

**OPERATION  
MAINTENANCE  
MANUAL**

**AUDIOCOM**

**THREE-CHANNEL MASTER  
INTERCOM STATION**

**IC-3M**

**TELEX**<sup>®</sup>

**TELEX COMMUNICATIONS, INC.**

9600 Aldrich Ave. So., Minneapolis, MN 55420 U.S.A.

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# **SECTION I**

## **GENERAL INFORMATION**

### **INTRODUCTION**

This manual contains information needed to operate and service the Telex Three-Channel Master Intercom Station IC-3M, the central component of the Telex Three-Channel Audiocom System. The operating instructions contained in this manual may also be useful to system installers as a guide for verifying the correct operation of the IC-3M and associated peripheral components after installation. Keep this manual with the unit as a handy reference guide for operating the unit, and also as a reference for qualified technical personnel should a problem arise with the equipment.

### **FACTORY SERVICE**

All equipment returns must be sent prepaid. Telex will not accept collect shipments. The following information must accompany all equipment returned for repair:

For in-warranty repairs include:

1. Your name, address and telephone number.
2. Purchasers name and address (if different from above).
3. Copy of proof of purchase (keep your original).
4. Model and serial numbers (or date codes).
5. A complete description of the problem.

For non-warranty repairs include:

1. Your name, address and telephone number.
2. Model and serial numbers (or date codes).
3. A complete description of the problem.

All equipment repaired in-warranty by Telex will be returned prepaid by Telex. If requested, an estimate will be sent before repairing non-warranty equipment. This is a guaranteed estimate - final charges will not exceed what is quoted. If payment is sent along with your estimate approval, COD charges will be avoided; otherwise, equipment will be returned to you COD.

Return all Audiocom equipment to:

Service Department  
Telex Communications, Inc.  
1720 East 14th Street  
Glencoe, Minnesota 55336 U.S.A.

For further information, or to request return authorization, call or write to:

Customer Service Department  
Telex Communications, Inc.  
9600 Aldrich Avenue South  
Minneapolis, Minnesota 55420 U.S.A.  
Telephone: (612) 884-4061  
(Collect calls not accepted)

### **REPLACEMENT PARTS**

When ordering, please include the Model and Serial numbers (or date codes), Parts Description, and Part Number and mail to:

Parts Department  
Telex Communications, Inc.  
9600 Aldrich Avenue South  
Minneapolis, Minnesota 55420 U.S.A.

## FEATURES

**Usable Lines:** Lines 1 through 6. Independently switchable for channel selection or isolated-line operation.

**Usable Channels:** Three. Independently selectable for mic, line and auxiliary inputs.

**Full Duplex Operation:** Simultaneous talk and listen audio system.

**Mic Preamp Shut Off Circuit:** Mic preamp is automatically shut off when headset is disconnected to reduce system noise.

**Call Light Monitoring:** Front panel indicator lamps for visual paging. Send and receive indication. Activated by 20 KHz signal.

**Noise Rejection:** Balanced lines used for excellent rejection of background noise such as electromagnetic interference (EMI) and radio frequency interference (RFI).

## SPECIFICATIONS

### Frequency Response:

Transmit: 150 to 12,000 Hz, +1, -3 dB  
Receive: 300 to 12,000 Hz, +1, -3 dB (speaker output). 180 to 6,000 Hz +1, -3 dB (phone output).

### Equivalent Input Noise:

Mic input: 2 microvolts (-116 dBV).

### Input Level:

Mic: 5 millivolts nominal, 12 millivolts maximum.  
Auxiliary: 1 volt nominal, 15 volts maximum.  
Line: 1 volt (0 dBm) nominal, 4 volts (12 dBm) maximum.

### Input Impedance:

Mic: Greater than 5,000 ohms. (Unit is designed for use with 50 to 600 ohm dynamic microphones.)  
Auxiliary: 50,000 ohms balanced, 25,000 ohms unbalanced.

### Output Impedance:

Phones: 60 ohms. (Unit is designed for use with 150 to 600 ohm phones.)  
Speaker: 1 ohm. (Unit is designed for 8 ohm loads.)

**Line Terminating Impedance:** 600 ohms.

### Audio Output Power:

Phones: 75 milliwatts into 150 ohms.  
Speaker: 3 watts into 8 ohms.  
Line: 10 milliwatts (+10 dBm).

### Total Harmonic Distortion:

Transmit: 1% at 10 dBm.  
Receive: 1% at 3 watts into 8 ohms (speaker output). 1% at 75 milliwatts into 150 ohms (phone output).

### Common Mode Rejection:

Line: 40 dB at 60 Hz.

**Output Voltage:** 24 Vdc, regulated.

### Output Current:

Per line: 250 milliamps maximum continuous, 500 milliamps maximum intermittent.  
Total: 525 milliamps maximum continuous (450 milliamps with battery installed).

### Power Requirements:

Ac Operation: 105 to 130 Vac, 48 to 62 Hz, 40 watts maximum. May be modified for 210 to 260 Vac.  
Dc Operation: Internal 1.2 ampere hour battery (optional) or external supply with nominal 24 Vdc output (IC-3M will operate with 12-30 Vdc supply). The IC-3M consumes 75 milliamps.

