

# table of contents

| Section |   | Page |
|---------|---|------|
| 1       | GENERAL DESCRIPTION . . . . .                         | 1-1  |
|         | 1.1 General . . . . .                                 | 1-1  |
|         | 1.2 Reference Data . . . . .                          | 1-1  |
|         | 1.3 Transistor and Diode Complement . . . . .         | 1-1  |
|         | 1.4 Fuse Complement . . . . .                         | 1-2  |
|         | 1.5 Battery Complement . . . . .                      | 1-2  |
| 2       | INSTALLATION . . . . .                                | 2-1  |
|         | 2.1 Unpacking . . . . .                               | 2-1  |
|         | 2.2 Preparing the Amplifier for Operation . . . . .   | 2-1  |
|         | 2.3 Permanent Installation . . . . .                  | 2-2  |
|         | 2.4 Multiple Input . . . . .                          | 2-2  |
|         | 2.5 Input Power Change . . . . .                      | 2-2  |
| 3       | OPERATION . . . . .                                   | 3-1  |
|         | 3.1 Setting Up for Remote Operation . . . . .         | 3-1  |
|         | 3.1.1 Connections . . . . .                           | 3-1  |
|         | 3.1.2 Prebroadcast Adjustments . . . . .              | 3-1  |
|         | 3.1.2.1 Setting Line Level . . . . .                  | 3-1  |
|         | 3.2 Operating Procedures . . . . .                    | 3-2  |
|         | 3.2.1 Broadcast Program . . . . .                     | 3-2  |
|         | 3.2.2 Public Address Operation . . . . .              | 3-2  |
|         | 3.2.3 Talk Back with One-Line Operation . . . . .     | 3-2  |
|         | 3.2.4 Emergency Switch to Line 2 . . . . .            | 3-2  |
|         | 3.2.5 Emergency Switch to Battery Operation . . . . . | 3-2  |
|         | 3.3 Description of Operating Controls . . . . .       | 3-2  |
|         | 3.3.1 Faders . . . . .                                | 3-2  |
|         | 3.3.2 MASTER Gain Control . . . . .                   | 3-2  |
|         | 3.3.3 TONE . . . . .                                  | 3-2  |
|         | 3.3.4 HEADSET LEVEL . . . . .                         | 3-2  |
|         | 3.3.5 PA Level . . . . .                              | 3-2  |
|         | 3.3.6 OUTPUT Switch . . . . .                         | 3-2  |
|         | 3.3.7 VU METER Control and Meter . . . . .            | 3-2  |
|         | 3.3.8 VU Lamp . . . . .                               | 3-3  |
|         | 3.3.9 Power Switch . . . . .                          | 3-3  |
|         | 3.3.10 Line Monitor Jack . . . . .                    | 3-3  |
|         | 3.3.11 Program Monitor . . . . .                      | 3-3  |
|         | 3.3.12 Multiple Jack . . . . .                        | 3-3  |
|         | 3.3.13 A-C Operation Pilot Lamp . . . . .             | 3-3  |
| 4       | PRINCIPLES OF OPERATION . . . . .                     | 4-1  |
|         | 4.1 Mechanical Details . . . . .                      | 4-1  |
|         | 4.2 Electrical Details . . . . .                      | 4-1  |
|         | 4.2.1 General . . . . .                               | 4-1  |
|         | 4.2.2 Audio Amplifier . . . . .                       | 4-1  |
|         | 4.2.3 VU Meter . . . . .                              | 4-2  |
|         | 4.2.4 Tone Oscillator . . . . .                       | 4-2  |
|         | 4.2.5 Power Supply . . . . .                          | 4-2  |

