Mobile Communications

DESK TOP STATION

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Maintenance Manual

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Mountain View Road • Lynchburg, Virginia 24502

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SYSTEM SPECIFICATIONS *

FREQUENCY RANGE	Refer to the applicable **MVS**, **TMX** or **MTD** 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 **MVS**, **TMX** or **MTD** Mobile Radio Maintenance Manual
DUTY CYCLE (EIA)	Receiver 100%, Transmitter 20%
TEMPERATURE RANGE	-30ºC to + 60ºC (-22ºF to + 140ºF) (Performance specified per EIA)
SPEAKER	4 ohms
DIMENSIONS (HXWXD)	14x50x43 cm (5.5x20x17 in.)
WEIGHT	20 kg (44 lb.)

* For detailed transmitter and receiver specifications, refer to the appropriate mobile Maintenance Manual.

PACKAGE NUMBERS

Package Number	Includes	Description
DSTA01		120 VAC Desk Top station with standard control panel. Order MVS style radio and appropriate microphone (mobile or desk top) separately. Field modify power supply by changing straps for 240 VAC.
	DSML1F0	Desk Top Station package combination
	DSPS3L	120/240 VAC, 50\60 Hz Power Supply
	DSCP3G	Standard Control Panel Option
DSTA02		Same as DSTA01 with CY1F DC Remote
	DSML1F0	Desk Top Station Package Combination
	DSPS3L	120/240 VAC, 50/60 Hz Power Supply
	DSCP3H	Remote Control Front Panel
	DSCY1K	Remote Board Interface Kit
DSTA03		Same as DSTA01 with Keypad on Standard front panel.
	DSML1F0	Desk Top Station Package Combination
	DSPS3L	120/240 VAC, 50/60 Hz Power Supply
	DSCP3J	Standard Front Control Panel with Keypad
	KE1F	Keypad/Freq Select Bd Kit (Keypad only)
DSTA04		Same as DSTA01 with keypad and Remote Control Front Panel
	DSML1F0	Desk Top Station Package Combination
	DSPS3L	120/240 VAC, 50/60 Hz Power Supply
	DSCP3K	Remote Control Front Panel with Keypad
	DSCY1K	Remote Board Interface Kit
	KE1E	Keypad/Freq Select Bd Kit (keypad and CY1J Tone Remote)
DSTA05		Same as DSTA02 with CY1G Tone Remote
	DSML1F0	Desk Top Station Package Combination
	DSPS3L	Same as above
	DSCP3H	Same as above
	DSCY1K	Same as above

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OPTIONS

Option Number	Description
DSCY1F	1-Frequency DC Remote Board (Field Install)
DSCY1G	1-Frequency Tone Remote Board (Field Install)
DSCY1J	5-Frequency PST Tone Remote Board (Field Install)
DSCY1K	Remote Interface Board Kit (Standard On DSTA02 And DSTA04 And DSTA05)
DSCP3G	Standard Control Panel (Standard On DSTA01)
DSCP3H	Remote Control Panel With Intercom (Standard On DSTA02 And DSTA05)
DSCP3J	Standard Control Panel With Keypad (Standard On DSTA03)
DSCP3K	Remote Control Panel With Keypad (Standard on DSTA04)

NOTE

The "**DSCP**" options come standard with the Desktop Station Package. Order only to switch control panels in the field.

DSCD1A	Standby Power Transfer Kit (Field Install)
DSZM1K	External Weatherproof Speaker And Cord Set (Delta Style)

APPLICABLE MAINTENANCE MANUALS

DESCRIPTION

Ericsson GE's **MVS**, **TMX** or **MTD** 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 **MVS**, **TMX** or **MTD** Mobile Radio Units as follows:

- MVS Conventional Radio in all frequency bands
- TMX-8825 Radio
- MTD 900 MHz Trunked Radio (GE-NET)
- MTD 800 MHz Trunked Radio (EDACS)

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 **MVS**, **TMX** or **MTD** mobile radio unit. The Desk Top Station operates from 120 or 240 VAC sources @ 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 Volt, 50/60 Hz)
- Interconnect Board
- DC/Tone Remote Control Panel with Intercom Control
- Optional DC/Tone Remote Interface Board combination, with 1 of 4 types of Remote Board:

  1. DC Remote Board (19A704686P3)
  2. Tone Remote Board, 1 - Channel (19A704686P4)
  3. EDACS Tone Remote Board, 5-Channel (19A704686P8)

  NOTE

  Remote channel selection can only be used with **MTD** radios.

- 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 connecting to:

- Radio
- Control Panel
- Power Supply, or Standby Power Transfer Option
- DC/Tone Remote Interface Board (Option)
- Keypad/Frequency Select Board (Option)
- Station Speaker
- Station Fan
- Desk Microphone

A single transistor (Q201) is used to reduce the 13.8 Vdc power supply voltage to a suitable voltage to power the station fan. Q201 is turned on and off by the temperature control circuit consisting of thermistor R212 and Q202 and Q203. The only other circuitry on the Interconnect Board consists of jack interconnections.

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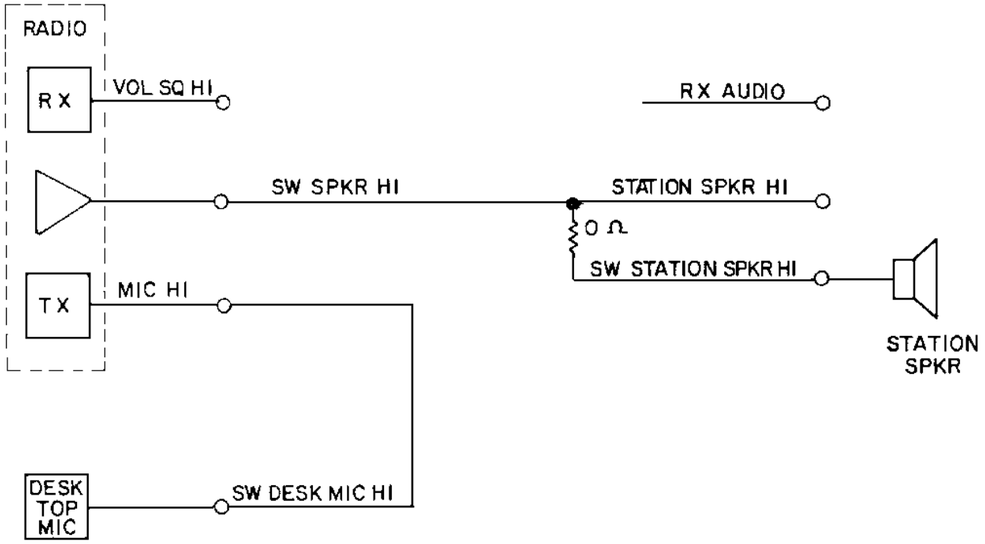

Figure 1 - Interconnect Board Without Remote Interface Board Audio Connections

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 19A704686P4 (1-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.

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 microphone is connected to the radio microphone input through the **SW DESK MIC HI** and **MIC HI** lines.

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

All of the Station audio paths are controlled by bilateral switches with exception of two FET switches in the **VOL SQ HI** to **RX AUDIO** connection. 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:

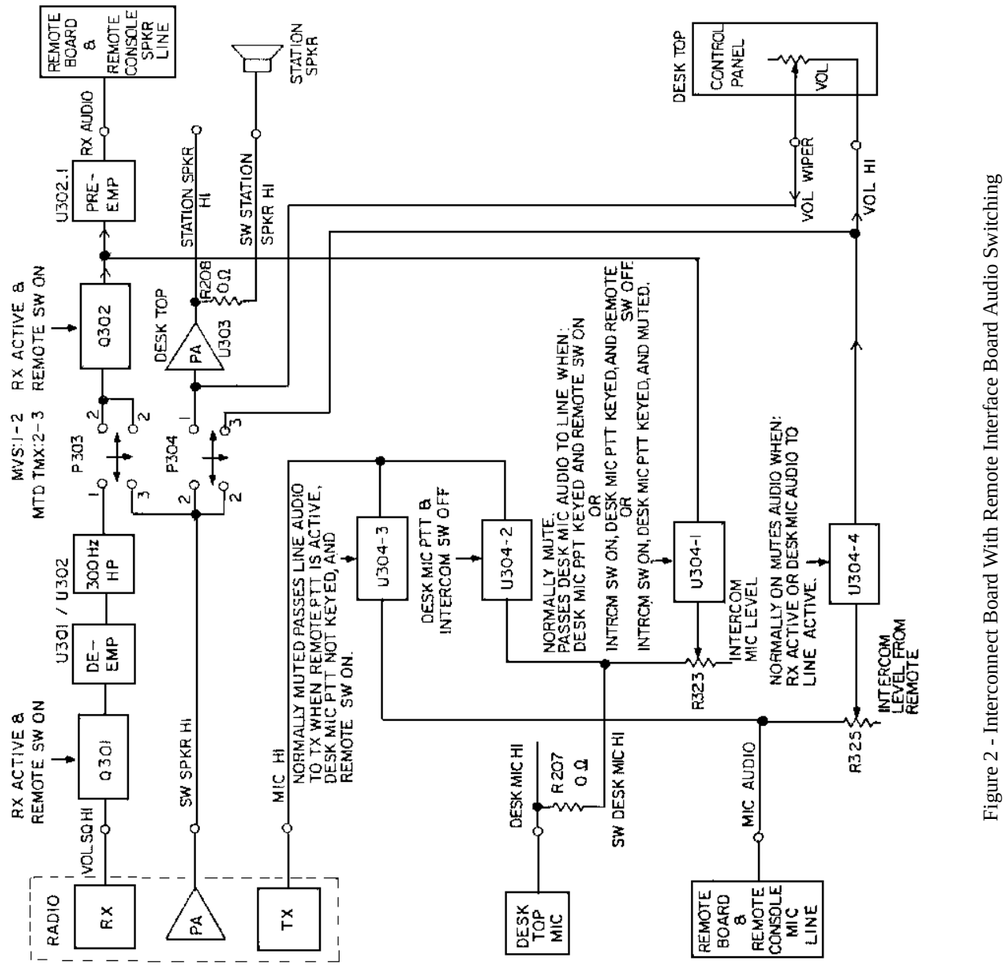

Figure 2 - Interconnect Board With Remote Interface Board Audio Switching

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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 Mic PTT **AND** Remote Sw **ON**

OR

2) Intercom Sw **ON** **AND** Dcsk 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 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 Mic PTT

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:

Rx active
OR

Desk Mic to Remote Speaker audio line active

Q301 An FET switch, which for an MVS radio, passes the non-processed audio from the radio **VOL SQ HI** through the audio processing in the Desk Top Station and to the Remote Board. For the **MVS** radio the plugs P303 and P304 must be set for a 1-2 connection. The conditions for transmission are:

Rx Active **AND** Remote Sw **ON**

Q302 An FET switch, which for an MTD or a 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 (Optional)

The Keypad/Frequency Select Board interfaces a 12 key keypad (344A3366P1) to serial data lines used for communication 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 19D902928) 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 Programing Notes For Desktop Station Operation

1) From the "Radio Personality" screen, enter the "Mobile Radio Options" screen (F7). Program the "Hookswitch to "NORMAL. This will allow the station to disable group scan when the MONITOR button is engaged on the desk microphone. Program the "Minimum Volume" to 9.

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.

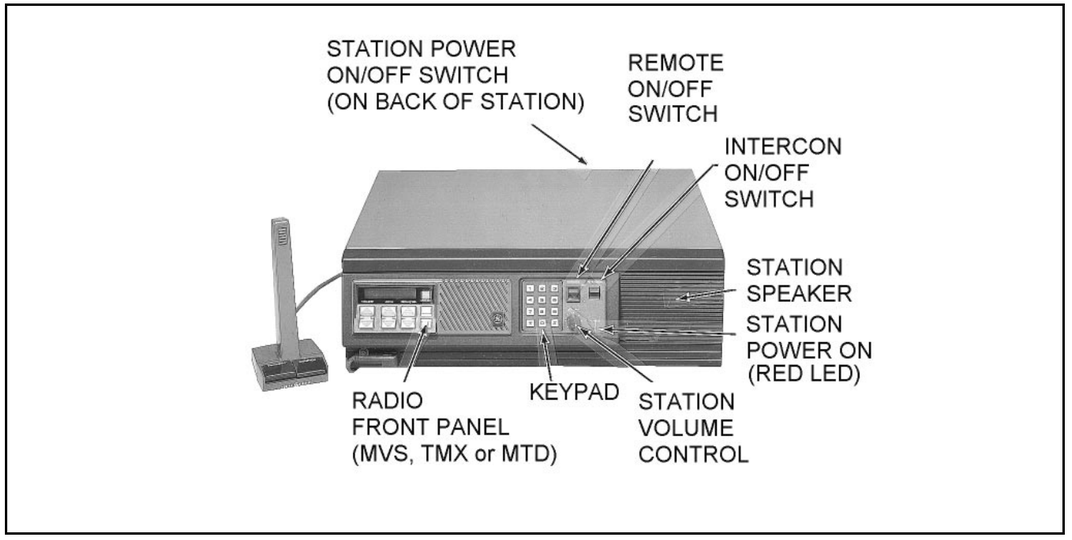

Figure 3 - Base Station Controls And Indicators

OPERATION

INTRODUCTION

The front panel of the Ericsson GE Desk Top Station, as shown in Figure 1, includes the front of an MVS conventional radio or a TMX or MTD trunking 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:

- **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).

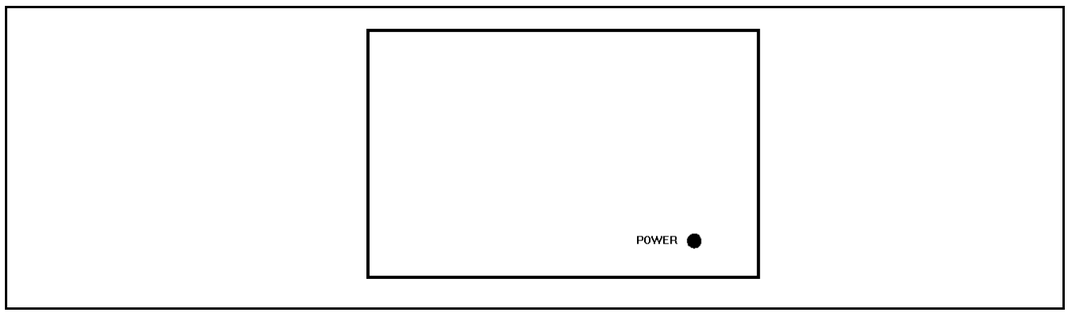

Figure 4 - Control Panel With Single LED Power Indicator

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

- **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 (see Figure 5).

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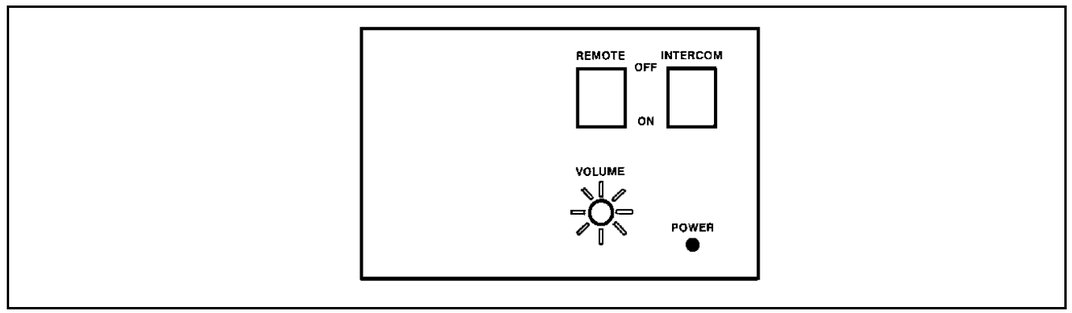

Figure 5 - Control Panel With Remote Option

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 there is enough heat inside the cabinet for the Temperature Control circuit to activate it. 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 radio used, **MVS**, **TMX** or **MTD**. Refer to the applicable Operator's Manual for more detailed information.

STATION WITH REMOTE OPTION

The DC/Tone Remote Options permit use of Ericsson GE's 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 these functions:

- Transmit, Receive and Intercom Audio
- Transmit Keying (PTT) Control
- 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 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 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 Mic PTT.

2. **Desk Top 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 Mic is heard on the Remote speaker.

   An intercom message from the Remote Mic can be heard on the Station speaker, but only if the Desk Mic is **not** active. The Desk 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 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 Mic is not keyed. Also, the Remote Console Mic is connected to the Station speaker if the radio receiver is squelched and the Desk Mic is not keyed (So that the "**Desk Mic Audio to Line Path**" is inactive).

   The radio receiver audio is connected to the Remote Console speaker if the receiver is unsquelched. The P.A. 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 Mic is connected only to the radio transmitter, when the Desk Mic is keyed.

   The radio receiver's P.A. 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 the Table **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 choice of **INTERCOM** and **REMOTE** switch positions.

An **MVS** conventional radio has volume control buttons to control the receiver audio level to the Station speaker independently of the intercom volume. The Station's rotary **VOLUME** controls the intercom volume only.

With the **TMX** and **MTD** 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 applicable Operator's Manual for specific information on setting the audio level of the particular radio installed**.