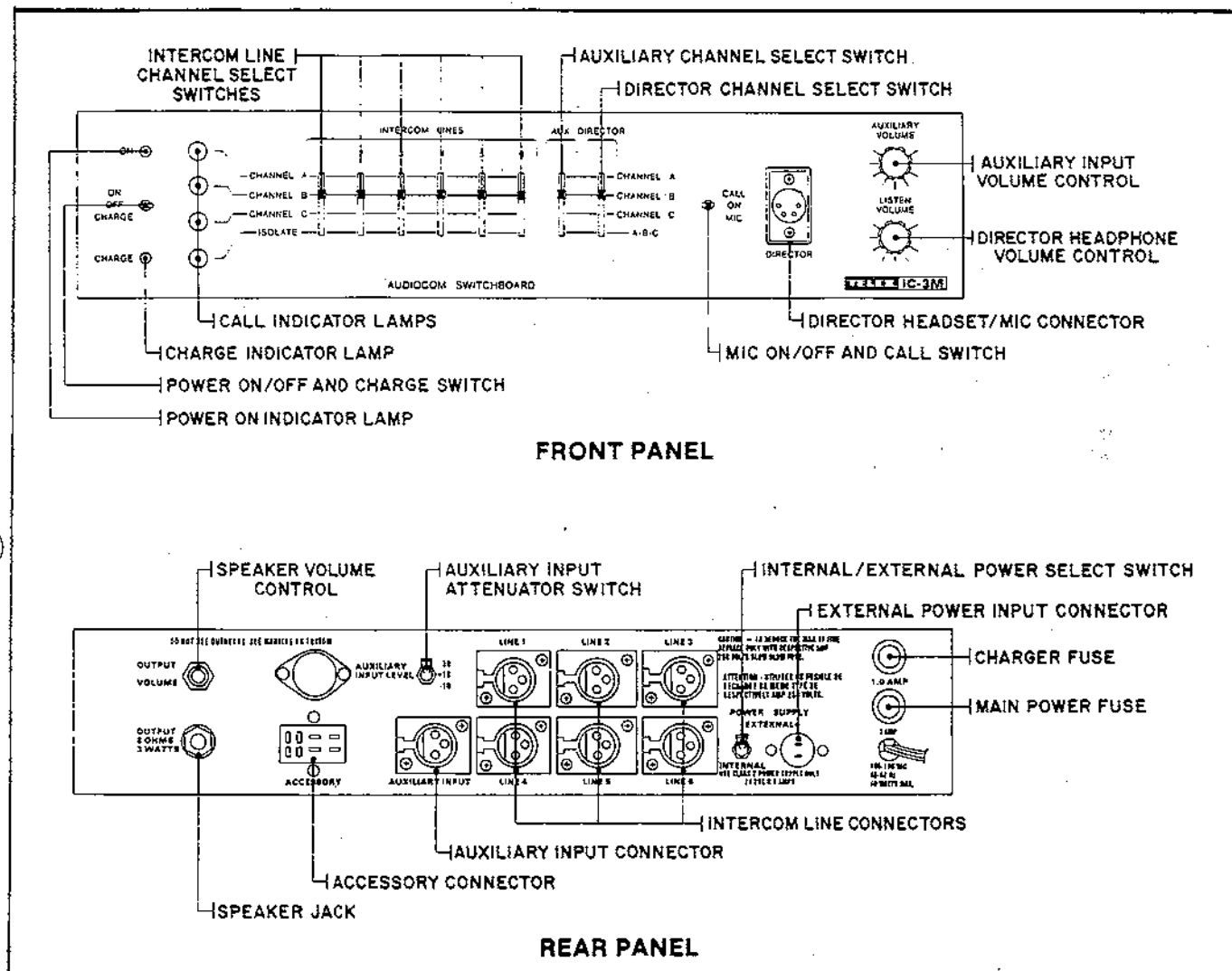
**Dimensions:** 3.5 inches (88.9 mm) high x 16.5 inches (419.1 mm) wide x 11.5 inches (292.1 mm) deep. (Depth does not include knob projection or connectors.)

**Weight:** 14 lbs (6.35 kg) without battery, 16.75 lbs (7.6 kg) with battery. (Battery optional.)

### Connectors:

Headset/Mic: One XLR-4M.  
Lines, auxiliary input: One XLR-3F each.  
Power: Six foot (1.8 m), permanently attached, three-wire grounded cord with three-pin U.S. standard grounding plug.  
Accessory: Eight-pin female (Jones type P300 AB or equivalent). Accepts mating plug with locking ears.  
Speaker: 1/4 inch phone jack.  
External power: Two-pin male (Jones type P300 AB or equivalent).

# SECTION II OPERATION



Reference Guide

## FRONT PANEL

**Power ON Indicator Lamp:** This lamp illuminates only when the unit is fully operational. It provides an indication when power is supplied from both internal and external sources.

**Power ON/OFF and CHARGE Switch:** Controls main power and the internal battery charger. When set to the ON position, the unit is fully operational and the charger operates in trickle-charge mode. When set to the CHARGE position, the intercom circuitry is shut off, but the charger operates in full-charge mode. (Internal battery available as a factory-installed option only.)

## NOTE

The rear panel INTERNAL/EXTERNAL Power Select Switch must be set to INTERNAL when using the main power supply in the IC-3M. The battery charger operates with this switch set to either INTERNAL or EXTERNAL but always receives its power from the IC-3M; consequently, the IC-3M power cord must still be plugged into a 120V/220V power outlet if the charger is to be used when operating with an external power supply.

**CHARGE Indicator Lamp:** Illuminates in trickle-charge (power switch ON) or full-charge (power switch set to CHARGE) modes.

**Call Indicator Lamps:** Provide both send and receive call indication. Whenever the director or any intercom line assigned to a particular channel sends a call signal, the lamp for that channel will illuminate.

**INTERCOM LINE Channel Select Switches:** Individually assign each of the six intercom lines, connected at the rear panel, to one of the three internal channels of the IC-3M. In order for one line to communicate with another, or with the director, both must be assigned to the same channel. If a line switch is set to the ISOLATE position, that line cannot communicate with any other line or the director; however, remote stations on that line may communicate with one another.

**Auxiliary (AUX) Channel Select Switch:** Assigns any program source connected at the rear panel AUXILIARY INPUT to one, or all, of the internal channels of the IC-3M. In order for an intercom line or the director to hear the auxiliary program, both must be assigned to the same channel.

**DIRECTOR Channel Select Switch:** Assigns director headset/microphone to one, or all, of the internal channels of the IC-3M. The director cannot communicate with an intercom line unless both are assigned to the same channel.

**Mic On/Off and Call Switch:** This switch controls the director microphone and is also used to send call signals. In the CALL position, with the switch held continuously, an inaudible signal is sent to any intercom line assigned to the same channel as the director. The call light for the channel will also illuminate to indicate that a call signal is present on the channel. In the ON position, the director microphone is operational for two-way communication. In the MIC position, the director microphone is shut off, but the director headphones and/or external speaker still monitor the channel to which the DIRECTOR Channel Select Switch is set.

**DIRECTOR Headset/Mic Connector:** This plug accepts headsets with monaural headphones and a dynamic microphone or may be used for microphone-only connection when using an external speaker.

## NOTE

The internal circuitry is designed to automatically shut off the mic input whenever the headset/microphone is disconnected. It does this by detecting the presence of a headphone load; consequently, if only a microphone is to be connected at the DIRECTOR Headset/Mic Connector, it must be specially wired to simulate the presence of a headphone. Otherwise, the microphone and CALL switch will not work. For further information on special microphone wiring techniques, consult Appendix A of the power supply and peripheral equipment manual, publication number 38108-998, which was packed with the IC-3M.

**AUXILIARY Input VOLUME Control:** Adjusts volume of auxiliary signal to intercom lines and/or director, when initially connecting an

auxiliary program source to the IC-3M, the rear panel AUXILIARY INPUT Attenuator Switch must be set to provide the correct operating range for the AUXILIARY VOLUME Control.

