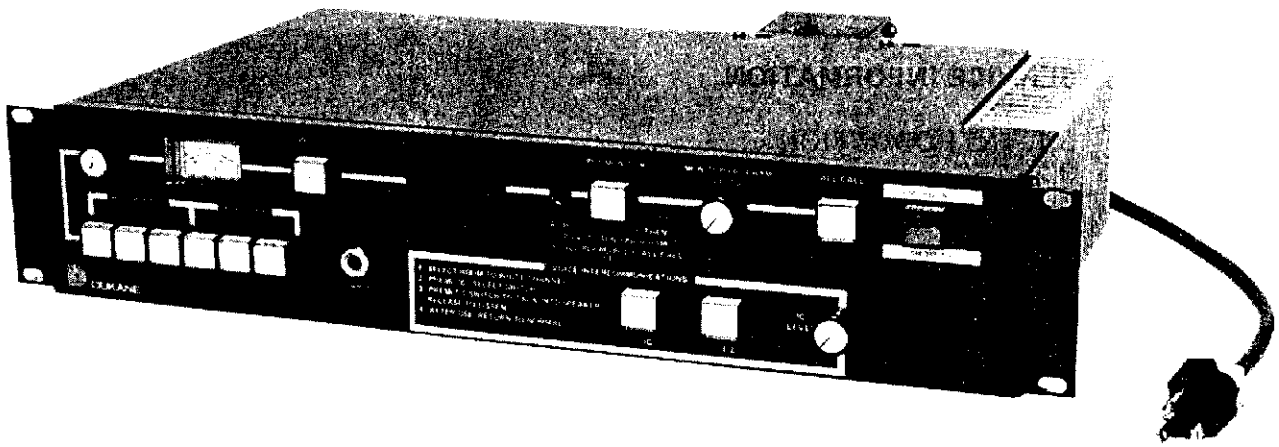
DUKANE

CHANNEL A MASTER CONTROL PANEL MODEL 1A952

CHANNEL A MASTER CONTROL PANEL WITH PROGRAM AMPLIFIER MODEL 1A953



Installation and Service Manual

403-276C

DUKANE CORPORATION | COMMUNICATIONS SYSTEMS DIVISION | ST. CHARLES, ILLINOIS 60174

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TABLES

FIGURES

SECTION 1

GENERAL INFORMATION

1.1 INTRODUCTION

This manual provides installation, set-up, and service information for the Channel A Master Control Panel, Model 1A952 and the Channel A Master Control Panel with Program Amplifier, Model 1A953. Both units are manufactured by Dukane Corporation, St. Charles, Illinois 60174.

This manual is divided into three sections, as follows:

1. **General Information.**
2. **Installation Information.**
3. **Service Information.**

1.2 GENERAL DESCRIPTION

Model 1A952 —
The functions provided by this panel include: Emergency, whereby all speakers in the system are gathered for an announcement to be made, using the panel speaker/microphone as a microphone and accomplished by the pressing of just one switch on the panel. Optionally, the announcement can be preceded by an alerting tone, provided that the system is equipped with a multi-tone generator. Other emergency announcements can be initiated by a Principal's microphone and/or a red emergency telephone, dedicated to emergency use. The emergency telephone requires an optional paging adapter. All emergency functions take priority over other system functions. The operation of the EMERGENCY switch can also result in the operation of external devices, alarm bells, AC override, etc., at the option of the user.

Other functions of the panel are: All-Call announcement from the console, dissemination of program material to selected rooms or to all rooms, program level indication, bass and treble control of program material, program monitoring, tone-to-room capability, and intercom operation.

Model 1A953 —
Incorporates all of the features of the above described 1A952 Panel except that the unit contains a 60 watt program channel and an associated power supply.

1.3 TECHNICAL SPECIFICATIONS

RATED OUTPUT:

1A952 —
Program: Nominal 1 volt (rms), max. +18 dBm, single ended.
Intercom: 4 watts (rms), 25 or 70 volt, transformer isolated.

1A953 —
Program: 60 watts (rms), 25 or 70 volts, transformer isolated.
Intercom: 4 watts (rms), 25 or 70 volts, transformer isolated.

POWER REQUIRED:

1A952 —
+24 to +26 VDC at 1 ampere.

1A953 —
105-130 or 220 VAC, 50-60 Hz; 240 watts at rated output, 30 watts at idle. +24 VDC at 5 amps (Battery backup to AC).

AUXILIARY POWER OUTPUT:

1A953 —
+24 VDC at .25 amperes.

PROGRAM INPUTS:

(1) low impedance, balanced, priority (principal's microphone).
(3) low impedance, balanced microphone.
(3) high impedance auxiliary (10K ohms).
(2) bridging (in parallel, 10K ohms).
(1) emergency telephone.

INPUT SENSITIVITY:

Microphone: 0.25 millivolts (rms).
Auxiliary: 0.1 volts (rms).
Bridging: 1 volt (rms).
Intercom: Optimized for speakers.

FREQUENCY RESPONSE:

1A952 —
Program: ±2 dB, 20 Hz to 20 kHz.
Intercom: Shaped for best voice articulation.

1A953 —
Program: ±3 dB, 85 Hz to 14 kHz.
Intercom: Shaped for best voice articulation.

DISTORTION:

1A952 —
Program: less than .5% at rated output.

1A953 —
Program: less than 2.5% at rated output.

NOISE LEVELS:

Microphones: –60 dB, band limited 20 Hz to 20 kHz.
Auxiliary: –70 dB, band limited 20 Hz to 20 kHz.

OUTPUT REGULATION:

1A952 —
Intercom: Less than 2 dB from no load to full load.

1A953 —
Program: Less than 3 dB from no load to full load.
Intercom: Less than 2 dB from no load to full load.

INDICATORS:

VU meter for program and intercom output levels.

Illuminating control panel switches.

FUSES:

1A953 —
(1) 2 amp, slow-blow (AC line).
(1) 5 amp (DC supply).

TERMINATIONS:

Screw terminals.
Phone type (RCA) jacks.

DIMENSIONS:

1A952 —
11-1/2" deep, 19" wide, 3-1/2" high.

1A953 —
13-1/2" deep, 19" wide, 3-1/2" high.

NET WEIGHT:

1A952 —
11 pounds, 8 ounces.

1A953 —
23 pounds, 4 ounces.

FINISH:

Charcoal, baked enamel with charcoal overlay. Yellow (program) and white (intercom) operational guidelines on overlay.

TONES:

Supervisory, call-in, tone-to-room, 7 distinct alarm (tone-to-room and alarm tones require the addition of a Dukane Model 15A266A Tone Generator).

1.3 TECHNICAL SPECIFICATIONS (Cont'd.)

CONTROLS:

- (3) Microphone input selectors.
- (3) Auxiliary input selectors.
- (1) Premonitor select switch.
- (1) Emergency announce switch with AC power override (see Note 1).
- (1) Program Level control (front panel).
- *(1) Microphone input level control.
- (1) Intercom level control.
- *(1) Bass tone control.
- *(1) Treble tone control.
- (1) All-Call switch.
- (1) Talk/Listen switch.
- (1) Intercom select switch.
- (1) Program monitor level control.
- (1) Tone-to-room activate switch.
- *(1) Emergency level control.
- *(1) Principal's mic volume control.

* Indicates preset, rear mounted, screwdriver adjustable.

1.4 ASSOCIATED EQUIPMENT

15A266A Multi-Tone Generator.

7A685 Emergency Telephone (requires 9A1565 Page Adapter for interface).

All Dukane Modular Speaker Selector Panels.

10A161-10A165 Modular AM/FM Tuner and Cassette Player Models.

7A825A Privacy Handset.

9A1492 AC Control Panel.
9A1890 Voice Call-In Switch.
1A954 Channel B Program Control Panel.

All Dukane Power Amplifiers (1A952 only).

17A365 24 VDC Regulated Power Supply (1A952 only).

438-544 Power Amplifier Switching Kit (see Note 2).

Note 1: When 9A1492 AC Control Panel is used, connections can provide for bypassing the AC panel key switch in the OFF position during "emergency" operation.

Note 2: When the 1A952 panel is used with power amplifier(s) which exceed 125 watts, the 438-544 kit must be used.

WARNING – TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

SECTION 2
INSTALLATION INFORMATION

2.1 INTRODUCTION

This section contains unpacking, mounting, and installation instructions. Complete installation information is arranged to facilitate an orderly installation. Installers should have a good understanding of this information prior to beginning the installation.

2.2 TOOLS AND TEST EQUIPMENT

The tools and test equipment contained in the following lists are not always required to install and service the 1A952 or 1A953 units. The lists are provided to give the installer or serviceperson an indication of the equipment that may be needed.

Installation Tools and Test Equipment:

- ☐ Screwdrivers (assorted sizes and types).
- ☐ Pliers (assorted sizes and types).
- ☐ A set of small socket wrenches.
- ☐ Wirestrippers.
- ☐ 60 watt soldering iron suitable for work on printed circuit boards.
- ☐ Rosin Core Solder (must NOT be acid based rosin).
- ☐ VOM multimeter.

Service Tools and Test Equipment:

- ☐ Assorted hand tools (screwdrivers, long nosed pliers, etc.).
- ☐ 60 watt soldering iron suitable for work on printed circuit boards.
- ☐ Rosin core solder (must NOT be acid based rosin).
- ☐ VOM multimeter.
- ☐ Oscilloscope with standard probe.
- ☐ Audio oscillator.

2.3 UNPACKING

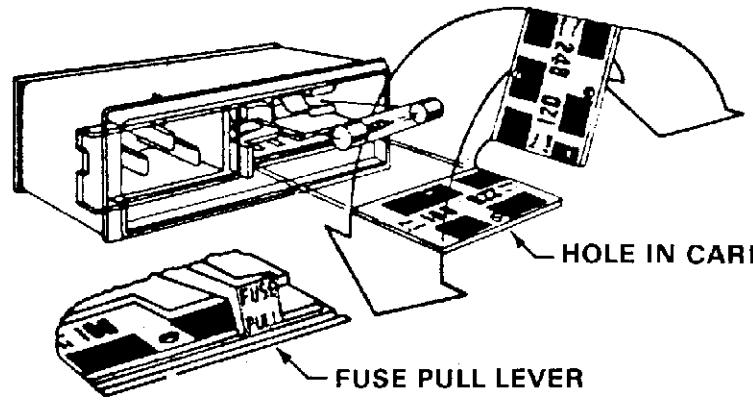
Examine the shipping carton and control panel. If there is any damage to this unit, bring it to the attention of the distributor from whom the unit was purchased, or, if the unit was shipped to you, notify the transportation company and place your claim without delay. This control panel was carefully inspected before it was packed and shipped.

2.4 EQUIPMENT MOUNTING

Both 1A952 and 1A953 panels require 3-1/2 inches of vertical space in a standard 19 inch rack. The mounting holes are spaced for EIA standard mounting rails and require #10 screws, or larger, for adequate strength. Screws with panheads are recommended.

2.5 POWER CONNECTIONS

The 1A953 Control Panel receives AC supply input via the #321-42 Fuse assembly. This assembly has a removable jumper card that allows the panel to operate on either 120 or 240 Vac, depending on how the jumper card is inserted into the assembly. Refer to the sketch below.



To replace 2A fuse (F1), remove the AC plug and slide the plastic cover up to expose the fuse. Move the lever labeled FUSE PULL upward to pop the fuse. Insert the new fuse, moving the lever downward.

The voltage selection is visible on the jumper card, either 120 or 240 when the card is inserted into the 321-42 assembly.

To change input voltage from 120 Vac to 240 Vac, or vice versa, remove the fuse as stated above, insert the point of a ball-point pen (or pencil) into the hole in the card and slide the card out of the assembly. Turn the card so that the desired voltage shows on the upper left-hand side of the card. Slide the card back into the assembly. Replace fuse and line cord plug.

Note: When 240 Vac supply is used, provide AC plug or cord set rated at 10 amperes, minimum.

2.6 ELECTRICAL CONNECTIONS

Table 2-1, following, identifies input and output terminals, both by silk screen designation and by terminal number, and shows a description of the function of the connection.

The origination terminals are shown in the left-hand column, refer to the typical connecting drawings, 400-1776 (1A952) and 400-1777 (1A953) for terminating ends of wire or cable runs.

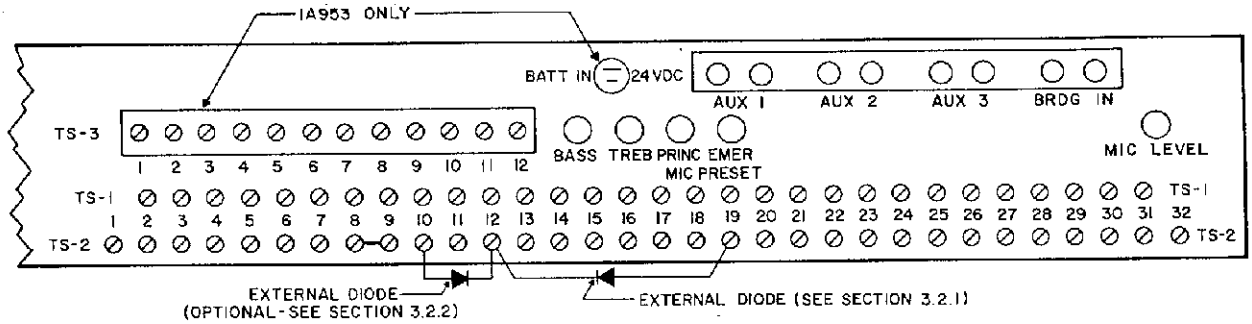


Figure 2-1. Rear Panel Terminal Strips and Preset Control Locations.