KEYPAD/REMOTE INTERFACE BOARD OPERATION

When the desktop 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 MENU button on the radio to select special call mode.

2. Enter the unit ID 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 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.

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

To make a telephone interconnect call from the keypad:

1. Push 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 microphone PTT switch to talk and release it to listen.

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

Tone Remote Operation

The RCN-1000 Remote Controller is capable of selecting up to 5 predefined radio system/group/special call combinations. The presets are programed into the radio by the PC Programmer.

The remotes and desktop station can operate as an intercom by setting the INTERCOM switch to "ON."

Remotes can be disabled by setting the station's REMOTE switch to "OFF."

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 speak. Release the PTT when you are finished.

3. Adjust the volume as needed while receiving a call.

REMOTE & INTERCOM AUDIO INTERFACE SUMMARY

Desk Top Intercom Switch ON, Remote Switch ON

Remote Mic	————————> Radio Xmtr
Remote Mic	————————> Station Spkr
Desk Mic	—— / ——> Radio Xmtr
Desk Mic	————————> Remote Spkr, If Rx is muted, otherwise Rx ————> Remote Spkr and Station Spkr
Rx Audio	————————> Station Spkr & Remote Spkr

Desk Top Intercom Switch ON, Remote Switch OFF

Remote Mic	—— / ——> Radio Xmtr
Remote Mic	————————> Station Spkr, if Desk Mic PTT inactive
Desk Mic	—— / ——> Radio Xmtr
Desk Mic	————————> Remote Spkr
Rx Audio	—— / ——> Remote Spkr
Rx Audio	————————> Station Spkr

Desk Top Intercom Switch OFF, Remote Switch ON

Remote Mic	————————> Radio Xmtr, if no Desk Mic; otherwise with Desk Mic PTT, Desk Mic ————> Radio Xmtr
Remote Mic	————————> Desk Spkr, if Desk Mic PTT inactive, otherwise Remote Mic muted
Desk Mic	————————> Radio Xmtr with Desk Mic PTT
Desk Mic	————————> Remote Spkr
Rx Audio	————————> Remote Spkr, if Rx unmuted
Rx PA Audio	————————> Station Spkr

Desk Top Intercom Switch OFF, Remote Switch OFF

Remote Mic	————————> Radio Xmtr
Remote Mic	—— / ——> Station Spkr
Desk Mic	————————> Radio Xmtr
Desk Mic	—— / ——> Remote Spkr
Rx Audio	—— / ——> Remote Spkr
Rx PA Audio	—— / ——> Station Spkr

Key:

Connection	= ————————>
No Connection	= —— / ——>

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CIRCUIT ANALYSIS

INTERCONNECT BOARD WITHOUT A REMOTE INTERFACE BOARD

Transmit Audio Path

The Desk 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 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 J209.9 **SW SPKR HI**. The Interface Board connection between the **SW SPKR HI** line and J210-1 **SW STATION SPKR HI** is made through 0 ohm resistor R208 and a jumper connecting P104-7 **SW SPKR HI** and P1 04-8 **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.

INTERCONNECT BOARD WITH REMOTE INTERFACE BOARD

The Remote Interface Board interfaces the radio to the DC or Tone Remote boards. Desk Mic and receiver audio are gated and summed on the Interface Board. This combined audio is then sent to the Remote Board which 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 Desk Microphone To Remote Board

Audio from the Desk Microphone enters the Interconnect Board at J201-2 **DESK MIC HI**. The 0 ohm resistor (R207) connects the **DESK MIC HI** to the **SW** e Interface Board at P204-1 and to **INTERCOM MIC LEVEL** potentiometer R323, a level adjustment on the board for the Desk 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 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 Mic PTT Keyed **AND** Remote Switch **ON**
OR
Intercom Sw **ON**, Desk Mic PTT Keyed and Remote Sw **OFF**
OR
Intercom Sw **ON**, Desk Mic PTT Keyed **AND** Rx Muted

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.

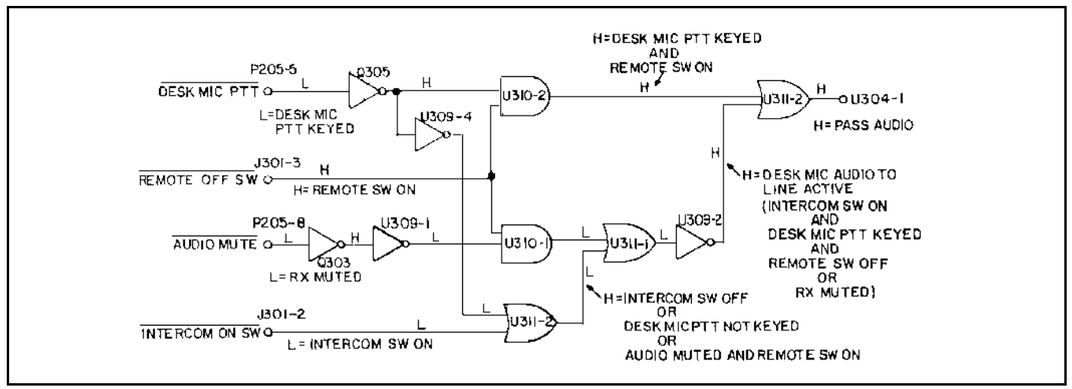

Figure 6 - Logic For Desk Mic to Remote Spkr Path

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 Microphone to Radio Transmitter

Audio from the Desk Microphone enters the Interconnect Board at J201-2 **DESK MIC HI**. The 0 ohm resistor R207 connects the **DESK MIC HI** to the **SW 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 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 **MTD** and **TMX** radios, Plug 303 jumpers 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 through the 0 ohm resistor R208 to J210-1 **SW STATION SPKR HI** for connection to the Station Speaker.

There is no switching control logic for this path.

Path For Processed Audio From The Radio PA To The Remote Board, For MTD And TMX Radios

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 **MTD** and **TMX** radio, Plug 303 jumpers 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 as to pass the audio signal for the following conditions:

Rx Active (Unsquelched) **AND** Remote Sw itch **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 Sw **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.

LBI-38635

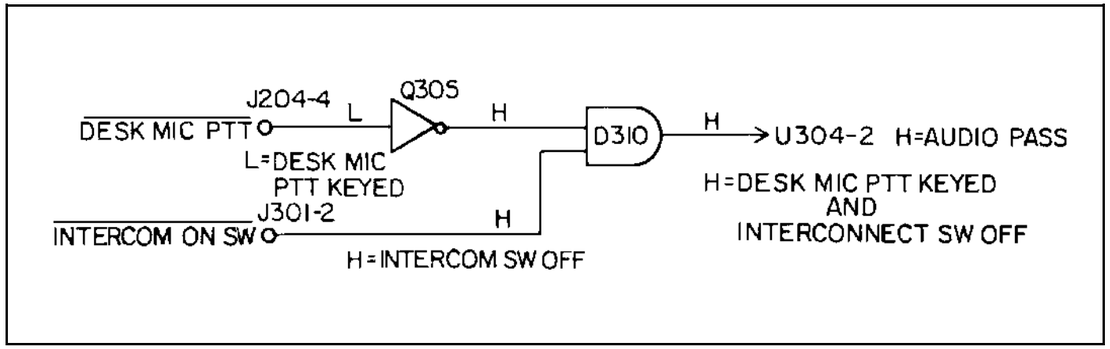

Figure 7 - Logic for Desk Mic To Radio Xmtr Path

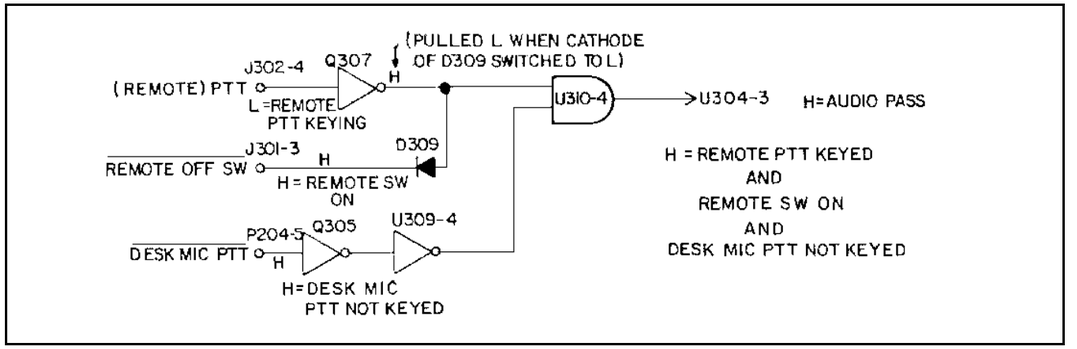

Figure 8 - Logic For Remote Mic To Radio Xmtr Path

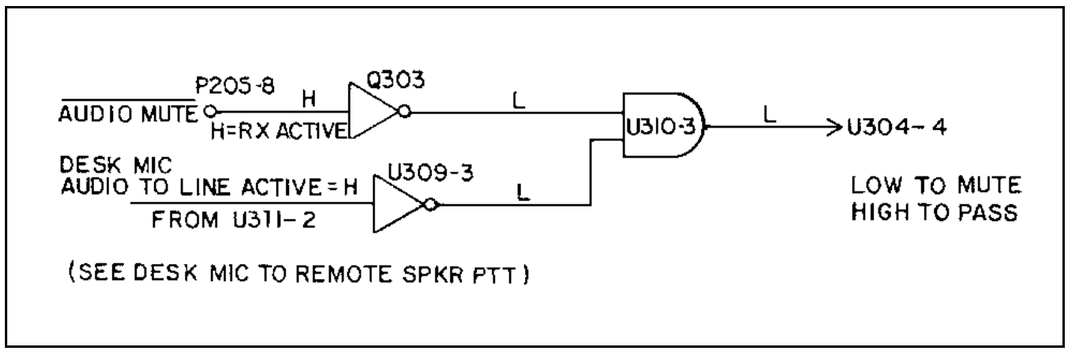

Figure 9 - Logic For Remote Mic To Station Spkr Path

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 to 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 + 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

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 **TMX** and **MTD** type radios. 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 through 0 ohm resistor R208 to J210-1 **SW STATION SPKR HI** for connection to the Station Speaker.

The gating conditions for this path are that 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.

Path For Non-Processed Audio From The Radio VOL SQ HI Line to Remote Board For MVS Radio

The unprocessed audio from the **MVS** radio comes to the Interconnect Board at J203-11 **VOL SQ HI** and on to the Remote Interface Board at P205-9. FET switch Q301 is next in the path. The gate of Q302 is controlled by logic on the Remote Interface Board. This 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**

The audio signal then goes through audio processing on the Remote Interface Board, with de-emphasis in the U301-1 amplifier stage and 300 Hz high pass filtering in Channel Guard filter U301-2.

For the **MVS** radio, P303 jumpers pins 1 and 2 of J303.

A second FET switch (Q302) in the path is in the same state as Q301 and similarly controlled, with the same conditions for switching. But, its purpose is for a "**Radio PA to Station Speaker Path**".

When the signal is passed through the Q302 switch it goes through amplifier U302-1 and to the J302-9 output as **RX AUDIO**, where connection is made for the Remote Board with line to the Remote Console speaker. Since the audio circuitry in the Remote Board has built in de-emphasis, amplifier U302-1 includes audio preemphasis.

The path from the radio to the remote speaker is set up with the Remote Switch **ON** and is complete only when the radio receiver is unsquelched.

The switching control logic for this path is shown in Figure 10.

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.

For the **MVS** radio P304 jumpers pin 1 and 2 of J304. This routes the receiver audio to audio PA U303. The radio volume control buttons adjust the receiver volume.

The Switching Logic for this path is shown in Figure 11.

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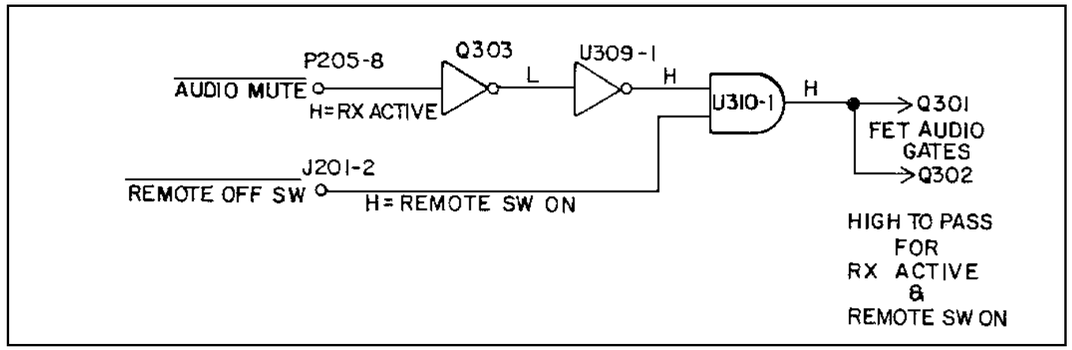


Figure 10 - Logic For Radio VOL SQ HI To Remote spkr Path

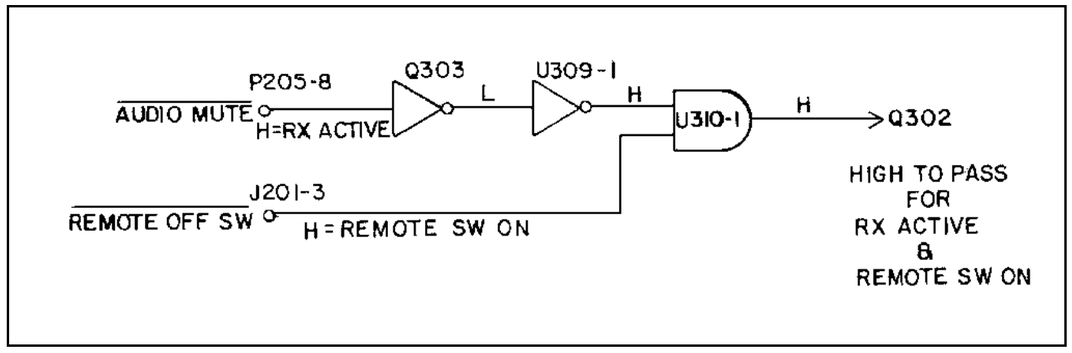


Figure 11 - Logic For Radio PA to Remote Spkr Path

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 12.

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 Disable signal enters the Desk Top Station from the Remote Board at J302-1 1 **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 PST tone remote applications with P305 moved to Pins 2 to 3.

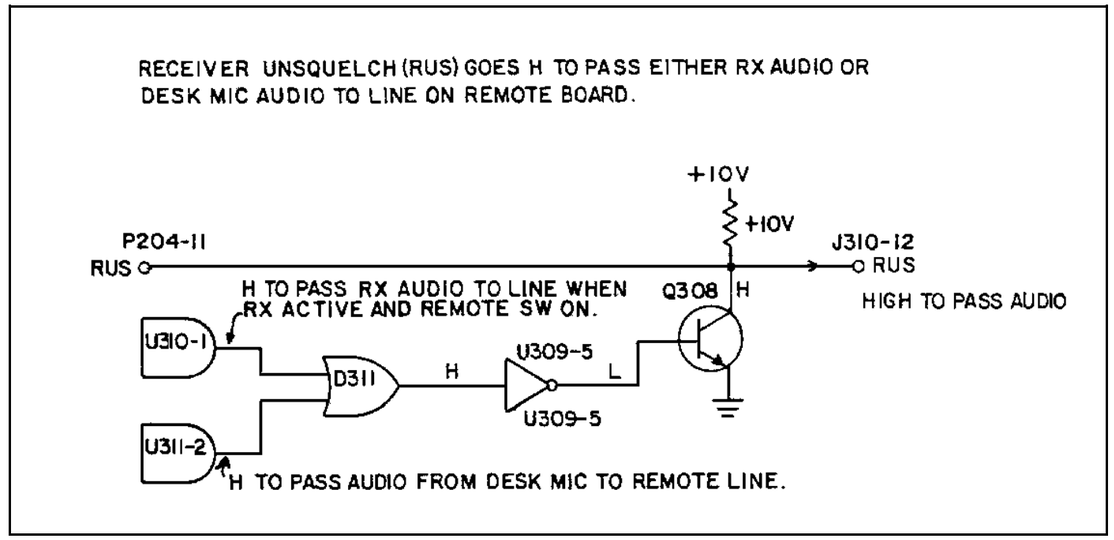


Figure 12 - Logic For Generation Of the RUS Signal

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

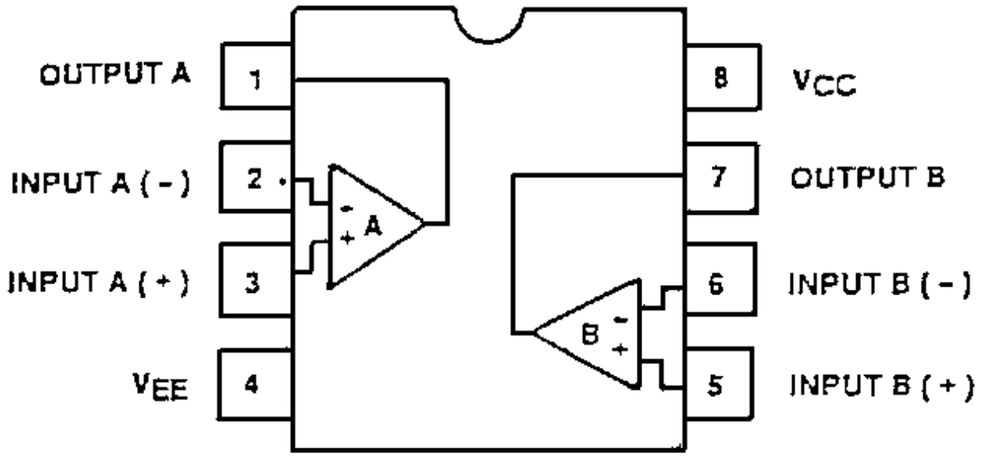
The PTT signal comes from the Remote Board at J302-4 PTT as a low to key the radio transmitter. After two inversions in transistors Q306 and Q307, the signal is found at P204-6 PTT, as a logical low to key the radio. It is connected to the radio through the 0 ohm resistor R209 connection to J203-7 on the Interconnect Board.