**Director Headphone Volume Control:** Adjusts volume of director headphones only. Does not affect director mic or external speaker volume.

## REAR PANEL

### NOTE

Connection of some equipment to the IC-3M rear panel may require specialized technical knowledge. System installers should refer to Section I of the power supplies and peripherals manual, publication number 38108-998, packed with the IC-3M for general installation information.

**Speaker Jack:** Provides an 8 ohm 3 watt maximum output for external speaker use.

**Speaker VOLUME Control:** Adjusts output to speaker jack only.

**ACCESSORY Connector:** Provides channel input/output access, auxiliary program input/output access, and 24 Vdc output and ground connections. This connector allows IC-3M master stations to be daisy-chained together to control more than six intercom lines. It may also be used to connect the IC-3M to other equipment such as patch panels, mixers and amplifiers.

**AUXILIARY INPUT Connector:** Allows connection of either balanced or unbalanced program sources.

**AUXILIARY INPUT Attenuator Switch:** Provides for three ranges of signal level attenuation for auxiliary input signals. Setting this switch to the -30 position causes the least amount of attenuation and setting it to the +10 position causes the greatest attenuation.

**Intercom Line Connectors:** Provide connections for up to six separate intercom lines.

**INTERNAL/EXTERNAL Power Select Switch:** Selects the main power source for the intercom system. Does not select the power source for the internal charger, which can only be powered by the internal power supply.

### NOTE

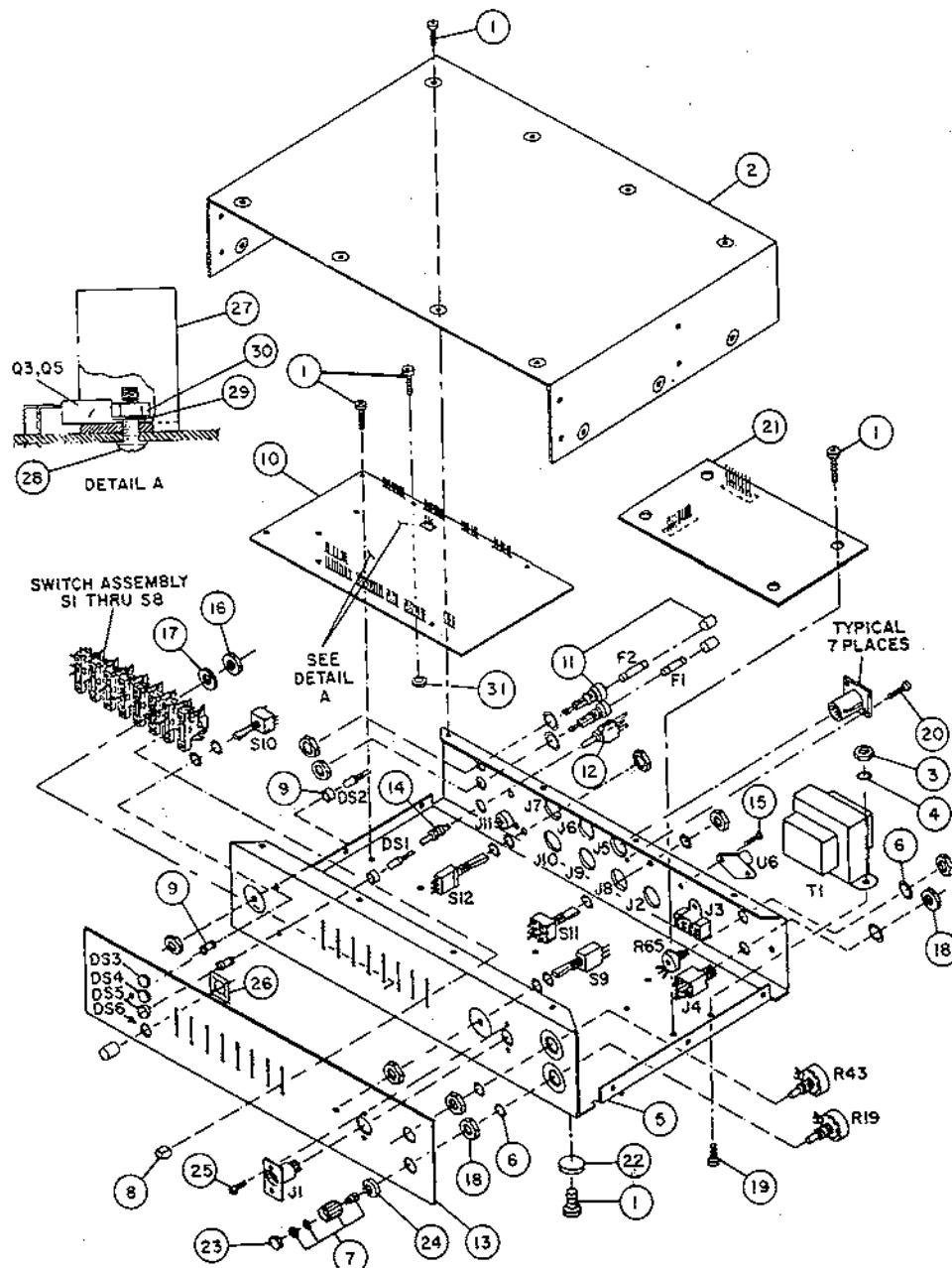
If power is being supplied from an external source, leave the Power ON/OFF and CHARGE switch, located on the front panel, in the OFF position. If the external power source has an ON/OFF switch, use this switch to operate the IC-3M.

**External Power Input Connector:** Accepts 24 Vdc nominal input voltage. The system will operate over a 12 Vdc-30 Vdc range, but may not meet indicated specifications at other than nominal input voltage.

# SECTION III MAINTENANCE

## CAUTION

THESE INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. TO AVOID ELECTRIC SHOCK DO NOT PERFORM ANY SERVICING OTHER THAN THAT CONTAINED IN THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO. REFER ALL SERVICING TO QUALIFIED SERVICE PERSONNEL.



**NOTE:** MOUNTING HARDWARE IS SUPPLIED WITH ALL SWITCHES AND FUSE HOLDERS. ALL PART NUMBERS FOR ELECTRICAL COMPONENTS SHOWN ARE LOCATED IN THE ELECTRICAL PARTS LIST.