Table 2-1. Electrical Connections

Terminal Strip #1 (TS1)	Function
2	(1A952) +24Vdc power for unit. (1A953) +24Vdc power for other units.
3, 4	(1A952) Output of external booster amplifier (25 or 70V) (1A953) 25V output (TS3-1) or 70V output (TS3-3)
5, 6 TS2-6 (shld)	(9A1890) Voice Call-In Room Station
7 8 9 8, 9	Console Handset – TLR (Wht/Grn) – Common (Red) – XM (Wht) Strap when handset is not used
10, 11 (shld)	Monitor Program (see Section 3.2.7 if "B" channel is used)
12	15A266A Tone Generator (via diode)
14, 15, 13 (shld)	Intercom
16, 17 (shld)	(1A952) Input of external booster amplifier (1A953) Input of booster amplifier
18, 19, 20, 21, 22	External equipment
23 through 31	For use with 1A952 panel

(Continued)

Table 2-1. Electrical Connections (Continued)

Terminal Strip #2 (TS2)	Function
1 or 2	(1A952) Ground for unit (1A953) Ground for other units (AM-FM Tuner, Cassette Player, 15A266A Tone Generator)
3, 4	Program Output
5	Annunciator Call-In
6	G (Common) on Switchbank #1
7	Ground during ALL-CALL and EMERG
8 9 8, 9	Console Handset – SP (Yel) – RCV (Orn) Remove capacitor C7 when handset is used (refer to dwgs. 190-2673 or 190-2674).
10	Optional (see Section 3.2.2)
11	Ground during EMERG
12	Optional (see Section 3.2.2)
13, 14	OFF Bus on Switchbank #1
16, 17 (shld)	Input of external emergency only amplifier
18	External equipment
19, 20, 21, 22 (shld)	Principal's Microphone
23 (shld), 24, 25	Microphone #3
26 (shld), 27, 28	Microphone #2
29, 30, 31 (shld)	Microphone #1

Pin jacks, located on rear panel, are for connecting inputs of auxiliary devices (tuner, cassette, etc.) and tone generator to the units. Refer to Table 2-2 for functions.

Table 2-2. Connections and Functions of Pin Jacks

Pin Jack	Function
AUX 1	Aux. Input #1 (normally tuner)
AUX 2	Aux. Input #2 (normally cassette player)
AUX 3	Aux. Input #3 (other program device)
BRIDGE IN	Output of 15A266A Tone Generator

To strap output amplifier on 1A953 units for either 25 or 70 volt operation, refer to Table 2-3.

Table 2-3. Output Strapping on 1A953 Units

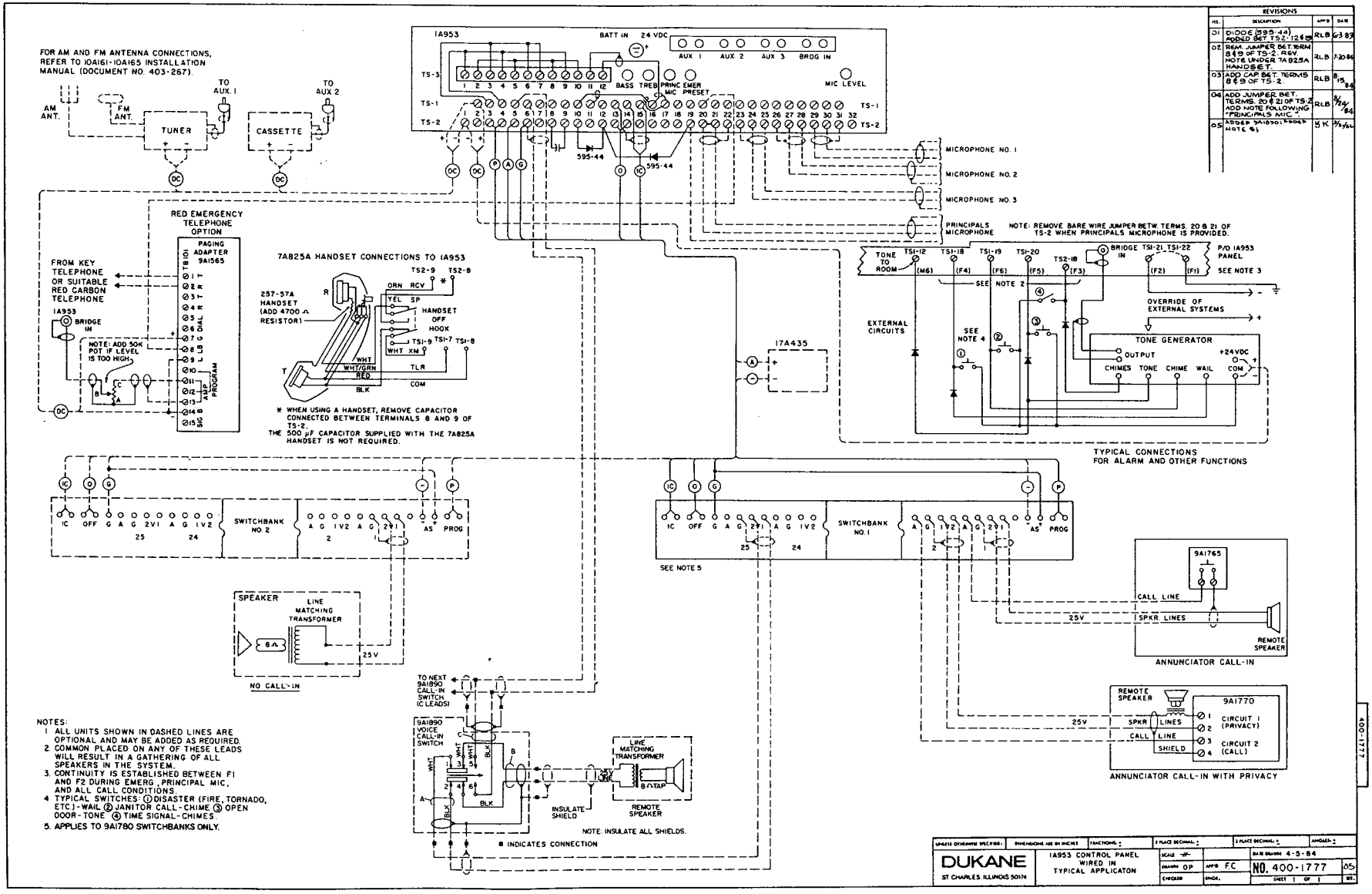
Terminal Strip #3 (TS3)	Strap To:	
	– For 25V Operation –	
1	TS3-4	
3	TS3-6	25V output across
4	TS3-9	terminals 1 and 3
6	TS3-7	
	– For 70V Operation –	
1	TS3-6	70V output across
4	TS3-7	terminals 3 and 9

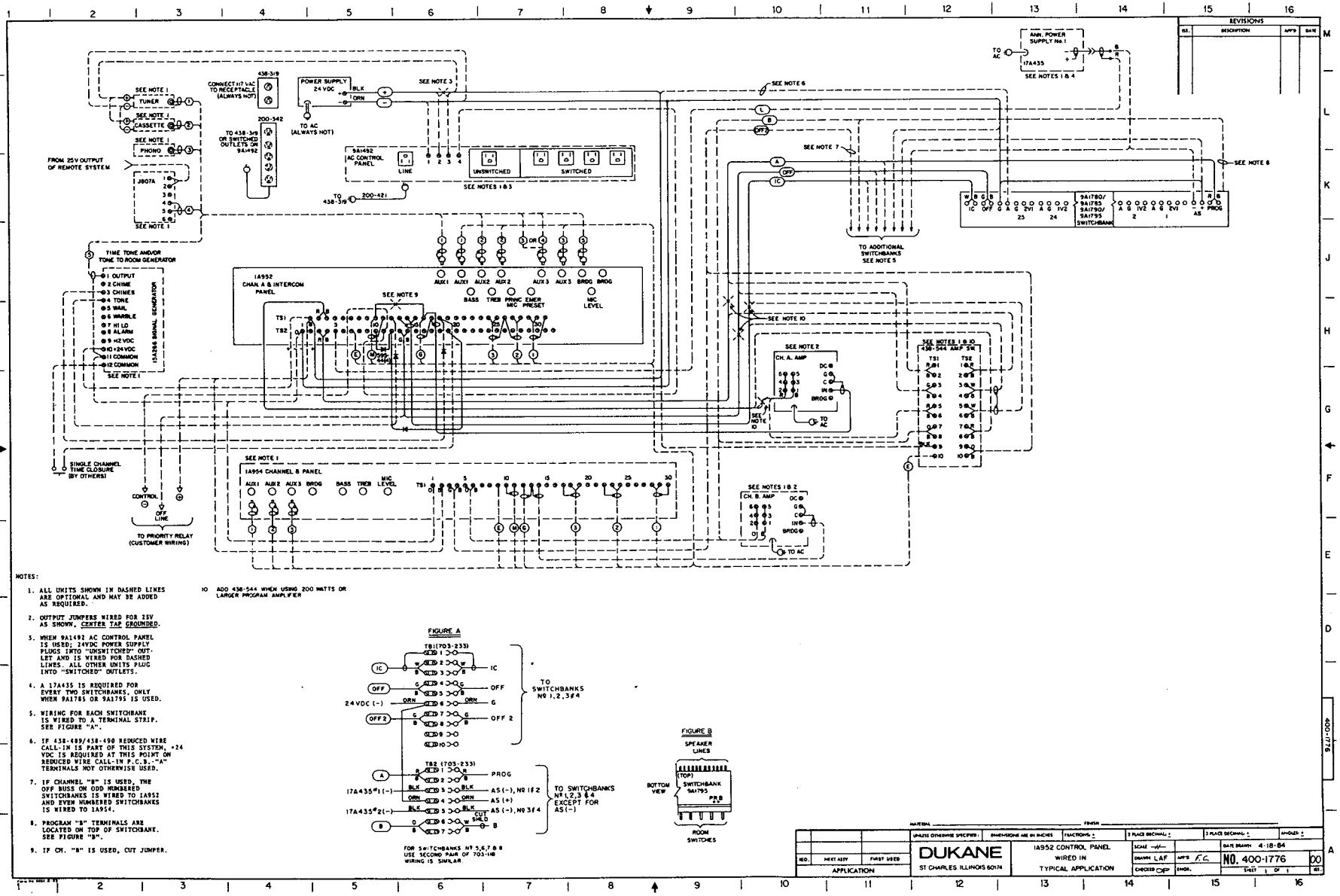
FOR 4W INTERCOM

Connect audio transformer T101 for either 25V or 70V operation by connecting the yellow lead for 25V or the green lead for 70V. Refer to drawings 190-2673 (1A952) or 190-2674 (1A953) in Section 3 of this manual. Fold back and tape the unused lead.

NOTE

For systems using the 70-volt output line from the 1A952 or 1A953 for program distribution, terminate all unused auxiliary inputs with a shorting plug to prevent oscillations when selecting unused auxiliary inputs.


FOR AM AND FM ANTENNA CONNECTIONS, REFER TO 10A161-10A165 INSTALLATION MANUAL (DOCUMENT NO. 403-267).
AM ANT.
FM ANT.
TUNER
CASSETTE
TO AUX. 1
TO AUX 2
1A953
BATT IN 24 VDC
AUX 1 AUX 2 AUX 3 BROG IN
BASS TREB
PRINC EMER MIC PRESET
MIC LEVEL
TS-3
TS-1
TS-2
595-44
MICROPHONE NO. 1
MICROPHONE NO. 2
MICROPHONE NO. 3
PRINCIPALS MICROPHONE
NOTE: REMOVE BARE WIRE JUMPER BETW. TERMS. 20 & 21 OF TS-2 WHEN PRINCIPALS MICROPHONE IS PROVIDED.
RED EMERGENCY TELEPHONE OPTION
PAGING ADAPTER 9A1565
FROM KEY TELEPHONE OR SUITABLE RED CARBON TELEPHONE
1A953
BRIDGE IN
NOTE: ADD 50K POT IF LEVEL IS TOO HIGH
7A825A HANDSET CONNECTIONS TO 1A953
257-57A HANDSET (ADD 4700 Ω RESISTOR)
ORN RCV
YEL SP
HANDSET OFF HOOK
WHT XM
WHT
WHT/GRN
RED
BLK
TLR
COM
* WHEN USING A HANDSET, REMOVE CAPACITOR CONNECTED BETWEEN TERMINALS 8 AND 9 OF TS-2. THE 500 μF CAPACITOR SUPPLIED WITH THE 7A825A HANDSET IS NOT REQUIRED.
17A435
TONE TO ROOM
BRIDGE IN
P/O 1A953 PANEL
SEE NOTE 3
SEE NOTE 2
EXTERNAL CIRCUITS
SEE NOTE 4
OVERRIDE OF EXTERNAL SYSTEMS
TONE GENERATOR
OUTPUT
+24VDC
CHIMES TONE CHIME WAIL COM
TYPICAL CONNECTIONS FOR ALARM AND OTHER FUNCTIONS
SWITCHBANK NO. 2
SWITCHBANK NO. 1
SEE NOTE 5
SPEAKER
LINE MATCHING TRANSFORMER
8Ω
25V
NO CALL-IN
9A1765
CALL LINE
SPKR LINES
REMOTE SPEAKER
ANNUNCIATOR CALL-IN
TO NEXT 9A1890 CALL-IN SWITCH (C LEADS)
9A1890 VOICE CALL-IN SWITCH
INSULATE SHIELD
NOTE: INSULATE ALL SHIELDS.
■ INDICATES CONNECTION
9A1770
CIRCUIT 1 (PRIVACY)
CIRCUIT 2 (CALL)
SHIELD
ANNUNCIATOR CALL-IN WITH PRIVACY
NOTES:
1. ALL UNITS SHOWN IN DASHED LINES ARE OPTIONAL AND MAY BE ADDED AS REQUIRED.
2. COMMON PLACED ON ANY OF THESE LEADS WILL RESULT IN A GATHERING OF ALL SPEAKERS IN THE SYSTEM.
3. CONTINUITY IS ESTABLISHED BETWEEN F1 AND F2 DURING EMERG., PRINCIPAL MIC., AND ALL CALL CONDITIONS.
4. TYPICAL SWITCHES: ① DISASTER (FIRE, TORNADO, ETC.) - WAIL ② JANITOR CALL - CHIME ③ OPEN DOOR - TONE ④ TIME SIGNAL - CHIMES.
5. APPLIES TO 9A1780 SWITCHBANKS ONLY.
REVISIONS
01 DIODE (595-44) ADDED BET TS2-12 & 15 RLB 6-3-83
02 REM. JUMPER BET. TERM 8 & 9 OF TS-2. REV. NOTE UNDER 7A825A HANDSET. RLB 7-20-84
03 ADD CAP BET. TERMS 8 & 9 OF TS-2. RLB 8-15-84
04 ADD JUMPER BET. TERMS. 20 & 21 OF TS-2 ADD NOTE FOLLOWING "PRINCIPALS MIC.". RLB 8/24/84
05 ADDED 9A1890 ADDED NOTE #3 SK 9/26/84
DUKANE
ST CHARLES, ILLINOIS 50174
1A953 CONTROL PANEL WIRED IN TYPICAL APPLICATON
DRAWN OP
APP'D F.C
DATE DRAWN 4-5-84
NO. 400-1777
05
SHEET 1 OF 1
400-1777



