ERICSSON

Mobile Communications

MDX Desk Top Station

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Maintenance Manual

ERICSSON
Ericsson GE Mobile Communications Inc.
Mountain View Road • Lynchburg, Virginia 24502

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LBI-38978

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SYSTEM SPECIFICATIONS

FREQUENCY RANGE	Refer to the applicable MDX Mobile Radio Maintenance Manual.
INPUT VOLTAGE	90-130 VAC @ 50/60 Hz 180-260 VAC @ 50/60 Hz (Standby Battery 13.8 VDC nominal)
AC INPUT POWER Transmit Receive	500 watts @ 4 amperes (maximum) 300 watts @ 2.4 amperes (maximum) 70 watts @ 1.8 amperes (maximum)
POWER OUTPUT RATINGS	Refer to the applicable MDX Mobile Radio Maintenance Manual.
DUTY CYCLE (EIA)	Receiver 100%, Transmitter 20%
TEMPERATURE RANGE	-30°C to +60°C (-22°F to +140°F) (Performance specified per EIA)
SPEAKER	4 ohms
DIMENSIONS (HxWxD)	14x50x43 cm (5.5x20x17 inches)
WEIGHT	20 kg (44 lb)

* For detailed transmitter and receiver specifications, refer to the appropriate mobile maintenance manual.

PACKAGE NUMBERS

Package Number	Includes	Description
DSMX01		MDX Local Control
	DSNN1F0	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5U	Local Control Panel
	AP5C	Application Assembly
DSMX02		MDX Local Control with Keypad
	DSNN1F0	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5V	Local Control Panel with Keypad
	KP1V	Keypad/Frequency Select Board
	AP5D	Application Assembly
DSMX03		MDX Local/DC Remote Control
	DSNN1F0	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5X	Remote Control Panel
	CY1F	DC Remote Board
	CY1P	Remote Interface Board
	AP5E	Application Assembly
DSMX04		MDX Local/DC Remote Control with Keypad
	DSNN1F0	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label

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PACKAGE NUMBERS (Cont')

Package Number	Includes	Description
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5Y	Remote Control Panel with Keypad
	CY1F	DC Remote Board
	CY1P	Remote Interface Board
	KP1V	Keypad/Frequency Select Board
	AP5F	Application Assembly
DSMX05		MDX Local/Tone Remote Control
	DSNN1F0	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5X	Remote Control Panel
	CY1H	Tone Remote Board
	CY1P	Remote Interface Board
	AP5G	Application Assembly
DSMX06		MDX Local/Tone Remote Control with Keypad
	DSNN1F0	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5Y	Remote Control Panel with Keypad
	CY1H	Tone Remote Board
	CY1P	Remote Interface Board
	KP1V	Keypad/Frequency Select Board
DSMX07		MDX EDACS Local/Remote Control
	DSNN1F0	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5Y	Remote Control Panel with Keypad
	KP1V	Keypad/Frequency Select Board
	CY1J	EDACS Remote Board
	CY1P	Remote Interface Board
	CP5Y	Remote Control Panel with Keypad
DSMX08		MDX Local Control with Clock
	DSNN1F0	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5W	Local Control Panel with Clock
DSMX09		MDX Local/DC Remote Control with Clock
	DSNN1F0	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5Z	Remote Control Panel with Clock
	CY1F	DC Remote Board
	CY1P	Remote Interface Board
	AP5J	Application Assembly
DSMX10		MDX Local/Tone Remote Control with Clock
	DSNN1FO	Combination Number
	FC1D	MDX Station Equipment
	LA1T	EGE Label
	PS3L	13A, 120 VAC Power Supply
	CE9G	MDX DC Power Cable
	CP5Z	Remote Control Panel with Clock

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PACKAGE NUMBERS (Cont')

Package Number	Includes	Description
	CY1H	Tone Remote Board
	CY1P	Remote Interface Board
	KP1V	Keypad/Frequency Select Board
	AP5K	Application Assembly
	DSSU3H	Standby Power Transfer Kit (Field Install)
	DSZM1K	External Weatherproof Speaker and Cord Set (Delta Style)
	DSTSCP	PC Programming Option
	DSRB1L	Radio Data Interface Option

APPLICABLE MAINTENANCE MANUALS

Installation Instruction	LBI-38977
Operator's Manual	LBI-38976
DC Remote Board (Option DSCY1F)	LBI-31549
Tone Remote Board (Options DSCY1G/H)	LBI-31552
Tone Remote Board (Option DSCY1J)	LBI-38119

DESCRIPTION

The MDX Desk Top Station is an all solid state station for local/remote control operation. The most advanced manufacturing techniques are used to provide the highest quality and reliability.

The station is available in all frequency bands and power levels available in the MDX Mobile radio family.

MECHANICAL PACKAGE

The station is housed in an attractively styled Desk Top cabinet and operates over a wide range of AC power sources. The basic station consists of a Control Panel, a 13-ampere power supply, and an MDX mobile radio unit. The Desk Top Station operates from 120 or 240 VAC sources at 50/60 Hz. Input power variations of ±20% are tolerated (see Figures 1 and 2). The basic Desk Top Station package combination is equipped with:

- AC Power Supply (120/240 VAC, 50/60 Hz)
- Interconnect Board
- DC/Tone Remote Interface Board combination, with 1 of 3 types of Remote Board:
  1. DC Remote Board (19A704686P3)
  2. Tone Remote Board, 4-Channel (19A704686P6)
  3. EDACS Tone Remote Board, 5-Channel (19A704686P8)
- Speaker, 3.5 inches for improved radio audio quality
- Slow speed, low noise, 12 VDC fan

The transmitter power output of the Desk Top Station is the same as the selected mobile radio. The station meets all applicable radio EIA standards.

Interconnect Board

The Interconnect Board interconnects the radio in the Desk Top Station with the controls and options. When the radio and options are connected, the following functions are controllable:

- Receiver Muting (RX Mute)
- Audio Switching
- Local and Remote Keying
- Channel Guard Monitor
- Volume Adjustment
- Frequency Selection
- Intercom
- Remote ON/OFF Control
- Voltage Regulator and Power Supply choice

The Interconnect Board is provided with jacks for connection to:

- Radio
- Control Panel
- Power Supply
- Remote Interface Board (Option)
- Keypad/Frequency Select Board (Option)
- Station Speaker
- Station Fan
- Desk Top Microphone
- Clock/VU Module (Option)

A single transistor (Q201) is used to reduce the 13.8 VDC power supply voltage to a suitable voltage to power the station fan. Except for this transistor, the only other circuitry on the Interconnect Board consists of jack interconnections.

DC Tone Remote Interface Board (Optional)

The optional Remote Interface Board is used to interface the radio with other remote boards as follows:

DC Remote Board 19A704686P3

Tone Remote Board 19A704686P6 (4-Channel)

EDACS Tone Remote Board 19A704686P8 (5-Channel)

The DC or Tone Remote boards allow use of the Ericsson GE RCN-1000 Remote Control Consoles with the Desk Top Station. There is a choice of 2-wire or 4-wire interface to the consoles for transmit, receive, and intercom audio.

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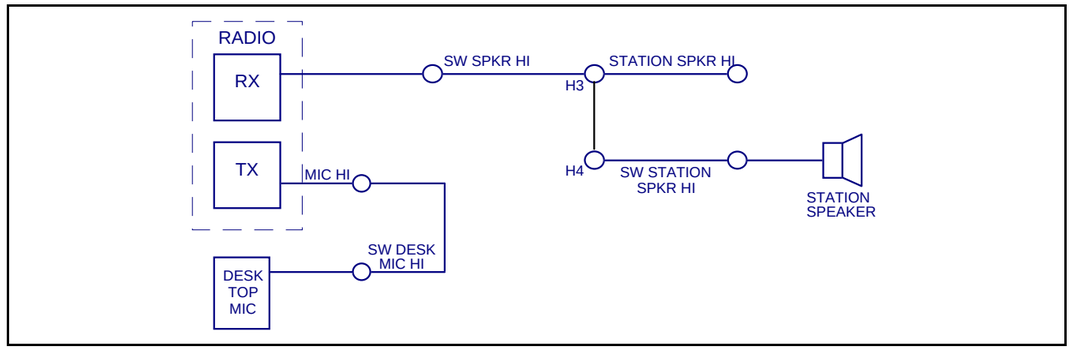

Figure 1 - Interconnect Board without Remote Interface Board Audio Connections

The intercom allows communication between the Desk Top Station and the Remote Control Consoles without keying the transmitter. All intercom or transmit conversations from the Remote Consoles are heard on the station speaker. The Remote Consoles can be set to also hear all intercom and radio transmit conversations from the Desk Top Station. Intercom messages from the Remote Consoles are muted when the station is receiving radio messages or is being used as a radio transmitter. Transmitting from the Desk Top Station overrides a radio transmission from the Remote Consoles.

Desk Top Station Audio Switching

The audio connections made with the Interconnect Board, with no Remote Interface Board, are shown in Figure 1. The processed audio output of the radio comes from the power amplifier and is connected to the station speaker through the SW SPKR HI and SW STATION SPKR HI lines. The Desk Top microphone is connected to the radio microphone input through the SW DESK MIC HI and MIC HI lines.

All of the station audio paths are controlled by bilateral switches. When the control input is low, the switch is turned off. When the control input goes high, the switch is turned on to input audio to the selected circuit. The function of each audio switch is described, showing the operation of the system with a Remote Interface Board.

Figure 2 shows the audio paths when using the Remote Interface Board.

U304-1 Normally muted, passes audio from the Desk Top microphone and Intercom Mic Level potentiometer to the Remote Console speaker. Passes audio when:

1. Desk Top Mic PTT **AND** REMOTE Sw ON

   OR

2. INTERCOM Sw ON **AND** Desk Mic PTT **AND** (REMOTE Sw OFF **OR** RX Muted)

U304-2 Connects the audio from the Desk Top microphone to the **MIC HI** input to the radio transmitter. Passes audio when:

Desk Top Mic PTT **AND** INTERCOM Sw OFF

U304-3 Normally muted, connects the audio from the Remote Console microphone line to the **MIC HI** input to the radio. Passes audio when:

Remote PTT **AND** no Desk Top Mic PTT

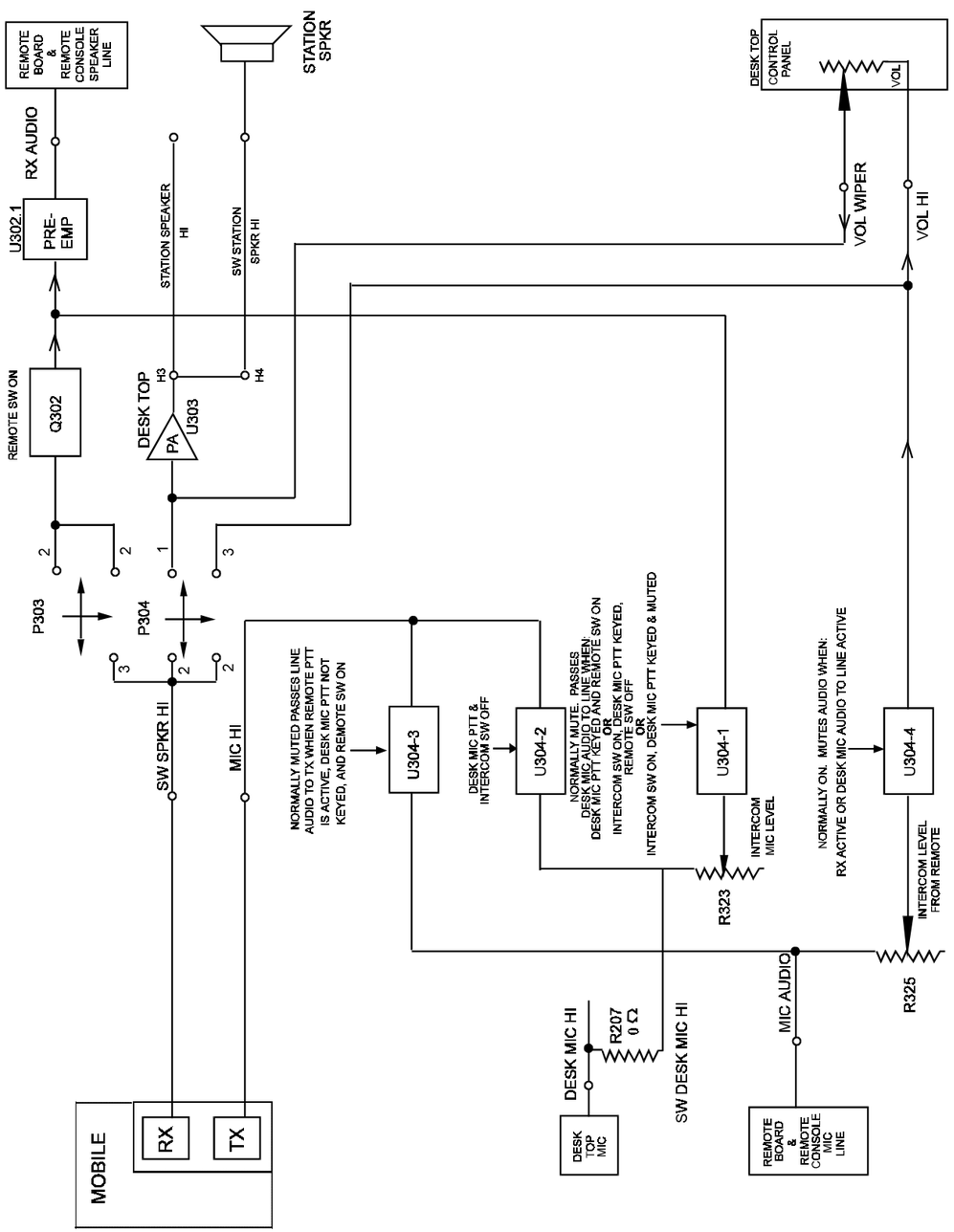

Figure 2 - Interconnect Board with Remote Interface Board

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U304-4 Normally unmuted, connects the audio from the Remote Console microphone line, through the VOLUME potentiometer on the Desk Top Control Panel, to the station speaker. Mutes audio when:

1. RX active

OR

2. Desk Top Mic to Remote Speaker audio line active

Q302 An FET (Field Effect Transistor) switch, which for an MTD or TMX radio, passes processed audio from the radio audio PA through the **SW SPKR HI** line to the Remote Board with line to Remote Console Speaker. For this condition, the plugs P303 and P304 must be set for a 2-3 connection. The conditions for transmission are:

RX active **AND** REMOTE Sw ON

The pre-emphasis circuit following Q302 on the Interface Board is for canceling a de-emphasis circuit in the audio circuit of the Remote Board.

Keypad/Frequency Select Board (Optional)

The Keypad/Frequency Select Board interfaces with a 12-key keypad (344A3366P1) to serial data lines used for communications with the radio. Also, the board handles the protocol to use the 5 frequency select lines from the EDACS Tone Remote Board (19A704686P8) and converts these lines to serial data to the radio.

Four connectors provide all the external connections. The board plugs into the Desk Top Station Interconnect Board (EGE drawing 19D904448) on P207 and P208 and is held on by these connectors. No mounting screws are needed. A cable from the keypad plugs into J401 and a cable from the Tone Remote Board plugs into J402.

PC Programming Notes for Desk Top Station Operation

1. From the "Radio Personality" screen, enter the "Mobile Radio Options" screen (F7). Program the "Hook switch to NORMAL." This will allow the station to disable group SCAN when the MONITOR button is engaged on the Desk Top microphone. Program the initial volume level to 7.
2. From the "Mobile Radio Options" screen, enter the "Desk Top Options" screen (F6). Program the desired system and group combinations. Note that exact system/group/special call definitions are not required. For instance, if the system field is left blank and only group selections are programmed, the radio will select the defined group on the currently selected system when the remote selects a function. Select "Fixed Volume" = "Yes" to disable the radio volume ramp control so that only the rotary volume control will set the volume.
3. Individual call ID range limits for the keypad are defined in the special call set. From the "Radio Personality" screen, "Detail" (F1) the special call set and then select "Option" (F7) to define the allowed ID range.
4. With 344A3758G2 a later software in the 344A3383P1 board, the station AC power supply must be cycled off and on after programming.

OPERATION

INTRODUCTION

The front panel of the Desk Top Station, as shown in Figure 1, includes the front of an MDX mobile radio, as well as a Control Panel. The station is assembled as a standard station with or without one of the combinations of options. The Control Panel is illustrated for each combination.