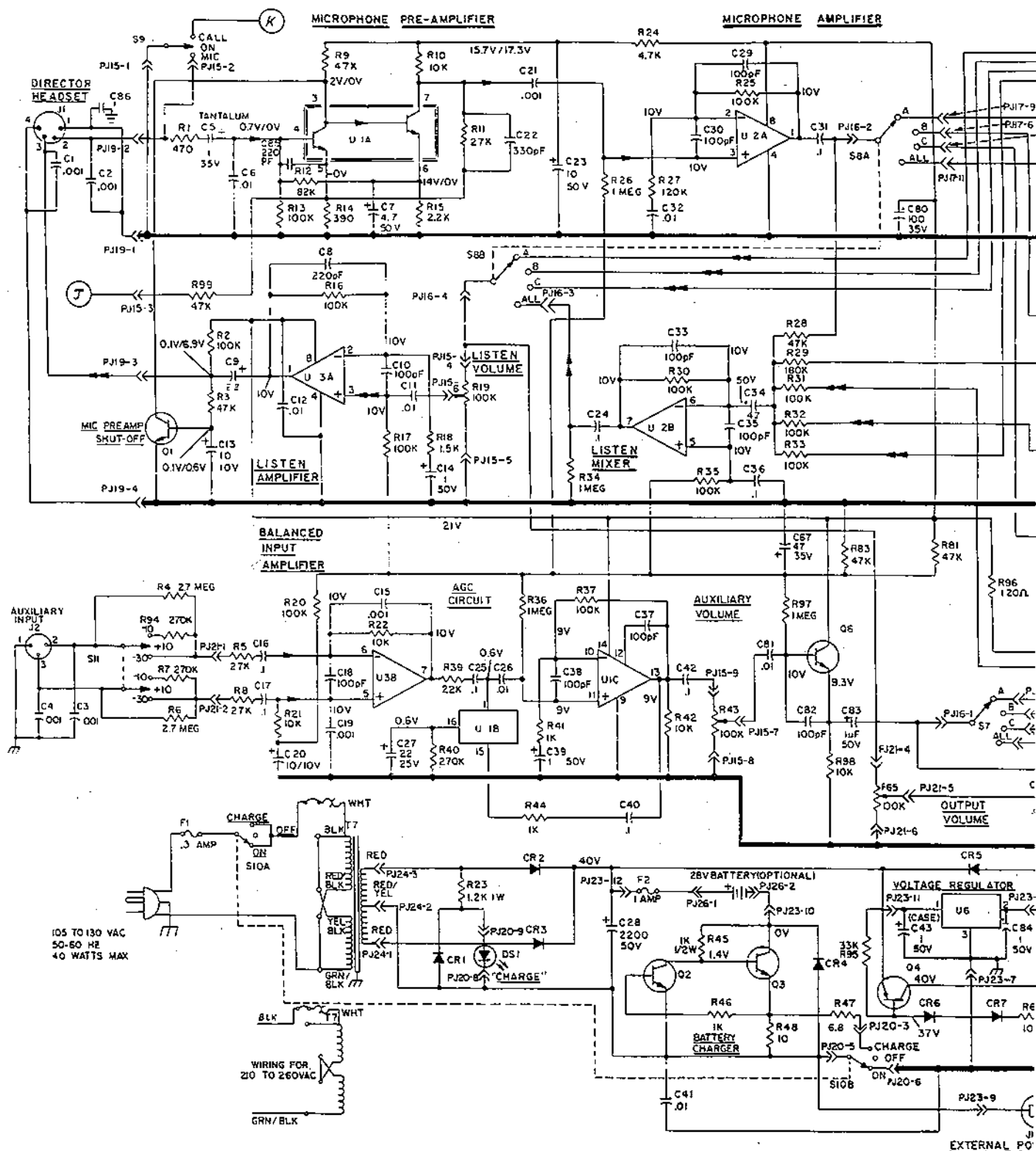
Mechanical Exploded View

## MECHANICAL PARTS

ITEM NO.	DESCRIPTION	PART NO.
1	Screw, No. 4-40 x $\frac{1}{4}$	51849-011
2	Cover	92786-000
3	Nut, No. 8-32	52188-009
4	Washer, Lock, No. 8	50014-003
5	Chassis	92797-000
6	Washer, Lock, No. $\frac{3}{8}$	35298-010
7	Knob	53432-116
8	Knob	57487-001
9	Mounting Clip	53627-000
10	PCB Assembly, Audio	92884-000
11	Fuse Holder	57074-003
12	Cord with Plug	52132-000
13	Panel, Front	92782-000
14	Strain Relief	50489-033
15	Screw, No. 4-40 x $\frac{1}{4}$	51845-038
16	Nut, No. 4-40	52188-006
17	Washer, Lock, No. $\frac{1}{4}$	50014-002
18	Nut, No. $\frac{3}{8}$ -32	50033-001
19	Screw, No. 8-32 x $\frac{3}{8}$	51845-111
20	Screw, No. 4-40 x $\frac{1}{4}$	51847-011
21	PCB Assembly, 20 KHz Light Signal	92571-001
22	Foot	52108-000
23	Cap	53433-115
24	Collet	53434-101
25	Screw, No. 4-40 x $\frac{3}{8}$	51847-112
26	Speed Nut	52192-000
27	Heat Sink (Q3, 5 Mtg)	85441-001
28	Screw, 4-40 x $\frac{3}{8}$ (Q3, 5 Mtg)	51845-057
29	Washer, Lock, No. 4 (Q3, 5 Mtg)	50014-002
30	Nut, 4-40	52188-006
31	Washer, Fishpaper	86318-001

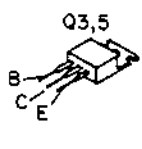
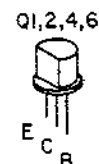
92786. F  
92877 N  
92878 L  
92914 J  
92915. K





# NOTES:

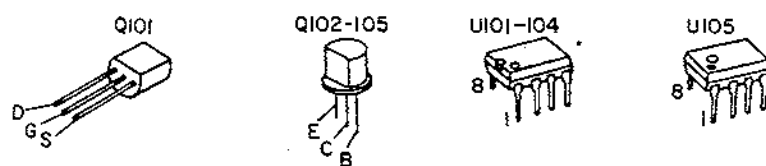
1. ALL RESISTORS IN OHMS, 1/2 WATT, ±5% UNLESS OTHERWISE NOTED.
2. ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE NOTED.
3. ALL VOLTAGES ARE DC MEASURED UNDER NO-SIGNAL CONDITIONS USING A HIGH-IMPEDANCE METER WITH CHASSIS AS REFERENCE.
4. WHERE TWO VOLTAGES ARE INDICATED, THE FIRST IS WITH A HEADSET CONNECTED AT J1 AND THE SECOND IS WITH NO HEADSET CONNECTED.
5. ALL VOLTAGES ARE TYPICAL AND MAY VARY SLIGHTLY DUE TO CIRCUIT TOLERANCE AND METER LOADING.
6. THIS SCHEMATIC SUBJECT TO CHANGE TO ACCOMMODATE DESIGN IMPROVEMENTS.