NOTES:

1. ALL UNITS SHOWN IN DASHED LINES ARE OPTIONAL AND MAY BE ADDED AS REQUIRED.
2. OUTPUT JUMPERS WIRED FOR 25V AS SHOWN. CENTER TAP GROUNDED.
3. WHEN 9A1492 AC CONTROL PANEL IS USED; 24VDC POWER SUPPLY PLUGS INTO "UNSWITCHED" OUTLET AND IS WIRED FOR DASHED LINES. ALL OTHER UNITS PLUG INTO "SWITCHED" OUTLETS.
4. A 17A435 IS REQUIRED FOR EVERY TWO SWITCHBANKS, ONLY WHEN 9A1785 OR 9A1795 IS USED.
5. WIRING FOR EACH SWITCHBANK IS WIRED TO A TERMINAL STRIP. SEE FIGURE "A".
6. IF 438-489/438-490 REDUCED WIRE CALL-IN IS PART OF THIS SYSTEM, +24 VDC IS REQUIRED AT THIS POINT ON REDUCED WIRE CALL-IN P.C.B.-"A" TERMINALS NOT OTHERWISE USED.
7. IF CHANNEL "B" IS USED, THE OFF BUSS ON ODD NUMBERED SWITCHBANKS IS WIRED TO 1A952 AND EVEN NUMBERED SWITCHBANKS IS WIRED TO 1A954.
8. PROGRAM "B" TERMINALS ARE LOCATED ON TOP OF SWITCHBANK. SEE FIGURE "B".
9. IF CH. "B" IS USED, CUT JUMPER.
10. ADD 438-544 WHEN USING 200 WATTS OR LARGER PROGRAM AMPLIFIER

FIGURE A

FIGURE B

REQ.	NEXT ASSY	FIRST USED	APPLICATION	DUKANE ST CHARLES ILLINOIS 60174	1A952 CONTROL PANEL WIRED IN TYPICAL APPLICATION	DRAWN LAF 4-18-84 CHECKED OP ENGR. NO. 400-1776 00 SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED | DIMENSIONS ARE IN INCHES | FRACTIONS ± | 2 PLACE DECIMAL ± | 3 PLACE DECIMAL ± | ANGLES ±

MATERIAL _____ FINISH _____

400-1776

2.7 PRESET CONTROL ADJUSTMENTS

Note: Before setting the following controls, press and lock the PRE MONITOR switch. When settings have been completed, release the switch.

The preset controls are accessed through holes in the back panel of the unit. In order to set the controls, the unit must be completely installed and have remote speaker stations connected. Use a screwdriver to adjust controls.

Unless otherwise specified, all front panel switches are to be in the deselect (out) position.

Apply power to the unit.

MIC LEVEL

Select an external microphone with MIC 1, 2, or 3 switch on front panel. While speaking into the microphone, adjust MIC LEVEL control for a reading of just below the red section of the scale on the front panel VU meter. Deselect the microphone switch.

PRINCIPAL MIC (Optional)

Press the push-to-talk switch on the principal's microphone. Check that relays K1, K2, and K3 operate. While speaking into the microphone, adjust PRINC MIC control for a reading of just below the red section of the scale on the VU meter. Release the push-to-talk switch.

EMERG. PRESET and PRINC MIC

Press and hold EMERGENCY switch located on the front panel. Check that relays K2, K3, and K4 operate. While speaking in the direction of the front panel speaker/microphone, adjust both EMERG. PRESET and PRINC MIC controls for a reading of just under the red section of the scale on the VU meter. Release EMERGENCY switch.

TREBLE and BASS

The midpoint of these controls results in a flat response. Select an auxiliary by operating either AUX 1, 2, or 3 switch on the front panel. Set the volume control of the auxiliary to approximately 1/3 clockwise. Set ADJUST LEVEL control, located on the front panel, for peak readings of just below the red section of the scale on the VU meter. Operate PRE MONITOR switch and adjust MONITOR PROGRAM control for the desired listening level. Set BASS and TREBLE controls as desired to produce the best sounding music quality. Upon completion of the settings, deselect the AUX switch.

2.8 BATTERY BACKUP FOR 1A953 CONTROL PANEL

The 1A953 panel has provision for 24V battery backup supply in case of failure of AC supply. The external battery supply can be connected to the panel by means of a polarized socket located on the rear panel. The negative side of the battery is hard-wired to ground in the panel, and the positive side is connected to normally open contacts of relay K1 in the unit power supply. Under normal conditions, K1 is energized by the windings of the power transformer. If primary power fails, K1 drops out and the battery is then automatically connected to the power supply output.

Class 1 wiring is required.

The 1A952 panel is supplied with operating power from an external 24Vdc source.

Figure 2-2 shows the required battery charger, batteries, and connection to the polarized socket on the rear of the 1A953 panel.

The charger and batteries shall be mounted externally.

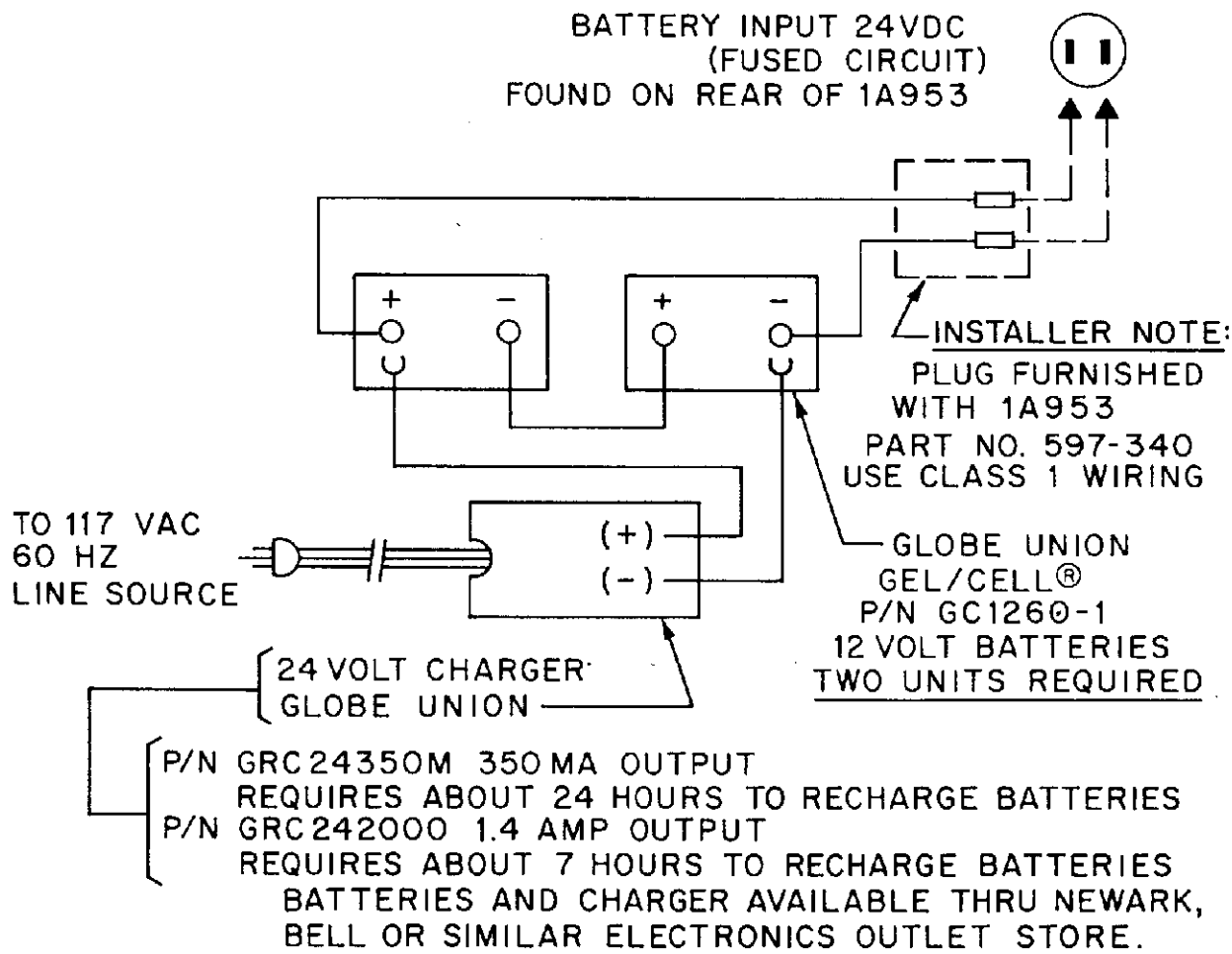


Figure 2-2. Battery Backup Connection for 1A953 Control Panel.

SECTION 3
SERVICE INFORMATION

3.1 INTRODUCTION

Standard parts are used in the Control Panel, and the Dukane Corporation Service Department maintains a supply of replacement parts that are listed on the Repair Parts List. All parts are available through your authorized Dukane distributor or dealer.

Transistors, integrated circuits, and diodes do not require periodic checking. If it is suspected that one of these components has caused the control panel to operate improperly, the unit should be referred to a qualified electronic technician in your vicinity. The wrong choice of component or incorrect installation can cause further part failures or component damage. Replacement of components on the printed circuit board should be performed only by a skilled technician, for it is extremely easy to damage the circuit foil on printed circuit boards.

3.2 TECHNICAL DESCRIPTION OF CONTROLS AND INDICATORS

This section is provided to give a technical description of each control and indicator. Refer to schematics following circuit description.

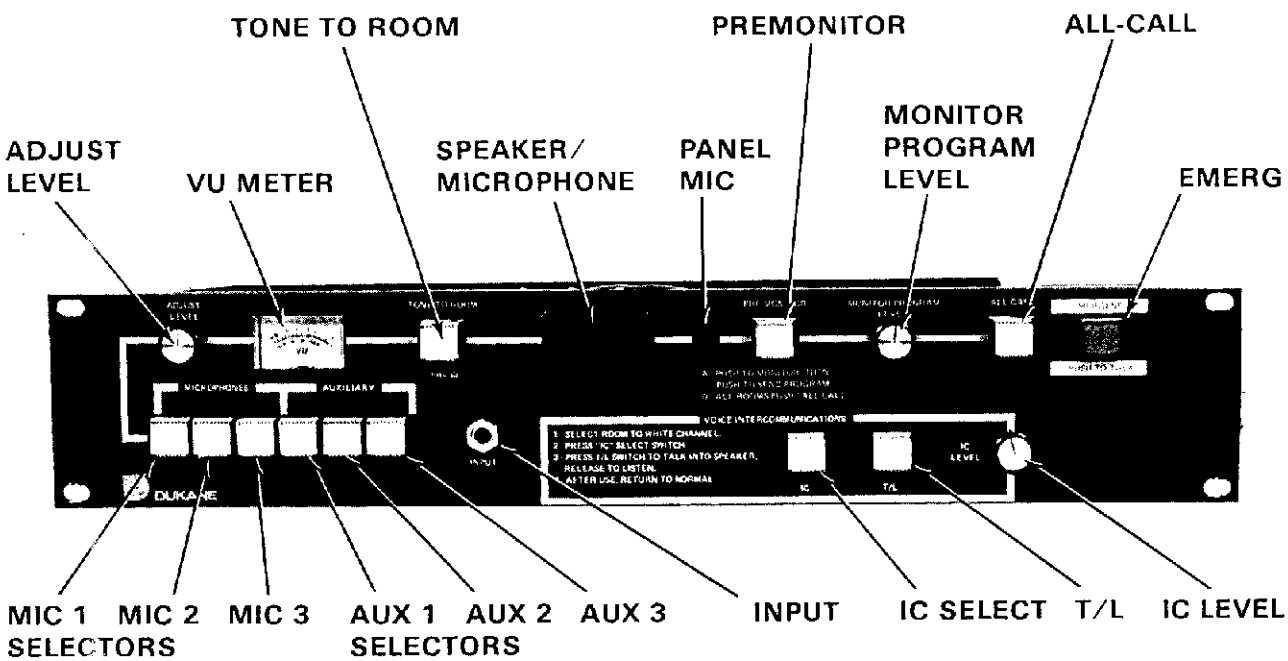


Figure 3-1. Front panel controls on 1A952 and 1A953 Control Panels.

3.2.1 Emergency (momentary switch)

Switch is held operated for the duration of the emergency voice message. Operation of the switch results in:

☐ Relays K2, K3, and K4 are energized by ground applied through the switch, J6-1, CR15 (K2), CR12, CR10, CR16 (K3), and CR13 (K4).

☐ Speaker/Microphone (LS101) is routed through operated EMERGENCY switch to the input of 110-3018 4W amplifier (J1 contacts 2 and 3) for use as a microphone.

☐ Relay K1 is operated via ground applied to lead R1 by the action of the switch, through the external diode connected across TS2-12 and 19, and the P1 lead. K1 operated breaks the voice leads from the MIC switches, normally connected to the input of the 110-3017 Mic Module, preventing any other voice messages during emergency condition.

☐ Relay K2 removes ADJUST LEVEL control (normally closed contacts 1-9 and 2-10) as level control for the 110-3016 amplifier driver and replaces it with the PRINCIPAL MIC preset control (through **no** contacts 5-9 and 6-10) located on the 110-3016 board. AUX 1, 2, and 3 selector switches are removed from the auxiliary input of the 110-3016 board (**nc** contacts 4-12) and EMER. PRESET located on the 110-3016 board is routed through **no** contacts 8-12 to aux. input. This is to insure that amp/driver will always have the correct level setting for emergency operation.