Keypad/Frequency Select Option

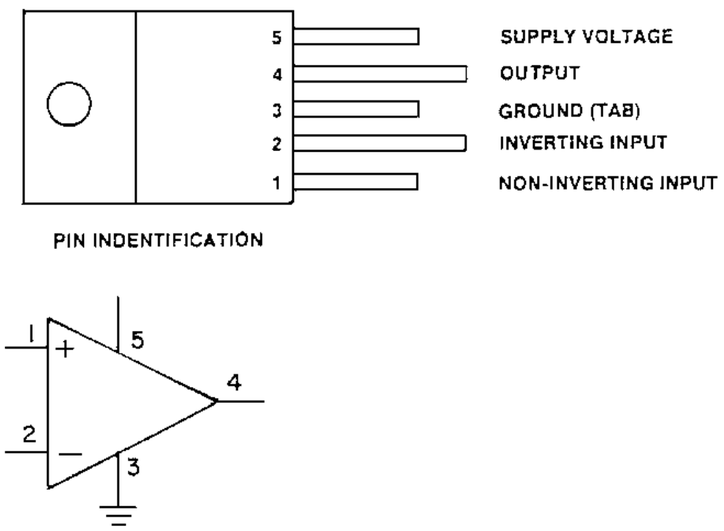
The keypad/frequency select board is microprocessor controlled. It connects a 12 key keypad to serial data lines for communication with the radio. The board also converts to serial data the information from the EDACS tone remote board 19A704686P8.

The keypad data is inputed through J401 to the Octal Bus Transceiver ICS U702 & U704. The outputs of U702 & U704 are connected to the EPROM chip U703 and the microprocessor U701. 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.

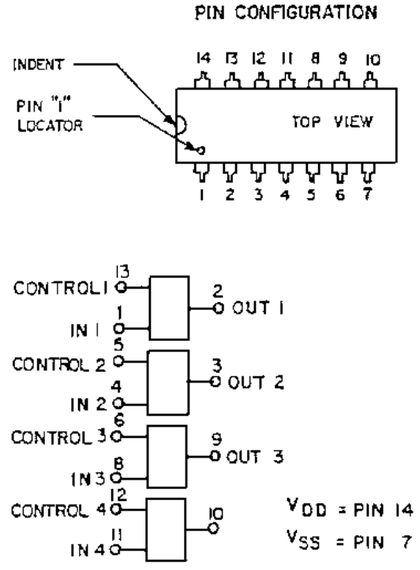
DUAL OPERATIONAL AMPLIFIER
19A700086P4 (U301 U302 & U305)



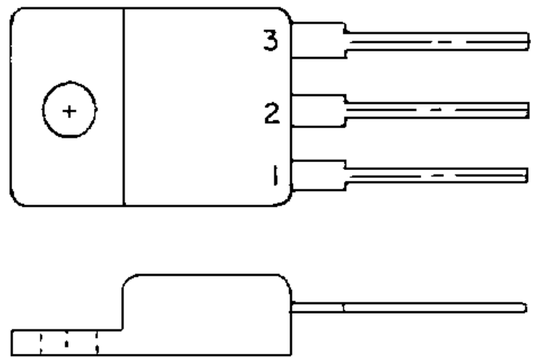
AUDIO AMPLIFIER
19A701830P1 (U303)



BILATERAL SWITCH
19A700029P44 (U304)

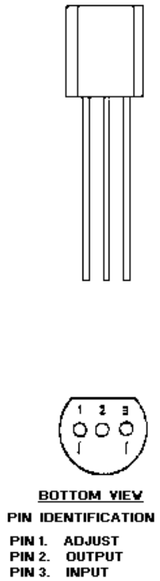


VOLTAGE REGULATOR
19A701999P1 (U307)

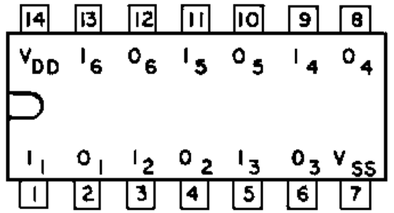


REMOTE INTERFACE BOARD
19D902928G1

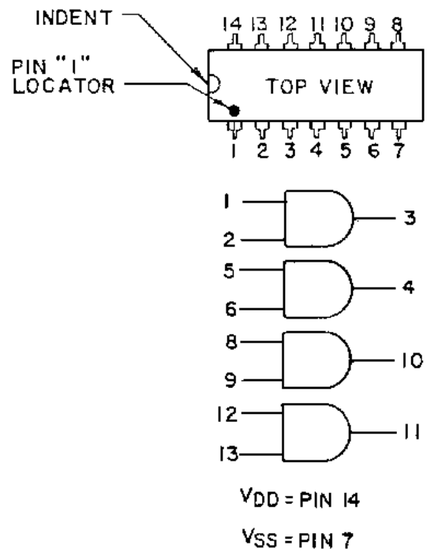
VOLTAGE REGULATOR
19A701999P4 (U308)



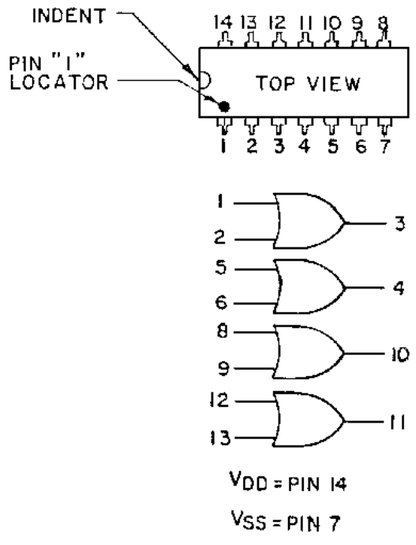
HEX BUFFER
19A700176P2 (U309)



QUAD 2-INPUT AND GATE
19A700029P47 (U310)

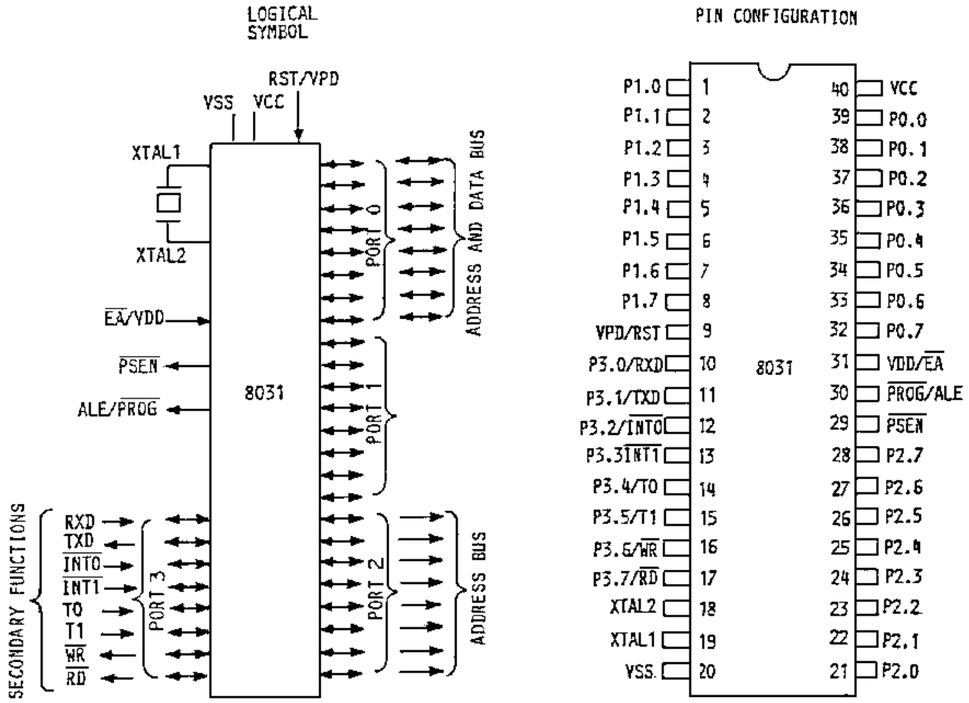


QUAD 2-INPUT OR GATE
19A700029P46 (U311)

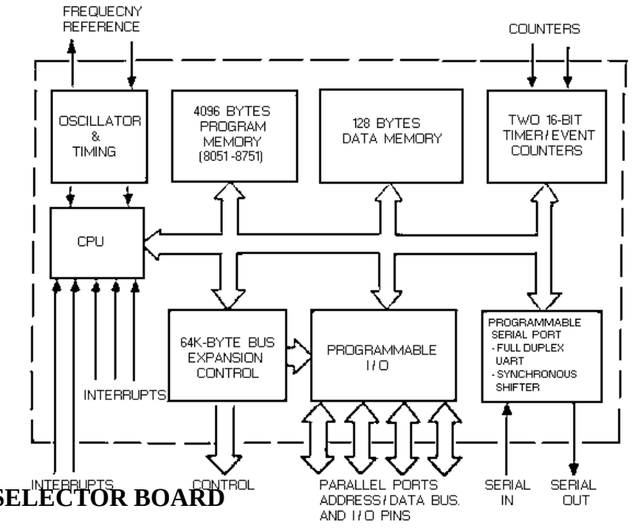


REMOTE INTERFACE BOARD
19D902928G1

8-BIT MICROPROCESSOR
(U701)

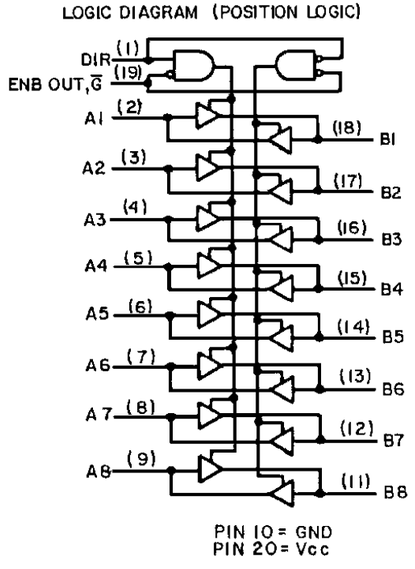


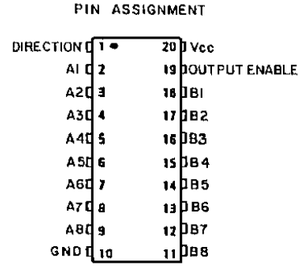
BLOCK DIAGRAM



KEYPAD/FREQUENCY SELECTOR BOARD
344A3383P1

3-STATE BUS/LINE TRANSCEIVER
19A703471P108 (U702, U704)



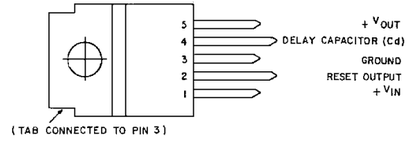


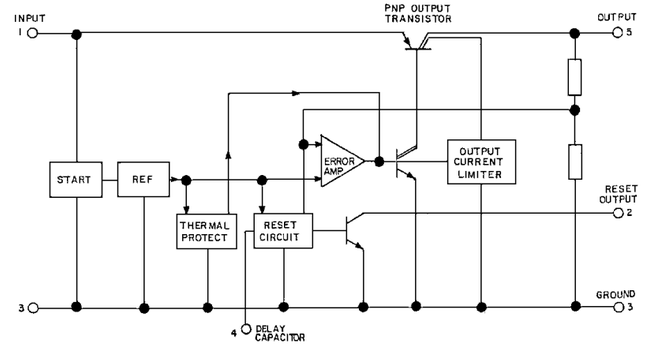
FUNCTION TABLE

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)

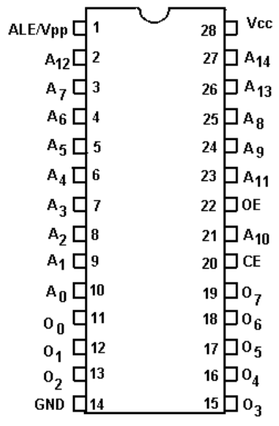
X=DON'T CARE

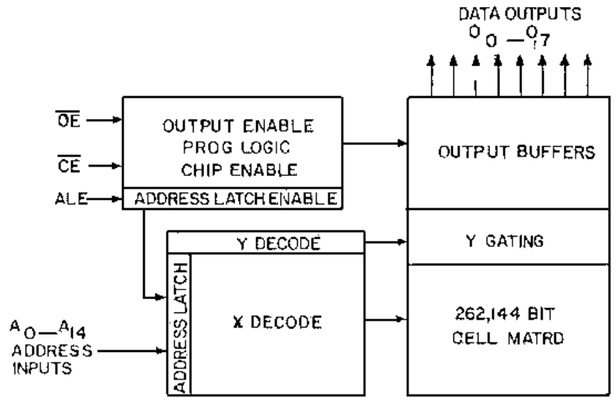
VOLTAGE REGULATOR
19A704970P1 (U705)



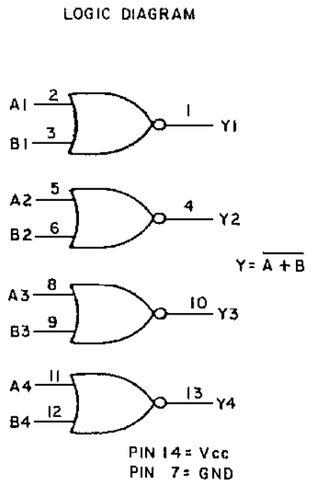


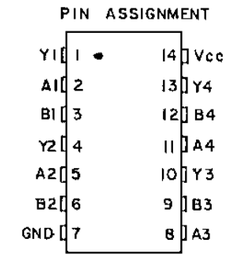
EPROM
3443758G1 (U703)





QUAD 2-INPUT NOR GATE
19A703483P101 (U712)



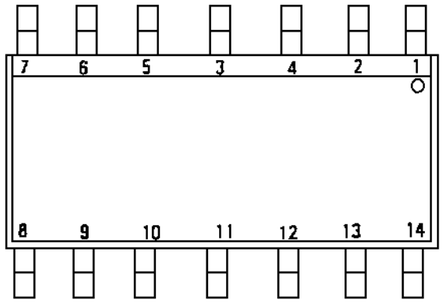


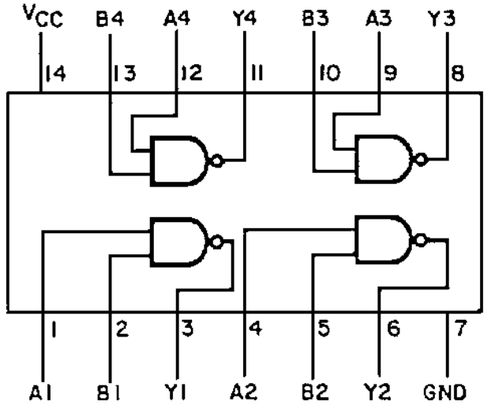
FUNCTION DIAGRAM

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

KEYPAD/FREQUENCY SELECTOR BOARD
344A3383P1

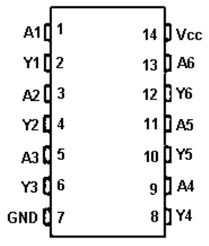
QUAD 2-INPUT NAN GATE
19A703483P302 (U713)





SCHMITT-TRIGGER-INVERTER
19A703483P321)

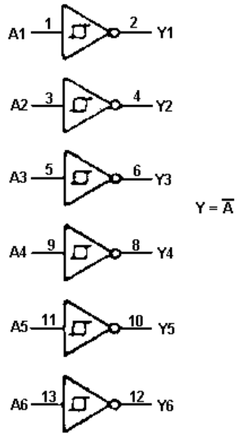
PIN ASSIGNMENT



FUNCTION TABLE

Input	Output
A	Y
L H	H L

LOGIC DIAGRAM



$Y = \overline{A}$

PIN 14 = Vcc
PIN 7 = GND

KEYPAD/FREQUENCY SELECTOR BOARD
344A3383P1

INTERCONNECT BOARD A1
19D902928G1/G2
Issue 2

SYMBOL	PART NO.	DESCRIPTION
		---------- CAPACITORS ----------
C201 thru C212	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C215 thru C221	19A702061P61	Ceramic: 100 pF ±5%, 50 VDCW, temp coef 0 ±30 PPM.
C225 thru C248	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. (Used in G2).
		---------- JACKS ----------
J200	344A3197P1	TB
J201 thru J203	19A703248P11	Post: Gold Plated, 10 mm length.
J204 and J205	19A703248P15	Post: Gold Plated, 21 mm length.
J206	19A704852P30	Printed wire: 4 contacts rated @ 2 1/2 amps; sim to Molex 22-29-2041.
J207 and J208	19A703248P15	Post: Gold Plated, 21 mm length.
J209	19A703248P11	Post: Gold Plated, 10 mm length.
J210 and J211	19A704852P28	Printed wire: 2 contacts rated @ 2.5 amps.
J212	19A700072P28	Printed wire: 2 contacts rated @ 2.5 amps; sim to Molex 22-27-2021.
J213	19A703248P11	Post: Gold Plated, 10 mm length. (Used in G2).
		-------- TRANSISTORS ----------
Q201	344A3238G1	TSTR PNP
Q202 and Q203	19A700076P2	Silicon, NPN: sim to MMBT3904, low profile. (Used in G2).
		---------- 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 thru R210	19B800607P1	Metal film: Jumper.
R211	19B800607P154	Metal film: 150K ohms ±5%, 1/8 w. (Used in G2).
R212	19A701864P4	Thermal 10K ohms ±10%, im to Midwest Component 2H-103. (Used in G2).
R213	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w. (Used in G2).
R214	19B800607P334	Metal film: 330K ohms ±5%, 1/8 w. (Used in G2).
R215	19B800607P103	Metal film: 10K ohms ±5%, 1/8 w. (Used in G2).
		------- MISCELLANEOUS --------
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.

* COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

REMOTE INTERFACE BOARD
19D902931G1
Issue 3

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	19B801251P473	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	19B801251P682	Metal film: 6.8K 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	19A700033P5	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.

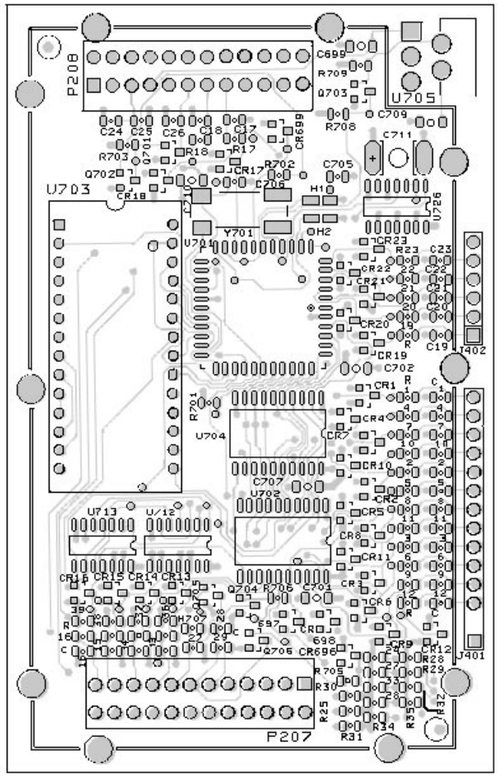
REV. B - REMOTE INTERFACE BOARD 19D902931G1
To equalize transmit audio between the desk mike and the RCN1000 remote unit. R333 was 47K ohms (19B801251P473).

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	19A705205P111	Tant, (D), 20%, 10V, 47 uF
		---------- DIODES ----------
CR1 thru CR25, 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

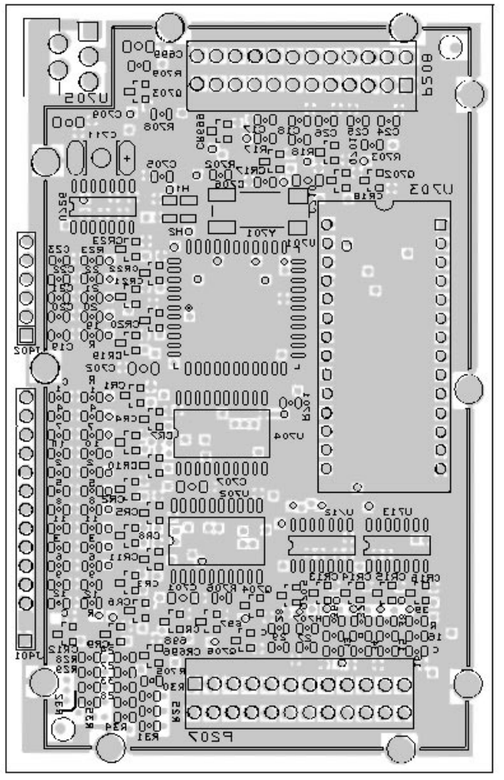
• COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

COMPONENT SIDE



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

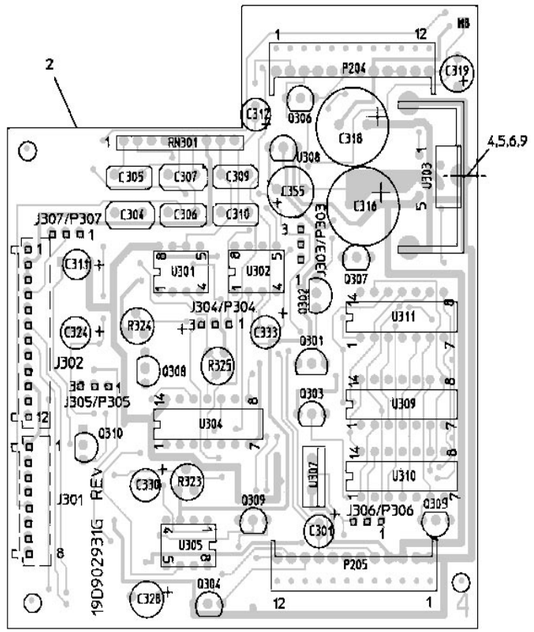
SOLDER SIDE



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

KEYPAD/FREQUENCY SELECTOR BOARD
344A3383P1

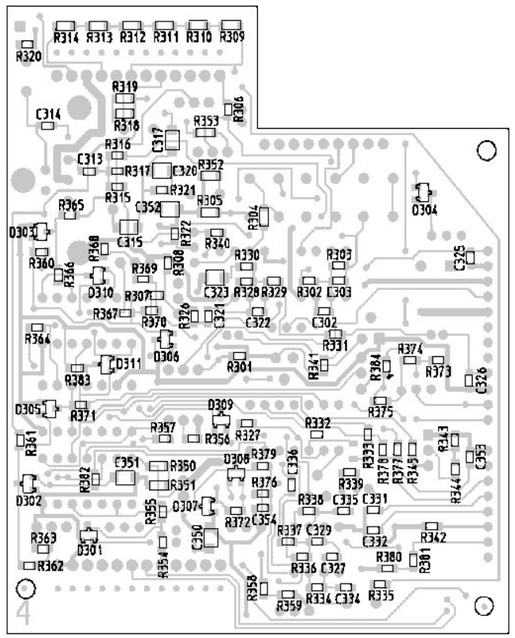
COMPONENT SIDE



FRONTSIDE VIEW

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

SOLDER SIDE



BACKSIDE VIEW

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

LEAD IDENTIFICATION FOR U308
FLAT
IN-LINE
TOP VIEW
NOTE:CASE SHAPE IS DETERMINING FACTOR FOR LEAD IDENTIFICATION

LEAD IDENTIFICATION FOR Q303-Q310
FLAT
IN-LINE
TOP VIEW
NOTE:CASE SHAPE IS DETERMINING FACTOR FOR LEAD IDENTIFICATION

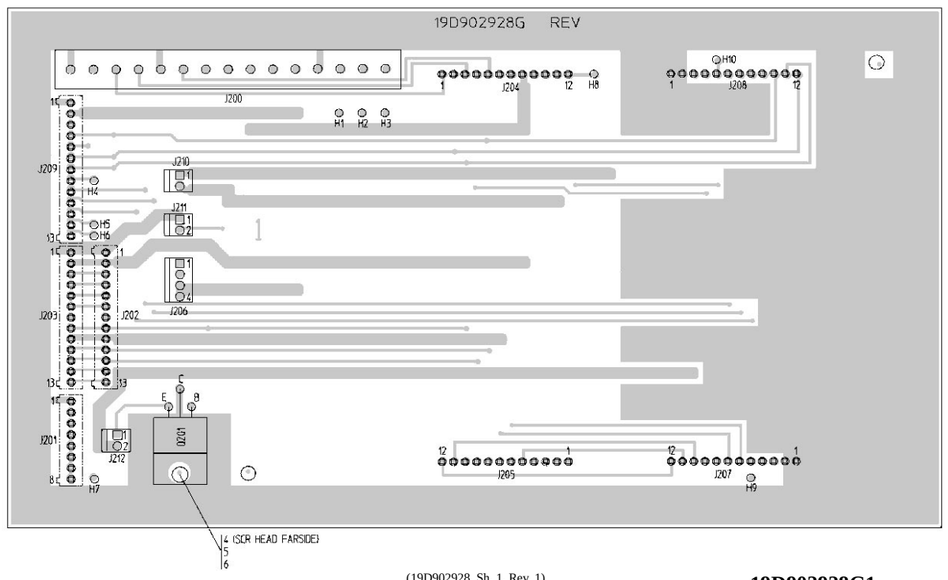
LEAD IDENTIFICATION FOR Q301-Q302
FLAT
IN-LINE
TOP VIEW
NOTE:CASE SHAPE IS DETERMINING FACTOR FOR LEAD IDENTIFICATION

LEAD IDENTIFICATION FOR R323, R324,& R325
TOP VIEW

LEAD IDENTIFICATION FOR Q301-Q311
VIEW FROM SOLDER SIDE

REMOTE INTERFACE BOARD
19D902931G1

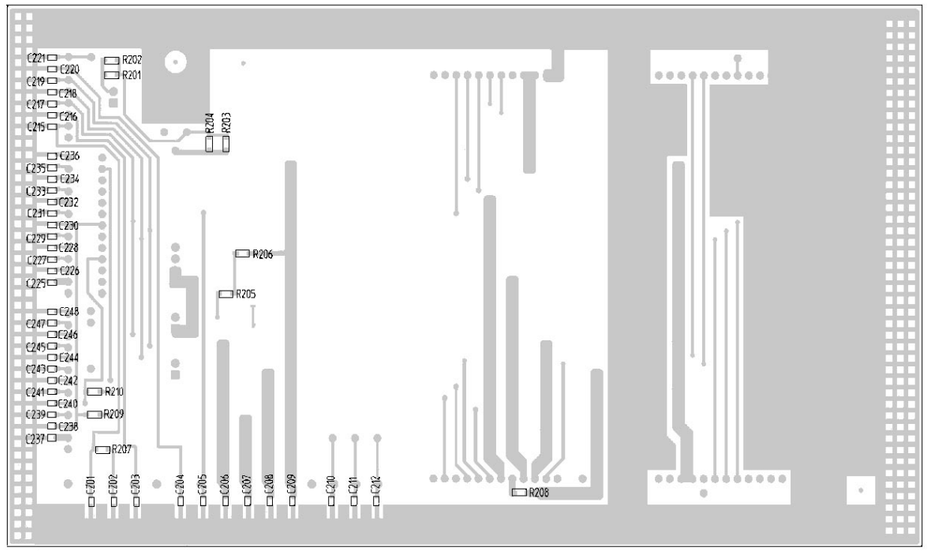
COMPONENT SIDE



(19D902928, Sh. 1, Rev. 1)
(19D902929, Component Side, Rev. 1)

19D902928G1
(Used Before 3/27/92)

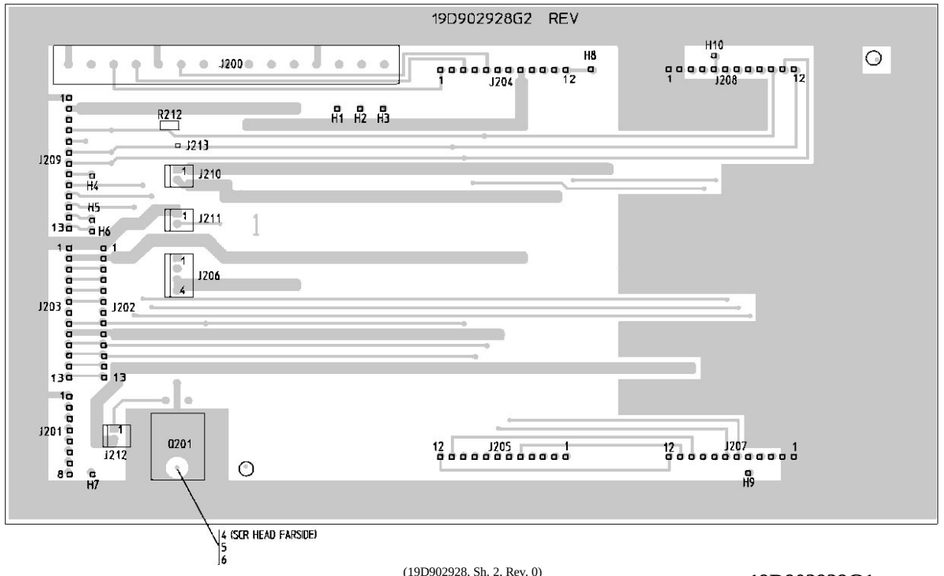
SOLDER SIDE



(19D902928, Sh. 1, Rev. 1)
(19D902929, Solder Side, Rev. 1)

INTERCONNECT BOARD A1
19D902928G1

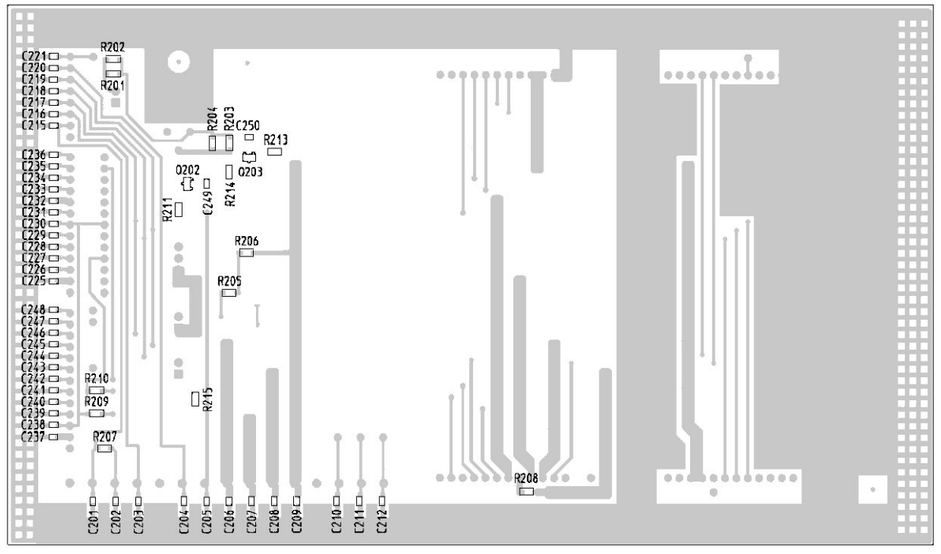
COMPONENT SIDE



(19D902928, Sh. 2, Rev. 0)
(19D902929, Component Side, Rev. 1)

19D902928G1
(Used After 4/1/92)

SOLDER SIDE



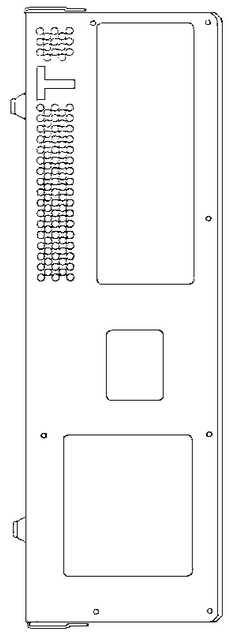
(19D902928, Sh. 2, Rev. 0)
(19D902929, Solder Side, Rev. 1)

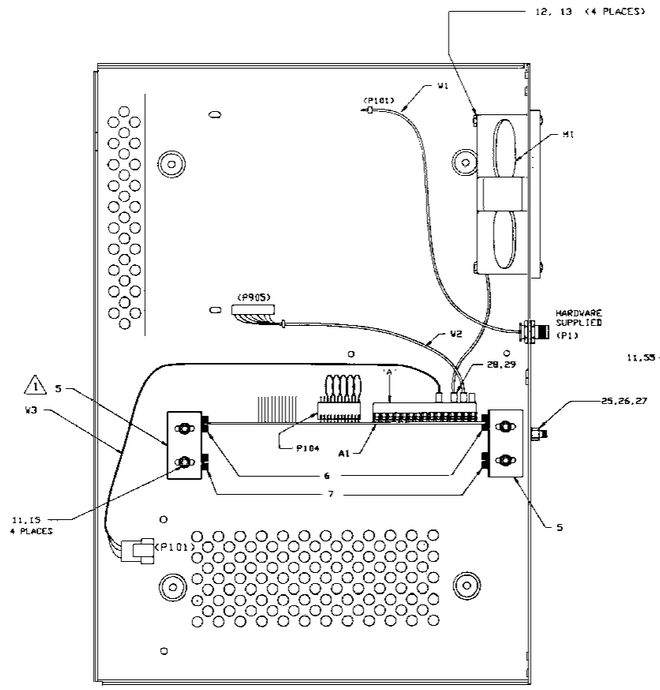
INTERCONNECT BOARD A1
19D902928G1

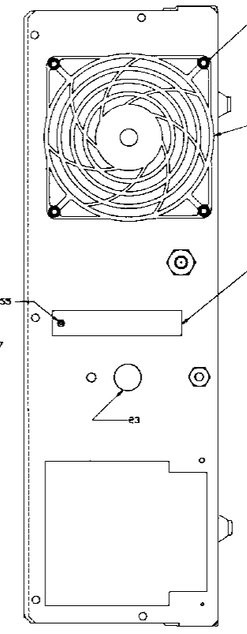
PARTS LIST
DESK TOP STATION
19D903101G1
Issue 2