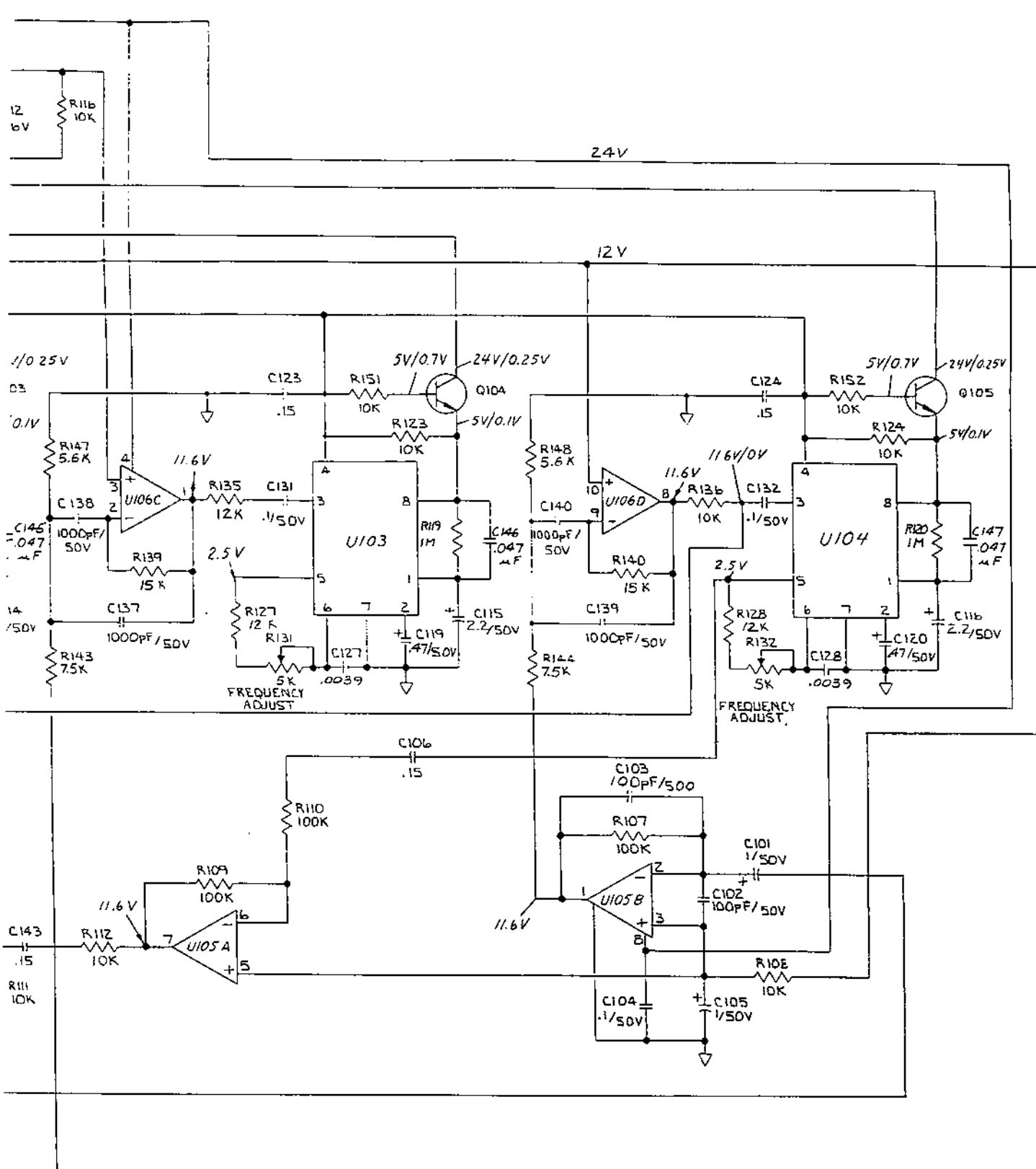


92882, Rev S

Audio Schematic Diagram

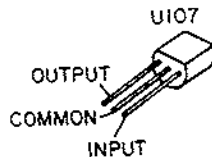
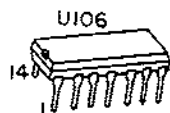






#### NOTES:

1. ALL RESISTORS IN OHMS, 1/4 WATT,  $\pm 5\%$  UNLESS OTHERWISE NOTED.
2. ALL CAPACITORS IN MICROFARADS UNLESS OTHERWISE NOTED.
3. ALL VOLTAGES ARE DC MEASURED USING A HIGH-IMPEDANCE METER WITH CHASSIS AS REFERENCE.
4. WHERE TWO VOLTAGES ARE INDICATED, THE FIRST IS WITH NO CALL SIGNAL AND THE SECOND IS WITH THE MIC ON/OFF AND CALL SWITCH HELD IN THE CALL POSITION WITH THE APPROPRIATE CHANNEL SELECTED FOR CALLING BY THE DIRECTOR CHANNEL SELECT SWITCH.
5. ALL VOLTAGES ARE TYPICAL AND MAY VARY SLIGHTLY DUE TO CIRCUIT TOLERANCE AND METER LOADING.
6. CALL FREQUENCY ADJUSTMENT: FOR CHANNEL A, CONNECT FREQUENCY METER BETWEEN PIN 5 OF U101 AND GROUND. ADJUST R129 FOR A READING OF 20 KHZ  $\pm 100$  HZ. FOR OTHER CHANNELS, REPEAT ADJUSTMENT AS DESCRIBED FOR CHANNEL A, BUT CONNECT FREQUENCY METER TO PIN 5 OF U102-U104 AND ADJUST APPROPRIATE POTENTIOMETER.
7. THIS SCHEMATIC SUBJECT TO CHANGE TO ACCOMMODATE DESIGN IMPROVEMENTS.