☐ Relay K3 gathers the IC, OFF, and Program buses to the output of the power amplifier, as follows: The IC bus (TS1-15 and TS1-14) is connected to the OFF bus (TS2-13 and TS2-14) through **no** contacts 9-5 and 12-8. The OFF and IC buses are connected to the output of the power amplifier (TS1-3 and TS1-4) through **no** contacts 11-7 and 10-6. The output of the power amplifier is connected to the Program bus (TS2-3 and TS2-4) through the PRE MONITOR switch.

☐ Operated EMERGENCY switch removes +24VDC supply for the supervisory tone circuit in the 110-3018 board. The supply is normally routed through T/L, ALL CALL and EMERGENCY switches to terminal J3-5 on the board. The supervisory tone circuit is thus muted during emergency call.

☐ Continuity is established between leads F1 (TS1-21) and F2 (TS1-22) through contacts 7-11. This is for the operation of an optional AC override circuit.

3.2.2 Principal Microphone (optional)

Principal microphone is connected to TS2-19, 20, 21, 22. The push-to-talk lead is connected to terminal 19. Closure of the p-t-t switch connects terminal 19 to terminal 22 which is at ground potential. The ground is applied to the coil of relay K1 (P1 lead) causing the relay to pull in. The MIC 1, 2, and 3 leads to the input of the 110-3017 Mic Module (thru normally closed contacts 3-11 and 4-12) are broken, and the voice leads P3 and P4 from the principal microphone are routed to the input through normally open contacts 7-11 and 8-12.

Relay K2 operates through ground applied through CR2. Relay K3 operates through ground applied on R1 lead, through the external diode connected between TS2-10 and TS2-12, to R2 lead and CR16. Operation of relays K2 and K3 is explained under paragraph 3.2.1. Release of the p-t-t switch removes ground from K1, K2, and K3. The relays drop out and the panel is restored to normal operation.

3.2.3 All Call (locking switch)

Operation of switch results in:

☐ Relay K3 is energized via ground applied through the switch, CR10 and CR16.

☐ Relay K3 gathers IC, OFF, and Program buses to the output of booster amplifier as explained under EMERGENCY operation.

☐ Supervisory tone circuit in 110-3018 is muted by the removal of +24VDC supply to the circuit caused by the operation of ALL CALL switch.

☐ Either microphones (MIC 1, 2, 3) or auxiliary sources (AUX 1, 2, 3, input jack) can be selected for the all call program.

3.2.4 Monitor Program Level

Allows setting of program listening level. Also used for level setting of incoming intercom, in conjunction with the IC LEVEL control (sec. 3.2.14). Note: On units built prior to serial #920252, the incoming intercom level was set by the IC LEVEL control only.

3.2.5 Pre Monitor (locking switch)

Operation of this switch results in:

☐ Connection between booster amplifier (TS1-3 and 4) and Program bus (TS2-3 and 4) is broken by switch action.

☐ Sampling of the program material is taken from TS1-10 (M1 lead) and fed to a low level input, J1-6 on the 110-3018 amplifier. The output of the amplifier is fed to the panel speaker and VU meter.

3.2.6 Tone-To-Room (momentary switch)

Operation of this switch results in:

☐ Ground applied to TS1-12, via M6 lead (w/o wire). This ground is applied to the tone input of the external Tone Generator, activating the generator and resulting in a tone input to be applied to the 110-3016 Amp Driver, at J2-4, via the BRIDGE pin jack on the rear of the panel.

☐ The tone will be sent to speakers as selected at the switch panels, or, if the ALL CALL switch is pressed at the same time as TONE-TO-ROOM, the tone will be transmitted to all speakers in the system.

☐ The duration of the tone transmitted is dependent on the length of time that TONE-TO-ROOM switch is held operated.

☐ The switch will be illuminated while held operated.

3.2.7 VU Meter

The output of 110-3016 Amp/Driver is routed to TS1-16, strapped to TS1-10 (M1), through the IC switch (out position), to the low level input (J1-6) of 110-3018, low level output (J2-1), to the VU meter.

Note: If a 1A954 "B" Channel unit is used with the "A" panel, the strap between TS1-16 and TS1-10 must be removed so that the "B" panel can also be monitored with the VU meter mounted on the "A" panel. Also, when monitoring the "A" panel, be sure that the MONITOR PROGRAM switch on the "B" panel is in the "out" position. If it is "in", the VU meter will be reading the output of the "B" panel's 110-3016.

3.2.8 Adjust Level

Normally connected to J3-1 and J3-2 of 110-3016 through nc contacts 1-9 and 2-10 of K2. When K2 operates, ADJUST LEVEL control is removed from the circuit.

3.2.9 Microphones (locking switches)

Up to three external microphones can be selected by this panel. The microphones MIC 1, MIC 2, and MIC 3 are connected to terminals TS2-29, 30, and 31 (A, B, com.); TS2-26, 27, and 28 (com., E, F); TS2-23, 24, and 25 (com., K, J). These leads are routed thru the selector switches (de-selected) and are connected to terminals TS1-29, 30, and 31 (D, C, com.); TS1-26, 27, and 28 (com., G, H); TS1-23, 24, and 25 (com., M, L). The leads connected to TS1 are provided for connection to an optional "B" panel.

The selector switches S1-1, S1-2, and S1-3 are routed to the input (A, B) of the 110-3017 Mic Module through **nc** contacts 4-12 and 3-11 of relay K1. During Principal Microphone operation, K1 is energized, and the selector switches are removed from the input of 110-3017 and replaced by the Principal Mic leads (P3 and P4) through **no** contacts 8-12 and 7-11.

3.2.10 Auxiliary (locking switches)

AUX 1, AUX 2, and AUX 3 switches are connected to Aux Input (J2-3) of the 110-3016 Amp Driver Module through **nc** contacts 4-12 of K2. The auxiliaries are fed into the panel through the pin jacks at the rear of the panel. Operation of one of the switches routes the particular auxiliary selected to the input of the amplifier. When relay K2 is energized, the auxiliaries are removed from the circuit. AUX 1 is normally the AM-FM Tuner, AUX 2 is normally the Cassette Tape Player, and AUX 3 is any other auxiliary device that the user chooses.

3.2.11 Input Jack

This is a convenient input for an auxiliary program source. AUX 3 switch is wired through the jack so that if a plug is inserted in the INPUT jack, auxiliary input No. 3 at rear is removed from the circuit and is inoperable, however, AUX 3 must be operated to enable the input jack.

3.2.12 IC Switch (locking)

This switch is used for intercom operation. With the IC switch nonoperated (out), the IC bus, connected at terminals TS1-14 and 15, is routed to the upper section of the IC switch via **nc** contacts 9-1 and 12-4 of K3. No contact is made with relay K4 in this condition. With IC switch operated (in), the IC bus is routed through the top section of the IC switch to J2-3 and J2-4 of 110-3018 via **nc** contacts 12-4 and 11-3 of K4. There is also a connection for the IC bus to the input (J1-2 and 3) of 110-3018 via contacts 3 and 4 of K4 and through the EMERGENCY switch (provided it is in the out position).

An annunciator call-in from a remote station appears on TS2-5 as a +24VDC voltage from the annunciator power supply on the switchbank and is applied to the base of Q1. This voltage causes Q1 to conduct which applies a ground to the sonalert (buzzer), via the center section of the IC switch (out position). If the IC switch is in, this circuit is broken. Voice call-in is not announced by the buzzer but by the voice heard from the panel speaker. Voice call-in remote stations come in on terminals TS1-5 and 6 and are routed through the EMERGENCY switch to the input (J1-2 and 3) of 110-3018.

The 110-3018 also has the supervisory tone circuit. The supervisory tone is provided to sound a short tone to the selected speaker on terminals TS1-14 and 15 when the IC switch is in the "in" position and the front panel speaker is monitoring the selected

speaker; i.e., T/L switch is "out". The start-up of the supervisory tone is accomplished by a switched +VCC and a switched ground to the 110-3018 by routing of both +VCC and ground through the IC, T/L, and ALL CALL, and EMERGENCY switches. The IC switch must be "in", T/L, ALL CALL, and EMERGENCY switches must be in the "out" position for the supervisory tone to be activated. When the supervisory tone activates, a signal is applied to and amplified by the 110-3018, at which time relay K4 is energized and the signal is routed to terminals TS1-14 and 15.

3.2.13 T/L Switch (momentary)

Used in conjunction with the IC switch during intercom operation. Operation of the T/L switch applies a ground to the coil of K4 pulling it in. The panel microphone is connected to the input (J1-2) of 110-3018 via the EMERGENCY switch (in out position). The amplified microphone output is applied to the IC buses at terminals TS1-14 and 15 via the operated IC switch.

Anytime a ground is applied to the E2 lead, either by the operation of EMERGENCY, ALL CALL, or T/L switches, a ground is applied to J3-2 of 110-3018. This ground **momentarily** operates relay K1 in the unit and results in the grounding of the wiper of IC LEVEL control (via no contacts 4-3). This momentary grounding of the level control prevents "pop" during switch action.

Handset Operation — If an optional handset is used, the T/L switch, panel microphone, and speaker are not used during intercom operation, as the handset replaces these components. The push-to-talk button on the handset provides the talk-listen function.

Remove capacitor C7 between TS2-8 and 9. The IC switch must be operated during intercom operation, as without handset. The intercom operation is otherwise the same as explained in Section 3.2.12.

3.2.14 IC Level

This control is connected directly to the input (J1-4 and 5) of the 110-3018 4W Amp & Tone board. The wiper of the control sets the level at the second stage of the amplifier (U2), which controls the volume level heard from the speaker when the T/L switch is non-operated (out). The control also controls the level of the outgoing signal when the T/L switch is operated (in).

Note: When a handset is used, IC LEVEL control sets the level heard at the earpiece of the handset but does not control the outgoing signal. This is pre-determined by the resistor R11 on 110-3018. If a higher level is desired, R11 (100K ohm) must be replaced by a smaller value resistor. If it is desired to lower the level, replace with a higher value resistor.

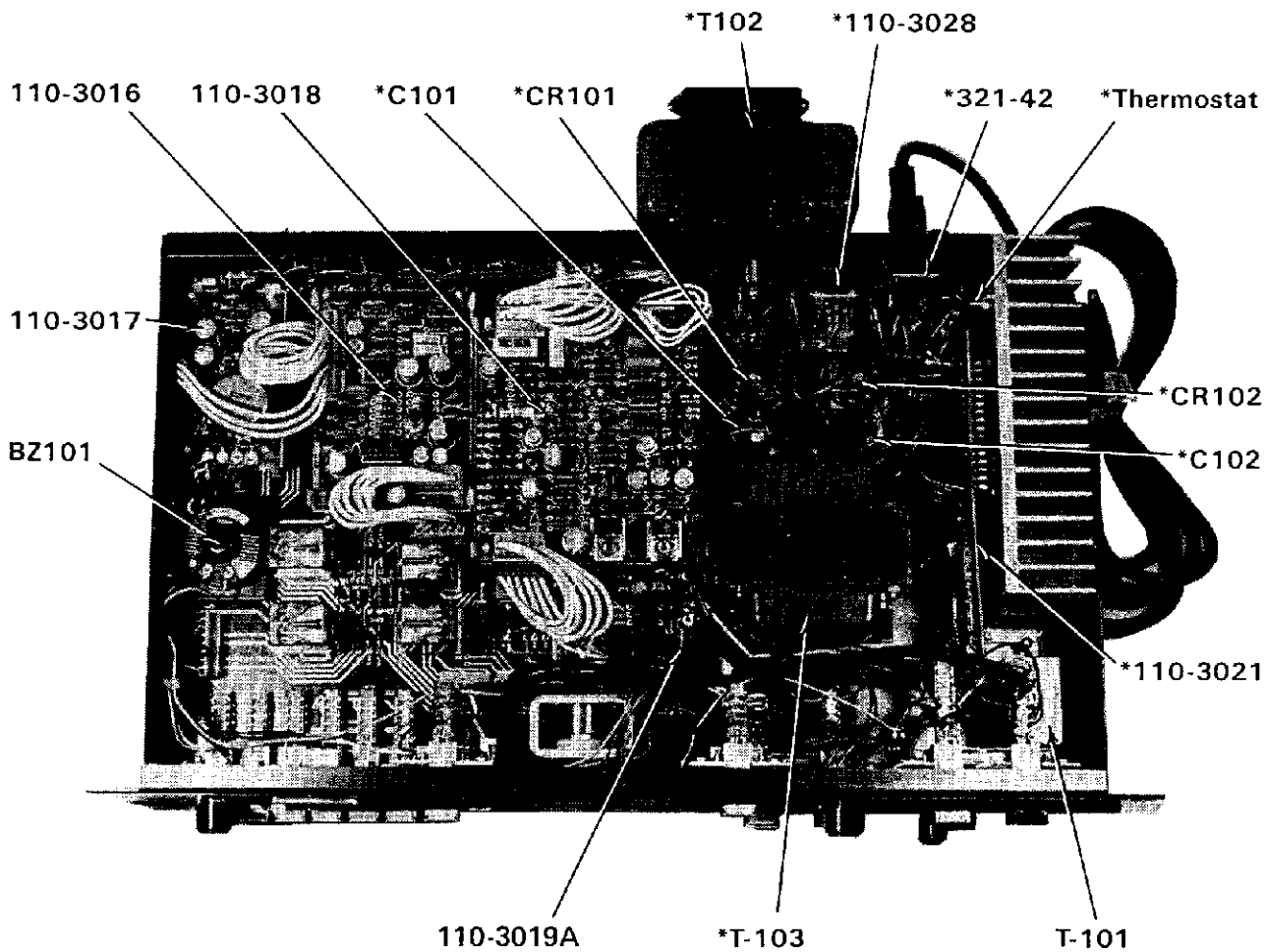
3.2.15 Power Supplies

Primary power for the 1A953 Panel can be 120V or 240V at 50/60 Hz. The user has the option of selecting which input voltage to use by the placement of the jumper card in the #321-42 Fuse Assembly (see Sec. 2.5). Power can also be supplied to the panel via a polarized socket at the rear panel. This is 24V DC at 5 Amperes, and is used for battery backup in the event of primary power failure. The internal switching between primary AC power and the battery backup is accomplished by the 110-3028 Fuse Connector pcb and its associated wiring.