1. **Standard Desk Top Station, without Options** - The standard station has only a single red LED to indicate when the power supply is ON (see Figure 4).

   The power supply ON/OFF switch is mounted on the rear of the station housing.

2. **Standard Station with Remote Option** - In addition to the LED POWER indicator, there is a REMOTE ON/OFF switch, an INTERCOM ON/OFF switch, and a VOLUME control switch (see Figure 5).

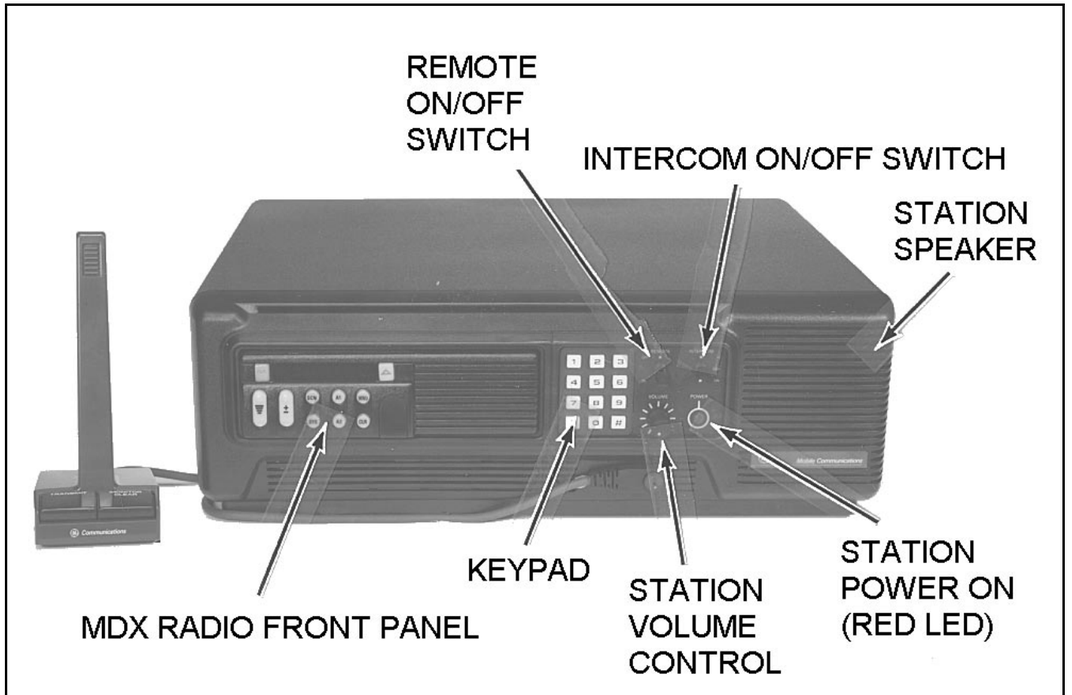

Figure 3 - Base Station Controls and Indicators

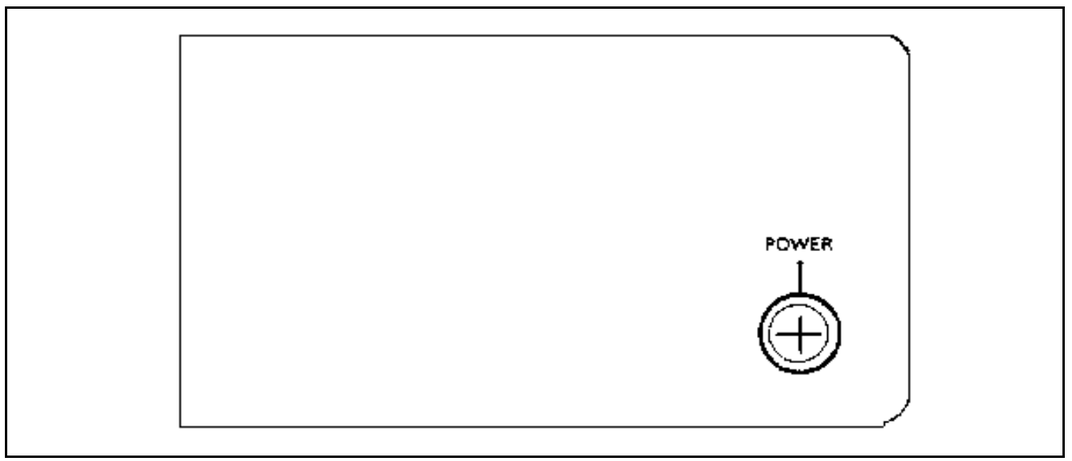

Figure 4 - Control Panel with Single LED Power Indicator

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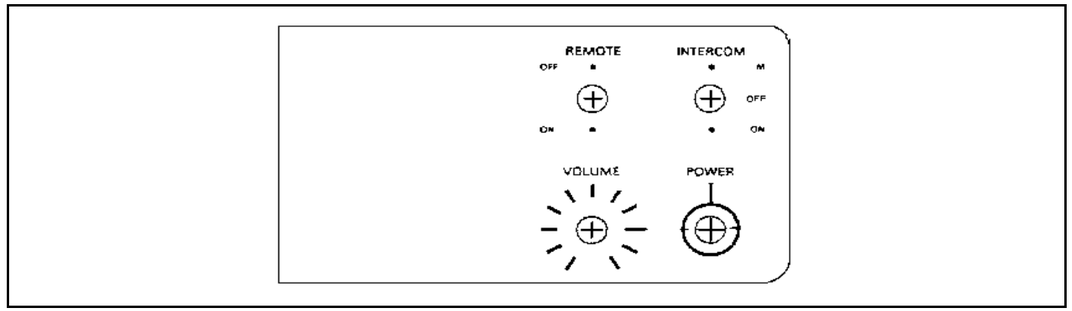

Figure 5 - Control Panel with Remote Option

OPERATION OF THE STANDARD STATION WITHOUT OPTIONS

Operation of the standard station without any option begins with turning ON the POWER switch. The POWER switch is located on the rear of the power supply, accessible at the rear of the Desk Top Station housing. The POWER indicator lights, showing that the power supply is ON. The radio is NOT on yet. The Power Supply provides power to the station cooling fan. The fan is ON when the POWER switch is ON. The radio has its own ON/OFF POWER switch.

The radio uses the Station Speaker mounted behind the front cap of the station. The radio's internal speaker is not used.

Further operation of the station is that of the MDX Mobile radio. Refer to the applicable Operator's Manual for more detailed information.

STATION WITH REMOTE OPTION

The DC/Tone Remote Options permit use of RCN-1000 Remote Control Consoles with the Desk Top Station. Any of these options require that the station have a DC or Tone Remote Board with a Remote Interface Board. These options provide for a two- or four-wire interface to the consoles for the following functions:

- Transmit, Receive, and Intercom Audio,
- Transmit Keying (PTT) Control, and
- Channel Guard Monitor.

OPERATION OF THE STATION WITH REMOTE OPTION

Operation of the Desk Top Station is described for four combinations of the INTERCOM switch and the REMOTE switch positions. These two switches control the various audio paths between remote and local microphones, the radio, and remote and local speakers.

1. **Desk Top INTERCOM Switch ON, REMOTE Switch ON**

With this switch arrangement, intercom communication is possible between the Desk Top Station and the Remote Console. Also, the Remote Console can key the radio transmitter and hear the receiver's audio output.

When the Desk Top Mic PTT is keyed, there is no connection to the radio transmitter. If the radio receiver is squelched, the speaker at the Remote Console hears the audio as an intercom conversation. Should the radio receiver be unsquelched, receiver audio is heard on both the Desk Top speaker and the Remote Console speaker, with priority over the intercom message from the Desk Top Mic to the Remote speaker.

The audio from the microphone at the Remote Console is heard on the Desk Top Station speaker. The Remote Console's INTERCOM switch must be OFF to key the station's radio transmitter.

The audio from the unsquelched radio receiver is heard on both the station speaker and The Remote Console speaker. Intercom messages from the Remote Consoles are muted when radio messages are being received, or when the Desk Top Station operator is using the Desk Top Mic PTT.

2. **Desk INTERCOM Switch ON, REMOTE Switch OFF**

This arrangement offers intercom service only. Neither the Desk Top Station nor the Remote Console microphone can be used to key the radio transmitter. The radio receiver's audio can be heard on the station speaker, but not on the Remote Console speaker.

A message from the Desk Top Mic is heard on the Remote Console speaker.

An intercom message from the Remote Console Mic can be heard on the station speaker, but only if the Desk Top Mic is not active. The Desk Top Mic has priority over the Remote Console microphone in the intercom connection.

3. **Desk Top INTERCOM Switch OFF, REMOTE Switch ON**

These switch settings are for remote control of the radio, without an intercom connection.

When the Desk Top Mic is keyed, the radio transmitter is keyed and the Remote Console is able to monitor the transmission.

The Remote Console microphone is connected to the radio transmitter if the Remote Console Mic is keyed and the Desk Top Mic is not keyed. Also, the Remote Console Mic is connected to the station speaker if the radio receiver is squelched and the Desk Top Mic is not keyed (so that the "Desk Top Mic Audio to Line Path" is inactive).

The radio receiver audio is connected to the Remote Console speaker if the receiver is unsquelched. The PA output from the receiver is unconditionally connected to the station speaker, but is subject to the radio's internal squelch.

4. **Desk Top INTERCOM Switch OFF, REMOTE Switch OFF**

This arrangement is for operating the Desk Top Station as a radio.

The Desk Top Mic is connected only to the radio transmitter when the Desk Top Mic is keyed.

The radio receiver's PA audio output is connected only to the station speaker.

A summary of the audio path connections for the four combinations of INTERCOM and REMOTE switches is given in Table 1 "REMOTE and INTERCOM Audio Interface Summary."

The VOLUME control is a rotary potentiometer on the Desk Top Station Control Panel which controls the level of the audio signal fed to the station speaker as determined by the INTERCOM and REMOTE switch positions.

With the MDX trunked radios, the rotary VOLUME control adjusts both the receiver and the intercom audio levels. The radio volume control buttons are disabled by a PC programming option so that the receiver audio volume level is fixed and the internally adjusted Intercom Level adjusts the intercom audio relative to the receiver audio. This arrangement allows all Alert Tones generated by the radio to pass to the Remote Consoles at a suitable level, independent of the Desk Top Station rotary VOLUME control. Refer to the applicable Operator's Manual for specific information on setting the audio level of the particular radio installed.

KEYPAD/REMOTE INTERFACE BOARD OPERATION

When the Desk Top Station is equipped with the Keypad/Remote Board, the unit will be capable of placing individual calls to other mobiles on the system, as well as making interconnect calls. The board also allows operation with a 5-function remote RCN-1000 controller when the Tone Remote Control Board (19A704686P8) is installed in the station.

Keypad Operation

To make an individual call from the keypad:

1. Push the "MENU" button on the radio to select Special Call mode.

2. Enter the unit ID number of the radio to be called using the keypad. The allowed range is from 1 to 16382. (This range may be restricted by the PC programmer.)

3. Key the Desk Top Microphone to call the individual unit. The radio will transmit and receive only to the individual radio in this mode and no other units in the fleet can hear the call. The individual unit ID will be displayed on the radio as long as the call is in progress.

4. Push either the CLR (clear) button on the radio or the "#" (pound) key on the keypad to end the call and return to normal operation.

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To make a telephone interconnect call using the keypad

1. Push the "MENU" button on the radio to select Special Call mode.
2. Enter the desired phone number using the keypad.
3. Push the star "*" key on the keypad and wait for the radio to dial the number.
4. Key the Desk Top Microphone PTT switch to talk and release it to listen.
5. Push either the CLR (clear) button on the radio or the "#" (pound) key on the keypad to end the call and return to normal operation.

EDACs Remote Operation

The RCN-1000 Remote Controller is capable of selecting up to 5 pre-defined radio system/group/special call combinations. The presets are programmed into the radio by the PC programmer.

The remotes and Desk Top Station can operate as an intercom by setting the INTERCOM switch to "ON."

To Place a Call from the Remote

1. Select the desired "SF" function switch on the RCN-1000. The LED next to the function switch will illuminate.
2. Key the microphone PTT switch and wait for a short beep before you begin to transmit (speak). Release the PTT when you have finished.
3. Adjust the volume as needed while receiving a call.

CIRCUIT ANALYSIS

INTERCONNECT BOARD WITHOUT A REMOTE INTERFACE BOARD

Transmit Audio Path

The Desk Top microphone is used to modulate the radio transmitter. The Interconnect Board connection between the microphone at J201-2 **DESK MIC HI** and the radio transmitter input at J202-4 **MIC HI** is made through the 0 (zero) ohm resistor (R207) connection between the **DESK MIC HI** line and **SW DESK MIC HI** line and a jumper connecting P104-1 **SW DESK MIC HI** and P104-2 **MIC HI**. P104 is a jumper plug for J204 in lieu of Interface Board P204. There is no active circuitry in the path.

Receive Audio Path

The station speaker is driven by the radio audio PA output, available on J202.9 **SW SPKR HI**. The Interface Board connection between the **SW SPKR HI** line and J211-3 **SW STATION SPKR HI** is made through a jumper connecting P104-7 **SW SPKR HI** and P104-8 **SW STATION SPKR HI**. P104 is a jumper plug for J204 in lieu of Interface Board P204. There is no active circuitry in the path. The volume must be controlled with the volume control on the radio.

INTERCONNECT BOARD WITH REMOTE INTERFACE BOARD

The Remote Interface Board interfaces the radio to the DC or Tone Remote Boards. Desk Top Mic and receiver audio are gated and summed on the Interface Board. This combined audio is then sent to the Remote Board which in turn feeds the phone line to the Remote Console Speaker.

Conversely, Remote Console Mic audio from the phone line is buffered by the Remote Board and sent to the Remote Interface Board, which gates the audio to the radio transmitter or to the station speaker.

Audio Path from the Desk Top Microphone to the Remote Board

Audio from the Desk Top microphone enters the Interconnect Board at J201-2 DESK MIC HI. The 0 (zero) ohm resistor (R207) connects the DESK MIC HI to the DESK MIC HI SW on the Interface Board at P204-1 and to INTERCOM MIC LEVEL potentiometer R323, a level adjustment on the board for the Desk Top Microphone signal.

The bilateral switch (U304-1), next in the path, controls connection of the signal through to the Remote Board. The logic on the Interface Board applies 0 (zero) VDC to Control Pin 13 to keep the gate normally muted, but switches this control voltage to +10 VDC to unmute the gate for the following conditions:

Desk Top Mic PTT keyed **AND** REMOTE Switch ON
OR
INTERCOM Switch ON, Desk Top Mic PTT keyed,
AND REMOTE Switch OFF
OR
INTERCOM Switch ON, Desk Top Mic PTT keyed,
AND RX muted

Table 1 - Remote and Intercom Audio Interface Summary

Desk Top INTERCOM Switch ON, REMOTE Switch ON		
Remote Mic	→	Radio Transmitter
Remote Mic	→	Station Speaker
Desk Top Mic	⊘→	Radio Transmitter
Desk Top Mic	→	Remote Speaker (if RX is muted), otherwise RX → Remote Remote Speaker and Station Speaker
RX Audio	→	Station Speaker and Remote Speaker
Desk Top INTERCOM Switch ON, REMOTE Switch OFF		
Remote Mic	⊘→	Radio Transmitter
Remote Mic	→	Station Speaker (if Desk Mic PTT inactive)
Desk Top Mic	⊘→	Radio Transmitter
Desk Top Mic	→	Remote Speaker
RX Audio	⊘→	Remote Speaker
RX Audio	→	Station Speaker
Desk Top INTERCOM Switch OFF, REMOTE Switch ON		
Remote Mic	→	Radio Transmitter (if no Desk Top Mic) otherwise with Desk Top Mic inactive
Desk Top Mic	→	Radio Transmitter
Remote Mic	→	Desk Speaker (if Desk Top Mic PTT inactive) otherwise Remote Mic muted
Desk Top Mic	→	Radio Transmitter with Desk Top Mic PTT
Desk Top Mic	→	Remote Speaker
RX Audio	→	Remote Speaker (if RX unmuted)
RX PA Audio	→	Station Speaker
Desk Top INTERCOM Switch OFF, REMOTE Switch OFF		
Remote Mic	⊘→	Radio Transmitter
Remote Mic	⊘→	Station Speaker
Desk Top Mic	→	Radio Transmitter
Desk Top Mic	⊘→	Remote Speaker
RX Audio	⊘→	Remote Speaker
RX PA Audio	→	Station Speaker
Key:	Connection = →	
	No Connection = ⊘→	

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When the signal is gated through switch U304-1, it goes through amplifier U302-1 and to the J302-9 output as RX AUDIO, where connection is made for the Remote Board. Since the audio circuitry in the Remote Board has built-in de-emphasis, the amplifier U302-1 includes audio pre-emphasis.