SYMBOL	PART NO.	DESCRIPTION
		---------ASSEMBLIES ----------
A1		CPNT BD INTR 19D902928G2
		---------- FAN ----------
M1	5493477P8	FAN AX.
		----------PLUGS ----------
P104	19A149448P2	JMPR
		---------- CABLES ----------
W1	19A705501P4	CA ASM RF
W2	19C851585P12	CA
W3	19C852054P1	CA ASM
		------- MISCELLANEOUS --------
3	19D903044P1	CHASSIS
5	19D903046P1	SPT CARD
6	344A3328P1	CARD GUIDGRD
7	344A3336P1	CARD GUIDPLSTC
8	344A3284P1	PLATE COVER
10	19A902364P455	SCR MACH
11	19A901312P5	Flatwasher: M3.5.
12	19A700034P5	Hex nut: No. M3.5 x 0.6.
13	19A700033P6	Lockwasher, external tooth, M3.5.
15	19A702364P408	Machine screw: TORX Drive, M3.5 - 0.6 x 8.
17	344A332P1	BUMPER RUBBER
23	N329P38B6	BUT PLG
24	5493477P11	FAN AX.
25	N210P16B6	Nut, steel: No. 10-32.
26	N403P19B6	Lockwasher: No. 10.
		---- ASSOCIATED ASSEMBLIES ------
	19D903043P1	COVER TOP
	19D903159G1	CAP FRONT
	344A3346G1	KIT HARDWARE
	344A3347G1	KIT HARDWARE

* COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

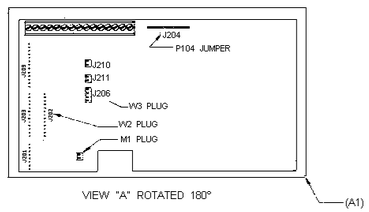


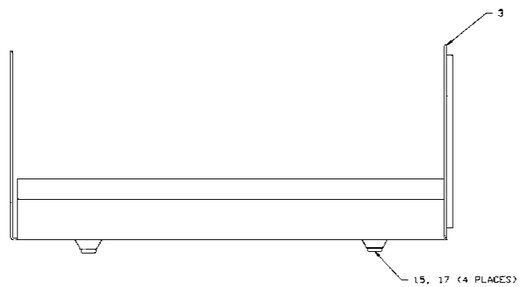




1 BRACKETS (5) ARE ADJUSTED TO BE PARALLEL TO AND TO HOLD CARD A1 SECURLY.

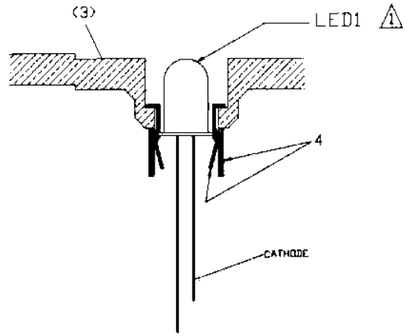
2 MARK PL 19D903101, GR.NO. & REV. LTR PER 19A700154P1. FOR LATEST REV LETTER SEE 19C852060.



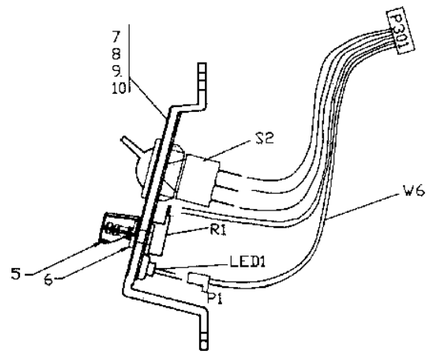


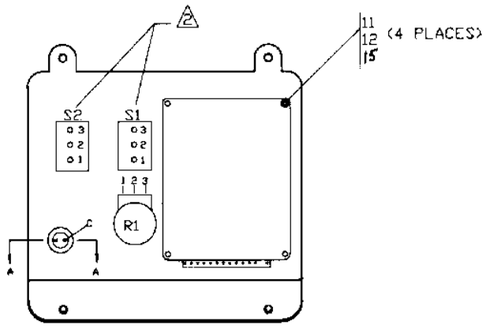
CHASSIS ASSEMBLY
19D903101G1
(19D903101, Rev. 2)

FROM	TO	WIRE	REMARKS
W6	S1 - 2	BLACK	GPS 2 & 4 ONLY
S1 - 2	S2 - 2	ITEM 13	
W6 - P1	LED1 - CATHODE	ORANGE	⚠1
W6	S2 - 3	BROWN	
	S1 - 1	GREEN	
	R1 - 3	BLUE	
	R1 - 2	W/VIOLET	
W6	R1 - 1	WHITE	
W6 - P1	LED1 - ANODE	RED	GPS 2 & 4 ONLY ⚠1

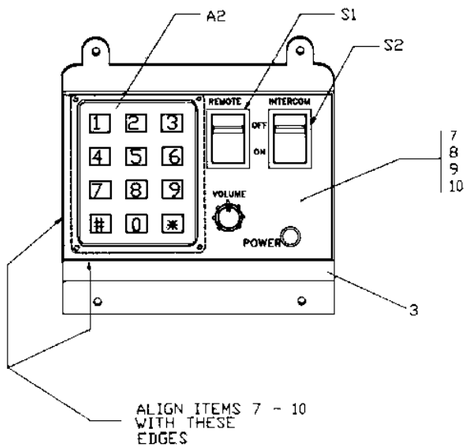


SECTION 'A - A'





REAR VIEW
WIRING OMITTED FOR CLARITY



(1) NOTES:

⚠1 AFTER PLUGGING P1 ON TO LED1 LEADS, BEND BOTH LEADS TO LOCK P1 INTO POSITION.

⚠2 SWITCHES S1 & S2 ORIENTATION UNIMPORTANT.

CONTROL PANEL
19D903102G1-G4

(19D903102, Sh. 1, Rev. 0)

PARTS LIST
CONTROL PANEL
19D903102G1 - G4
Issue 1

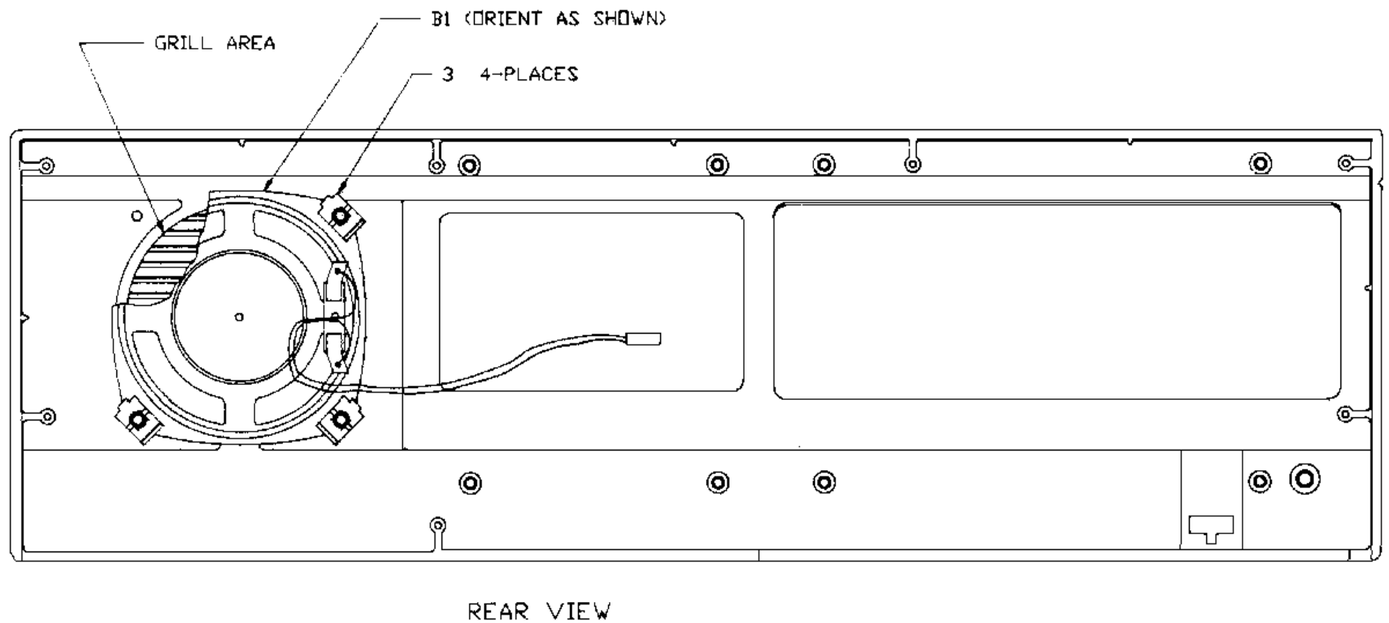
SYMBOL	PART NO.	DESCRIPTION
		---------- ASSEMBLIES ----------
A2	344A3366P1	KEYPAD (Used in G3 and G4).
		---------- INDICATORS ----------
LED1	19A134354P1	Optoelectronic: Red; sim to HP 5082-4655.
		---------- RESISTORS ----------
R1	19B800762P1	Variable, carbon film: 5K ohms ±20%, 150 VDCW, .1 w; sim to TOCOS RPR124. (Used in G2 and G4).
		---------- SWITCHES ----------
S1 and S2	344A3334P1	SW TGL (Used in G2 and G4).
		---------- CABLES ----------
W6	19B801735P1	CABLE (Used in G2 and G4).
		------- MISCELLANEOUS --------
5	19D903047P1	PLATE COVER
4	19A703332P1	Bushing: sim to Hewlett-Packard No. 5082-4707.
5	344A3338P1	KNOB CONT (Used in G2 and G4.)
6	19A702332P1	Nut, slotted: M7 x .75. (Used in G2 and G4).
7	19C8522061P1	DECAL (Used in G1).
8	19C8522061P3	DECAL (Used in G2).
9	19C8522061P2	DECAL (Used in G3).
10	19C8522061P4	DECAL (Used in G4).
11	N84P5008B6	SCR MACH (Used in G2 and G4)
12	N402P33B6	WASH. PLN (Used in G2 and G4).
13	19A700134P10	W SOL (Used in G2 and G4).
15	N210P586	NUT MACH (Used in G2).

* COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

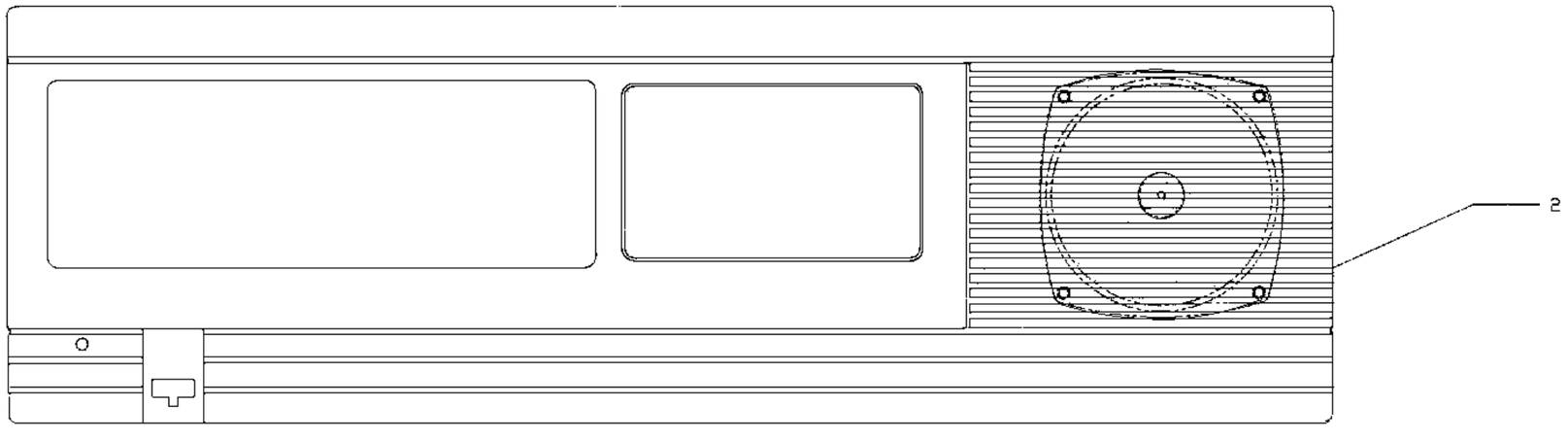
PARTS LIST
FRONT CAP ASSEMBLY
19D903159G1
Issue 1

SYMBOL	PART NO.	DESCRIPTION
		----------MODULE ----------
B1	344A3325G2	LS (Speaker)
		------- MISCELLANEOUS --------
2	19D903042P1	CAP FR
3	19C907038P16	NUT PUSH ON

* COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES



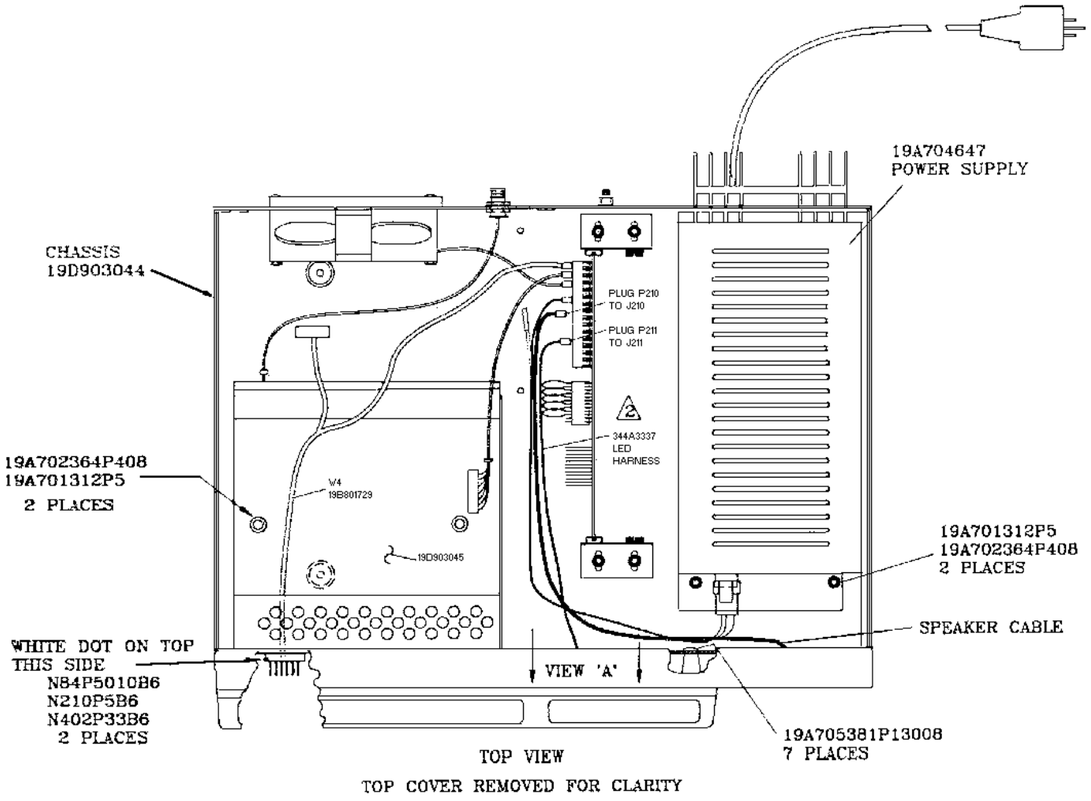
REAR VIEW



FRONT VIEW

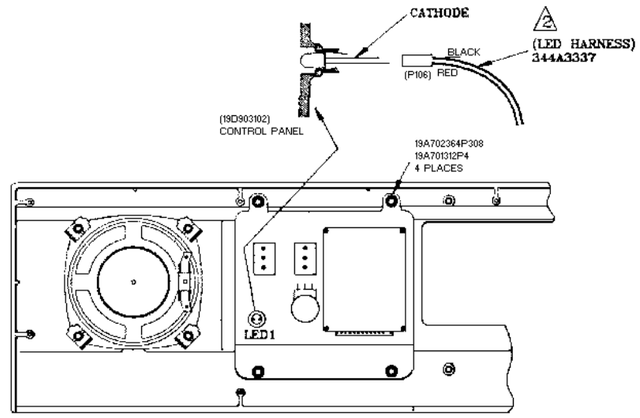
FRONT CAP ASSEMBLY (19D903159G1

(19D903159, Sh. 1, Rev. 0)