A thermostat (part #702-1) is connected in series with the power supply lead to the hybrid amplifier. The thermostat will open, removing power to the amplifier if the temperature of the amplifier area exceeds 200 ± 8 degrees F. When the temperature subsides to 130 ± 12 degrees F, the thermostat will close and reinstate the power to the amplifier.

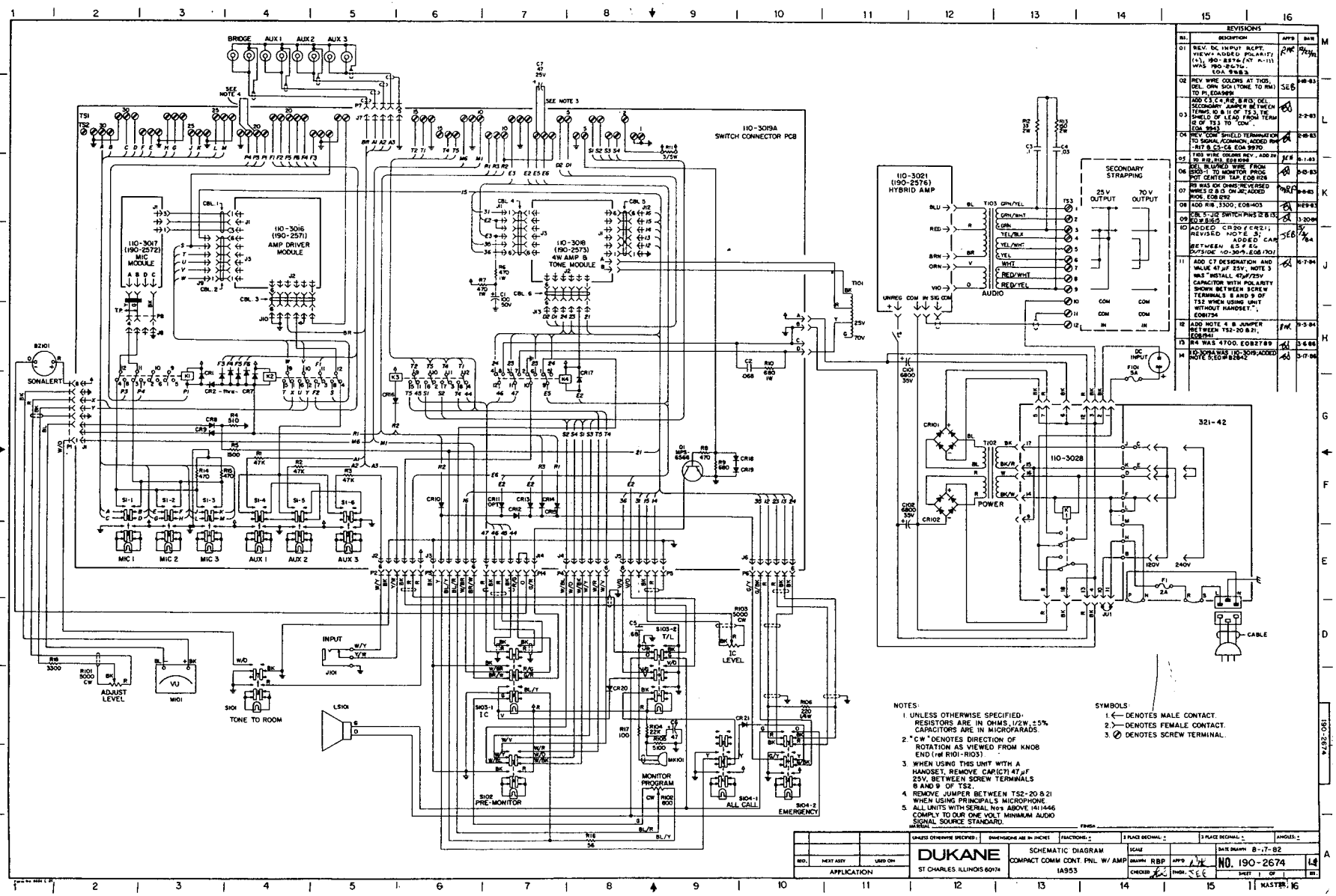
3.3 SCHEMATICS, PARTS LOCATIONS, AND PARTS LISTS

The remainder of this manual contains information on parts locations and parts lists along with the schematic drawings of the overall panel and of the individual printed circuit modules. Figure 3-2 shows the locations of the pc boards and of the major chassis mounted parts.

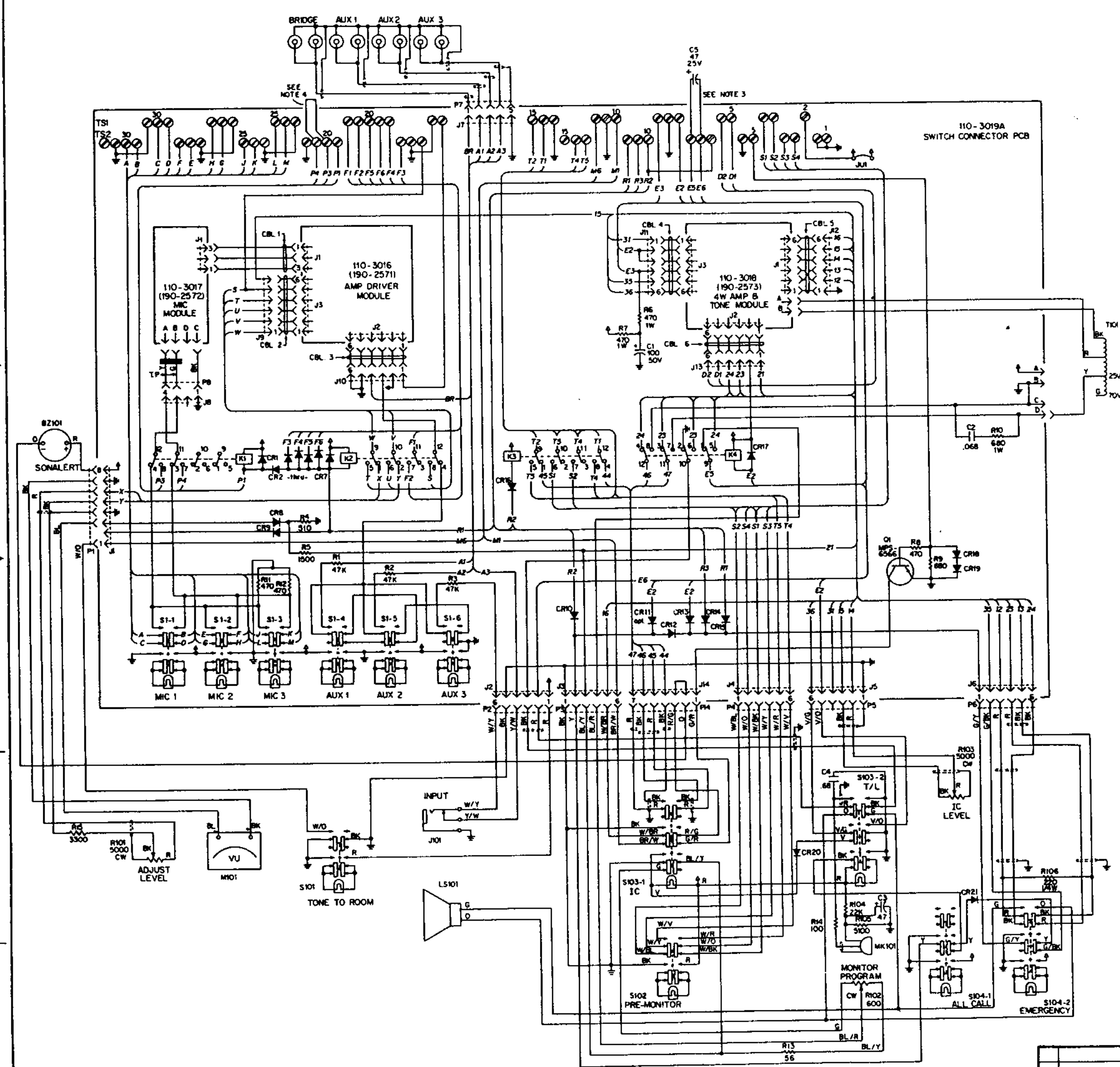


*1A953 ONLY

Figure 3-2 Parts Layout on Chassis


110-3019A
SWITCH CONNECTOR PCB
110-3017
(190-2572)
MIC MODULE
110-3016
(190-2571)
AMP DRIVER MODULE
110-3018
(190-2573)
4W AMP & TONE MODULE
110-3021
(190-2576)
HYBRID AMP
SECONDARY STRAPPING
25V OUTPUT
70V OUTPUT
AUDIO
POWER
110-3028
321-42
SONALERT
MIC 1
MIC 2
MIC 3
AUX 1
AUX 2
AUX 3
BRIDGE
AUX 1
AUX 2
AUX 3
INPUT
ADJUST LEVEL
TONE TO ROOM
IC LEVEL
MONITOR PROGRAM
PRE-MONITOR
ALL CALL
EMERGENCY
CABLE
DC INPUT
120V
240V
REVISIONS
NOTES:
1. UNLESS OTHERWISE SPECIFIED: RESISTORS ARE IN OHMS, 1/2W, ±5%. CAPACITORS ARE IN MICROFARADS.
2. "CW" DENOTES DIRECTION OF ROTATION AS VIEWED FROM KNOB END (re R101-R103)
3. WHEN USING THIS UNIT WITH A HANDSET, REMOVE CAP.(C7) 47 µF 25V, BETWEEN SCREW TERMINALS 8 AND 9 OF TS2.
4. REMOVE JUMPER BETWEEN TS2-20 & 21 WHEN USING PRINCIPALS MICROPHONE
5. ALL UNITS WITH SERIAL Nos ABOVE 1411446 COMPLY TO OUR ONE VOLT MINIMUM AUDIO SIGNAL SOURCE STANDARD.
SYMBOLS:
1. ← DENOTES MALE CONTACT.
2. → DENOTES FEMALE CONTACT.
3. ⊘ DENOTES SCREW TERMINAL.
DUKANE
ST CHARLES ILLINOIS 60174
SCHEMATIC DIAGRAM
COMPACT COMM CONT. PNL W/ AMP
1A953
NO. 190-2674
DATE DRAWN 8-17-82
DRAWN RBP
CHECKED
APPLICATION
MASTER

3-9/10



NOTES:

1. UNLESS OTHERWISE SPECIFIED: RESISTORS ARE IN OHMS, 1/2W, ±5%. CAPACITORS ARE IN MICROFARADS.
2. "CW" DENOTES DIRECTION OF ROTATION AS VIEWED FROM KNOB END (ref. R101-R103).
3. WHEN USING THIS UNIT WITH A HANDSET, REMOVE CAP. (C5) 47 µF 25V, BETWEEN SCREW TERMINALS 8 AND 9 OF TS2.
4. REMOVE JUMPER BETWEEN TS2-20 & 21 WHEN USING PRINCIPALS MICROPHONE.
5. ALL UNITS WITH SERIAL No's ABOVE 1402580 COMPLY TO OUR ONE VOLT MINIMUM AUDIO SIGNAL SOURCE STANDARD.

SYMBOLS:

1. ←— DENOTES MALE CONTACT.
2. ≻— DENOTES FEMALE CONTACT.
3. ⊘ DENOTES SCREW TERMINAL.

REVISIONS

ISS.	DESCRIPTION	APP'D	DATE
01	DELETED ORN LEAD S101 (TONE TO RM) TO P1, EOA9891	JEB	1-17-83
02	ADDED R11-R14 & C3-C4 EOB 1006	[illegible]	3-10-83
03	DEL BLU/RED WIRE FROM S103-1 TO MONITOR PROG POT CENTER TAP. EOB 1126	[illegible]	5-16-83
04	ADD R106; R9 WAS 10K OHMS; REVERSED WIRES 12 & 13 ON J12. EOB 1292	[illegible]	9-8-83
05	ADD R15; EOB1402	JEB	11-16-83
06	CBL 5-J12 SWITCH PINS 12 & 13; EO# B1615	[illegible]	3-20-84
07	ADDED CR20 & CR21; REV. NOTE 3. ADDED CAP. BETWEEN E5 & E6 OUTSIDE 110-3019. EOB 1701	JEB	5/4/84
08	ADD C5 DESIGNATION AND VALUE 47 µF 25V; NOTE 3 WAS "INSTALL 47µF/25V CAPACITOR WITH POLARITY SHOWN BETWEEN SCREW TERMINALS 8 AND 9 OF TS2 WHEN USING UNIT WITHOUT HANDSET"; EOB1754	[illegible]	6-7-84
09	ADD NOTE 4 & JUMPER BETWEEN TS2-20 & 21, EOB1946	[illegible]	9-5-84
10	R4 WAS 4700. EOB2789	[illegible]	3-6-86
11	110-3019A WAS 110-3019; ADDED NOTE 5; EO# B2842	[illegible]	3-17-86

REQ.	NEXT ASSY	USED ON
APPLICATION		

MATERIAL ______ FINISH ______

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES | FRACTIONS: ± | 2 PLACE DECIMAL: ± | 3 PLACE DECIMAL: ± | ANGLES: ±