The switching logic for this path is shown in Figure 6.

Audio Path from Desk Top Microphone to the Radio Transmitter

Audio from the Desk Top Microphone enters the Interconnect Board at J201-2 DESK MIC HI. The 0 (zero) ohm resistor R207 connects the DESK MIC HI line which brings the signal into the Interface Board at P204-1.

Next, bilateral switch U304-2 gates the audio path. The logic on the Interface Board normally grounds U304, Pin 5 to keep the gate muted, but switches it to +10 VDC to unmute the gate and pass the audio for the following conditions:

Desk Top Mic PTT Keyed **AND** INTERCOM Sw OFF

A combining amplifier U305-2 follows and the output labeled **MIC HI** goes to the Interconnect Board through P204-2 and then through the 0 ohm resistor R209 connection to the Radio Option connector J202-4. This is the transmitter audio input line.

The microphone audio from the phone line is controlled by the volume control on the Desk Top Station and summed into audio PA U303.

For the MDX radio, plug P303 jumper on J303 for a Pin 2 to Pin 3 connection. This routes the signal to the combining amplifier U305-1 where it is amplified and sent through J301-4 **VOLUME HI** to the **VOLUME** potentiometer R1 on the Desk Top Control Panel. This potentiometer is a level control for both the Remote Console microphone audio and audio from the radio PA. The signal returns to the Remote Interface Board at J301-5 **VOLUME WIPER** and is amplified in Desk Top Station 3-Watt Audio PA U303.

Finally, the path connects to the Interconnect Board J204-8 **STATION SPKR HI** and then to J211-3 **SW STATION SPKR HI** for connection to the Station Speaker.

There is no switching control logic for this path.

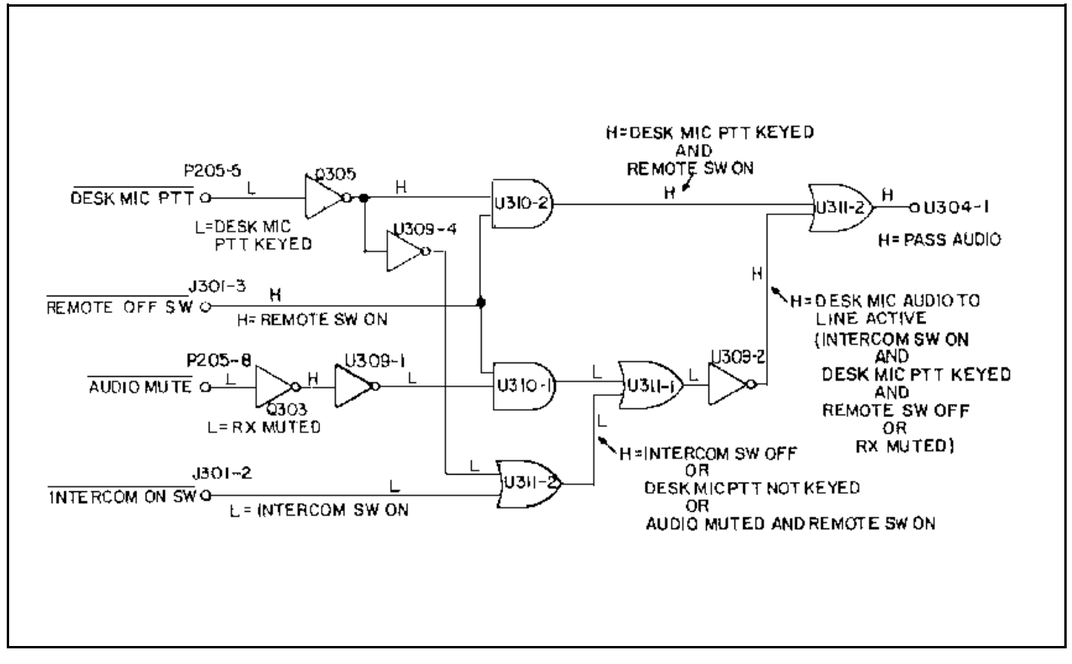


Figure 6 - Switching Logic for Desk Top Mic to Remote Speaker Path

Path for Processed Audio from the MDX Radio PA to the Remote Board

The radio internal speaker is disconnected when installed in the Desk Top Station. The audio signal from the radio PA enters the Interconnect Board at J202-9 **SW SPKR HI** and then the Remote Interface Board at P204-7.

For the MDX radio, plug P303 jumper on J303 for a Pin 2 to Pin 3 connection. This routes the signal to FET switch Q302. The gate is controlled by the logic on the Remote Interface Board and the switch is normally OFF with 0 VDC applied, but switched ON with +5 VDC applied to pass the audio signal for the following conditions:

RX Active (Unsquelched) **AND** REMOTE Switch ON

When the signal is passed through switch transistor Q302, it goes through amplifier U302-1 which feeds the J302-9 output as **RX AUDIO** to the Remote Board. Since the audio circuitry in the Remote Board has built-in de-emphasis, the amplifier U302-1 includes audio pre-emphasis.

The path from the radio to the Remote Console Speaker is set up with REMOTE Switch ON and is complete only when the radio is unsquelched.

The condition for audio gating in this path is activation of the Desk Microphone PTT for radio transmission, unless the INTERCOM Switch is ON. In the Intercom mode the transmitter is not keyed.

The switching control logic for this path is shown in Figure 7.

Audio Path from Remote Board to Radio Transmitter

The Remote Console microphone audio signal from the phone line comes through the Remote Board to J302-1 MIC AUDIO on the Remote Interface Board. The audio is gated by bilateral switch U304-3. The control Pin 6 of U304-3 is controlled by logic on the Interface Board. The gate is normally muted with 0 VDC. This control voltage is switched to +10 VDC to unmute the gate for the following conditions:

Remote Mic PTT Keyed **AND** Desk Top Mic PTT not Keyed
AND REMOTE Switch ON

Combining amplifier U305-2 follows and its output, labeled **MIC HI**, goes to the Interconnect Board through P204-2 and then through the 0 ohm resistor R209 connection to the Radio Option connector J202-4. This is the transmitter audio input line.

The condition for gating in this path is that the REMOTE Switch must be ON and that the Desk Microphone has priority over a remote microphone for radio transmission.

The switching control logic for this path is shown in Figure 8.

Audio Path from Remote Board to Station Speaker

The Remote Console microphone audio signal from the phone line comes through the Remote Board J302-1 **MIC AUDIO** on the Remote Interface Board. The signal level can be independently adjusted by the INTERCOM LEVEL from REMOTE potentiometer R325.

Next, the audio is gated by bilateral switch U304-4, where the Control Pin 12 is controlled by logic on the Interface Board. The gate is normally ON with a +10 VDC applied. This control voltage is switched to 0 VDC to mute the gate for the following conditions:

RX Active
OR
Audio Path Active from Desk Mic to Remote Line

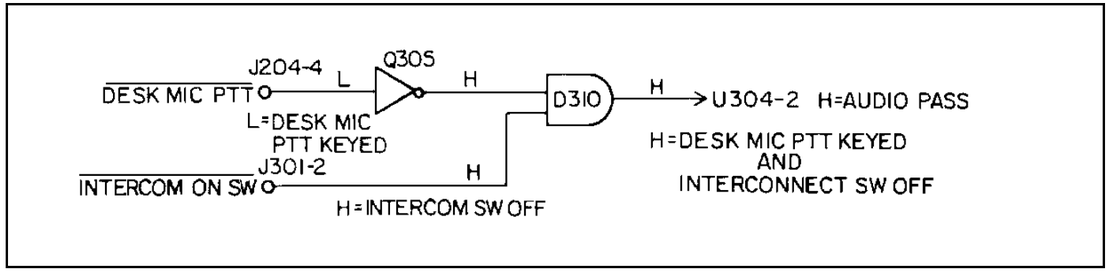


Figure 7 - Logic for Desk Mic to Radio Transmitter Path

LBI-38978

The second condition is a restatement of the gating conditions for the **Desk Top Mic to Remote Spkr Line** path previously listed.

The signal is amplified in combining amplifier U305-1 and sent through J301-4 VOLUME HI to VOLUME potentiometer R1 on the Desk Top Control Panel. This control is a level control for both the Remote microphone audio and audio from the radio PA when plug P304 is jumpered as required for the MDX radio. The signal returns to the Remote Interface Board at J301-5 **VOLUME WIPER** and is amplified in the Desk Top Station 3-Watt Audio PA U303.

Finally, the path connects to the Interconnect Board J204-8 **STATION SPKR HI** and then to J211-3 **SW STATION SPKR HI** for connection to the Station Speaker.

The gating conditions for this path are: the path is normally unmuted for connection of the Remote Console Microphone to the Station Speaker, except when the receiver is active or the "Desk Mic to Line" path is active. Without muting, undesirable feedback between the Desk Mic and speaker is possible.

The switching control logic for this path is shown in Figure 9.

Processed Audio from the Radio Audio PA to the Station Speaker

The radio internal speaker is disconnected when installed in the Desk Top Station. The audio signal from the radio PA enters the Interconnect Board at J202-9 **SW SPKR HI** and then the Remote Interface Board at P204-7. The switching logic for this path is shown in Figure 10.

RUS Path

The **R**eceiver **U**n**S**quelch (**RUS**) signal is generated on the Remote Interface Board. It is a high (logical 1) sent to the Remote Board to connect the audio signal through the phone line to the Remote Console speaker, when the **RX AUDIO** line output is to be connected to the remote speaker. For an active high **RUS** signal to be passed through to the Remote Board, the conditions that must be met are:

RX Audio to Line Path active
OR
Station Mic to Line Path active

These conditions are met for switch conditions:

REMOTE Switch ON
OR
INTERCOM Switch ON

The RUS signal at J308-12 is generated at the collector of transistor Q308 as a high when Q308 is turned OFF. This is done with a low on the base as determined by the logic controlling the paths of either the radio **VOL SQ HI** line or the radio audio PA line to the Remote Console speaker, shown in Figure 11.

Channel Guard Disable Path

The **C**hannel **G**uard **D**isable (**CGD**) signal is generated on the Remote Board by either remote tones or DC current from the Remote Console. When Channel Guard is disabled in the radio, all audio transmissions on the receive frequency are heard. The CGD signal enters the Desk Top Station from the Remote Board at J302-11 **CG DISABLE**, as a logical low to disable the Channel Guard control of the radio.

Plug P305 jumpers J305 for a Pin 1 to Pin 2 connection when the CGD signal is used. The CGD signal is not used with the PST tone remote applications with P305 moved to Pins 2 to 3.

The disabling logical low signal becomes a high at the collector of transistor Q309, where it can be overridden by a Remote Switch OFF condition which, through diode D308, pulls the signal low with grounding. This acts to enable the Channel Guard in the radio with an output high.

After another inversion in transistor Q304, the CGD signal is sent on to the radio at P206-10 CGD as a logical low for disabling and as a logical high for enabling.

PTT Path

The PTT signal comes from the Remote Board at J302-4 PTT as a low to key the radio transmitter. After two inversions in transistors Q306 and Q307, the signal is found at P204-6 PTT, as a logical low to key the radio. It is connected to the radio through the 0 ohm resistor R209 connection to J202-7 on the Interconnect Board.

Keypad/Frequency Select Option

The Keypad/Frequency Select Board is microprocessor-controlled. It connects the 12-key keypad to serial data lines for communication with the radio. The board also converts to serial data, the information from the EDACS Tone Remote Board 19A704686P8.

The keypad data is inputted through J401 to the Octal Bus Transceiver ICs U702 and U704. The outputs of U702 and U704 are connected to the EPROM chip U703 and the microprocessor U702. The EDACS Tone Remote Board's signal path is J402 through microprocessor U701 to EPROM U703 and then back to microprocessor U701. The connections to the radio are made through plugs P207 and P208 and the station Interconnect Board.

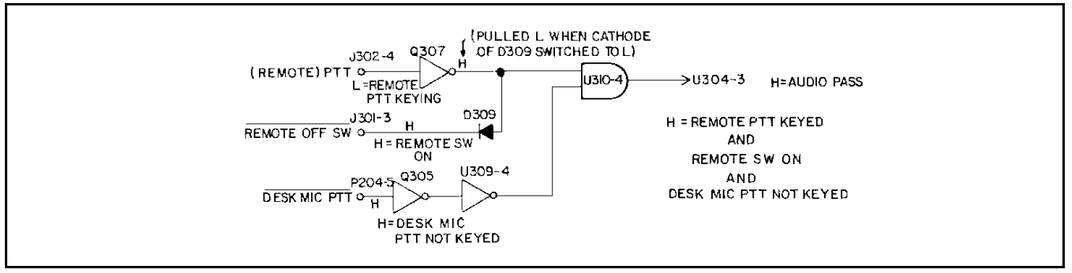


Figure 8 - Logic for Remote Mic to Radio Transmitter Path

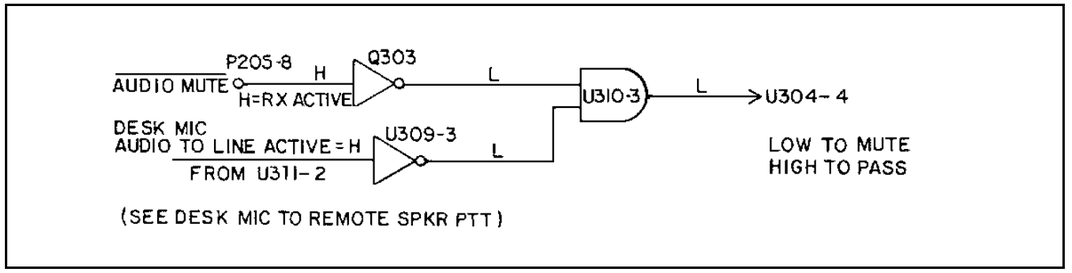


Figure 9 - Logic for Remote Mic to Station Speaker Path

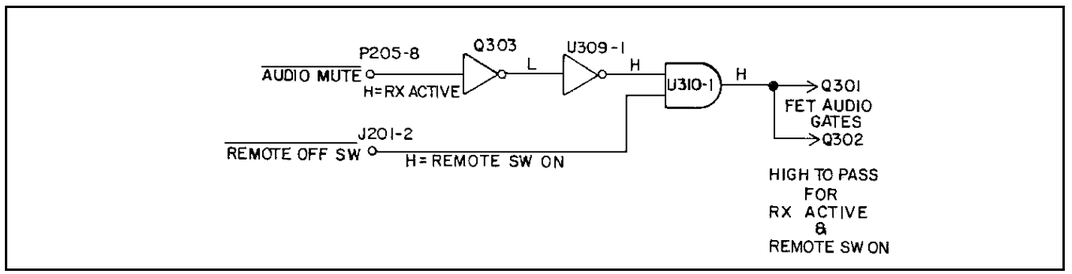


Figure 10 - Logic for Radio PA to the Remote Speaker Path

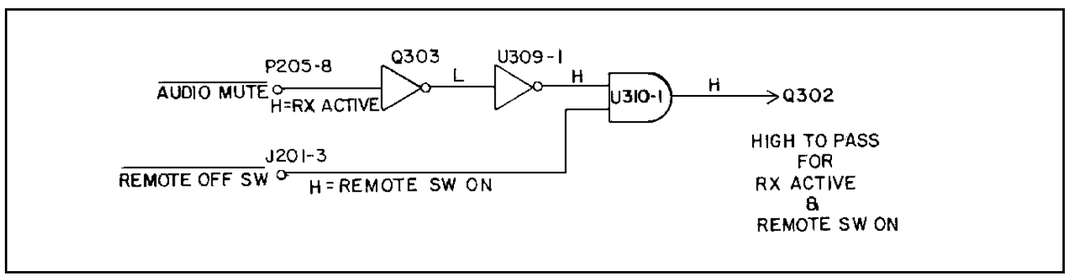


Figure 11 - Logic for Generation of the RUS Signal

REMOTE INTERFACE BOARD
19D902931G1

Issue 2

SYMBOL	PART NO.	DESCRIPTION
		--------- CAPACITORS ---------
C301	19A704879P8	Capacitor, Electrolytic: 2.2uF ±20%, 50 VDCW.
C302	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C303	19A702052P7	Ceramic: 2200 pF ±10%, 50 VDCW.
C304	T644ACP368J	Polyester: .068 uF ±5%, 50 VDCW.
C305 and C306	T644ACP333J	Polyester: .033 uF ±5%, 50 VDCW.
C307	T644ACP368J	Polyester: .068 uF ±5%, 50 VDCW.
C309 and C310	T644ACP333J	Polyester: .033 uF ±5%, 50 VDCW.
C311	19A701534P4	Tantalum: 1 uF ±20%, 35 VDCW.
C312	19A704879P8	Capacitor, Electrolytic: 2.2uF ±20%, 50 VDCW.
C313	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C314	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ± 30 PPM.
C315	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C316	19A701225P11	Electrolytic: 470 uF -10% to +75%, 16 VDCW.
C317	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C318	19A701225P11	Electrolytic: 470 uF -10% to +75%, 16 VDCW.
C319	19A701534P7	Tantalum: 10 uF ±20%, 16 VDCW.
C320	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C321	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C322	19A702061P17	Ceramic: 12 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C323	19A702052P122	Ceramic: 0.047 uF ±5%, 50 VDCW.
C324	19A704879P8	Capacitor, Electrolytic: 2.2uF ±20%, 50 VDCW.
C325 thru C327	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C328	19A701534P7	Tantalum: 10 uF ±20%, 16 VDCW.
C329	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C330	19A704879P8	Capacitor, Electrolytic: 2.2uF ±20%, 50 VDCW.
C331 and C332	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C333	19A704879P8	Capacitor, Electrolytic: 2.2uF ±20%, 50 VDCW.
C334 and C335	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C336	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C350 thru C352	19A702052P26	Ceramic: 0.1 uF ±10%, 50 VDCW.
C353 and C354	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C355	19A703314P2	Tantalum: 220 uF, -10 + 50%, 10 VDCW.

* COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	PART NO.	DESCRIPTION
		---------- DIODES ----------
D301 thru D307	19A700053P2	Silicon: 2 Diodes in Series; sim to BAV99.
D308 and D309	19A700053P3	Silicon: 2 Diodes in Series, Common Cathode; sim to MBAV70L.
D310	19A703561P2	Silicon, fast recovery (2 diodes in series).
D311	19A700053P3	Silicon: 2 Diodes in Series, Common Cathode; sim to MBAV70L.
		--------- HEAT SINK ---------
HS301	19A702917P7	Heat Sink, Transistor: Sim to Thermalloy Cat 6030B-TT.
		---------- JACKS ----------
J301 thru J307	19A703248P11	Post: Gold Plated, 10 mm length.
		---------- PLUGS ----------
P204 and P205	19A704779P11	Connector; sim to Molex 22-17-2122.
P303 thru P307	19A702104P2	Connector: Shorting Jumper, Gold Plated. (Housing Color: White).
		-------- TRANSISTORS ---------
Q301 and Q302	19A700060P4	N-type, field effect.
Q303 thru Q310	19A700023P2	Silicon, NPN: sim to 2N3904.
		--------- RESISTORS ---------
R301 and R302	19B801251P475	Metal film: 47K ohms ±5%, 1/10 w.
R303	19B801251P334	Metal film: 330K ohms ±5%, 1/10 w.
R304	19A702931P289	Metal film: 8250 ohms ±1%, 200 VDCW, 1/8 w.
R305	19A702931P333	Metal film: 21.5K ohms ±1%, 200 VDCW, 1/8 w.
R306	19B801251P561	Metal film: 560 ohms ±5%, 1/10 w.
R307	19B801251P223	Metal film: 22K ohms ±5%, 1/10 w.
R308	19B801251P273	Metal film: 27K ohms ±5%, 1/10 w.
R309 thru R314	19B800607P2R2	Metal film: 2.2 ohms ±5%, 1/8 w.
R315	19B801251P153	Metal film: 15K ohms ±5%, 1/10 w.
R316	19B801251P222	Metal film: 2.2K ohms ±5%, 1/10 w.
R317	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R318 and R319	19B800607P2R2	Metal film: 2.2 ohms ±5%, 1/8 w.
R320	19B801251P221	Metal film: 220 ohms ±5%, 1/10 w.
R321	19B801251P100	Metal film: 10 ohms ±5%, 1/10 w.
R322	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R323 thru R325	19B800779P10	Variable: 10K ohms. 25%, 100 VDCW, .3 watt.
R326	19B801251P823	Metal film: 82K ohms ±5%, 1/10 w.
R327	19B801251P562	Metal film: 5.6K ohms ±5%, 1/10 w.
R328	19B801251P223	Metal film: 22K ohms ±5%, 1/10 w.
R329	19B801251P563	Metal film: 56K ohms ±5%, 1/10 w.
R330	19B801251P331	Metal film: 330 ohms ±5%, 1/10 w.

SYMBOL	PART NO.	DESCRIPTION
R331	19B801251P332	Metal film: 3.3K ohms ±5%, 1/10 w.
R332	19B801251P153	Metal film: 15K ohms ±5%, 1/10 w.
R333	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R334	19B801251P333	Metal film: 33K ohms ±5%, 1/10 w.
R335	19B801251P561	Metal film: 560 ohms ±5%, 1/10 w.
R336	19B801251P562	Metal film: 5.6K ohms ±5%, 1/10 w.
R337	19B801251P154	Metal film: 150K ohms ±5%, 1/10 w.
R338	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R339	19B801251P470	Metal film: 47 ohms ±5%, 1/10 w.
R340	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R341	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R342	19B801251P470	Metal film: 47 ohms ±5%, 1/10 w.
R343 and R344	19B801251P224	Metal film: 220K ohms ±5%, 1/10 w.
R345	19B801251P223	Metal film: 22K ohms ±5%, 1/10 w.
R350	19A702931P137	Metal film: 237 ohms ±1%, 200 VDCW, 1/8 w.
R351	19A702931P221	Metal film: 1620 ohms ±1%, 200 VDCW, 1/8 w.
R352	19A702931P137	Metal film: 237 ohms ±1%, 200 VDCW, 1/8 w.
R353	19A702931P185	Metal film: 750 ohms ±1%, 200 VDCW, 1/8 w.
R354	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R355 and R356	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R357 thru R359	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R360 and R361	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R362 and R363	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R364	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R365 and R366	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R367	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R368 and R369	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R370	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R371 and R372	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.
R373 and R374	19B801251P104	Metal film: 100K ohms ±5%, 1/10 w.
R375 thru R377	19B801251P103	Metal film: 10K ohms ±5%, 1/10 w.
R378 and R379	19B801251P102	Metal film: 1K ohms ±5%, 1/10 w.
R380 and R381	19B801251P391	Metal film: 390 ohms ±5%, 1/10 w.
R382 thru R384	19B801251P473	Metal film: 47K ohms ±5%, 1/10 w.

SYMBOL	PART NO.	DESCRIPTION
		------ RESISTOR NETWORK -------
RN301	19A704885P8	Resistor Network, Custom: 9 pins, .125 W.
		----- INTEGRATED CIRCUITS ------
U301 and U302	19A700086P4	Linear: Dual Op Amp; sim to 4558.
U303	19A701830P1	Linear, Audio AMPLIFIER; sim to TDA 2003.
U304	19A700029P44	Digital: BILATERAL SWITCH.
U305	19A700086P4	Linear: Dual Op Amp; sim to 4558.
U307	19A701999P1	Linear: Voltage Regulator; sim to LM317T.
U308	19A701999P4	Linear, (Positive Voltage Regulator): sim to LM317LZ.
U309	10A700176P2	Digital: Hex Buffer; sim to 4069UB.
U310	19A700029P47	Digital: Quad 2-Input AND Gate; sim to 4081B.
U311	19A700029P46	Digital: QUAD 2-INPUT OR GATE.
		------- MISCELLANEOUS --------
2	19D902932P1	BD PW
3	19D902931G7	CPNT BD REM
4	19A702364P308	Machine screw, TORZ Drive: No. M3-0.5 x 8.
5	19A701312P4	Flatwasher: 3.2 ID.
6	19A700034P4	Nut, hex: No. M3 x 0.5MM.
9	19A700035P5	Lock washer, external tooth: No. 3.

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions.

Revision A - to change volume control range, add time delay and add jumpers to accomodate the keypad option. Added capacitor C311, Jacks J306 and J307, plugs P306 and P307, transistor Q310, and resistors R324 and R342 through R345.

REV. A - KEYPAD/FREQ SEL BOARD 344A3383P1
Incorporated in initial shipments.

REV. B - KEYPAD/FREQ SEL BOARD 344A3383P1
To add "sleep" command when PC programming, software changed for U703. Was 344A3758G1.

REV. C - KEYPAD/FREQ SEL BOARD 344A3383P1
To support 2-freq. DC control board software changed for U703. Was 344A3758G2.

KEYPAD/FREQUENCY SELECTOR BOARD
344A3383P1
Issue 2

SYMBOL	PART NO.	DESCRIPTION
		---------- CAPACITORS ----------
C1 thru C29	19A702061P61	Cer, 0805, 5%, 50V, NPO, 100pf
C699, C701, C702, C707, C709, C710,	19A702052P26	Cer, 1206, 20%, 50VMIN, Z5U, 0.1 uF
C705	19A702061P13	Cer, 0805, 5%, 50V, COG, 10pf
C706	19A702061P25	Cer. 0805, 5%, 50V, COG, 18pf
C711	19A705203P111	Tant, (D), 20%, 10V, 47 uF
		----------DIODES ----------
CR1 thru CR23, and CR696 thru CR699	19A700053P2	DIO, SW Dual, SOT23, 7000, 100V
		---------- JACKS ----------
J401	19A703248P11	HDR, 14, S RW, V MT, W/PP, 10U" AU CT
J402	19A703248P11	HDR, 06, S RW, V MT, .1CTR, 10U" AU CT
		---------- PLUGS ----------
P207, P208	19A704779P11	PCBCON, 12, BTM, NTRY, .1CTR, 10U" AU CT
		----------TRANSISTORS ----------
Q701 thru Q706	19A700076P2	General Purpose, NPN, SOT23, 3904
		----------RESISTORS ----------
R1 thru R23	19B801251P331	0805, 5%, 1/10W, 330 Ohms
R24 thru R39	19B801251P104	0805, 5%, 1/10W, 100K Ohms
R701 thru R703 and R705 thru R707	19B801251P103	0805, 5%, 1/10W, 10K Ohms
R708	19B801251P472	0805, 5%, 1/10W, 4.7K Ohms
R709	19B801241P473	0805, 5%, 1/10W, 47K Ohms
		----- INTEGRATED CIRCUITS ------
U701		8-BIT MICROPROCESSOR, N80C31BH
U702 and U704	19A703471P108	BUS/LINE TRANSCEIVER, 74HC245
U703	344A3758G3	EPROM, 87C257
U705	19A704970P1	VOLTAGE REGULATOR (5V), L387A
U712	19A703483P101	2-INPUT NOR GATE, 74HC02
U713	19A703483P302	2-INPUT NAND GATE, 74C00
U726	19A703483P321	SCHMITT-TRIGGER-INVERTER, 74HC14
		----------SOCKET ----------
XU703	19A700156P3	DIP28, D WP, 0/BD, 10U" AU CT
		---------- CRYSTAL ----------
Y701		SMT, 20PF, 100PPM, 11.0592 MHz

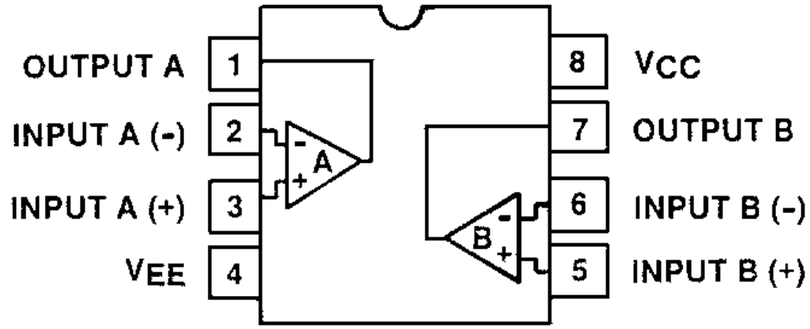
• COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

19D904448G1 - G2
Interconnection Board A1

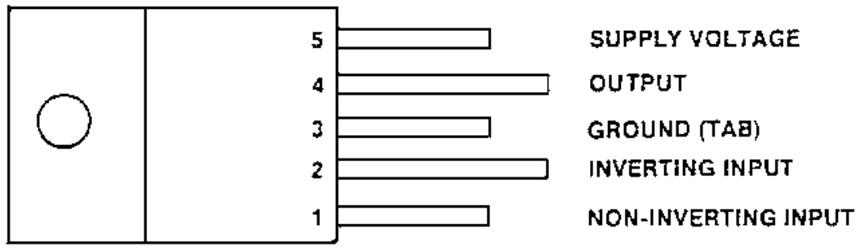
SYMBOL	PART NO.	DESCRIPTION
		---------- CAPACITORS ----------
C201 thru C212	19A702061P61	Ceramic: 100 pF ± 5%, 50 VDCW, temp coef 0 ± 30 PPM.
C214 thru C221	19A702061P61	Ceramic: 100 pF ± 5%, 50 VDCW, temp coef 0 ± 30 PPM.
C223 thru C236	19A702061P61	Ceramic: 100 pF ± 5%, 50 VDCW, temp coef 0 ± 30 PPM.
C238 thru C246	19A702061P61	Ceramic: 100 pF ± 5%, 50 VDCW, temp coef 0 ± 30 PPM.
C249 and C250	19A702061P61	Ceramic: 100 pF ± 5%, 50 VDCW, temp coef 0 ± 30 PPM.
C251 thru C253	344A4194P471160	Electrolytic capacitor. Radial lead; 470ãF.
		---------- JACKS ----------
J200	344A3197P1	TB.
J201	19A704852P35	Connector.
J202	19A704852P41	Connector.
J203	19A704852P30	Printed wire: 4 contacts rated @ 2 1/2 amps; sim to Molex 22-29-2041.
J204 and J205	19A703248P18	Post: Gold Plated, 18 mm length.
J206	19A704852P30	Printed wire: 4 contacts rated @ 2 1/2 amps; sim to Molex 22-29-2041.
J207 and J208	19A703248P18	Post: Gold Plated, 18 mm length.
J209	19A704852P36	Printed wire, two part: 10 contacts, sim to Molex 22-29-2101.
J211	19A704852P30	Printed wire: 4 contacts rated @ 2 1/2 amps; sim to Molex 22-29-2041.
J212	19A704852P28	Printed wire: 2 contacts rated @ 2.5 amps.
J213 and J214	19A703248P11	Post: Gold Plated, 10 mm length.
		---------- PLUGS ----------
P214	19A702104P2	Connector: Shorting Jumper, Gold Plated. (Housing Color: White).
		---------- TRANSISTORS ----------
Q201	19A116942P1	Silicon, PNP.
Q202 and Q203	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile.
		---------- RESISTORS ----------
R201 and R202	19B800607P821	Metal film: 820 ohms ±5%, 1/8 w.
R203 and R204	19B800607P681	Metal film: 680 ohms ±5%, 1/8 w.
R205 and R206	19B800607P391	Metal film: 390 ohms ±5%, 1/8 w.
R207	19B800607P1	Metal film: Jumper.
R209 and R210	19B800607P1	Metal film: Jumper.
R211	19B800607P154	Metal film: 150K ohms ± 5%, 1/8 w.
R212	19A701864P4	Thermal 10K ohms ±10%, sim to Midwest Components 2H-103.
R213	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R214	19B800607P334	Metal film: 330K ohms ±5%, 1/8 w.
R215	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w.
		---------- MISCELLANEOUS ----------
2	19D904377P1	Printed wire board.
4	19D904448G2	Interconnection Board.
5	19A701502P3	Bumper, plastic.