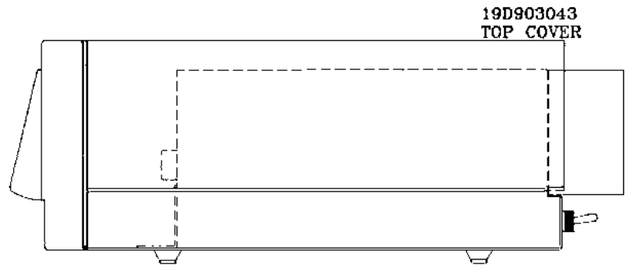


TOP VIEW

TOP COVER REMOVED FOR CLARITY

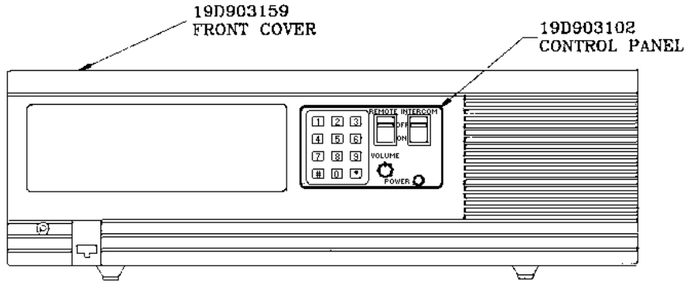


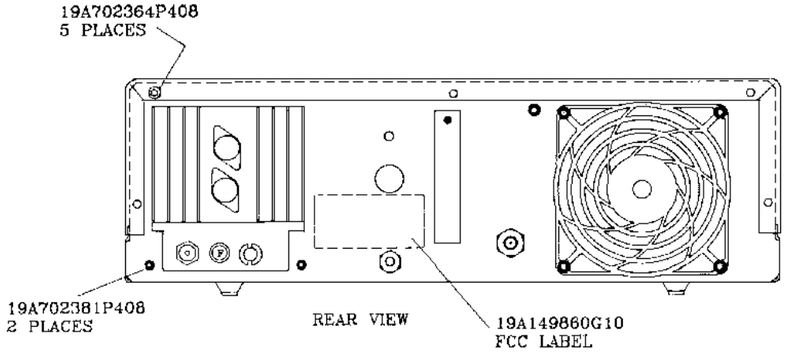
VIEW 'A' – WIRING DELETED FOR CLARITY



SIDE VIEW

19D903101
CHASSIS





REAR VIEW

(1)

NOTES:

1.

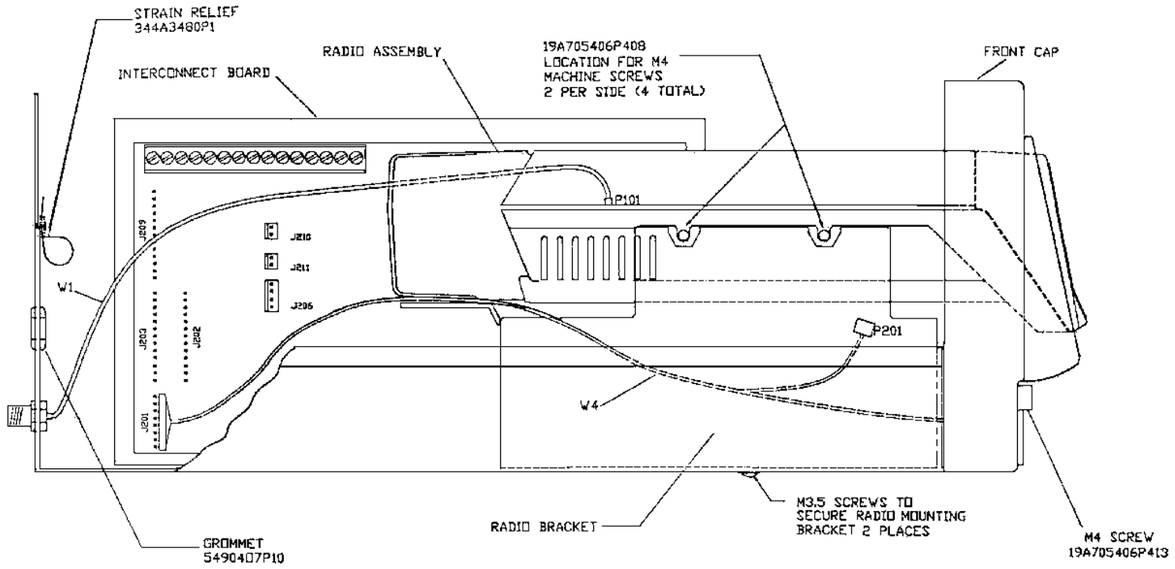
2 PLUG P106 ONTO THE LEADS OF LED1 AS SHOWN (BLACK WIRE TO CATHODE) AND BEND LEADS OVER THE BODY OF P106 TO HOLD IN PLACE.

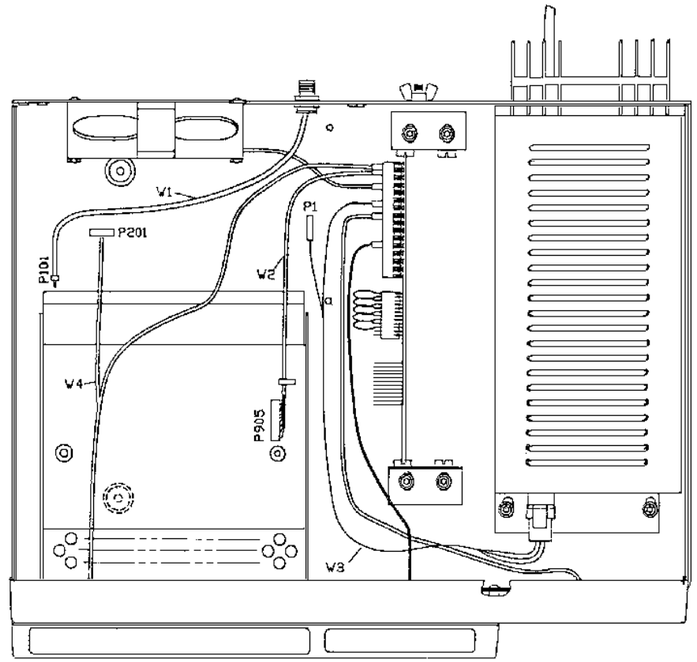
3. TEST PER QTI-170-180

(2)

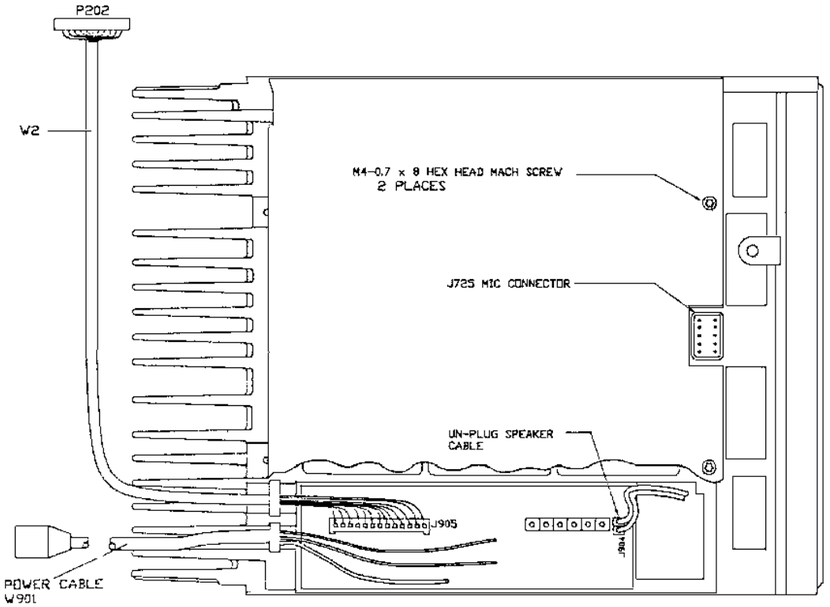
EDACS ASM
SAME AS PART 1 EXCEPT TEST PER QTI-170-179

COMPLETED DESK TOP STATION
(19D903168, Sh. 1, Rev 3)





TOP VIEW
TOP COVER REMOVED FOR CLARITY



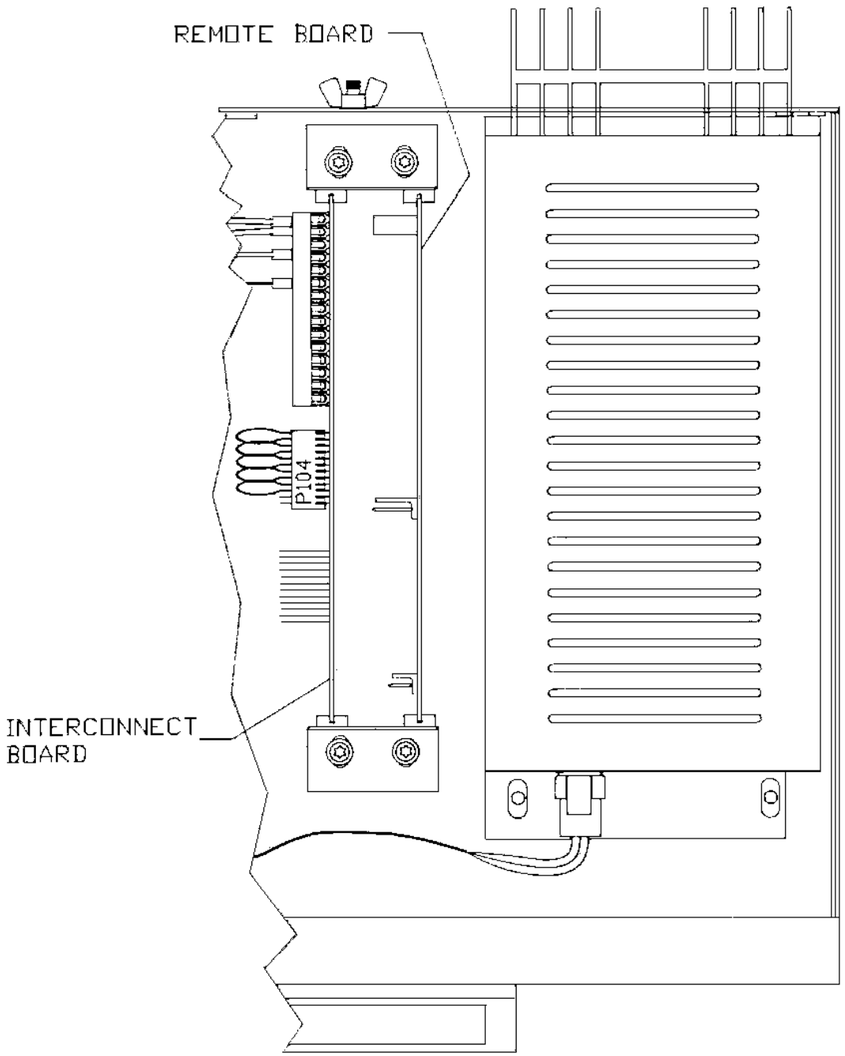
BOTTOM VIEW

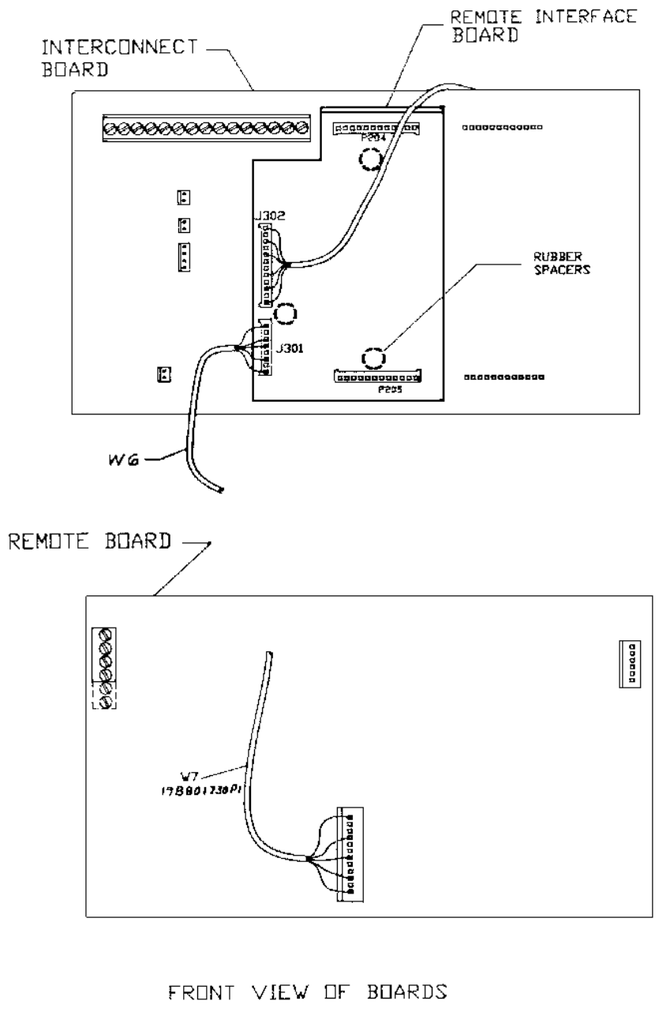
THESE INSTRUCTIONS COVER THE INSTALLATION OF HARDWARE KIT 344A3347 FOR APPLICATION OF MVS, TMX 8825 AND MTD RADIOS IN THE DESK TOP STATION

1. REMOVE (5) M3.5 x 8 SCREWS WHICH HOLD TOP COVER TO DESK TOP STATION
2. DISCONNECT W2 FROM J202 ON INTERCONNECT BOARD
3. REMOVE (2) M4 x 8 SCREWS WHICH HOLD BOTTOM COVER OF RADIO. UNPLUG SPEAKER CABLE FROM J904 ON RADIO. DISCARD RUBBER PLUG. INSTALL P905 (W2) ONTO J905. REPLACE BOTTOM COVER AND REINSTALL SCREWS.
4. COPY RADIO FCC ID NUMBER ONTO DESK TOP STATION FCC LABEL BY PERMANENT MEANS.
5. REMOVE RADIO TOP COVER.
6. REMOVE ANTENNA CABLE CONNECTED TO J101 AND DISCARD.
7. INSTALL (4) M4 x 8 SCREWS (19A705406P408) INTO SIDES OF RADIO. DO NOT TIGHTEN.
8. LOOSEN THE TWO M3.5 SCREWS THAT SECURE THE RADIO MOUNTING BRACKET
9. CONNECT P201 (W4) TO RADIO FRONT CAP MIC CONNECTOR J725.
10. INSTALL RADIO INTO RADIO MOUNTING BRACKET AND THROUGH THE FRONT CAP AND SECURE WITH THE 4 MOUNTING SCREWS.
11. ADJUST THE RADIO BRACKET FOR PROPER ALIGNMENT AND APPEARANCE AND THEN TIGHTEN THE 2 M3.5 SCREWS.
12. CONNECT ANTENNA CABLE P101 (W1) TO J101 ON RADIO
13. REPLACE RADIO TOP COVER
14. CONNECT P1 OF DESK TOP POWER CABLE W3 TO J1 OF RADIO POWER CABLE W901
15. CONNECT P202 (W2) TO J202 ON INTERCONNECT BOARD
16. REPLACE DESK TOP STATION TOP COVER AND RE-INSTALL 5 M3.5 SCREWS.
17. WHEN EXTERNAL WIRES FOR OPTIONS ARE TO BE CONNECTED, REMOVE AND DISCARD PLUG BUTTON AND INSERT RUBBER GROMMET (5490407P10) AND PLACE STRAIN RELIEF (344A3480P1) AROUND WIRES AND SNAP INTO HOLE ADJACENT TO GROMMET.
18. AFTER PLUGGING IN MIC CABLE, SECURE TO FRONT CAP WITH M4 SCREW (19A705406P413)

RADIO INSTALLATION
Sheet 1 of 3

(19D903274, Sh. 1, Rev. 0)





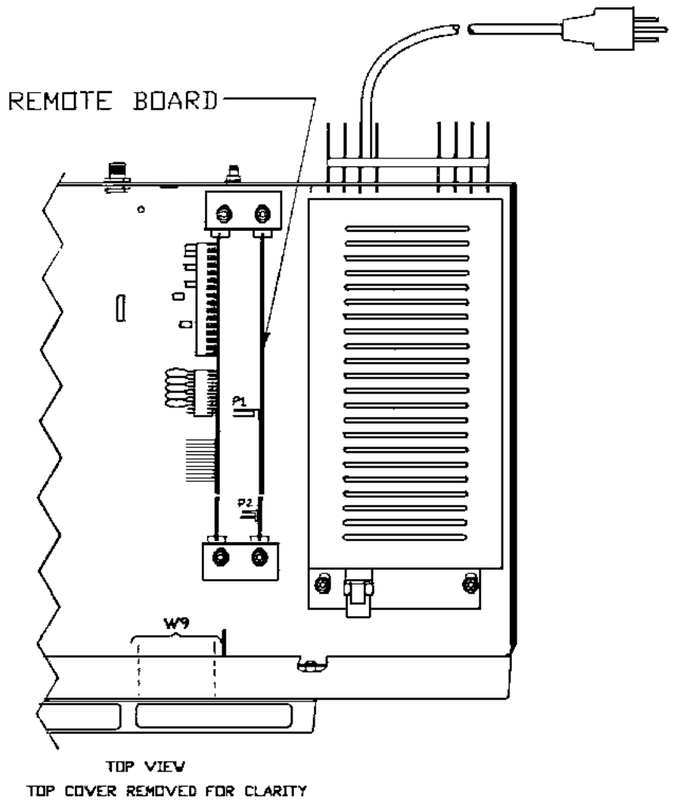
FRONT VIEW OF BOARDS

(2)