DUKANE
ST CHARLES, ILLINOIS 60174

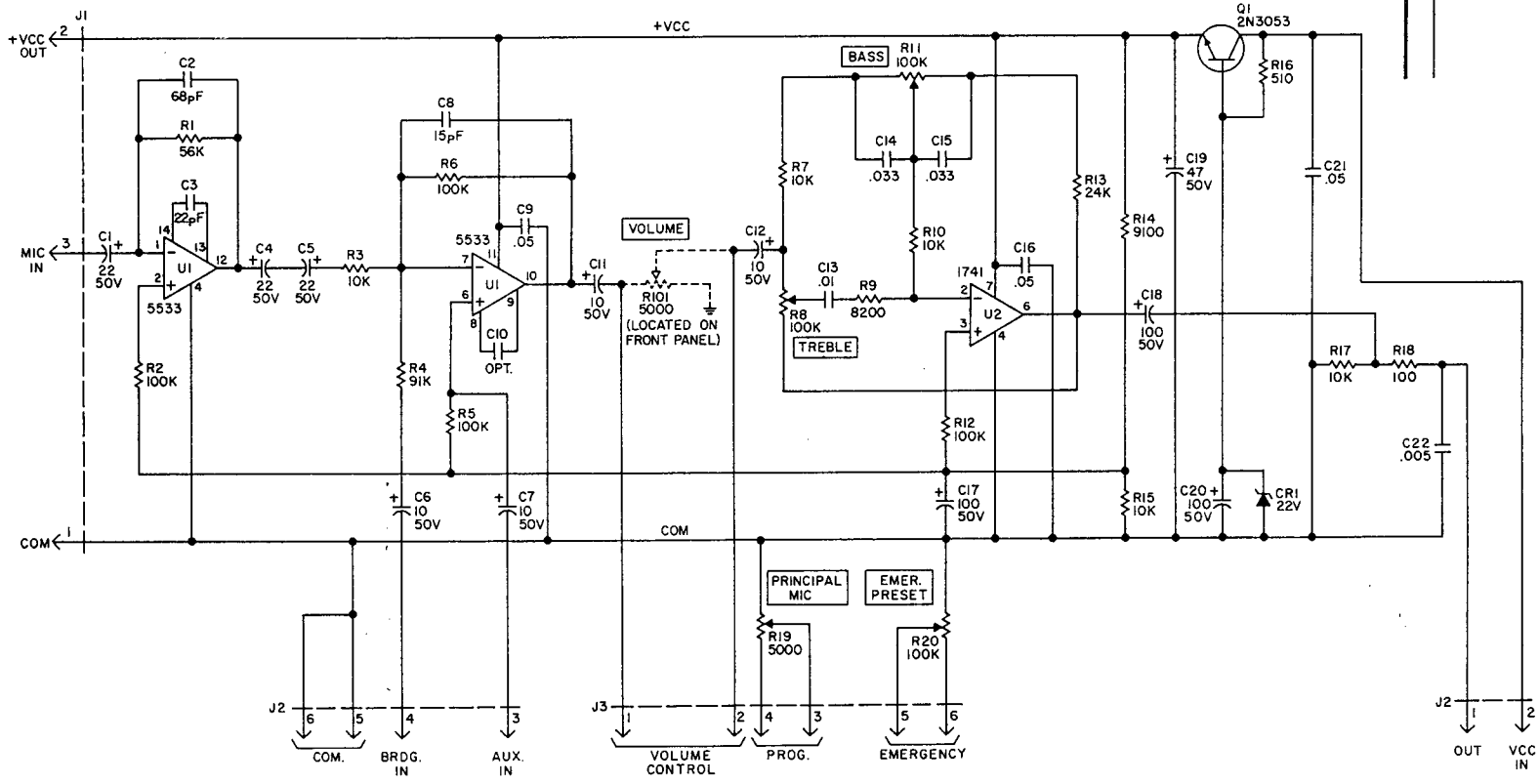
SCHEMATIC DIAGRAM
COMPACT COMM CONTROL PANEL
1A952

SCALE
DRAWN STRAN
APP'D [illegible]
CHECKED [illegible]
ENGR. [illegible]
DATE DRAWN 7/27/82
NO. 190-2673
ISS. 11
SHEET 1 OF 1

190-2673

190-2571

REVISIONS			
ISS.	DESCRIPTION	APP'D	DATE
01	R13 WAS 10K; EOB1402		11-16-83



DESIG.	LAST USED	NOT USED
CAP.	C22	
RES.	R20	
DIODE	CR1	
INT. CKT.	U2	
XSTR.	Q1	

NOTES:
UNLESS OTHERWISE SPECIFIED:
1. RESISTANCE VALUES IN OHMS, 1/4 WATT, ±5%.
CAPACITANCE VALUE IN MICROFARADS.

SYMBOLS:
1. ⟵ DENOTES MALE CONNECTOR.
2. [XXX] DENOTES PANEL MARKINGS.

MATERIAL _____ FINISH _____

REQ.	NEXT ASSY	USED ON
APPLICATION		

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES | FRACTIONS: ± | 2 PLACE DECIMAL: ± | 3 PLACE DECIMAL: ± | ANGLES: ±

DUKANE
ST. CHARLES, ILLINOIS 60174

SCHEMATIC DIAGRAM
AMP DRIVER
110-3016

SCALE #
DRAWN OP
CHECKED
APP'D
ENGR.

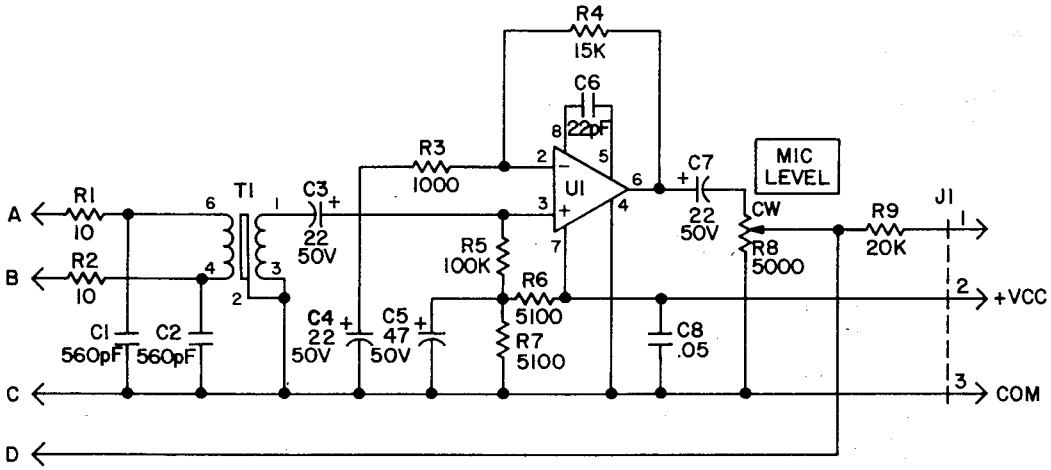
DATE DRAWN 6-15-82
NO. 190-2571 01
SHEET 1 OF 1 ISS.

Form No. 8833-8-73

6 MASTER

DESIG.	LAST USED	NOT USED
CAP.	C8	
RES.	R9	
INT. CKT.	U1	

REVISIONS			
ISS.	DESCRIPTION	APP'D	DATE
01	R4 WAS 24K; E0B1402	JEB	11-16-83



NOTES:

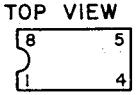
UNLESS OTHERWISE SPECIFIED:

1. RESISTORS ARE IN OHMS, 1/4W, ±5%, K=1000
2. CAPACITORS ARE IN MICROFARADS.

SYMBOLS:

1. ← DENOTES MALE CONNECTOR.
2. ☐ DENOTES PANEL MARKINGS.

TOP VIEW



U1, 408-36
NE5534AN

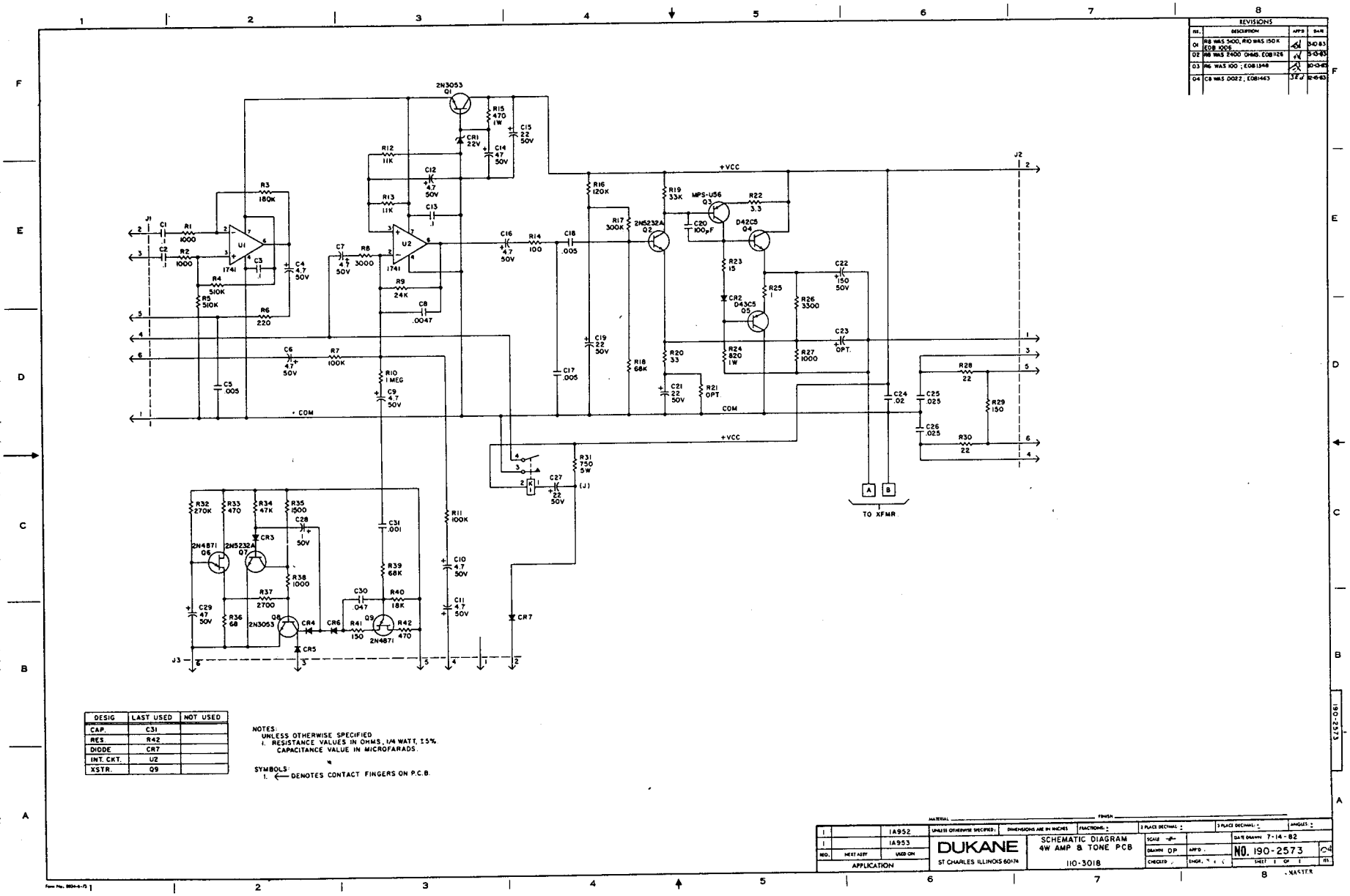
MATERIAL _____ FINISH _____

			UNLESS OTHERWISE SPECIFIED:	DIMENSIONS ARE IN INCHES	FRACTIONS: ±	2 PLACE DECIMAL: ±	3 PLACE DECIMAL: ±	ANGLES: ±
			DUKANE CORPORATION, ST. CHARLES, ILLINOIS U.S.A.	SCHEMATIC DIAGRAM SINGLE MIC MODULE 110-3017	SCALE ~		DATE DRAWN 6-11-82	
REQ.	NEXT ASSY	USED ON			DRAWN RBP	APP'D B.S.J.	NO. 190-2572	01
APPLICATION					CHECKED OP	ENGR. JEB	SHEET 1 OF 1	ISS.

Form No. 8832-C-73

MAJTEK

190-2572



DESIG	LAST USED	NOT USED
CAP.	C31	
RES	R42	
DIODE	CR7	
INT. CKT.	U2	
XSTR.	Q9	

NOTES:
UNLESS OTHERWISE SPECIFIED
1. RESISTANCE VALUES IN OHMS, 1/4 WATT, ±5%
CAPACITANCE VALUE IN MICROFARADS.

SYMBOLS:
1. ⟵ DENOTES CONTACT FINGERS ON P.C.B.

		1A952	
		1A953	
NEXT ASSY	USED ON		
APPLICATION			

DUKANE
ST CHARLES ILLINOIS 60174

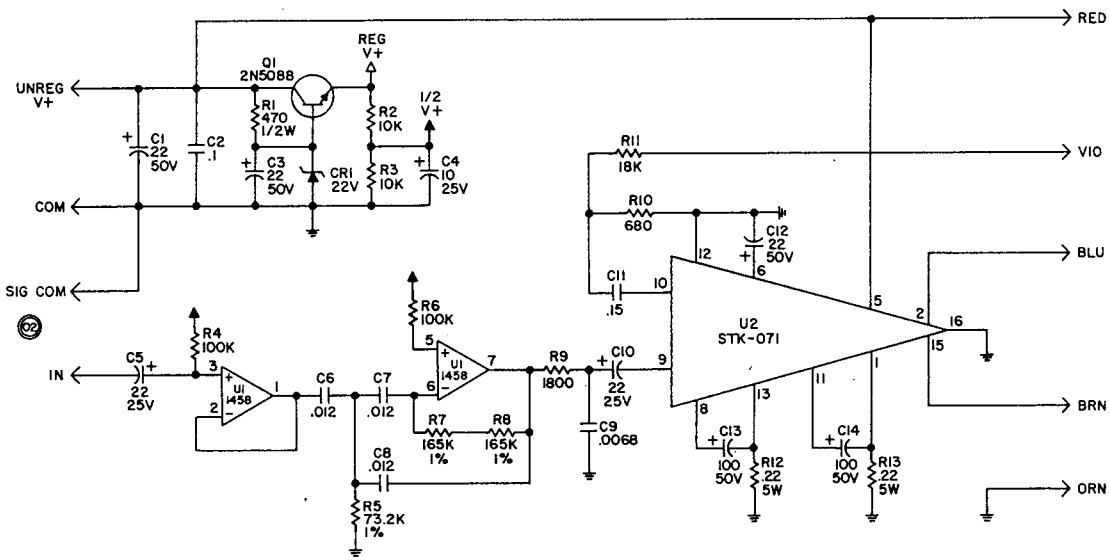
SCHEMATIC DIAGRAM
4W AMP & TONE PCB
110-3018

DRAWN DP | DATE 7-14-82
CHECKED | SCALE
NO. 190-2573
SHEET 1 OF 1

190-2576

REVISIONS

ISS.	DESCRIPTION	APP'D	DATE
01	R9 WAS 2400Ω. EOA 9943		2-1-83
02	ADDED SIGNAL COMMON; EOA9970		2-18-83



NOTES:
UNLESS OTHERWISE SPECIFIED:
1. RESISTORS ARE IN OHMS, 1/4W, ±5%.
CAPACITORS ARE IN MICROFARADS.