REMOTE INTERFACE BOARD

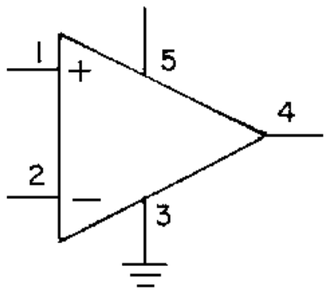
Dual-Operational Amplifier
19A700086P4 (U301, U302, & U305)



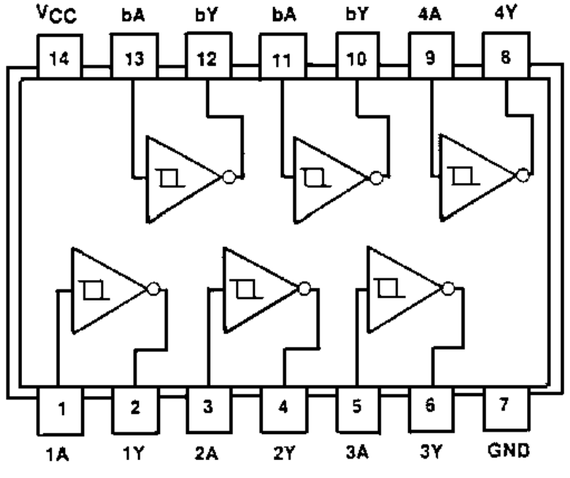
Audio Amplifier
19A701830P1 (U303)



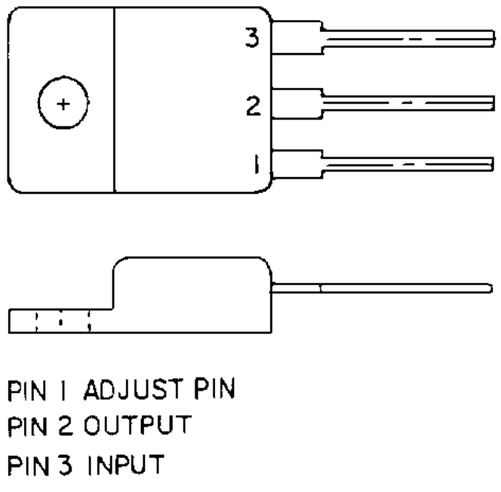
PIN INDENTIFICATION



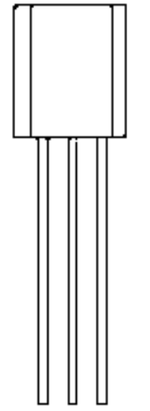
Bilateral Switch
19A700029P44 (U304)



Voltage Regulator
19A701999P1 (U307)



Voltage Regulator
19A701999P4 (U308)

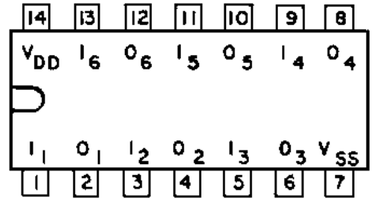


BOTTOM VIEW

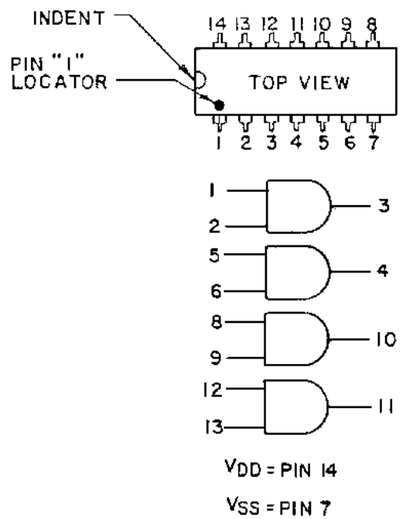
PIN IDENTIFICATION

PIN 1. ADJUST
PIN 2. OUTPUT
PIN 3. INPUT

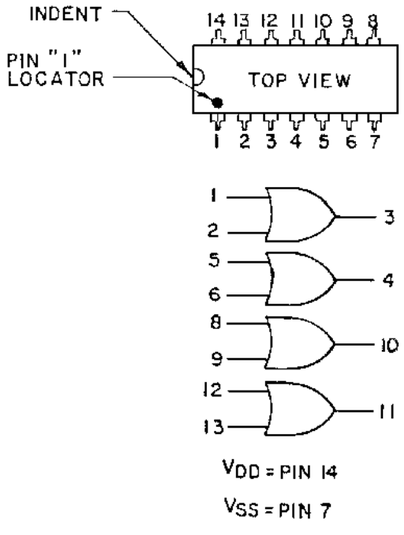
Hex Buffer
19A700176P2 (U309)



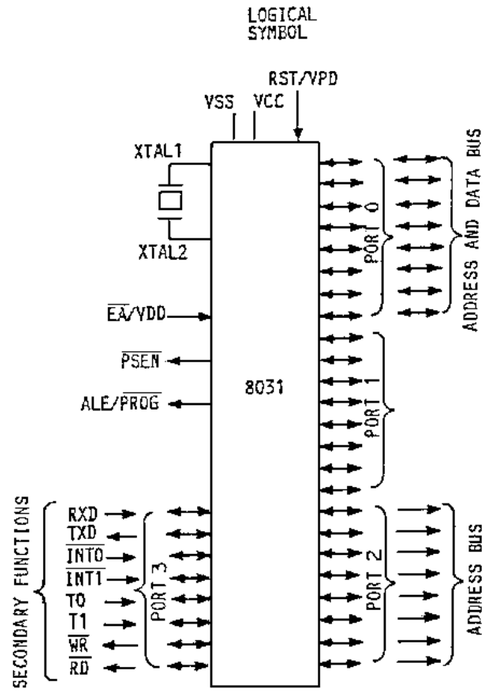
Quad 2-Input AND Gate
19A700029P47 (U310)

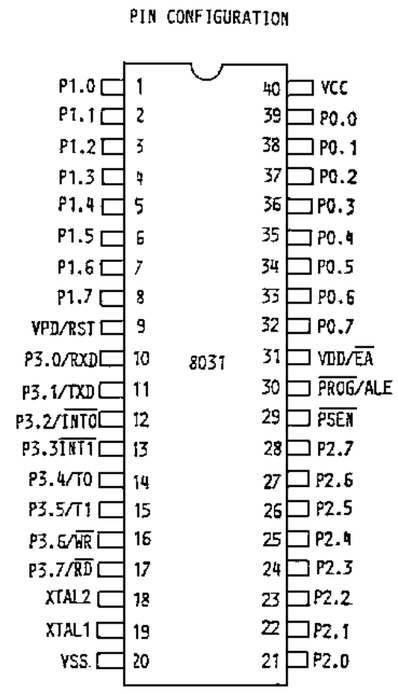


Quad 2-Input OR Gate
19A700029P46 (U311)

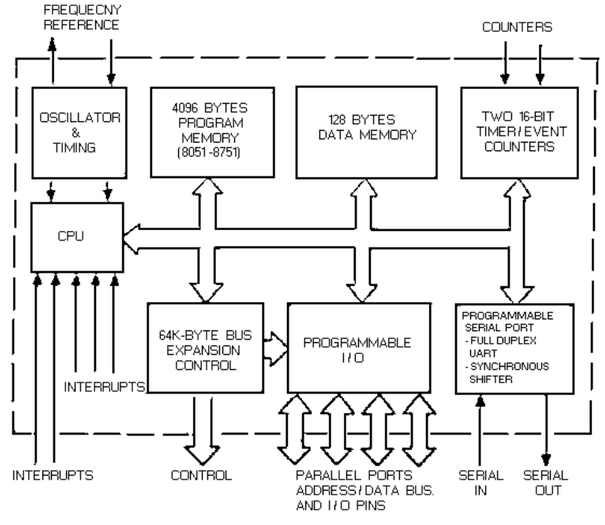


8-Bit Microprocessor (U701)
344A3608P1





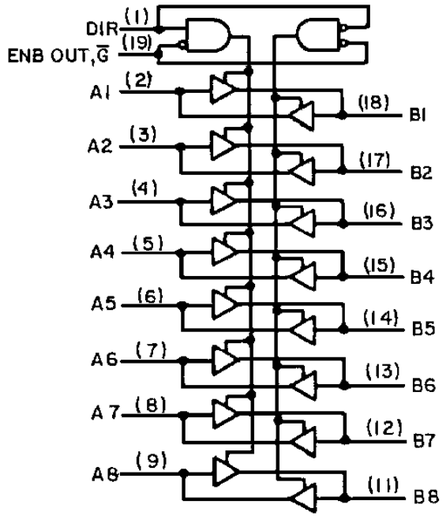
BLOCK DIAGRAM



KEYPAD/FREQUENCY SELECTOR BOARD

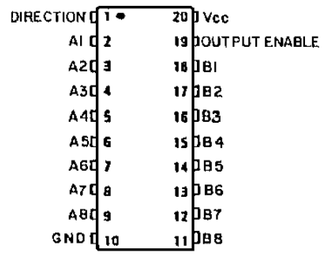
3-State Bus/Line Transceiver
19A703471P108 (U702 and U704)

LOGIC DIAGRAM (POSITION LOGIC)



PIN 10 = GND
PIN 20 = Vcc

PIN ASSIGNMENT

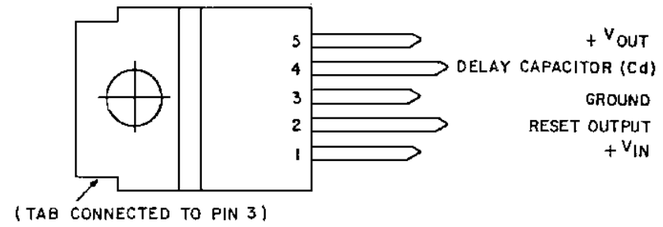


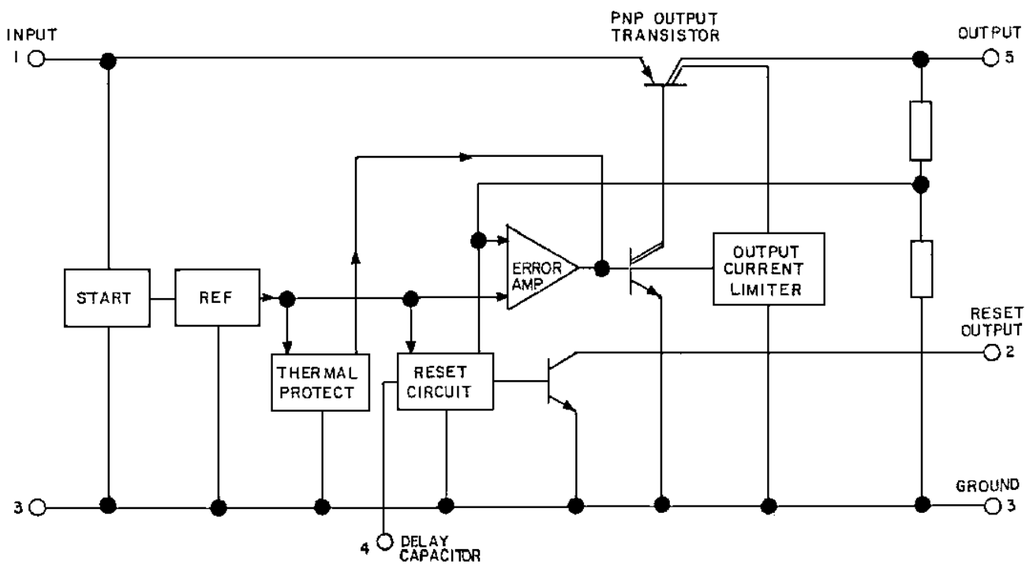
FUNCTION TABLE

CONTROL INPUTS		OPERATION
OUTPUT ENABLE	DIRECTION	
L	L	DATA TRANSMITTED FROM BUS B TO BUS A
L	H	DATA TRANSMITTED FROM BUS A TO BUS B
H	X	BUSES ISOLATOR (HIGH IMPEDANCE STATE)

X=DON'T CARE

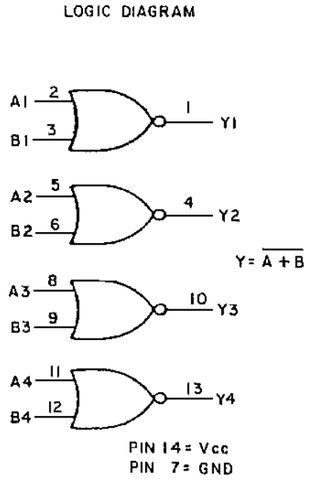
Voltage Regulator
19A704970P1 (U705)





Quad 2-Input NOR Gate
19A703483P101 (U712)

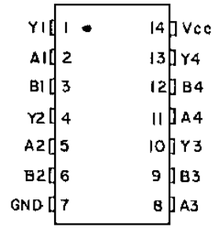
LOGIC DIAGRAM



$Y = \overline{A + B}$

PIN 14 = Vcc
PIN 7 = GND

PIN ASSIGNMENT

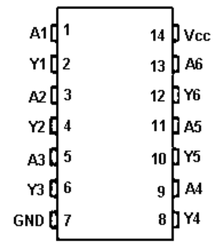


FUNCTION DIAGRAM

INPUTS		OUTPUT
A	B	Y
L	L	H
L	H	L
H	L	L
H	H	L

Schmitt-Trigger Inverter
19A703483P321 (U726)

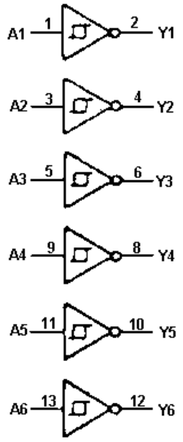
PIN ASSIGNMENT



FUNCTION TABLE

Input	Output
A	Y
L	H
H	L

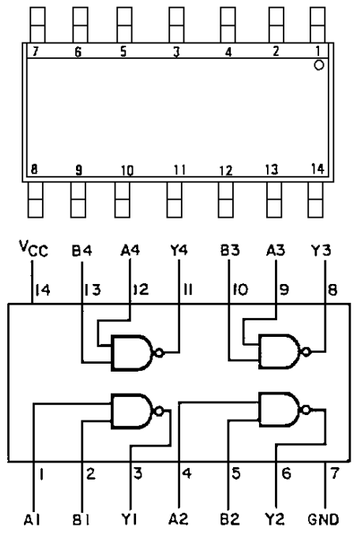
LOGIC DIAGRAM



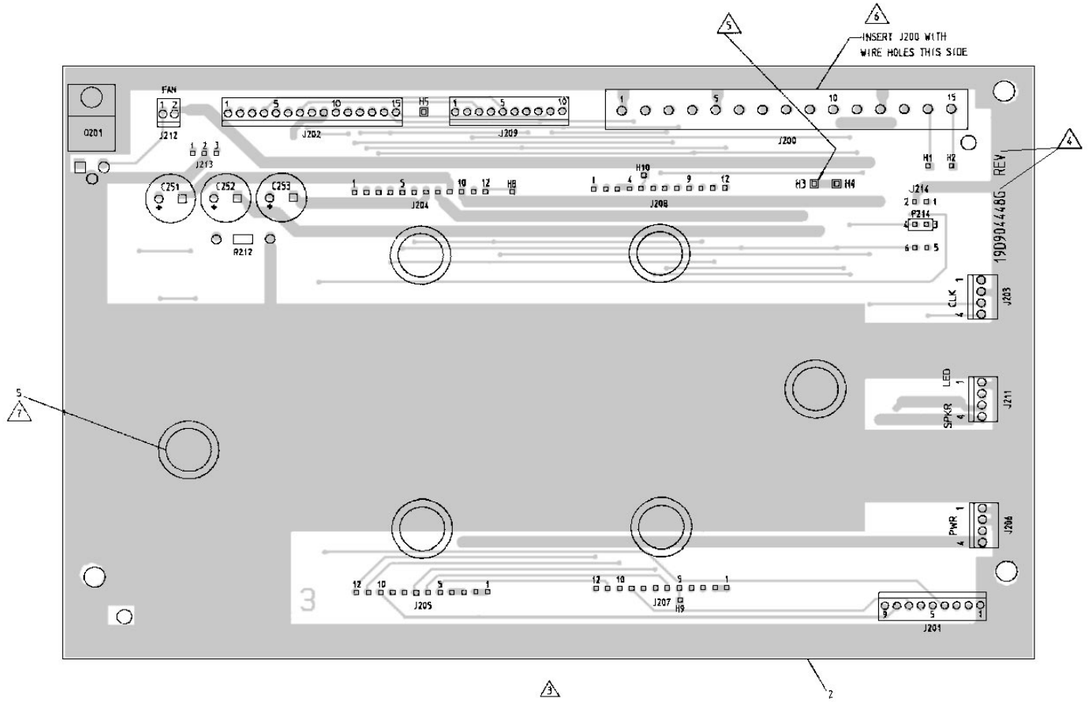
$Y = \overline{A}$

PIN 14 = Vcc
PIN 7 = GND

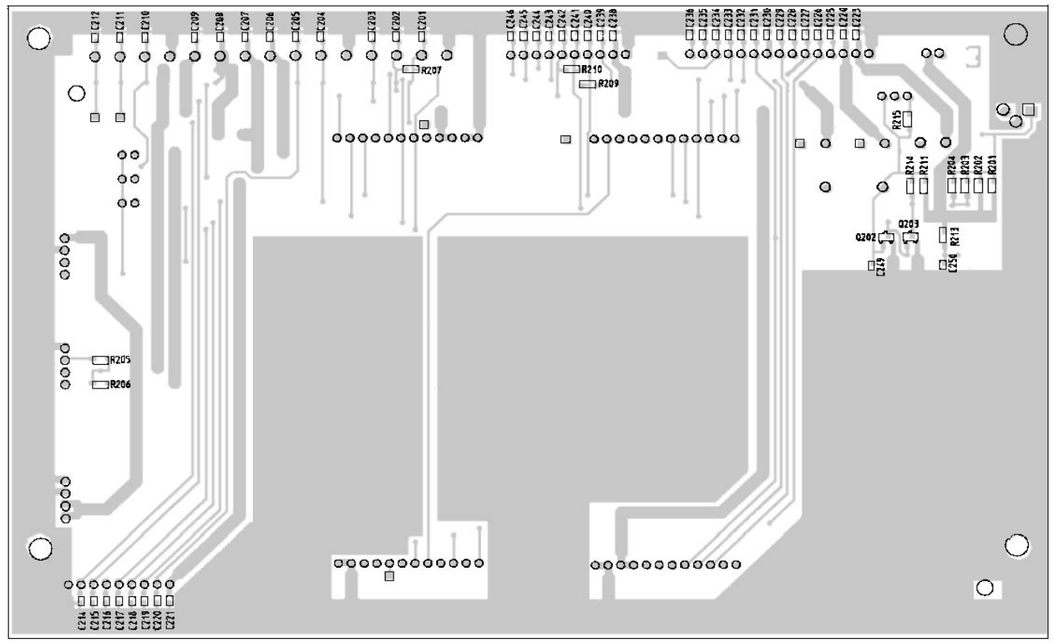
Quad 2-Input NAND Gate
19A703483P302 (U713)