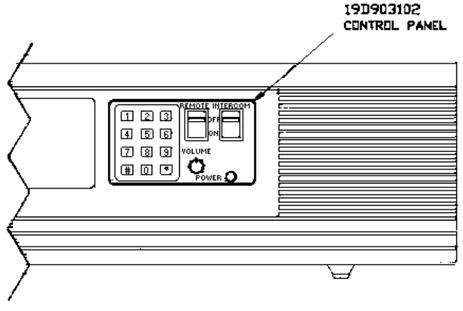
THESE INSTRUCTIONS COVER THE INSTALLATION OF THE REMOTE OPTIONS FOR APPLICATION IN THE DESK TOP STATION

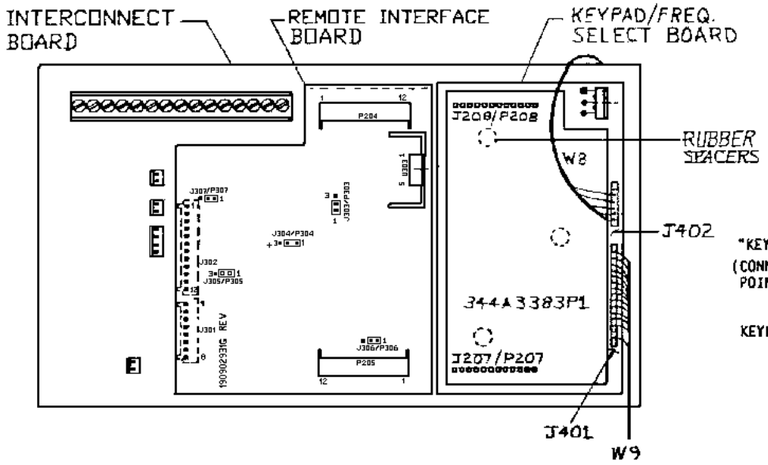
1. REMOVE AND DISCARD P104 FROM INTERCONNECT BOARD
2. REMOVE AND DISCARD CABLES INCLUDED WITH REMOTE BOARD. INSTALL REMOTE BOARD AS SHOWN.
3. INSTALL REMOTE INTERFACE BOARD AND THREE (3) RUBBER SPACERS BETWEEN INTERFACE BOARD & INTERCONNECT BOARD. LOCATE APPROX. AS SHOWN UNDER P204,P205 & J302
4. CONNECT W7 FROM REMOTE BOARD AS SHOWN TO J302 ON REMOTE INTERFACE BOARD. CABLE TO GO OVER THE TOP OF INTERCONNECT BOARD AND ORIENTATE CONNECTOR AS SHOWN. W7 IS 19B801730P1.
5. CONNECT P301 (W6) FROM CONTROL PANEL TO J301 ON REMOTE INTERFACE BOARD. ORIENTATE CONNECTOR AS SHOWN

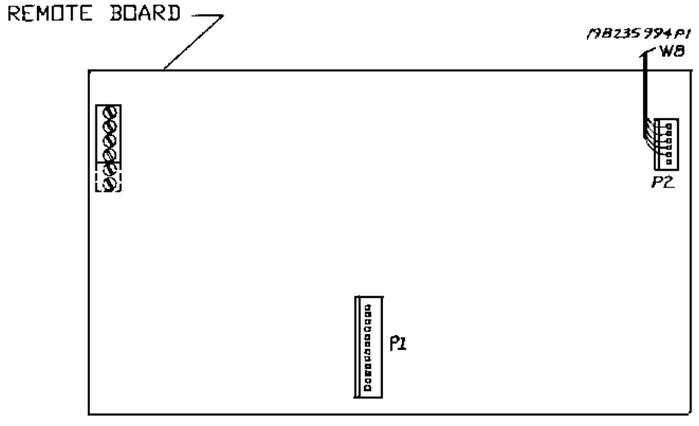
RADIO INSTALLATION
Sheet 2 of 3
(19D903274, Sh. 2, Rev. 2)



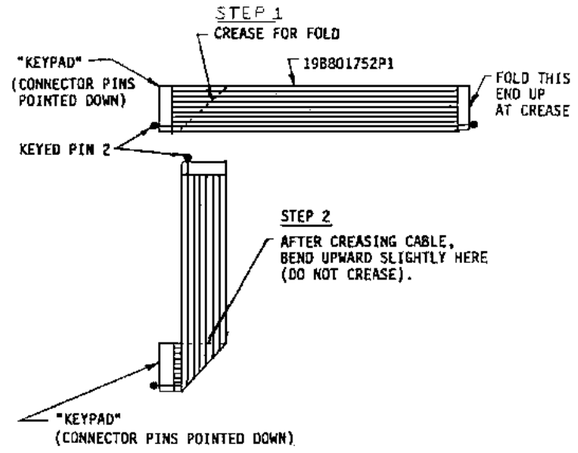
TOP VIEW
TOP COVER REMOVED FOR CLARITY







FRONT VIEW OF BOARDS



VIEW "A"

(3)

THESE INSTRUCTIONS COVER THE INSTALLATION OF THE KEYPAD OPTIONS FOR APPLICATION IN THE DESK TOP STATION

1. Install Keypad/Freq. Select Bd. and three (3) rubber spacers between Keypad Bd. & Interconnect Board. Locate spacers approx. as shown at J207, J208 & the center of keypad Board.

2. Preform W9 ribbon cable 19B801752P1 per View "A".

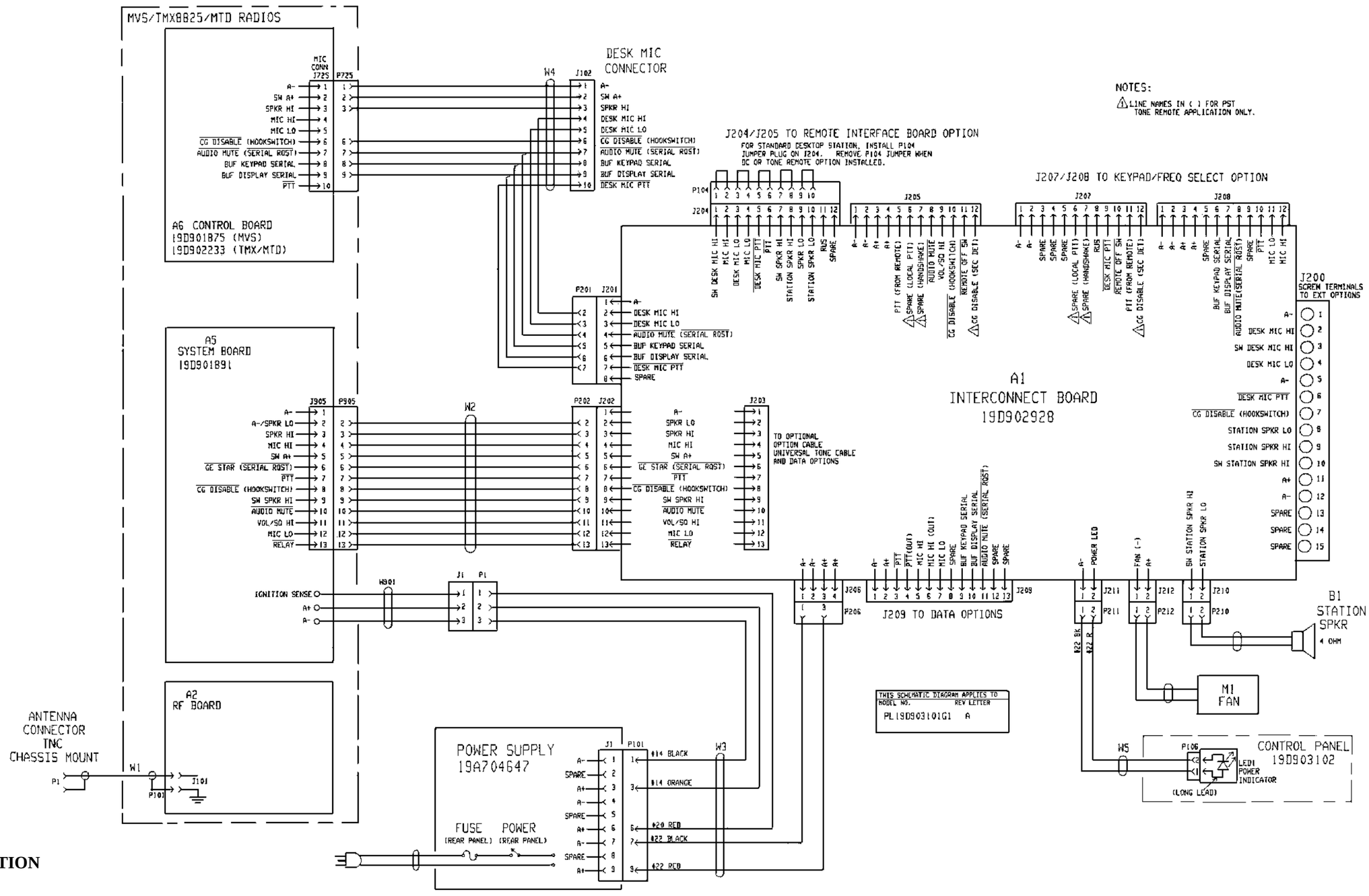
3. Insert End of W9 marked "Keypad" through the chassis opening behind the Volume Control and slide on to Keypad Pins. Plug the other end on to J401 of Keypad Board. Observe Keyed Pins of W9.

4. When EDACS Tone Remote Board Is used
   A.) Connect W8 to P2 of Remote Board. The other end to J402 of Keypad Board. Orient plug @ J402 so pin with no wire is UP. W8 is 19B235994P1.

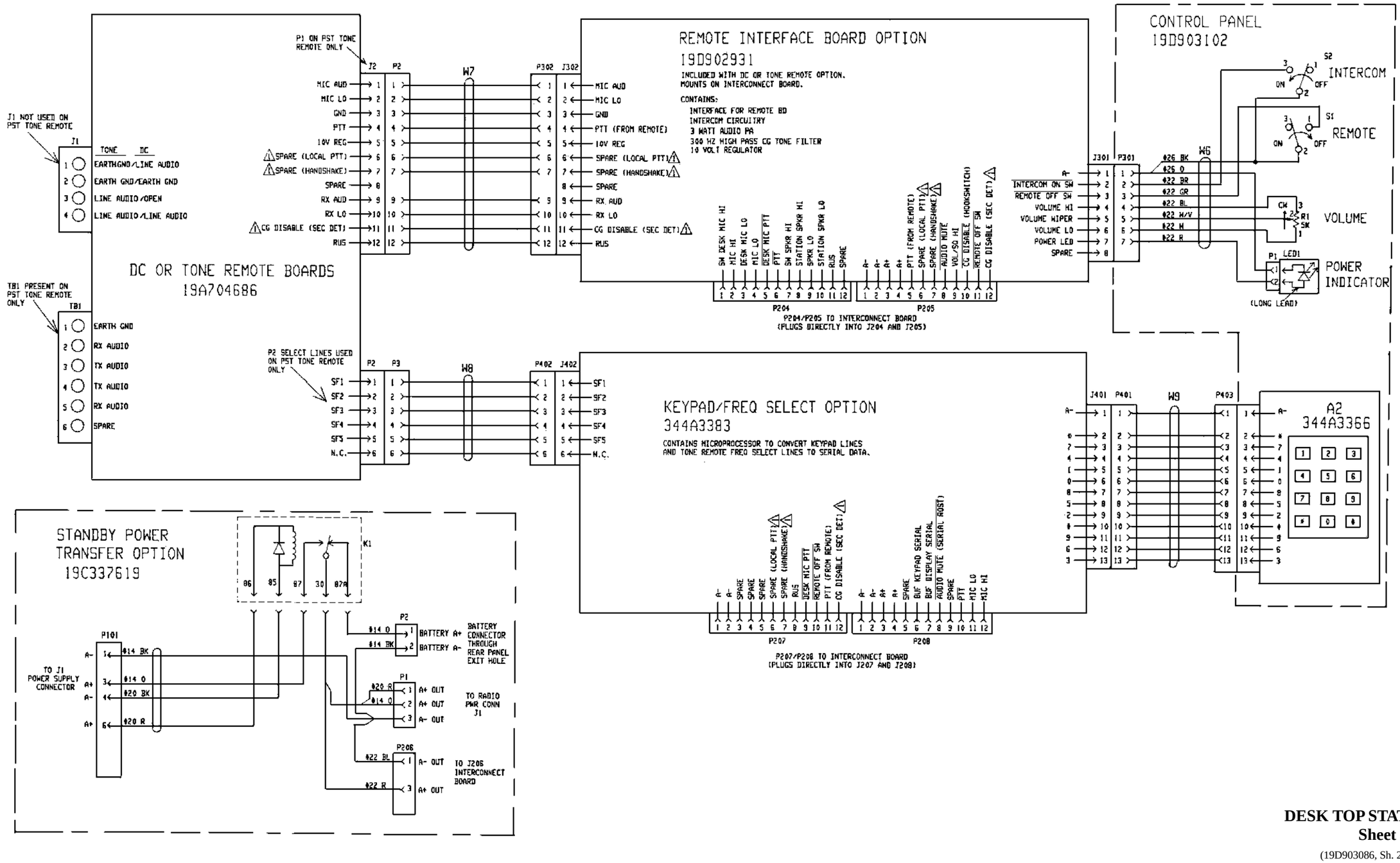
   B.) On Remote Interface Board Plug jumpers as follows: P303 on J303 pins 2 & 3, P304 on J304 pins 2 & 3, P305 on J305 pins 2 & 3, P306 on J306 pins 2 & 3, P307 on J307 pins 2 & 3.

RADIO INSTALLATION
Sheet 3 of 3

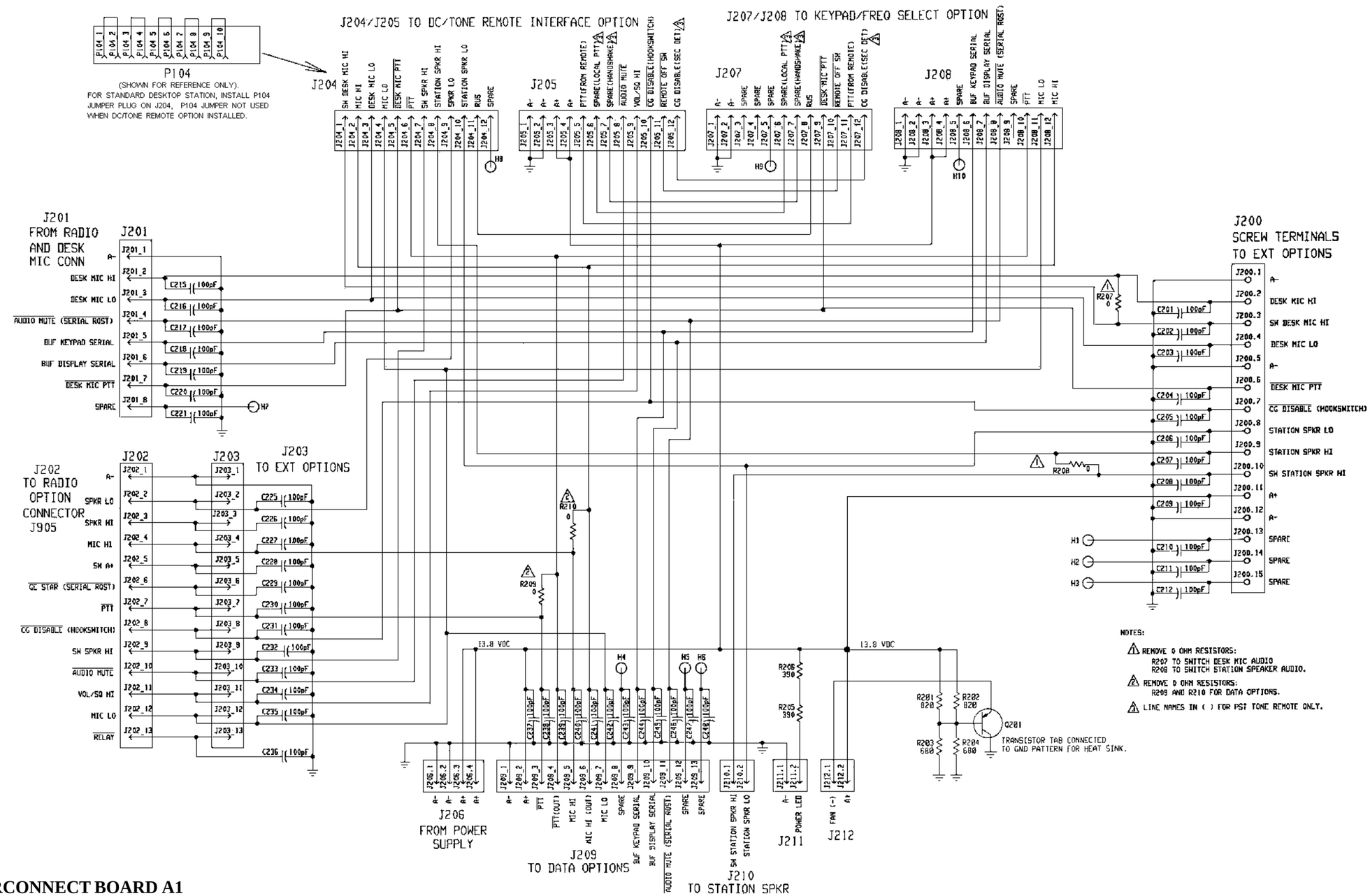
(19D903274, Sh. 3, Rev. 1)



