MAINTENANCE MANUAL
DESKTOP STATION
INTERCONNECT BOARD 188D5418G1

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DESCRIPTION

Interconnect board 188D5418G1 is used with the ORION Desk Top Station. Interconnect Board 188D5418 is backward compatible with the 19D904448 MDX Desk Top Station Interconnect Board. The same interconnections are provided to the power supply, station speaker, control panel, station fan, external options terminal board, and the optional Keypad/Frequency Select board, Tone Remote Interface board, and Clock VU Meter board. Four jumpers are located on the board to provide correct routing of signals for the ORION or MDX. The jumper position depends on which radio is used. The jumpers are positioned as indicated in the table.

JUMPER	ORION	MDX	DESCRIPTION
P217	2 & 3	1 & 2	Display Serial
P218	2 & 3	1 & 2	Keypad Serial
P219	2 & 3	1 & 2	PTT
P220	2 & 3	1 & 2	Serial Port

ERICSSON

Ericsson Inc.
Private Radio Systems
Mountain View Road
Lynchburg, Virginia 24502
1-800-528-7711 (Outside USA, 804-528-7711)

Printed in U.S.A.

When the radio and options are connected, the following functions are available.

- Audio Switching
- Local and Remote Keying
- Channel Guard Monitor
- Volume Adjustment
- Frequency Selection
- Intercom
- Remote ON/OFF Control

The interconnect board is supplied with jacks for connecting to:

- External Options (J200)
- Desk Microphone (J201)
- Radio (J202, J215)
- Clock/VU Module, Optional (J203)
- Remote Interface Option (J204, J205)
- Power Supply, or Standby Power Transfer
- Option (J206)
- Keypad/Freq, Select board, Option (J207, J208)
- Data Options (J209, J210)
- Station Speaker/Power LED (J211)
- Station Fan (J212)
- Station Fan Test (J213)
- VU Meter Enable (J214)
- ORION RS485 Devices (J216)
- MDX/ORION Jumpering (J217-J220)

CIRCUIT DESCRIPTION

TRANSMIT AUDIO PATH

The desk microphone is used to modulate the radio transmitter. The audio is received as DESK MIC HIGH on J201-2. It is then routed to External Option Connector J200-2 and returned on J200-3 as SW DESK MIC HIGH. See Figure 1. This allows an external device to break the mic path. Zero ohm resistor R207 is used to connect DESK MIC HI to SW DESK MIC HI when an external device is not used to break the mic path.

SW DESK MIC HI is then routed to the Remote Interface Board through connector J204-1. It is received from the Remote Interface Board as MIC HI via connector J204-2. If a Remote Interface board is present (optional), the transmit audio from the remote board will be summed into the mic path here. DESK MIC HI is connected to MIC HI by a jumper on P104-1 & 2 when the Remote Interface Board is not used.

MIC HI is also routed to the Keypad/Frequency Select board on J208-12 and to the ORION RS485 connector at J216-9. This allows an external RS485 device to provide the transmit audio. MIC HI is also routed to the Data Device connector on J209-6 and returned from the Data Device connector at J209-5. This allows a data device to break the mic path. Zero ohm resistor R210 is used to connect J209-5 to J209-6 when a data device is not used or when a data device does not break the mic path.

MIC HI from the Data Device is routed to the radio through J202-4 and to the Clock/Vu Meter through J203-3.

The desk microphone supplied with the equipment requires a dc bias voltage. This voltage is generated inside the radio. External devices breaking the mic path must provide dc continuity between the radio connector (J202-4) and the desk mic connector (J201-2) when not active or an equivalent mic bias circuit to the desk mic connector. Note, there are no active devices or frequency response shaping components in the mic lines on the Interconnect board. The return for the mic lines, MIC LO, is not switched. It is common to all connectors that have a mic input.

PTT PATH

The ground closure, PTT, from the desk mic is routed to the Interconnect board as DESK MIC PTT through J201-7. At this point, it is labeled MIC PTT. Refer to Figure 1 for PTT routing through the interconnect board.

In ORION applications, MIC PTT is routed to the PTT Isolation circuit consisting of two NPN buffer transistors Q204 & Q205. These transistors keep the 12V P-P voltage on the PTT line during flashing and personality programming isolated from the +5V PTT line. MIC PTT is routed through Q204 & Q205 and returned as DESK_MIC_PTT through jumper P219-2 & 3.

In MDX applications, the MIC PTT is connected directly to DESK_MIC_PTT through jumper P219-1 & 2.