# ELECTRICAL PARTS

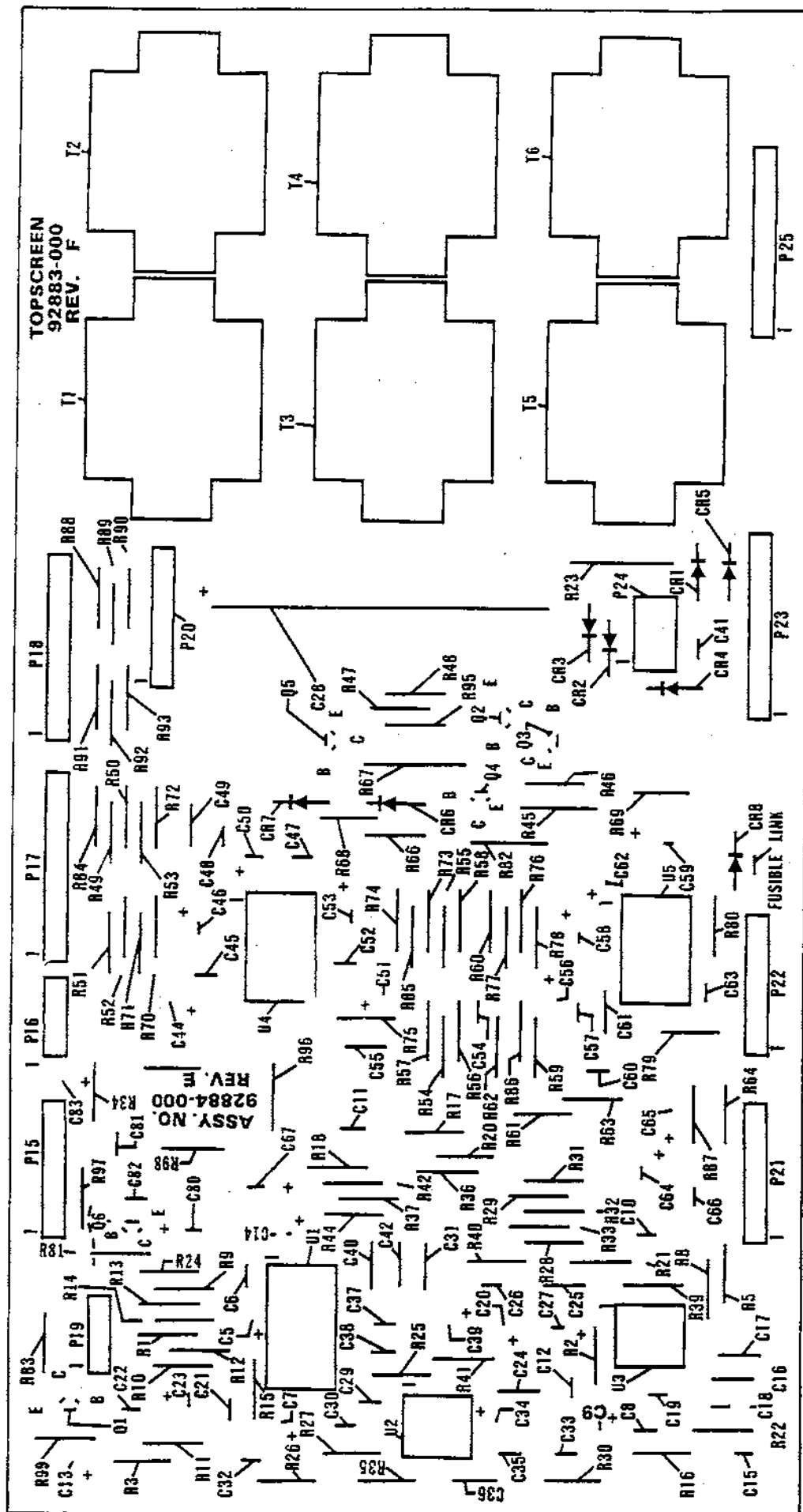
REF NO.	DESCRIPTION	PART NO.
<b>Capacitors</b>		
C1-C4	Ceramic, 0.001, 500V, $\pm 10\%$	52157-022
C5	Tantalum, 1, 35V, $\pm 20\%$	52257-049
C6	Ceramic, 0.01, 100V, $\pm 20\%$	52157-251
C7	Electrolytic, 4.7, 50, $\pm 20\%$	51821-109
C8	Ceramic, 220 pF, 500V, $\pm 10\%$	52157-012
C9	Electrolytic, 22, 25V, $\pm 20\%$	51821-081
C10	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C11, C12	Ceramic, 0.01, 100V, $\pm 20\%$	52157-251
C13	Electrolytic, 10, 16V, $\pm 20\%$	51821-045
C14	Electrolytic, 1, 50V, $\pm 20\%$	51821-106
C15	Ceramic, 0.001, 500V, $\pm 10\%$	52157-022
C16, C17	Polyester, 0.1, 100V, $\pm 5\%$	52708-024
C18	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C19	Ceramic, 0.001, 500V, $\pm 10\%$	52157-022
C20	Electrolytic, 10, 16V, $\pm 20\%$	51821-045
C21	Ceramic, 0.001, 500V, $\pm 10\%$	52157-022
C22	Ceramic, 330 pF, 500V, $\pm 10\%$	52157-015
C23	Electrolytic, 10, 50V, $\pm 20\%$	51821-110
C24, C25	Polyester, 0.1, 100V, $\pm 5\%$	52708-024
C26	Ceramic, 0.01, 100V, $\pm 20\%$	52157-251
C27	Electrolytic, 22, 25V, $\pm 20\%$	51821-081
C28	Electrolytic, 2200, 50V, $\pm 20\%$	52160-116
C29, C30	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C31	Polyester, 0.1, 100V, $\pm 5\%$	52708-024
C32	Ceramic, 0.01, 100V, $\pm 20\%$	52157-251
C33	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C34	Electrolytic, 4.7, 50V, $\pm 20\%$	51821-109
C35	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C36	Polyester, 0.1, 100V, $\pm 5\%$	52708-024
C37, C38	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C39	Electrolytic, 1, 50V, $\pm 20\%$	51821-106
C40	Polyester, 0.1, 100V, $\pm 5\%$	52708-024
C41	Ceramic, 0.01, 100V, $\pm 20\%$	52157-251
C42	Polyester, 0.1, 100V, $\pm 5\%$	52708-024
C43	Tantalum, 1, 50V, $\pm 20\%$	52257-088
C44	Electrolytic, 4.7, 50V, $\pm 20\%$	51821-109
C45	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C46	Electrolytic, 22, 50V, $\pm 20\%$	51821-112
C47	Ceramic, 0.01, 100V, $\pm 20\%$	52157-251
C48	Ceramic, 0.001, 500V, $\pm 10\%$	52157-022
C49	Polyester, 0.1, 100V, $\pm 5\%$	52708-024
C50, C51	Electrolytic, 4.7, 50V, $\pm 20\%$	51821-109
C52	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C53	Electrolytic, 22, 50V, $\pm 20\%$	51821-112
C54	Ceramic, 0.001, 500V, $\pm 10\%$	52157-022
C55	Polyester, 0.1, 100V, $\pm 5\%$	52708-024
C56	Electrolytic, 4.7, 50V, $\pm 20\%$	51821-109
C57	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C58	Electrolytic, 22, 50V, $\pm 20\%$	51821-112
C59	Electrolytic, 100, 35V, $\pm 20\%$	51821-011
C60	Ceramic, 0.001, 500V, $\pm 10\%$	52157-022
C61	Polyester, 0.1, 100V, $\pm 5\%$	52708-024
C62	Electrolytic, 4.7, 50V, $\pm 20\%$	51821-109
C63	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C64	Electrolytic, 220, 25V, $\pm 20\%$	51821-086
C65	Electrolytic, 1, 50V, $\pm 20\%$	51821-106
C66	Ceramic, 0.01, 100V, $\pm 20\%$	52157-251
C67	Electrolytic, 47, 35V, $\pm 20\%$	51821-010
C68-C79	Ceramic, 0.001, 500V, $\pm 10\%$	52157-022
C80	Electrolytic, 100, 35V, $\pm 20\%$	51821-011
C81	Ceramic, 0.01, 100V, $\pm 20\%$	52157-251
C82	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008
C83	Electrolytic, 1, 50V, $\pm 20\%$	51821-106
C84	Tantalum, 1, 50V, $\pm 20\%$	52257-088
C85	Ceramic, 220 pF, 500V, $\pm 10\%$	52157-012
C86	Ceramic, 0.1, 500V, -20 = 80%	52157-279
C101	Electrolytic, 1, 50V, $\pm 20\%$	51821-106
C102, C103	Ceramic, 100 pF, 500V, $\pm 10\%$	52157-008