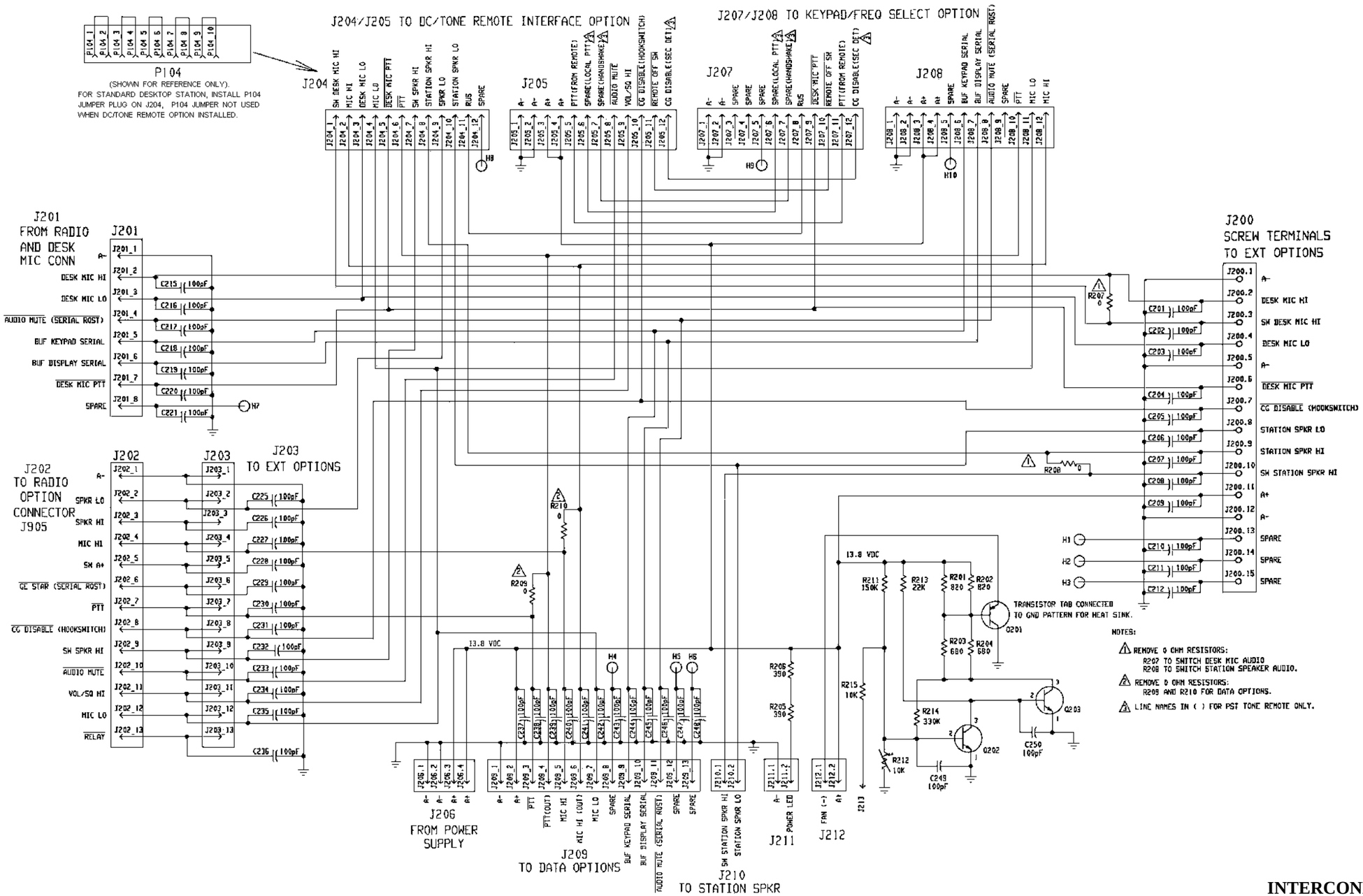
DESK TOP STATION
Sheet 1 of 2
(19D903086, Sh. 1, Rev. 2)



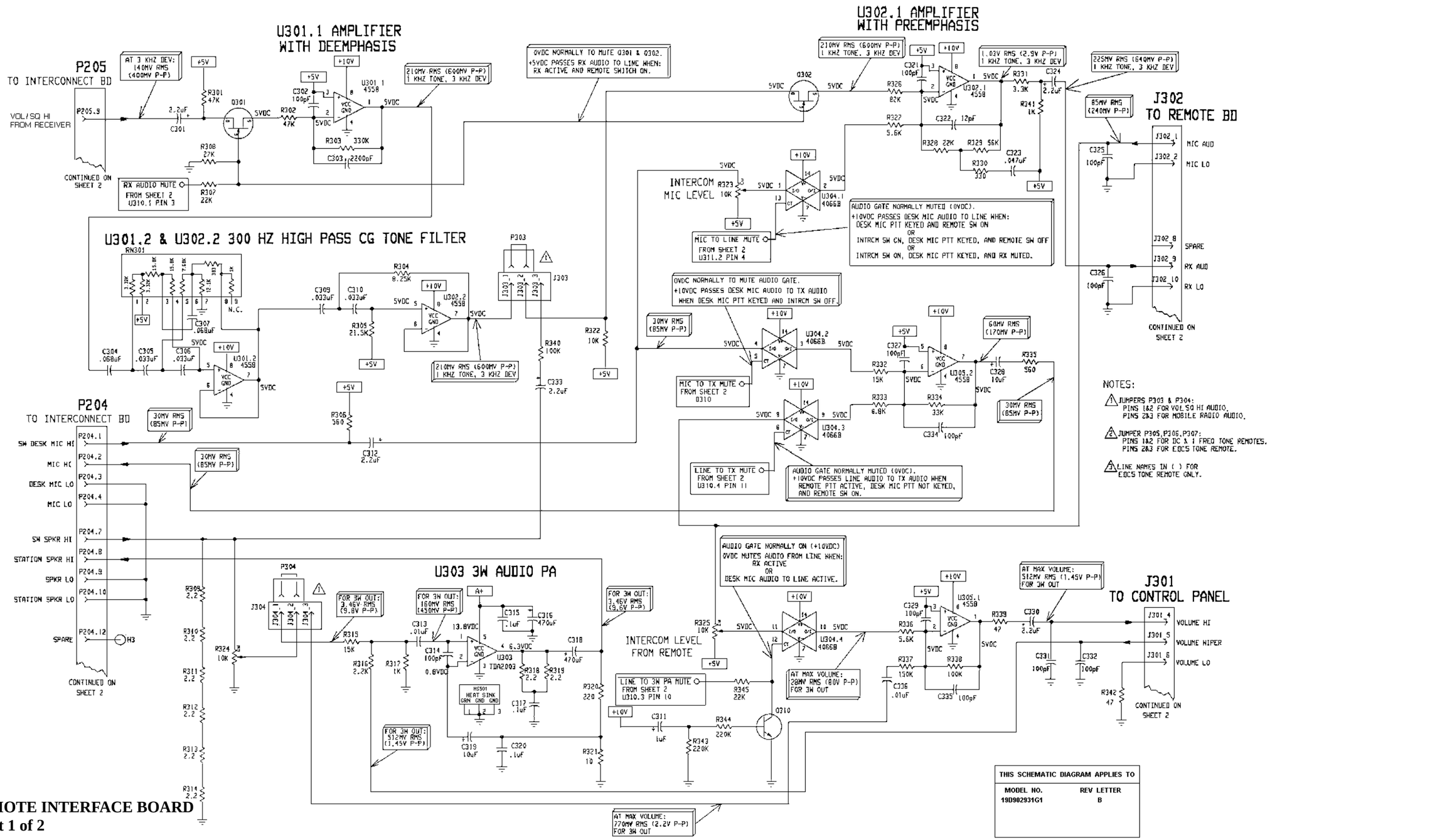
DESK TOP STATION
Sheet 2 of 2
(19D903086, Sh. 2, Rev. 2)



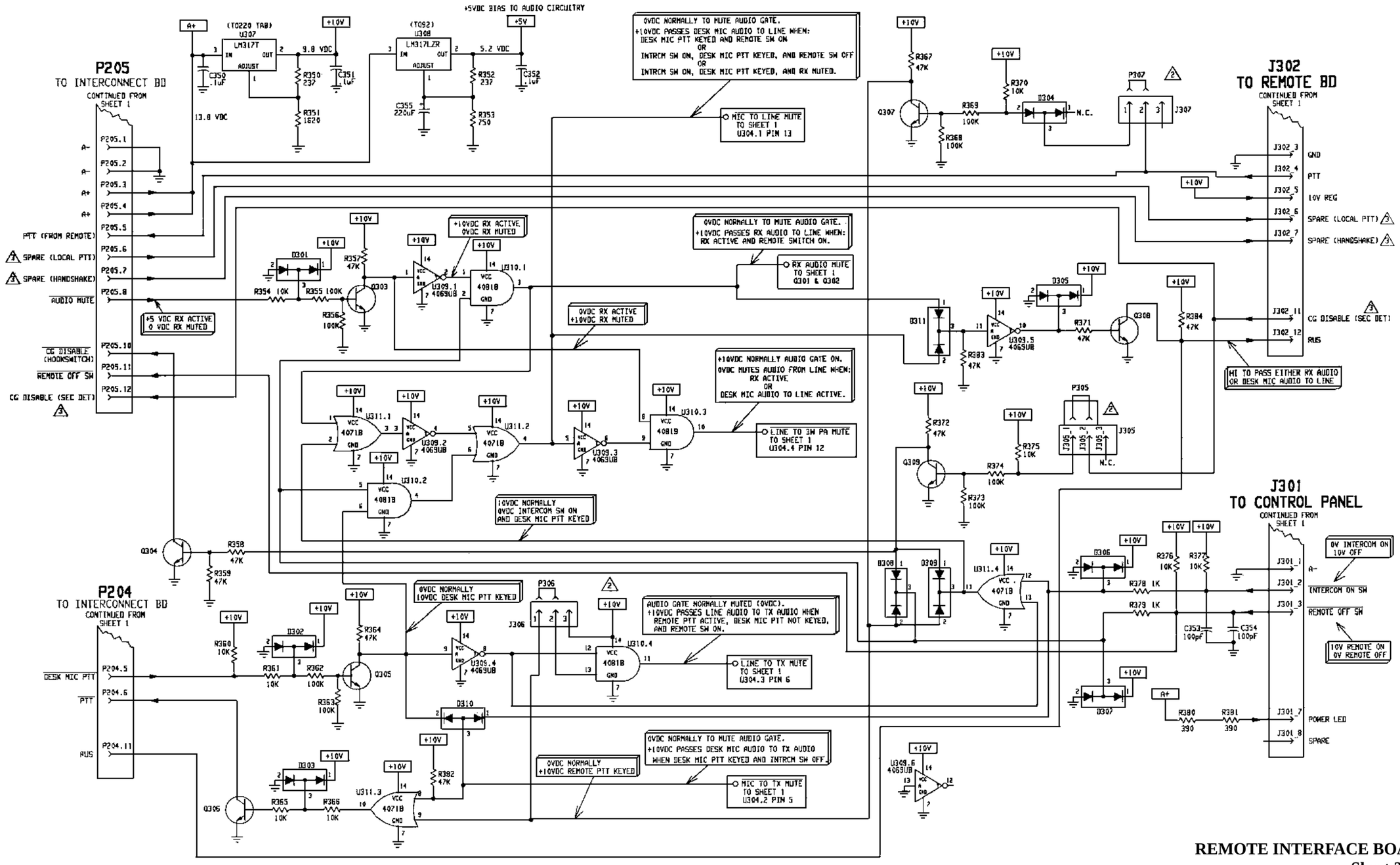
INTERCONNECT BOARD A1
19D902928G1
(19D902930, Rev. 0)



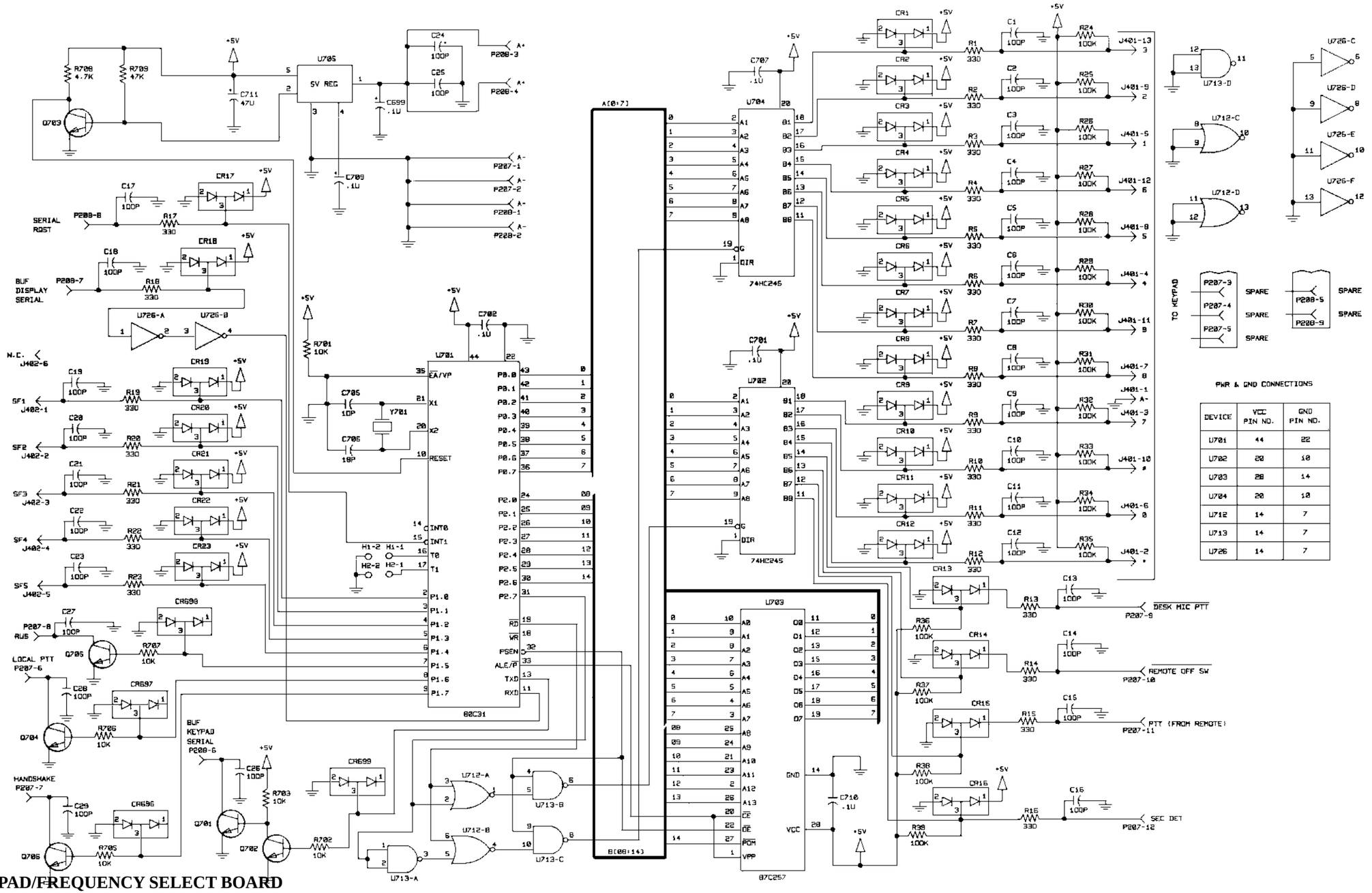
INTERCONNECT BOARD A1
19D902928G2
(19D903386, Rev. 0)



REMOTE INTERFACE BOARD
Sheet 1 of 2
(19D902933, Sh. 1, Rev. 8)



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



PWR & GND CONNECTIONS

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

KEYPAD/FREQUENCY SELECT BOARD 344A3383P1

(19D903567, Rev. 0)

LBI-38635

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