The DESK MIC PTT signal is then routed to the External Option connector at J200-6, the Keypad/Frequency Select board connector at J207-9, the Remote Interface board connector at J204-5, and to the VU PTT jumper field at J214-6. The radio may be keyed with an external device by grounding J200-6. However, it cannot break the PTT line. The Keypad/Frequency Select board uses the DESK MIC PTT signal to recognize when a local transmission is in progress. Connecting the VU PTT line to DESK MIC PTT on the J214 jumper field will only enable the VU meter on local transmissions. Jumper definitions for J214 are identified below.

JACK	JUMPER	DESCRIPTION
J214	1 & 2	VUPTT - GND
J214	3 & 4	VUPTT - PTT
J214	5 & 6	PTT

The PTT path is then routed to the Remote Interface Board connector as DESK MIC PTT on J204-5 and returned from the Remote Interface Board connector as PTT on J204-6. Remote PTT will be summed into the PTT path if there is a remote option. If there is no remote option, DESK MIC PTT will be tied to PTT by a jumper from P104-5 & 6. The PTT signal is also brought to Keypad/Frequency Select Board at J207-9 The PTT signal is then routed to the Data Option connector at J209-4. It is received from the Data Option connector at J209-3. This allows a data device to break the PTT path. If a data option is not used or if a data option does not break the PTT path, then zero ohm resistor R209 is used to connect J209-3 & 4 together to complete the PTT path to the radio.

The radio is keyed by its PTT line through J202-7. It will transmit when this line is low. The line is also routed to the VU PTT via a jumper on J214-4 & 5. When selected, the VU meter is enabled on all transmissions. The radio also contains a five-volt pull-up resistor. External devices keying the radio should do so with an open collector transistor or by a mechanical closure to ground.

RECEIVE AUDIO PATH

Speaker audio is passed from the radio to the Interconnect board over three lines: SPKR LO, SPKR HI, and SW SPKR HI. All three lines have dc blocking capacitors. Both the ORION and MDX radios have floating dc coupled push-pull speaker lines. The blocking capacitors allow external devices greater versatility when using the radio's balanced outputs. Refer to Figure 2.

SPKR HI from the radio is routed to the Interconnect Board through connector J202-3 and applied to the Desk Mic Connector at J201-9. It's purpose is to drive a low power handset or headset speaker - referenced to A-. The complementary SPKR LO line is not brought to the Mic Connector.

SPKR LO from the radio is routed to the Interconnect Board through J202-2 and then to the Remote Interface Board through J204-9. It comes back from the Remote Interface Board through J204-10 as STATION SPKR LO. If there is no remote option, then SPKR LO is tied to STATION SPKR LO by a jumper on P104-9 & 10. This makes STATION SPKR LO the floating complementary output of SW SPKR HI. When a Remote Interface Board is present, SPKR LO and STATION SPKR LO are connected to A-. From the Remote Interface Board, STATION SPKR LO is routed to the External Option connector on J200-8, the Data Port connector at J210-4, the desktop speaker/power LED connector at J211-4, and to the ORION RS485 device at J216-8.

SW SPKR HI from the radio is received by the Interconnect board at J202-9 and routed to the Remote Interface Board connector at J204-7. It is returned to the Remote Interface Board as STATION SPKR HI on J204-8. If a Remote Interface Board is not present, then SW SPKR HI and STATION SPKR HI are connected by a jumper on P104-7 & 8. STATION SPKR HI is the radio's SW SPKR HI. Speaker volume is controlled by the radio volume control. If a remote option is present, the radio's SW SPKR HI is routed to the desktop's front panel volume control and STATION SPKR HI is the output of the audio amplifier on the Remote Interface Board. The audio amplifier is used to sum the audio from a remote into the speaker path. With this option, the speaker level out of the radio is fixed and the volume control on the radio is not used. Volume is controlled from the front panel control of the desktop station.

STATION SPKR HI from the Remote Interface Board connector is then routed to the ORION data connector at J210-3, the ORION RS485 Device connector at J216-7, and out to the External Device through connector J200-9. It is returned from the External Device as SW STATION SPKR HI on J200-10. This allows an external device to break the speaker path. A wire run on the PC board between holes H3 and H4 on the Interconnect board connects STATION SPKR HI to SW STATION SPKR HI. If an external device is to break the speaker path, this run must be cut. SW STATION SPKR HI is applied to the desktop speaker at the Station Spkr/Power Led connector at J211-4.