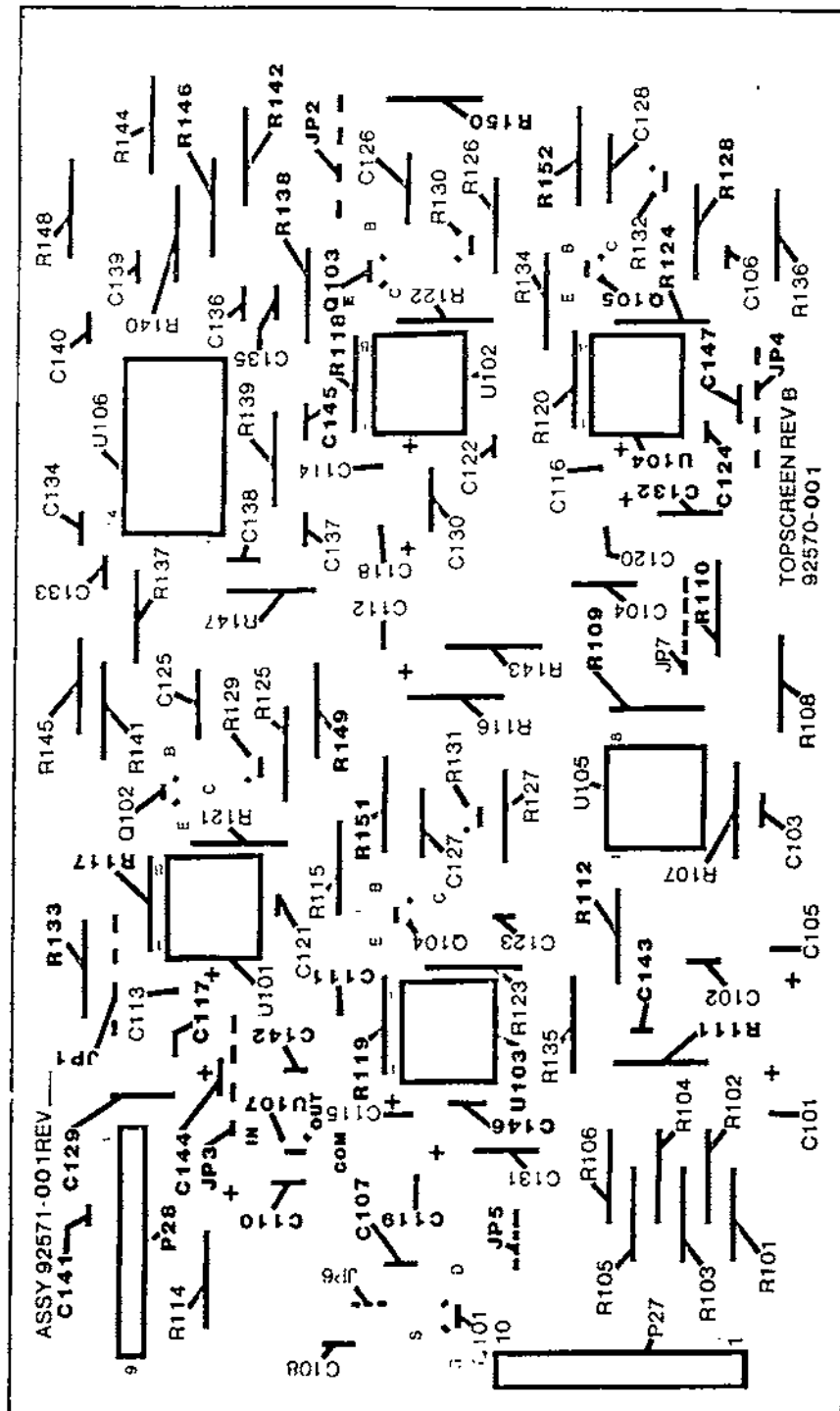
REF NO.	DESCRIPTION	PART NO.
<b>Capacitors (Cont)</b>		
C104	Ceramic, 0.1, 50V, $\pm 20\%$	52158-047
C105	Electrolytic, 1, 50V, $\pm 20\%$	51821-106
C106	Ceramic, 0.15, 50V, $\pm 20\%$	52676-014
C107	Ceramic, 1000 pF, 50V, $\pm 10\%$	52157-022
C108	Ceramic, 0.01, 100V, $\pm 20\%$	52157-251
C110	Tantalum, 1, 50V, $\pm 20\%$	52257-088
C111, C112	Electrolytic, 10, 16V, $\pm 20\%$	51821-045
C113-C116	Electrolytic, 2.2, 50V, $\pm 20\%$	51821-107
C117-C120	Tantalum, 0.47, 35V, $\pm 20\%$	52257-069
C121-C124	Ceramic, 0.15, 50V, $\pm 20\%$	52676-014
C125-C128	Mica, 0.0039, 500V, $\pm 5\%$	50555-011
C129-C132	Ceramic, 0.1, 50V, $\pm 20\%$	52158-047
C133-C140	Ceramic, 0.001, 50V, $\pm 10\%$	52157-022
C141-C143	Ceramic, 0.15, 50V, $\pm 20\%$	52676-014
C144-C147	Ceramic, 0.047, 25V, +80 -20%	52158-033
<b>Diodes</b>		
CR1-CR8	1N4003	50745-002
CR101	1N4148	52228-000
DS1	LED, Yellow	53626-003
DS2	LED, Red	53626-001
<b>Lamps</b>		
DS3-DS6	28V, 0.04 Amp	53629-001
<b>Fuses</b>		
F1	3/10 Amp, 250V	50547-018
F2	1 Amp, 250V	50547-006
<b>Connectors</b>		
J1	XLR-4M	50994-004
J2	XLR-3F	50995-000
J3	8-Pin Jones	51106-002
J4	1/4-Inch Phone	35347-000
J5-J10	XLR-3F	50995-000
J11	2-Pin Jones	50477-008
J15	9-Pin	52264-009
J16*	5-Pin	53043-003
J17, J18*	12-Pin	53043-010
J19*	5-Pin	52264-005
J20-J22*	9-Pin	52264-009
J23*	12-Pin	52264-012
J24*	3-Pin	57704-003
J25*	12-Pin	52264-012
J27*	10-Pin	53043-008
J28*	8-Pin	52264-008
* Terminals not supplied with housings. Order terminals as required. Use following part numbers: For 52264 and 53043 connectors order 54460-000 terminals. For 57704 connectors order 57704-000 terminals.		
P15	9-Pin	52263-009
P16	5-Pin	52263-005
P17, P18	12-Pin	52263-012
P19	5-Pin	52263-005
P20-P22	9-Pin	52263-009
P23	12-Pin	52263-012
P24	3-Pin	57705-003
P25	12-Pin	52263-012
P27	10-Pin	52263-010
P28	9-Pin	52263-009
<b>Transistors</b>		
Q1	2N2925	51547-000
Q2	2N3417	35596-007
Q3	2N6290	51793-001
Q4	2N5366	51820-000
Q5	2N6290	51793-001
Q6	2N2925	51547-000