COMPONENT SIDE



SOLDER SIDE



1. NOTES:
1. SOLDER ALL ELECTRICAL CONNECTIONS.

2. COMPONENT LEADS TO PROTRUDE .060 MAX. BELOW SOLDER SIDE OF BOARD.

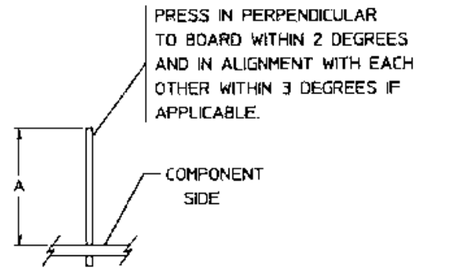
3. INDICATES FRONT OF COMPONENT AUTO-INSERTION MACHINES.

4. MARK APPLICABLE GROUP NUMBER AND REVISION LETTER PER 19A700152P1, .09 HIGH, COLOR BLACK FOR LATEST REVISION SEE 19C852060.

5. CUT RUN BETWEEN HOLE 3 & HOLE 4 TO SWITCH STATION SPEAKER AUDIO.

6. J200 TO BE FLUSH WITH ITEM 2 WITHIN .030.

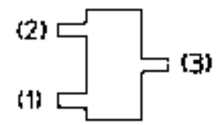
7. ATTACH ITEM 5 TO ITEM 2 IN AREAS SHOWN IN MARKING (6 PLACES).



MOUNTING FOR J204, J205, J207, J208, J213, AND J214

A DIMENSION = .580 FOR-J204, J205, J207, AND J208
A DIMENSION = .260 FOR J213, J214

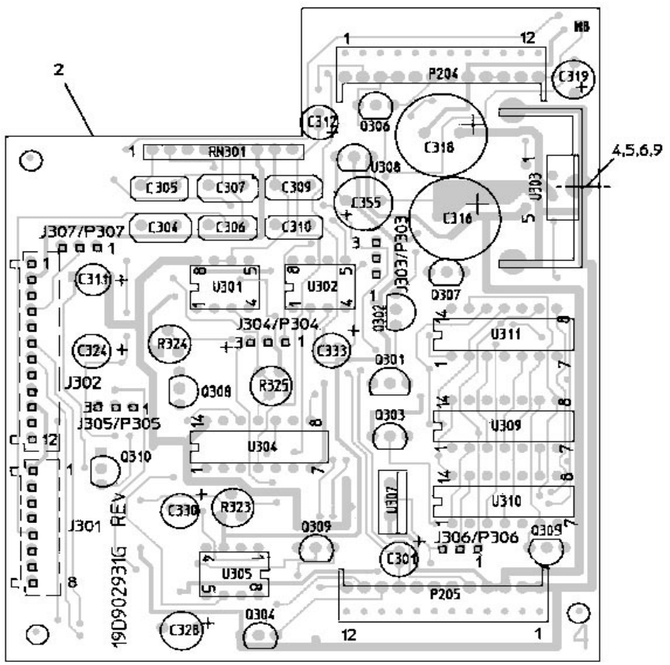
LEAD IDENTIFICATION FOR Q202 AND Q203 (SOT) TRANSISTORS (TOP VIEW)



INTERCONNECT BOARD A1
19D904448G1 & G2

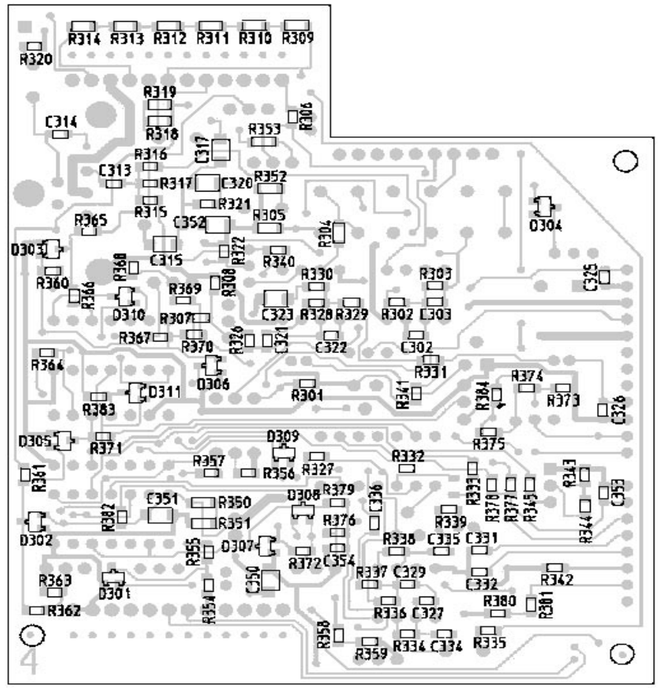
(19D904448, Sh. 1, Rev. 3)
(19D904448, Sh. 2, Rev. 3)

COMPONENT SIDE



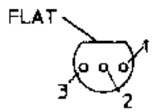
FRONTSIDE VIEW

SOLDER SIDE



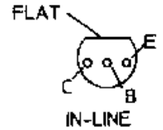
BACKSIDE VIEW

LEAD IDENTIFICATION
FOR U308



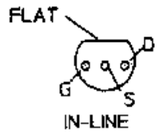
IN-LINE
TOP VIEW
NOTE:CASE SHAPE IS DETERMINING
FACTOR FOR LEAD IDENTIFICATION

LEAD IDENTIFICATION
FOR Q303-Q310



IN-LINE
TOP VIEW
NOTE:CASE SHAPE IS DETERMINING
FACTOR FOR LEAD IDENTIFICATION

LEAD IDENTIFICATION
FOR Q301-Q302



IN-LINE
TOP VIEW
NOTE:CASE SHAPE IS DETERMINING
FACTOR FOR LEAD IDENTIFICATION

LEAD IDENTIFICATION
FOR R323, R324,& R325

TOP VIEW

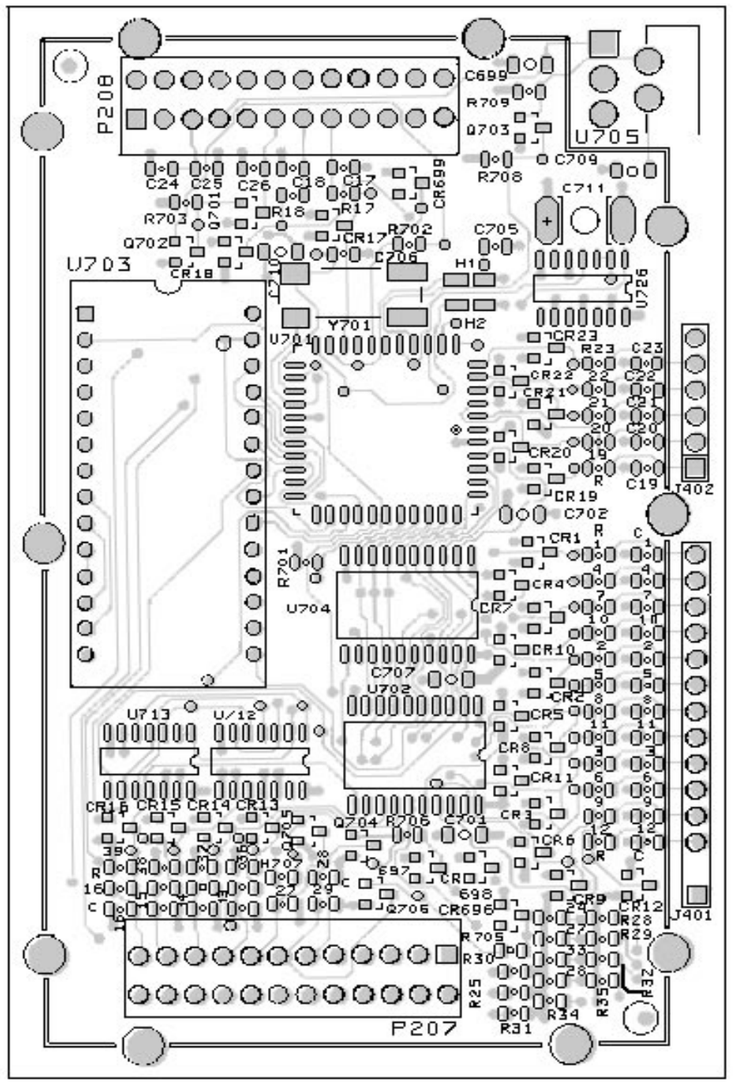
LEAD IDENTIFICATION
FOR Q301-Q311

VIEW FROM SOLDER SIDE

REMOTE INTERFACE BOARD
19D902931G1

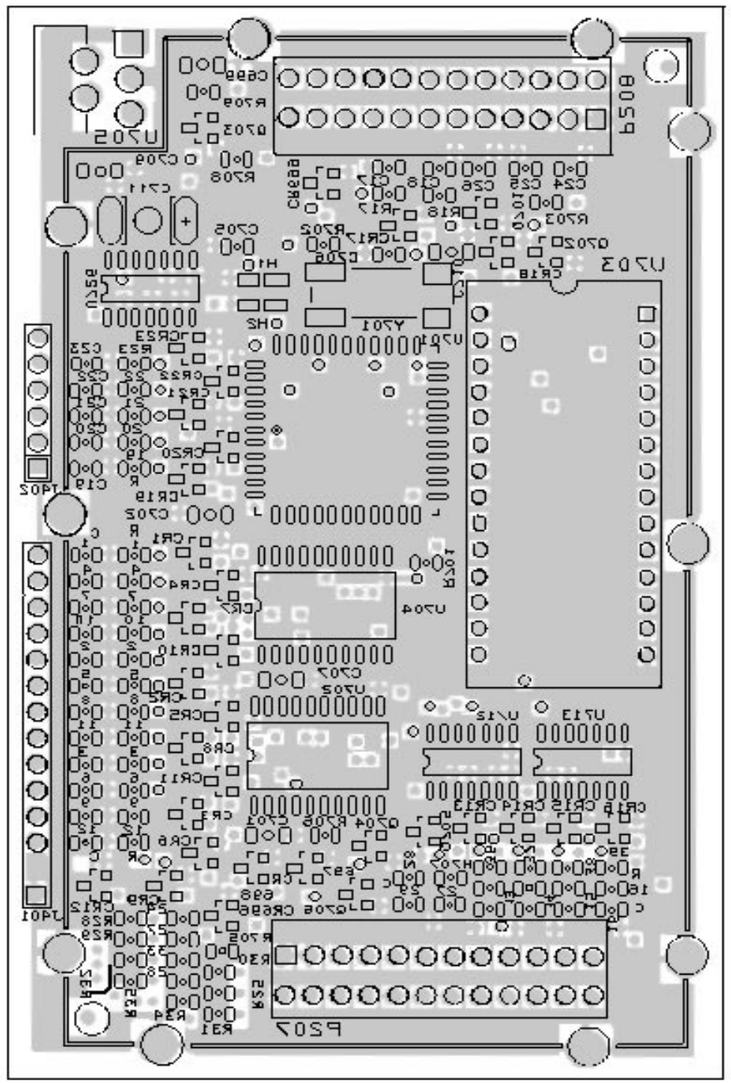
(19D902931, Sh. 1, Rev. 4)
(19D902932, Component Side, Rev. 4)
(19D902932, Solder Side, Rev. 4)

COMPONENT SIDE



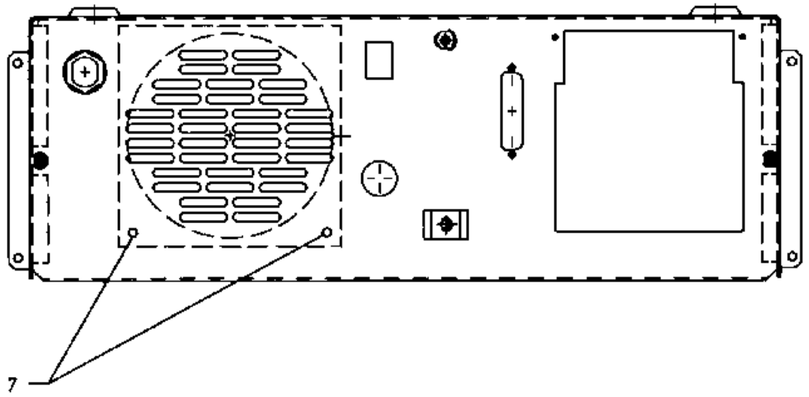
(42-001022-0628#, Marking)
(42-001022-0601#, Side A, Layer 1)
(42-001022-0602#, VCC, Layer 2)