SYMBOLS:
1. ⟵ DENOTES SOLDER LUG.

DESIG	TYPE	REG V+	COM
U1	1458	8	4

DESIG	LAST USED	NOT USED
CAP	C14	
DIODE	CR1	
I.C.	U2	
RES	R13	
XSTR	Q1	

MATERIAL _____ FINISH _____

UNLESS OTHERWISE SPECIFIED: | DIMENSIONS ARE IN INCHES | FRACTIONS: ± | 2 PLACE DECIMAL: ± | 3 PLACE DECIMAL: ± | ANGLES: ±

REQ.	NEXT ASSY	USED ON
APPLICATION		

DUKANE
ST. CHARLES, ILLINOIS 60174

SCHEMATIC DIAGRAM
HYBRID AMPLIFIER
110-3021

SCALE ~ | DATE DRAWN 6-23-82
DRAWN RBP | APP'D
CHECKED OP | ENGR.
NO. 190-2576 02
SHEET 1 OF 1 ISS.

Form No. 8833-8-73

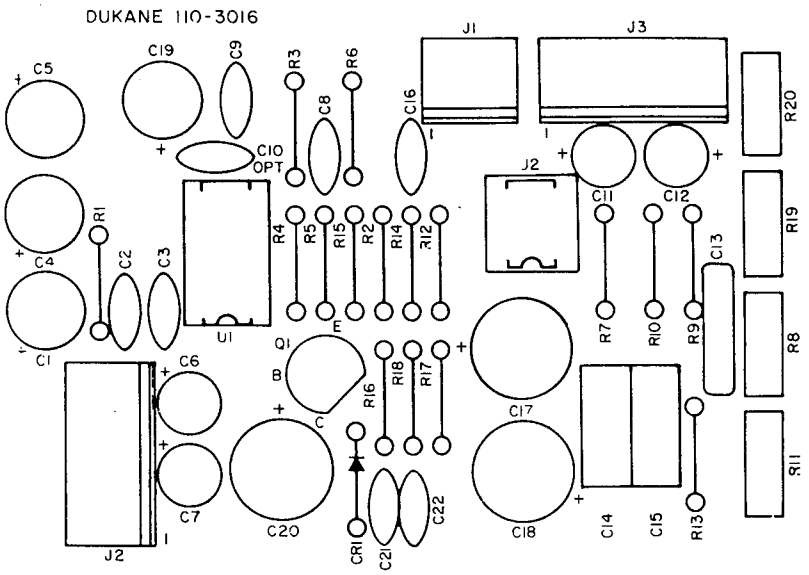


Figure 3-3 Parts Layout on 110-3016 Amplifier Driver Module

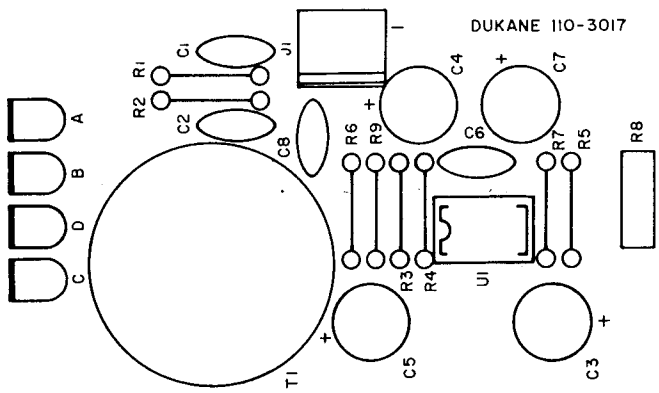


Figure 3-4 Parts Layout on 110-3017 Mic Module

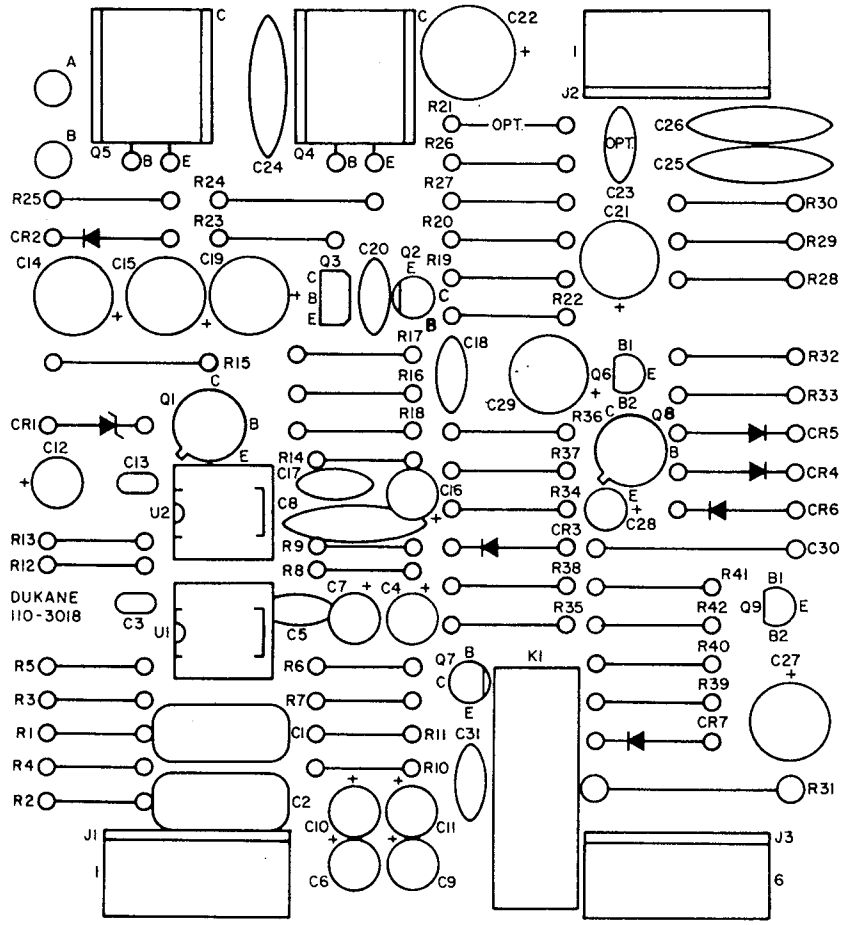


Figure 3-5 Parts Layout on 110-3018 4W Amp. & Tone Module

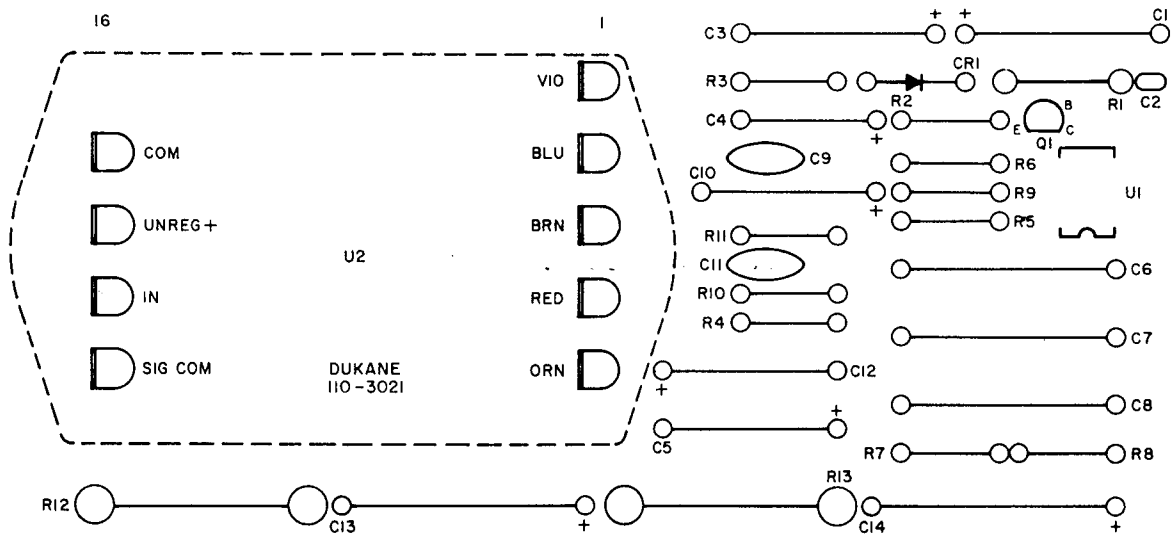


Figure 3-6 Parts Layout on 110-3021 Hybrid Amplifier Module

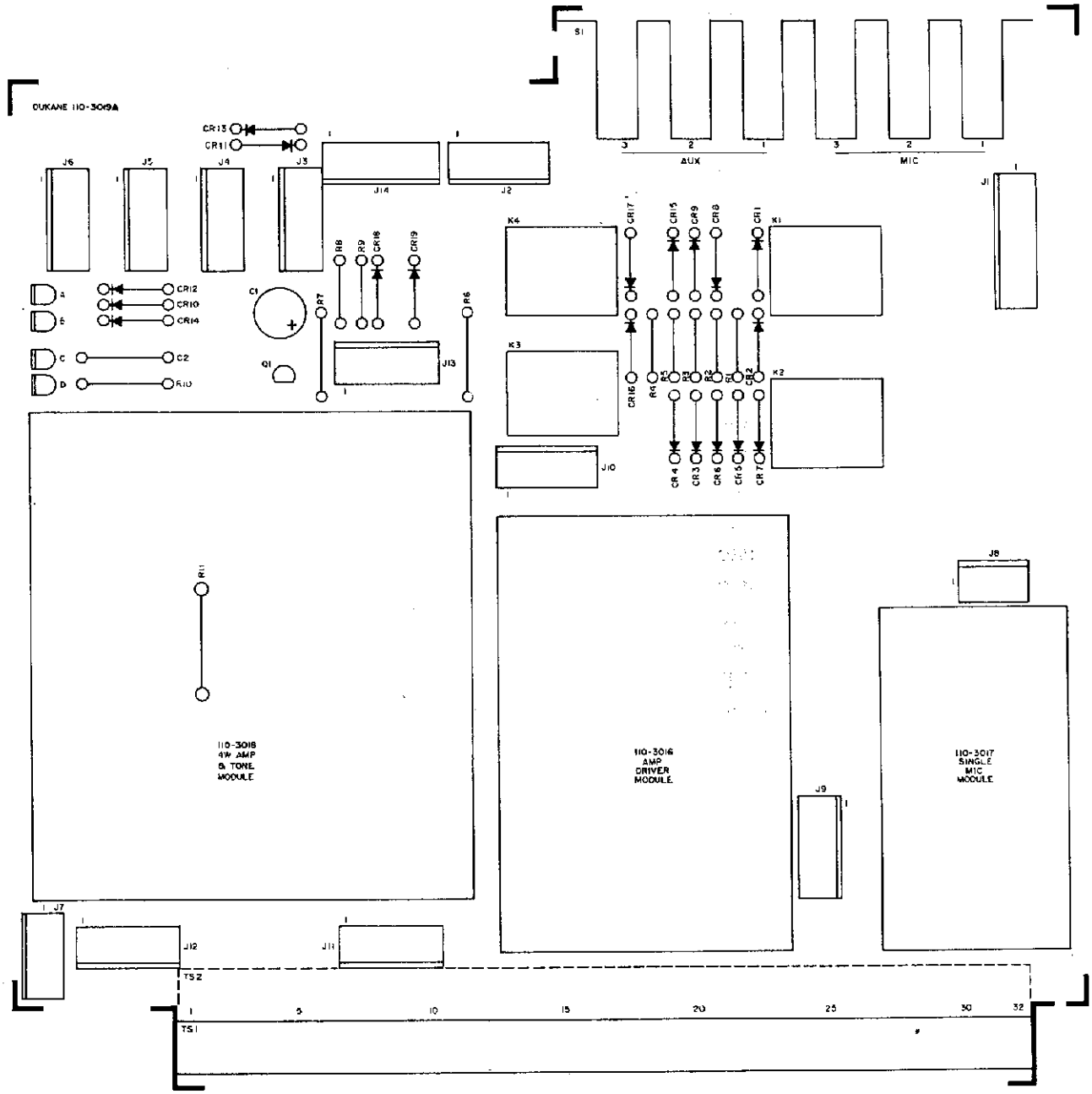


Figure 3-7 Parts Layout on 110-3019A Switch Connector Module

Legend	Description	Dukane Part Number
	– On 110-3016 Amp Driver Module –	
C1, 4, 5	Capacitor, 22 uF, electrolytic, 50V	199-2062-226
C2	Capacitor, 68 pF, ceramic disc, 1000V	199-1013-680
C3	Capacitor, 22 pF, ceramic disc	199-1013-220
C6, 7, 11, 12	Capacitor, 10 uF, electrolytic, 50V	199-2062-106
C8	Capacitor, 15 pF, ceramic disc	199-1009-150
C9, 16, 21	Capacitor, 0.05 uF, ceramic disc, 50V	199-1011-503
C10	Capacitor (optional – value, if provided, depends on circuit parameters)	– – – – –
C13	Capacitor, 0.01 uF, mylar, 100V	199-4043-103
C14, 15	Capacitor, 0.033 uF, mylar, 100V	199-4007-333
C17, 18, 20	Capacitor, 100 uF, electrolytic, 50V	199-2062-107
C19	Capacitor, 47 uF, electrolytic, 50V	199-2062-476
C22	Capacitor, 0.005 uF, ceramic disc	199-1012-502
R1	Resistor, 56k ohm, 5%, 1/4W	600-0039-563
R2, 5, 6, 12	Resistor, 100k ohm, 5%, 1/4W	600-0039-104
R3, 7, 10, 15, 17	Resistor, 10k ohm, 5%, 1/4W	600-0039-103
R4	Resistor, 91k ohm, 5%, 1/4W	600-0039-913
R8, 11, 20	Potentiometer, 100k ohm, pcb vert (TREBLE, BASS, EMERG PRESET)	601-1003-104
R9	Resistor, 8200 ohm, 5%, 1/4W	600-0039-822
R13	Resistor, 24k ohm, 5%, 1/4W	600-0039-243
R14	Resistor, 9100 ohm, 5%, 1/4W	600-0039-912
R16	Resistor, 510 ohm, 5%, 1/4W	600-0039-511
R18	Resistor, 100 ohm, 5%, 1/4W	600-0039-101
R19	Potentiometer, 5000 ohm, pcb vert (PRINCIPAL MIC)	601-1003-502
CR1	Diode, zener, 22.0V	230-19-00022
Q1	Transistor, 2N3053	720-37
U1	Integrated Circuit, NE5533AN	408-62
U2	Integrated Circuit, MC1741SCPI	408-18
	– On 110-3017 Single Mic Module –	
C1, 2	Capacitor, 560 pF, ceramic disc	199-1014-561
C3, 4, 7	Capacitor, 22 uF, electrolytic, 50 WVDC	199-2062-226
C5	Capacitor, 47 uF, electrolytic, 50 WVDC	199-2062-476
C6	Capacitor, 22 pF, ceramic disc	199-1013-220
C8	Capacitor, 0.05 uF, ceramic disc, 50 WVDC	199-1011-503
R1, 2	Resistor, 10 ohm, 5%, 1/4W	600-0039-100
R3	Resistor, 1000 ohm, 5%, 1/4W	600-0039-102