# ELECTRICAL PARTS (Cont)

REF NO.	DESCRIPTION	PART NO.	REF NO.	DESCRIPTION	PART NO.
Transistors (Cont)			Resistors and Potentiometers (Cont)		
Q101	J175	54687-001	R81	47K	52154-241
Q102-Q105	2N3417	35596-007	R82	2.2K, 1/2W, ±5%	52154-450
Resistors and Potentiometers			R83	47K	52154-241
R1	470 Ohm	52154-289	R84-R86	51 Ohm	52154-312
R2	100K	52154-233	R87	4.7K	52154-265
R3	47K	52154-241	R88-R93	51 Ohm	52154-312
R4	2.7M	85554-190	R94	270K	85554-202
R5	27K	52154-247	R95	33K	52154-245
R6	2.7M	85554-190	R96	120 Ohm	52154-303
R7	270K	85554-202	R97	1M	52154-209
R8	27K	52154-247	R98	10K	52154-257
R9	47K	52154-241	R99	47K	52154-241
R10	10K	52154-257	R101-R107	100K	52154-233
R11	27K	52154-247	R108	10K	52154-257
R12	82K	52154-235	R109-R110	100K	52154-233
R13	100K	52154-233	R111	10K	52154-257
R14	390 Ohm	52154-291	R112	10K	52154-257
R15	2.2K	52154-273	R114	1M	52154-209
R16,R17	100K	52154-233	R115,R116	10K	52154-257
R18	1.5K	52154-277	R117-R120	1M	52154-209
R19	Audio Taper, 100K, 1/2W, ±20%	57145-002	R121-R128	10K	52154-257
R20	100K	52154-233	R125-R128	12K	52154-255
R21,R22	10K	52154-257	R129-R132	5K	57148-048
R23	1.2K, 1W, ±5%	52154-633	R133,R134	10K	52154-257
R24	4.7K	52154-265	R135	12K	52154-255
R25	100K	52154-233	R136	10K	52154-257
R26	1M	52154-209	R137-R140	15K	52154-253
R27	120K	52154-231	R141-R144	7.5K	52154-260
R28	47K	52154-241	R145-R148	5.6K	52154-263
R29	180K	52154-227	R149-R152	10K	52154-257
R30-R33	100K	52154-233	Switches		
R34	1M	52154-209	S1-S8	Assembly, SP4T x 8	92876-000
R35	100K	52154-233	S9	SPDT	57481-003
R36	1M	52154-209	S10,S11	DPDT	57483-000
R37	100K	52154-233	S12	SPDT	57481-000
R39	22K	52154-249	Transformers		
R40	270K	52154-223	T1-T6	Audio	52444-001
R41	1K	52154-281	T7	Power	53002-000
R42	10K	52154-257	Integrated Circuits		
R43	Audio Taper, 100K, 1/2W, ±20%	57145-002	U1	TDA1054	53256-000
R44	1K	52154-281	U2	RC4558	52287-000
R45	1K, 1/2W, ±5%	52154-458	U3	RC4560	52287-001
R46	1K	52154-281	U4,U5	LM378N	53255-000
R47	6.8 Ohm	52154-333	U6	78HV24C	53268-000
R48	10 Ohm	52154-329	U101-U104	LM567	53258-000
R49,R50	100K	52154-233	U105	LM358	53227-004
R51,R52	390K	52154-219	U106	LM324	53291-000
R53	3.9K	52154-267	U107	μA7805	54680-005
R54,R55	100K	52154-233			
R56,R57	390K	52154-219			
R58	3.9K	52154-267			
R59,R60	100K	52154-233			
R61,R62	390K	52154-219			
R63	3.9K	52154-267			
R64	1.5K	52154-277			
R65	Audio Taper, 100K, 1/2W, ±20%	57145-001			
R66	47K	52154-241			
R67	220 Ohm, 1W, ±5%	52154-651			
R68	10K	52154-257			
R69	27K	52154-247			
R70	120K	52154-231			
R71,R72	680K	52154-213			
R73	120K	52154-231			
R74,R75	680K	52154-213			
R76	120K	52154-231			
R77,R78	680K	52154-213			
R79,R80	100K	52154-233			

92571, Rev H      92864, Rev X      92879, Rev E  
 92866, Rev E      92914, Rev J  
 92867, Rev E      92915, Rev K  
 92877, Rev N      95226, Rev A





20 KHz Light Signal PCB Assembly Component View