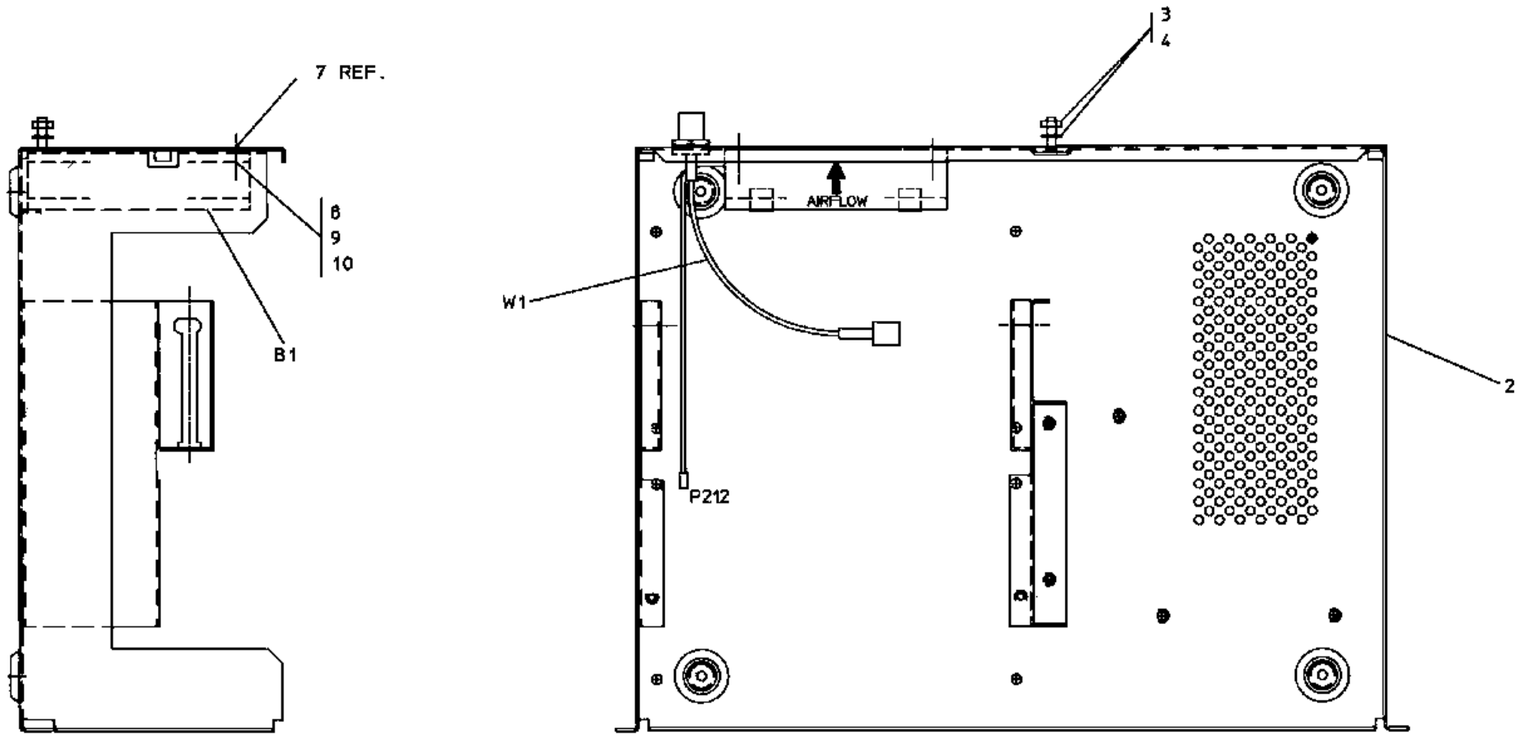
SOLDER SIDE



(42-001022-0628#, Marking (Flipped))
(42-001022-0604#, Side B, Layer 4)
(42-001022-0603#, Ground Plane, Layer 3)

KEYPAD/FREQUENCY SELECT BOARD
344A3383P1

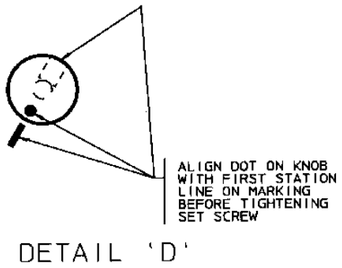


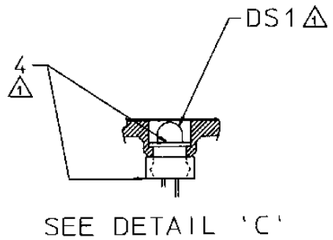


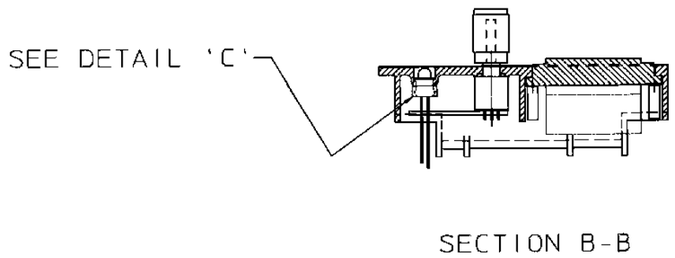
19D904706G1
CHASSIS ASSEMBLY

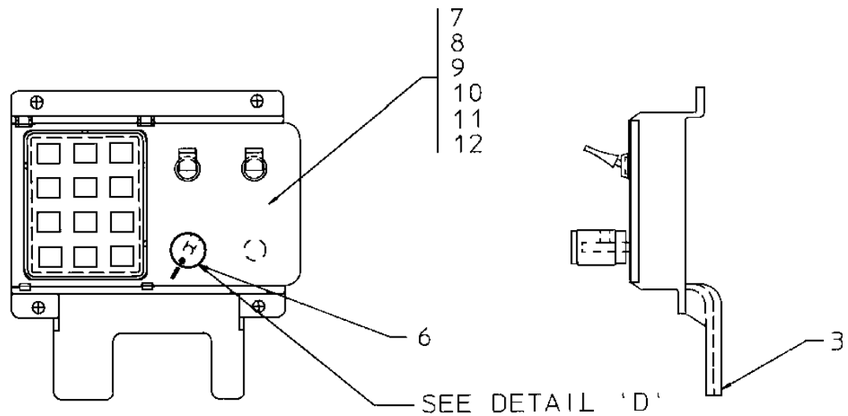
SYMBOL	PART NO.	DESCRIPTION
		---------- MODULE ----------
B1	5493477P9	Fan, AX.
		---------- CABLES ----------
W1	19B801454P42	Cable. RF Antenna.
W2	19B851585P16	Cable. Radio/Option.
W3	19B852054P2	Cable. DC Power.
W4	19B801729P2	Cable. Microphone.
W5	344A3337P3	Cable. LED/Speaker.
		--------- MISCELLANEOUS ---------
2	19D904703P1	Chassis.
3	N210P16B6	Nut, steel: No. 10-32.
4	N403P19B6	Lockwasher: No. 10.
7	19A702364P413	Machine screw, TORZ Drive, M3.5{.6 x 13.
8	19A701312P5	Flatwasher: M3.5.
9	19A700033P6	Lockwasher, external tooth, M3.5.
10	19A700034P5	Hex nut: No. M3.5 x 0.6.

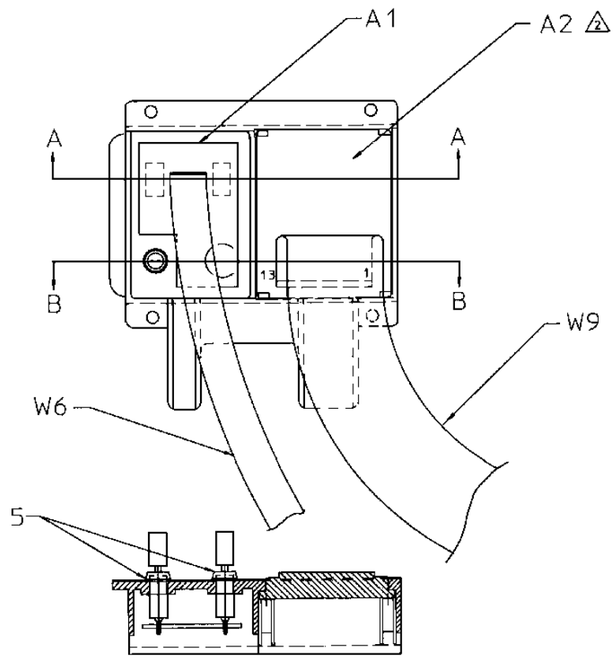
CHASSIS ASSEMBLY
19D904706G1
(19D904706, Rev. 1)











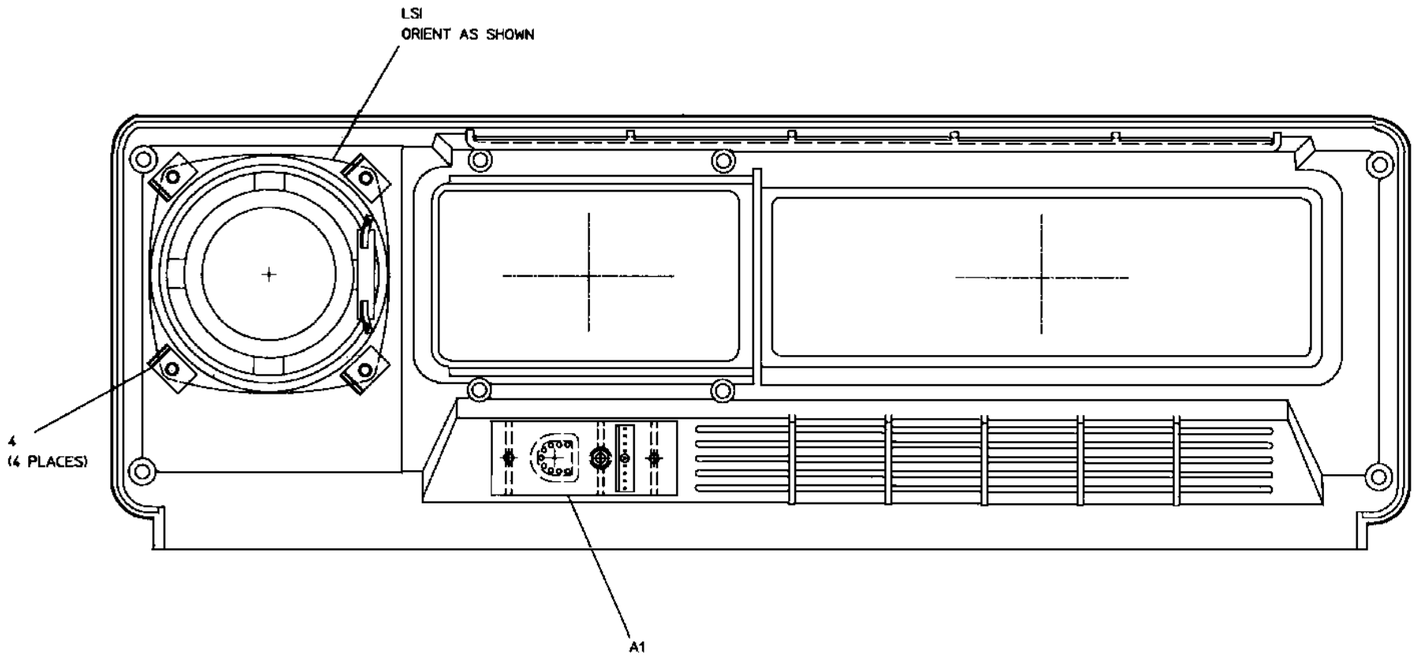
(1) NOTES

1. INSERT FERRULE, ITEM 4 INTO PANEL. FIRMLY SEAT DS1 IN FERRULE BEFORE SECURING WHOLE ASSEMBLY TO PANEL USING COLLAR, PART OF ITEM 4.
2. WHEN KEYPAD OPTION IS CALLED FOR, REMOVE BACKING PLATE FROM PANEL, ITEM 3. SNAP BOTTOM EDGE OF KEYPAD, A2, UNDER DOGS MOLDED INTO PANEL. ROTATE KEYPAD FORWARD AT THE TOP, SECURING THE TOP EDGE UNDER THE MOLDED IN SNAPS.
3. REMOVE HANDLES AND HARDWARE FROM S1 & S2 PRIOR TO ASSEMBLY. DISCARD HARDWARE, REUSE HANDLES.

CONTROL PANEL
19D904861G1-G6
(19D904861, Rev. 1)

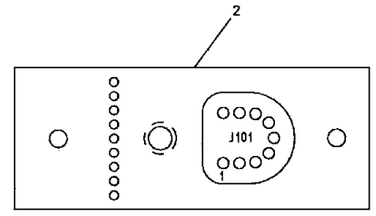
19D904861G1 - G6
CONTROL PANEL

SYMBOL	PART NO.	DESCRIPTION
		- - - - - - - - - - ASSEMBLIES - - - - - - - - -
A1	19C852424G1	Panel, switch (Used in G2, G4 and G6).
		- - - - - - - - - - JACKS - - - - - - - - - -
J1	19A704852P32	Printed wire, two part: 6 contacts, sim to Molex 22-29-2061. (Used in G1).
		- - - - - - - - - - RESISTORS - - - - - - - - - -
R1	RELUA316255/5	Resistor, Potentiometer, 5K ohms. (Used in G1).
		- - - - - - - - - - SWITCHES - - - - - - - - -
S1	19A700189P11	Toggle switch. (Used in G1).
S2	19A700189P12	Toggle switch. (Used in G1).
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
2	19C852425P1	Printed wire board. (Used in G1).
A2	19B802746P1	Keypad. (Used in G3 and G4).
A3	344A4758P1	CLK/VU (Used in G5 and G6).
		- - - - - - - - INDICATING DEVICES - - - - - - -
DS1	19A134354P1	Optoelectronic: Red; sim to HP 5082-4655.
		- - - - - - - - - - CABLES - - - - - - - - - -
W6	19B801735P2	Cable. (Used in G2, G4 and G6).
W9	19B801752P1	Cable Assembly. (Used in G3 and G4).
		- - - - - - - - - MISCELLANEOUS - - - - - - - - -
3	19D904702P1	Control Panel.
4	19A116677P1	Bushing: sim to Hewlett-Packard No. 5082-4707.
5	19A700189P13	Nut. (Used in G2, G4 and G6).
6	19A134939P4	SS Knob. (Used in G2, G4 and G6).
7	19C852432P1	Panel Marking. (Used in G1).
8	19C852432P2	Panel Marking. (Used in G2).
9	19C852432P3	Panel Marking. (Used in G3).
10	19C852432P4	Panel Marking. (Used in G4).
11	19C852432P5	Panel Marking. (Used in G5).
12	19C852432P6	Panel Marking. (Used in G6).

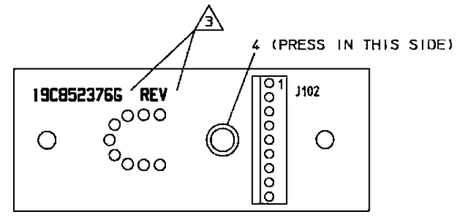


19D904705G1

SYMBOL	PART NO.	DESCRIPTION
		---------- ASSEMBLIES ---------
A1	19C852376G1	Component Board.
		---------- JACKS ----------
J101	344A4485P1	Connector, special; sim to CONXAL E4408.
J102	19A704852P35	Connector.
		--------- MISCELLANEOUS ---------
2	19C852375P1	Printed wire board.
4	19A702455P1	Nut. Self-CNC.
		---------- LOUDSPEAKERS --------
LS1	344A3269P1	Permanent Magnet Loudspeaker.
		--------- MISCELLANEOUS ---------
2	19D904700P1	Front Cap.
3	19A702362P310	Machine screw, TORX Drive M3-0.5 x 10.
4	19C307038P16	Nut. Push-On.



