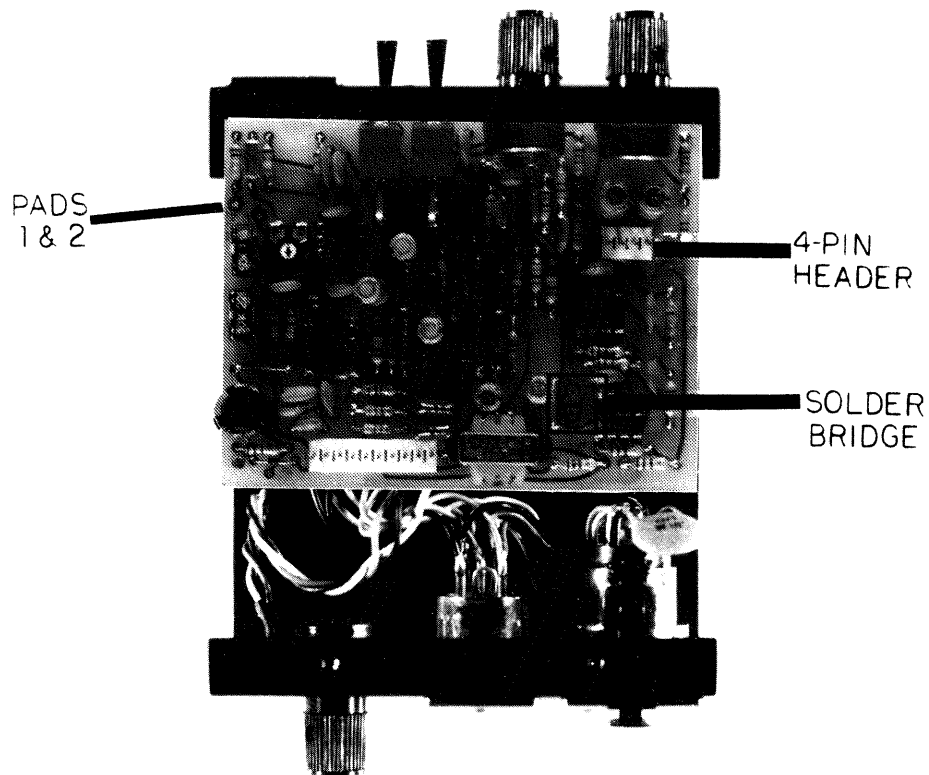
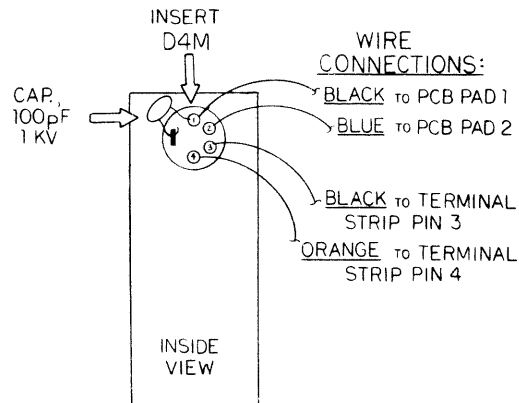
10) Plug the terminal strip onto the 4-pin header.

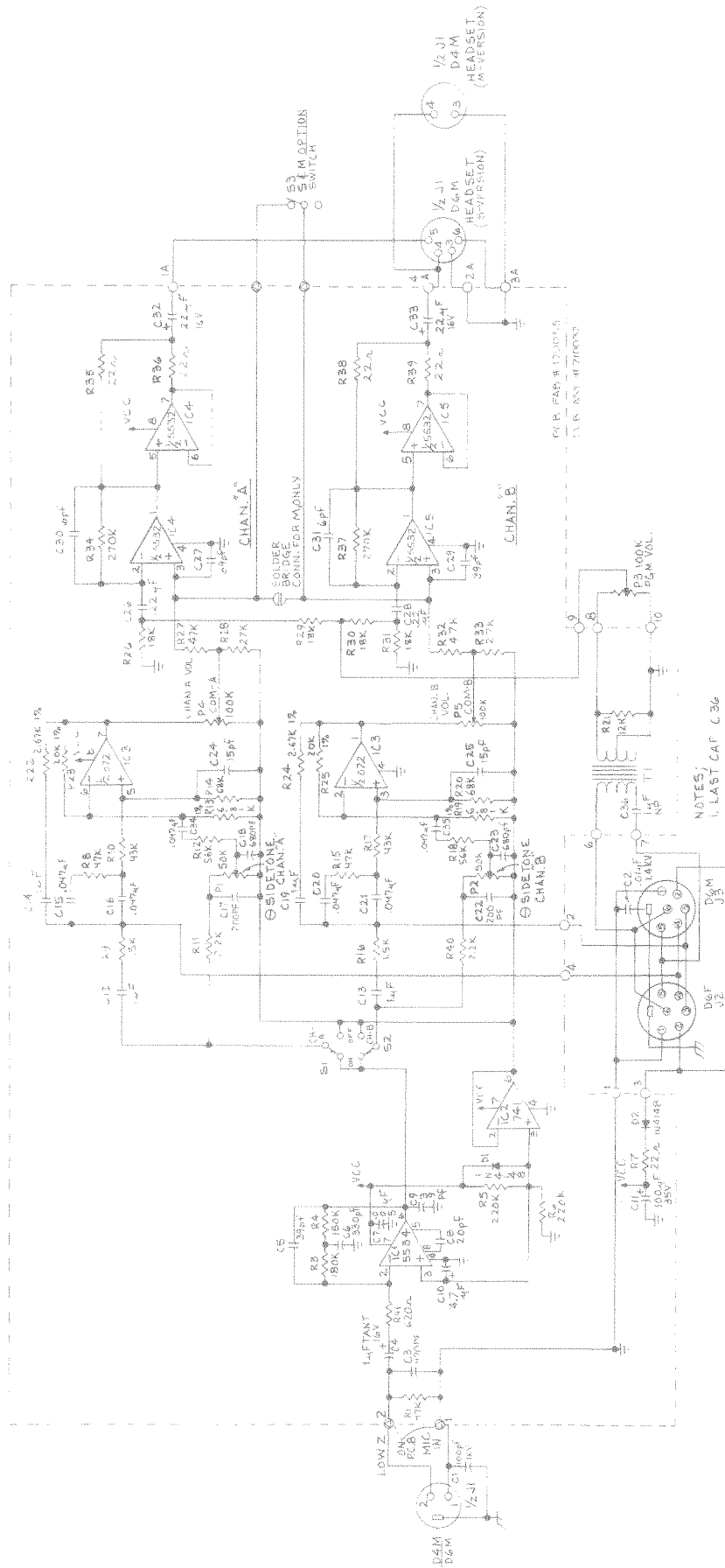
11) Replace the belt-pack's cover and screw into place.

To assure proper level and performance the monoaural headset should have the following characteristics:

Microphone type	dynamic
Impedance	150-250 ohms
Output Level:	-55 dB
Headphone type	dynamic
Output impedance	300-2000 ohms

NOTE: NEVER CONNECT MIC GROUND AND HEADPHONE GROUND TOGETHER.





CONN. PIN OUT J2, J3
 PIN-1 = GND
 PIN-2 = +V
 PIN-3 = CH B
 PIN-4 = CH A
 PIN-5 = PROG RAM
 PIN-6 = PROG RAM

NOTES:
 U1 LAST CAF C36
 LAST RES R40
 LAST DIODE D2
 Z PAD FOR WIRE
 O HEADER