Legend	Description	Dukane Part Number
	– On 110-3017 Single Mic Module (Cont'd.) –	
R4	Resistor, 15k ohm, 5%, 1/4W	600-0039-153
R5	Resistor, 100k ohm, 5%, 1/4W	600-0039-104
R6, 7	Resistor, 5100 ohm, 5%, 1/4W	600-0039-512
R8	Potentiometer, 5000 ohm, pcb vert (MIC LEVEL)	601-1003-502
R9	Resistor, 20k ohm, 5%, 1/4W	600-0039-203
T1	Transformer, Input	710-60
U1	Integrated Circuit, NE5534AN	408-36
	– On 110-3018 4W Amp and Tone PCB –	
C1, 2	Capacitor, 0.1 uF, PS film, 200 WVDC	199-4046-104
C3, 13	Capacitor, 0.1 uF, ceramic disc, 500 WVDC	199-9327
C4, 6, 7, 9, 10, 11, 12, 16	Capacitor, 4.7 uF, electrolytic, 50 WVDC	199-2062-475
C5, 17, 18	Capacitor, 0.005 uF, ceramic disc	199-1012-502
C8	Capacitor, 0.0047 uF, ceramic disc	199-1006-472
C14, 29	Capacitor, 47 uF, electrolytic, 50 WVDC	199-2062-476
C15, 19, 21, 27	Capacitor, 22 uF, electrolytic, 50 WVDC	199-2062-226
C20	Capacitor, 100 pF, ceramic disc	199-1009-101
C22	Capacitor, 150 uF, electrolytic, 50 WVDC	199-2062-157
C23	Capacitor (optional – value, if provided, depends on circuit parameters)	– – – – –
C24	Capacitor, 0.02 uF, ceramic disc	199-1012-203
C25, 26	Capacitor, 0.025 uF, ceramic disc	199-1012-253
C28	Capacitor, 1 uF, electrolytic, 50 WVDC	199-2062-105
C30	Capacitor, 0.047 uF, mylar, 100 WVDC	199-4007-473
C31	Capacitor, 0.001 uF, ceramic disc	199-1012-102
R1, 2	Resistor, 1000 ohm, 5%, 1/4W	600-0039-102
R3	Resistor, 180k ohm, 5%, 1/4W	600-0039-184
R4, 5	Resistor, 510k ohm, 5%, 1/4W	600-0039-514
R6	Resistor, 220 ohm, 5%, 1/4W	600-0039-221
R7, 11	Resistor, 100k ohm, 5%, 1/4W	600-0039-104
R8	Resistor, 3000 ohm, 5%, 1/4W	600-0039-302
R9	Resistor, 24k ohm, 5%, 1/4W	600-0039-243
R10	Resistor, 1 Megohm, 5%, 1/4W	600-0039-105
R12, 13	Resistor, 11k ohm, 5%, 1/4W	600-0039-113
R14	Resistor, 100 ohm, 5%, 1/4W	600-0039-101
R15	Resistor, 470 ohm, 5%, 1W	600-0110-471
R16	Resistor, 120k ohm, 5%, 1/2W	600-0073-124
R17	Resistor, 300k ohm, 5%, 1/2W	600-0073-304
R18, 39	Resistor, 68k ohm, 5%, 1/2W	600-0073-683
R19	Resistor, 33k ohm, 5%, 1/2W	600-0073-333
R20	Resistor, 33 ohm, 5%, 1/2W	600-0073-330
R21	Resistor (optional – value, if provided, depends on circuit parameters)	– – – – –
R22	Resistor, 3.3 ohm, 5%, 1/2W	600-0073-3R3
R23	Resistor, 15 ohm, 5%, 1/2W	600-0073-150

Legend	Description	Dukane Part Number
	– On 110-3018 4W Amp & Tone PCB (Cont'd.) –	
R24	Resistor, 820 ohm, 5%, 1W	600-0110-821
R25	Resistor, 1.0 ohm, 5%, 1/2W	600-0073-1R0
R26	Resistor, 3300 ohm, 5%, 1/2W	600-0073-332
R27, 38	Resistor, 1000 ohm, 5%, 1/2W	600-0073-102
R28, 30	Resistor, 22 ohm, 5%, 1/2W	600-0073-220
R29, 41	Resistor, 150 ohm, 5%, 1/2W	600-0073-151
R31	Resistor, 750 ohm, 10%, 5W, WW*	600-1007-751
R32	Resistor, 270k ohm, 5%, 1/2W	600-0073-274
R33, 42	Resistor, 470 ohm, 5%, 1/2W	600-0073-471
R34	Resistor, 47k ohm, 5%, 1/2W	600-0073-473
R35	Resistor, 1500 ohm, 5%, 1/2W	600-0073-152
R36	Resistor, 68 ohm, 5%, 1/2W	600-0073-680
R37	Resistor, 2700 ohm, 5%, 1/2W	600-0073-272
R40	Resistor, 18k ohm, 5%, 1/2W	600-0073-183
CR1	Diode, zener, 22.0V	230-19-00022
CR2, 3, 4, 5, 6, 7	Rectifier, silicon	595-44
K1	Relay, PCB mtg. reed type	596-188
Q1, 8	Transistor, 2N3053	720-37
Q2, 7	Transistor, 2N5232A	720-30
Q3	Transistor, MPS-U56	720-58
Q4	Transistor, D42C5	720-61
Q5	Transistor, D43C5	720-62
Q6, 9	Transistor, unijunction, 2N4871	720-70
U1, 2	Integrated Circuit, 1741	408-18
	– On 110-3019A Switch Connector PCB –	
C1	Capacitor, 100 uF, electrolytic, 50 WVDC	199-2062-107
C2	Capacitor, 0.068 uF, mylar, 100 WVDC	199-4007-683
CR1-10, 12-17	Rectifier, silicon	595-44
CR11	Rectifier, silicon (optional)	595-44
CR18, 19	Rectifier	595-67
R1, 2, 3	Resistor, 47k ohm, 5%, 1/2W	600-0073-473
R4	Resistor, 510 ohm, 5%, 1/2W	600-0073-511
R5	Resistor, 1500 ohm, 5%, 1/2W	600-0073-152
R6, 7	Resistor, 470 ohm, 5%, 1W	600-0110-471
R8	Resistor, 470 ohm, 5%, 1/2W	600-0073-471
R9	Resistor, 680 ohm, 5%, 1/2W	600-0073-681
R10	Resistor, 680 ohm, 5%, 1W	600-0110-681
R11	Resistor, 3 ohm, 5%, 5W (1A953 only)	600-1050-3R0
R11, 12	Resistor, 470 ohm, 5%, 1/4W (1A952 only)	600-0039-471
R14, 15	Resistor, 470 ohm, 5%, 1/4W (1A953 only)	600-0039-471
K1-K4	Relay, 4PDT, 24Vdc	596-126
S1	Switch, 4PDT, 6-gang w/lamps (MIC 1, 2, 3, AUX 1, 2, 3)	680-788
– – –	Lamp, 24V (Replacements for S1)	456-173
Q1	Transistor, MPS-6566	720-47

* WW - Wire Wound

Legend	Description	Dukane Part Number
	– Chassis and Front Panel Mounted –	
R13	Resistor, 56 ohm, 5%, 1/4W (1A952 only)	600-0039-560
R14	Resistor, 100 ohm, 5%, 1/4W (1A952 only)	600-0039-101
R15	Resistor, 3300 ohm, 5%, 1/4W (1A952 only)	600-0039-332
R16	Resistor, 56 ohm, 5%, 1/4W (1A953 only)	600-0039-560
R17	Resistor, 100 ohm, 5%, 1/4W (1A953 only)	600-0039-101
R18	Resistor, 3300 ohm, 5%, 1/4W (1A953 only)	600-0039-332
C3, 5	Capacitor, 47 uF, electrolytic, 25 WVDC (1A952 only)	199-2063-476
C4	Capacitor, 0.68 uF, ceramic (1A952 only)	199-1008-684
C5	Capacitor, 0.68 uF, ceramic (1A953 only)	199-1008-684
C6, 7	Capacitor, 47 uF. electrolytic, 25 WVDC (1A953 only)	199-2063-476
R101, 103	Potentiometer, 5k ohm, log taper (ADJUST LEVEL, IC LEVEL)	601-400
R102	Potentiometer, 600 ohm, log taper (MONITOR PROGRAM)	601-401
R104	Resistor, 22k ohm, 5%, 1/4W	600-0039-223
R105	Resistor, 5100 ohm, 5%, 1/4W	600-0039-512
R106	Resistor, 220 ohm, 5%, 1/4W	600-0039-221
CR20, 21	Rectifier, silicon	595-44
S101	Switch, momentary, 4P w/lamp (TONE TO ROOM)	680-789
S102	Switch, lock, 4P w/lamp (PREMONITOR)	680-790
S103	Switch, 6P, 2-gang, w/lamps (IC – lock), (T/L – momentary)	680-792
S104	Switch, 6P, 2-gang, w/lamps (ALL CALL – lock), (EMERGENCY – momentary)	680-791
– – –	Lamp, 24V (Replacements for S101-S104)	456-173
T101	Transformer, audio	710-2169
LS101	Speaker, 3 inch, 35 ohm	645-88
M101	Meter, VU	485-2014
MK101	Microphone	490-77
BZ101	Buzzer, Sonalert	175-18
	– Miscellaneous –	
	Inductor, sleeve bead	393-29
	Switch knob (ADJUST LEVEL), (MONITOR PROGRAM)	440-311
	Switch knob (IC LEVEL)	440-338
	Knob button, white (2)	440-330-0002
	Knob button, red (1)	440-330-0005
	Knob button, green (9)	440-330-0006

Legend	Description	Dukane Part Number
	– NOTE –	
	The remaining parts in this parts list apply to 1A953 units only.	
	– On 110-3021 Hybrid Amp –	
C1, 3	Capacitor, 22 uF, electrolytic, 50V	199-2065-226
C2	Capacitor, 0.1 uF, disc, 50V	199-9327
C4	Capacitor, 10 uF, electrolytic, 25V	199-2066-106
C5, 10, 12	Capacitor, 22 uF, electrolytic, 25V	199-2066-226
C6, 7, 8	Capacitor, 0.012 uF, mylar, 63V, 2.5%	199-4004-123
C9	Capacitor, 0.0068 uF, disc, 50V	199-1017-682
C11	Capacitor, 0.15 uF, disc, 25V	199-1008-154
C13, 14	Capacitor, 100 uF, electrolytic, 50V	199-2065-107
R1	Resistor, 470 ohm, 5%, 1/2W	600-0073-471
R2, 3	Resistor, 10k ohm, 5%, 1/4W	600-0039-103
R4, 6	Resistor, 100k ohm, 5%, 1/4W	600-0039-104
R5	Resistor, 73.2k ohm, ± 1%, 1/4W	600-2006-371
R7, 8	Resistor, 165k ohm, ± 1%, 1/4W	600-2006-405
R9	Resistor, 1800 ohm, 5%, 1/4W	600-0039-182
R10	Resistor, 680 ohm, 5%, 1/4W	600-0039-681
R11	Resistor, 18k ohm, 5%, 1/4W	600-0039-183
R12, 13	Resistor, 0.22 ohm, ± 10%, 5W	600-1007-R22
Q1	Transistor, 2N5088	720-49
U1	Integrated Circuit, MC1458	408-31
U2	Integrated Circuit, STK071	408-76
CR1	Diode, zener, 22V	230-19-00022
– – –	Thermostat	702-1
	– On 110-3028 Fuse Connector PCB –	
K1	Relay, 2 form C, 5A, 115Vac	596-243
	– On 321-42 Fuse Assembly –	
F1	Fuse, 2A, 250V, Slo-Blo	320-010-0200
	– Chassis Mounted –	
C101, 102	Capacitor, 6800 uF, 35V, solder lug	199-2067-688
CR101, 102	Rectifier, silicon	595-71
T102	Transformer, power	710-4285
T103	Transformer, audio, 60W	710-2168
F101	Fuse, 5A, 250V	320-835-0500
	– Mounted on TS3 Terminal Strip –	
C3	Capacitor, 0.1 uF, ceramic disc, 50 WVDC	199-9327
C4	Capacitor, 0.03 uF, ceramic disc, 100 WVDC	199-1012-303
R12	Resistor, 33 ohm, 2W, 10%	600-1002-330
R13	Resistor, 150 ohm, 2W, 10%	600-1002-151
– – –	External diode (see Section 3.2.1)	595-44
– – –	External diode – optional (see Section 3.2.2)	595-44