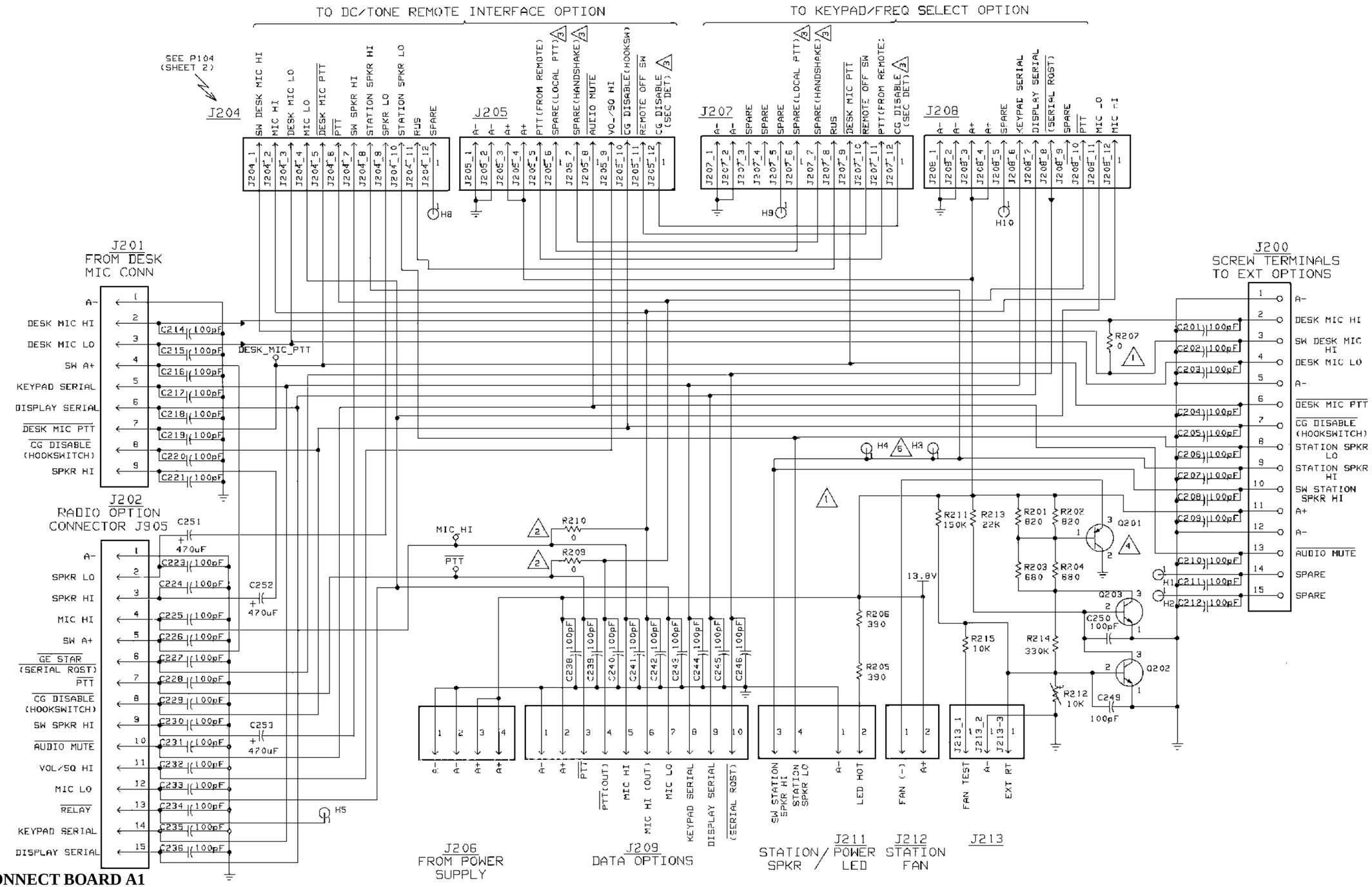
TOP SIDE



BOTTOM SIDE

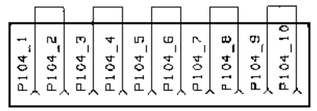
(1) NOTES:
1. SOLDER ALL ELECTRICAL CONNECTIONS.
2. LEADS TO PROTRUDE .060 MAX. BELOW BOARD ITEM 2.
(3) MARK APPLICABLE GROUP NUMBER AND REVISION LETTER PER 19A700152P1, .09 HIGH COLOR BLACK FOR LATEST REVISION SEE

FRONT CAP ASSEMBLY
19D904705G1
(19D904705, Rev. 1)



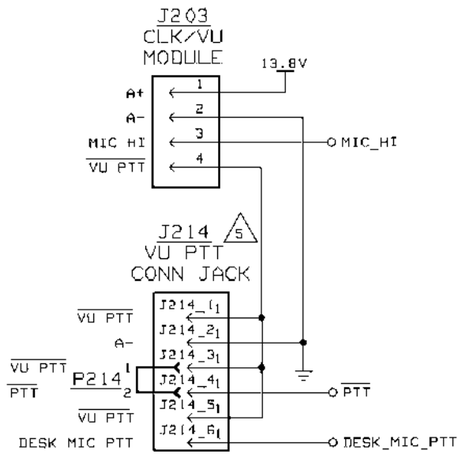
INTERCONNECT BOARD A1
19D904448G1 & G2

(19D904376, Sh. 1, Rev. 3)



P104

(SHOWN FOR REFERENCE ONLY)
FOR STANDARD DESKTOP STATION, INSTALL P104 JUMPER PLUG ON J204.
P104 JUMPER PLUG ON J204.
P104 JUMPER NOT USED WHEN DC/TONE REMOTE OPTION INSTALLED.

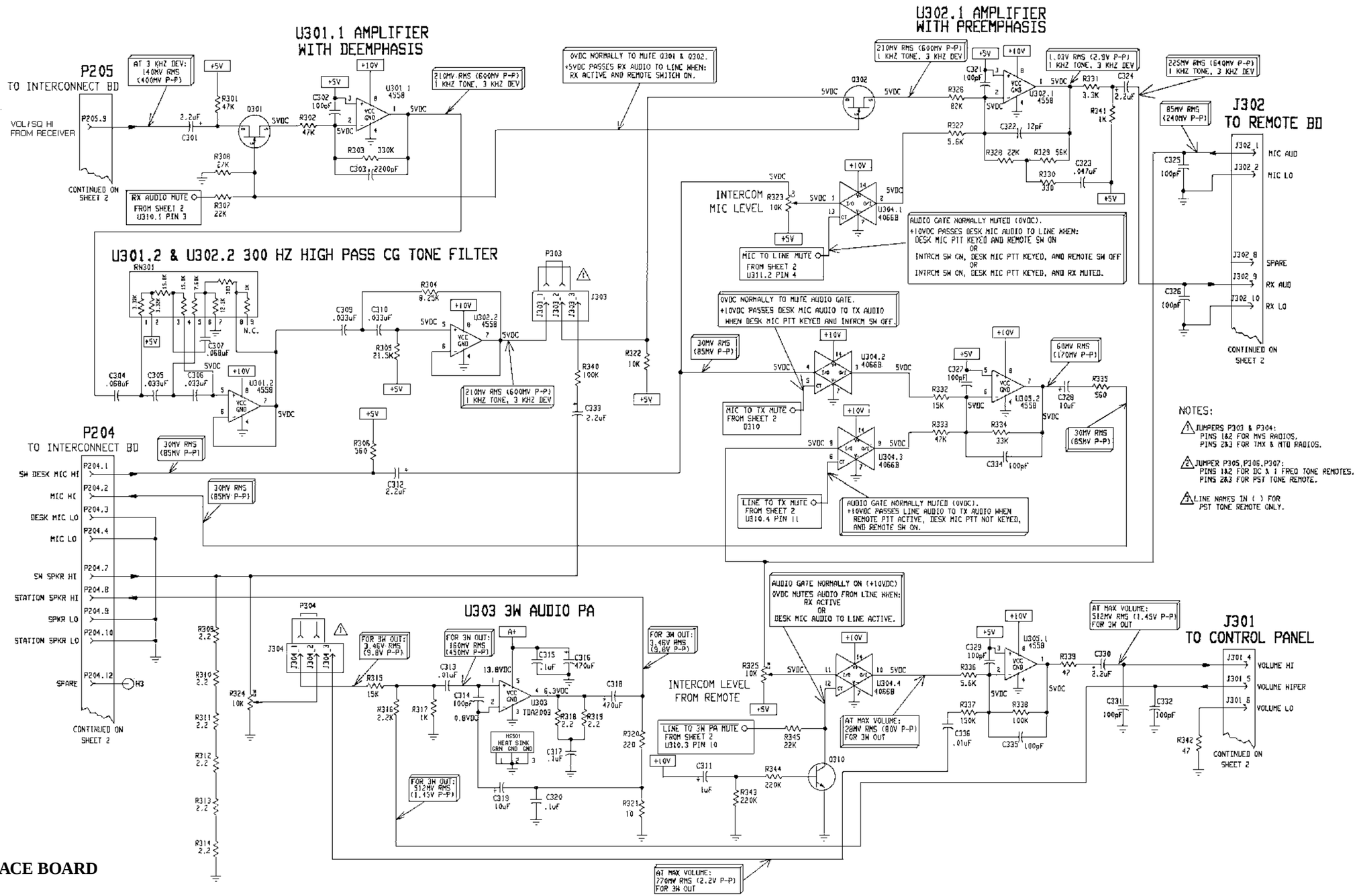


NOTES:

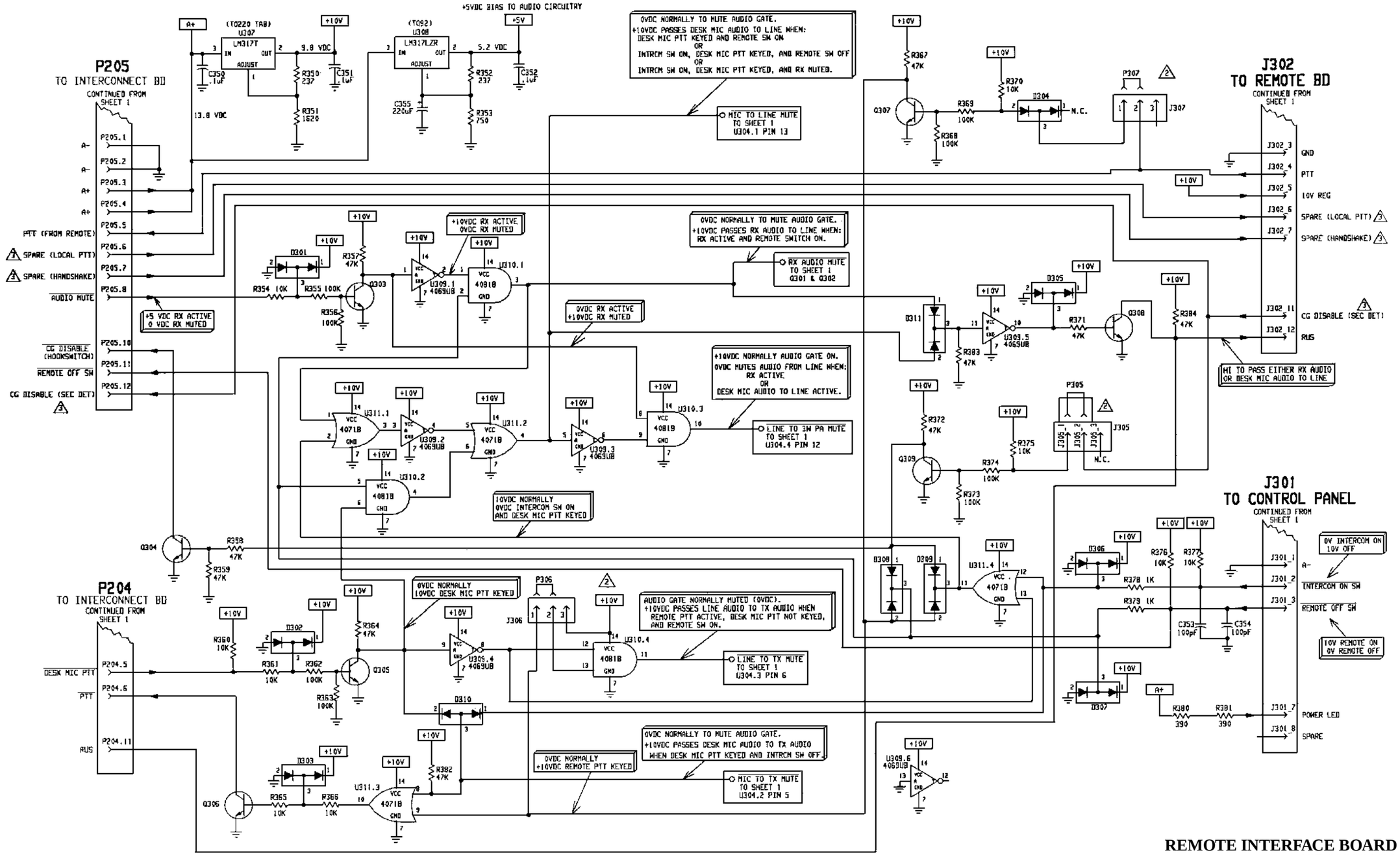
1. REMOVE 0 OHM RESISTORS: R207 TO SWITCH DESK MIC AUDIO
2. REMOVE 0 OHM RESISTORS: R209 AND R210 FOR DATA OPTIONS.
3. LINE NAMES IN () FOR EDACS TONE REMOTE ONLY.
4. Q201 IS MOUNTED TO BOARD USING MOUNTING STANDOFF FOR HEAT SINK.
5. VU METER ACTIVATION SELECTION CHART:
6. CUT RUN BETWEEN HOLE 3 AND HOLE 4 TO SWITCH STATION SPEAKER AUDIO.

FROM	TO	USING	EXPLANATION
J214-1	J214-2	P214	VU METER IS ALWAYS ACTIVE
J214-3	J214-4	P214	VU METER IS ACTIVE WHEN THE RADIO PTT IS LOW
J214-5	J214-6	P214	VU METER IS ACTIVE WHEN THE DESK MIC PTT IS LOW

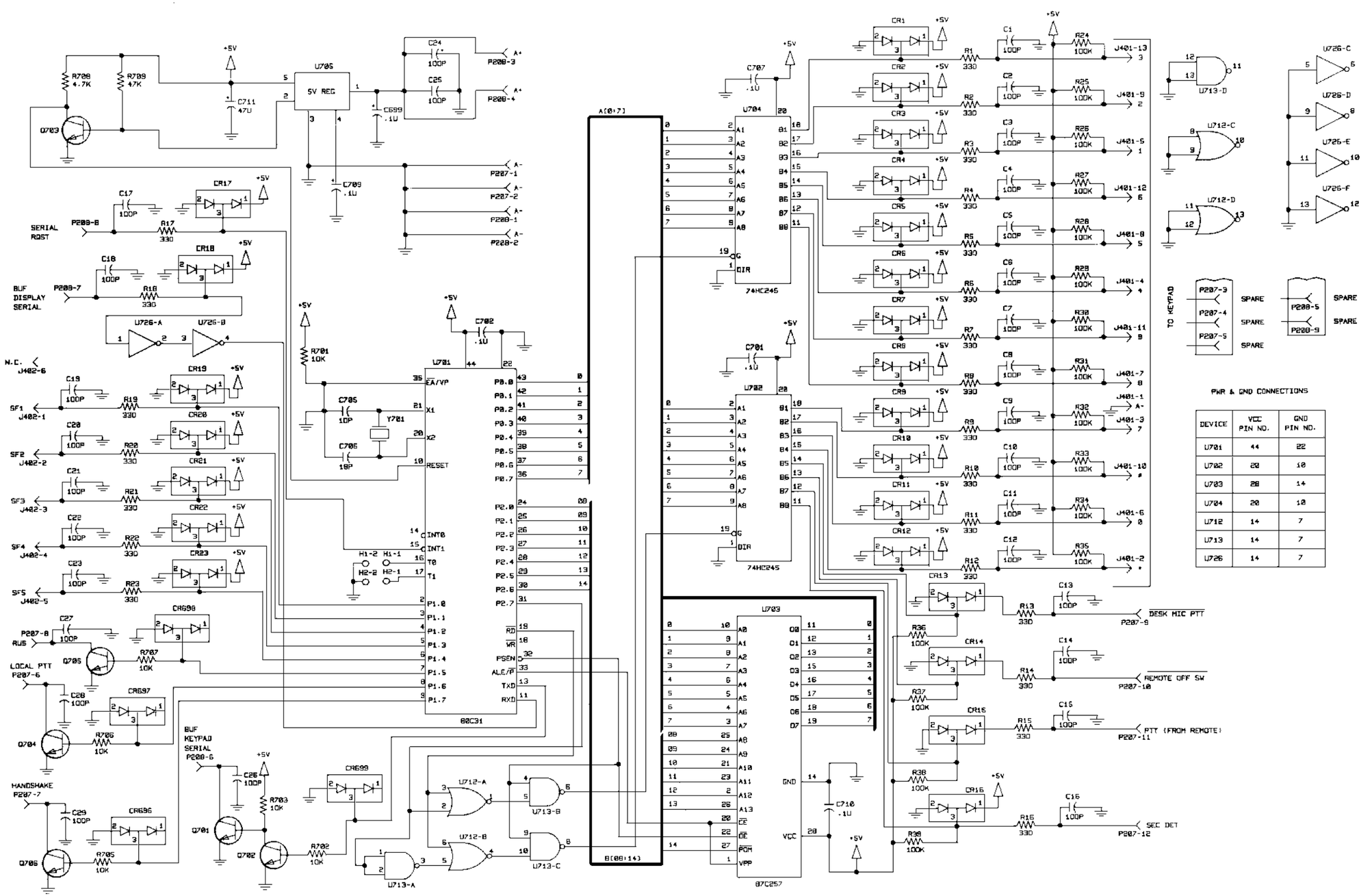
INTERCONNECT BOARD A1
19D904448G1 & G2
(19D904376, Sh. 2, Rev. 1)



REMOTE INTERFACE BOARD
19D902931G1
(19D902933, Sh. 1, Rev. 5)



REMOTE INTERFACE BOARD
19D902931G1
(19D902933, Sh. 2, Rev. 4)



PWR & GND CONNECTIONS

DEVICE	VCC PIN NO.	GND PIN NO.
U701	44	22
U702	20	10
U703	28	14
U704	20	10
U712	14	7
U713	14	7
U726	14	7

KEYPAD/FREQUENCY SELECT BOARD
344A3383P1
(19D903567, Rev. 0)

LBI-38978

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