## table of contents (cont)

| Section |  | Page |
|---------|--|------|
| 5       | MAINTENANCE . . . . .                                    | 5-1  |
| 5.1     | General . . . . .  | 5-1  |
| 5.2     | Test Equipment . . . . .                                 | 5-1  |
| 5.3     | Transistor Replacement . . . . .                         | 5-1  |
| 5.4     | Resistance and Voltage Measurements . . . . .            | 5-2  |
| 5.4.1   | General . . . . .  | 5-2  |
| 5.5     | Fuse . . . . .   | 5-2  |
| 5.6     | Component Parts Replacement . . . . .                    | 5-2  |
| 5.6.1   | General . . . . .  | 5-2  |
| 5.6.2   | Special Tools . . . . .                                  | 5-2  |
| 5.6.2.1 | Soldering Iron . . . . .                                 | 5-2  |
| 5.6.2.2 | Pin-Nosed Pliers . . . . .                               | 5-2  |
| 5.6.3   | Procedure . . . . .                                      | 5-2  |
| 5.7     | Servicing Transistor Circuits . . . . .                  | 5-3  |
| 5.7.1   | General . . . . .  | 5-3  |
| 5.7.2   | Test Equipment . . . . .                                 | 5-3  |
| 5.7.2.1 | Transformerless Power Supplies . . . . .                 | 5-3  |
| 5.7.2.2 | Line Filter . . . . .                                    | 5-3  |
| 5.7.2.3 | Low Sensitivity Multimeters . . . . .                    | 5-6  |
| 5.7.2.4 | Power Supply . . . . .                                   | 5-6  |
| 5.7.3   | Electric Soldering Irons . . . . .                       | 5-6  |
| 5.7.3.1 | Leakage Current . . . . .                                | 5-6  |
| 5.7.3.2 | Iron Size . . . . .                                      | 5-6  |
| 5.7.4   | Servicing Practices . . . . .                            | 5-7  |
| 5.7.4.1 | Heat Sink When Soldering . . . . .                       | 5-7  |
| 5.7.4.2 | Removal of Transistors from Operating Circuits . . . . . | 5-7  |
| 5.7.4.3 | Plug-In Transistors . . . . .                            | 5-7  |
| 5.7.4.4 | Resistance Measurements in Transistor Circuits . . . . . | 5-7  |
| 5.7.4.5 | Power Transistor Heat Sinks . . . . .                    | 5-7  |
| 5.7.4.6 | Test Prods . . . . .                                     | 5-7  |
| 5.7.5   | Trouble Shooting . . . . .                               | 5-7  |
| 5.7.5.1 | Ohmmeter Test of Transistors . . . . .                   | 5-7  |
| 6       | PARTS LIST . . . . .                                     | 6-1  |
| 7       | ILLUSTRATIONS . . . . .                                  | 7-1  |

## list of illustrations

| Figure |  | Page |
|--------|--|------|
| 1-1    | 212Z-1 Remote Amplifier in Carrying Case and 212Z-1 Block Diagram (C79-09-P)<br>(C79-13-3) . . . . . | 1-0  |
| 2-1    | 212Z-1 Remote Amplifier, Connections . . . . .   | 2-1  |
| 2-2    | 115V/230V Input Power Change, Schematic Diagram (C79-15-3) . . . . .                                 | 2-2  |

## list of illustrations (cont)

| Figure |   | Page |
|--------|---|------|
| 3-1    | 212Z-1 Remote Amplifier, Controls (C79-05-P) . . . . .                    | 3-1  |
| 4-1    | Output Circuits, Simplified Schematic (C97-02-4) . . . . .                | 4-0  |
| 5-1    | Voltage Measurements, Preamplifier Board (C79-11-4) . . . . .             | 5-3  |
| 5-2    | Voltage Measurements, Amplifier Board (C79-12-3). . . . .                 | 5-4  |
| 5-3    | Voltage Measurements, Oscillator Board (C79-10-3) . . . . .               | 5-5  |
| 5-4    | 212Z-1 Gain Chart (C79-14-3) . . . . .                                    | 5-6  |
| 7-1    | 212Z-1 Remote Amplifier, Bottom View (C79-08-P). . . . .                  | 7-1  |
| 7-2    | 212Z-1 Remote Amplifier, Bottom Open, Boards Removed (C79-06-P) . . . . . | 7-2  |
| 7-3    | Power Supply, Top Open View (C79-04-P) . . . . .                          | 7-3  |
| 7-4    | Power Supply, Side Open View (C79-03-P) . . . . .                         | 7-3  |
| 7-5    | 212Z-1 Remote Amplifier, Complete Schematic . . . . .                     | 7-5  |

## list of tables

| Table |                                  | Page |
|-------|----------------------------------|------|
| 5-1   | List of Test Equipment . . . . . | 5-1  |