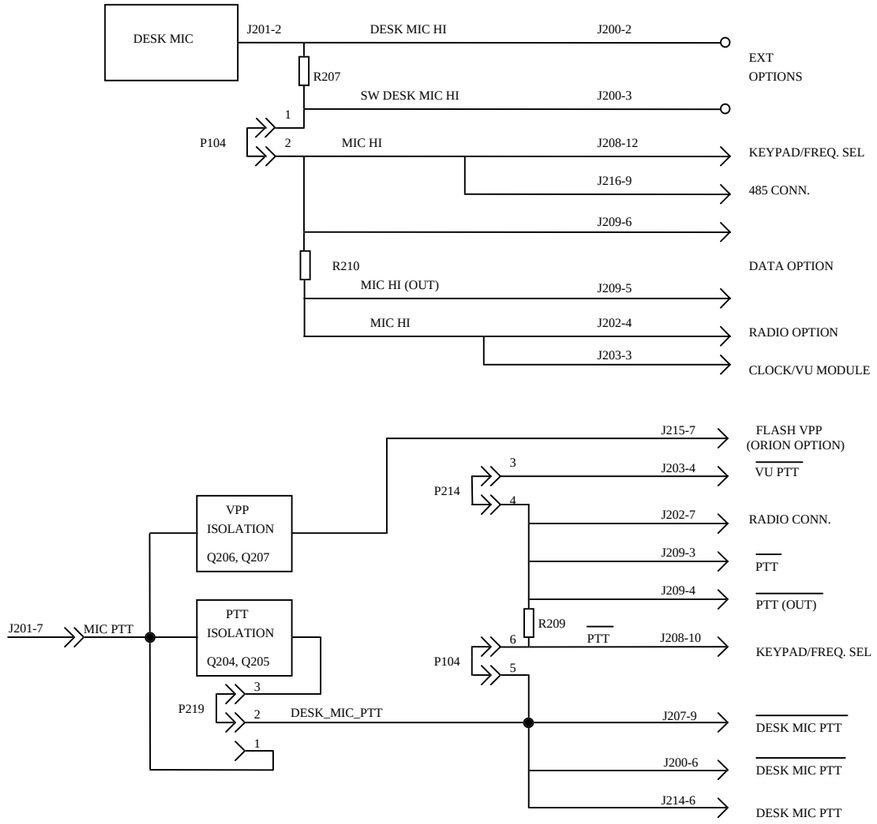


Figure 1 - MIC HI And PTT Routing

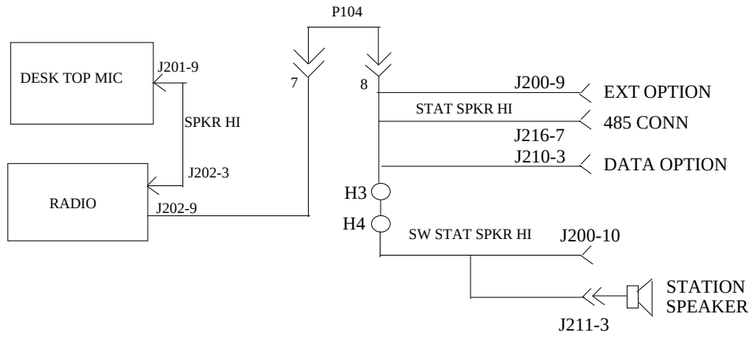


Figure 2 - Station Speaker Routing

STATION FAN CONTROL

The Interconnect Board contains a thermistor to allow the fan to be controlled by the ambient temperature. The positive side of the 12-volt dc fan is connected to A+ at J212-1. The negative side of the fan is connected to the emitter of PNP transistor Q201 at J212-2. When the station is "cool", the resistance of thermistor R212 is high. This relates to a higher voltage at the junction of R214 and R211. The voltage divider is formed by R211, R214, and thermistor R212. This holds Q202 and Q203 off, removing ground from the bottom of the voltage divider formed by R201, R202, R203, and R204. This also keeps Q201 turned off allowing its emitter voltage to rise to A+. The lack of voltage difference across the fan terminals keeps the fan off. This state also includes hystersis resistor R214 in the upper leg of the thermistor voltage divider.

Increasing temperature causes the resistance of the thermistor to decrease, causing the voltage at the base of Q202 to decrease. Q202 turns off when the station "overheats". This turns on Q203, grounding the lower side of the voltage divider at the base of Q201. Current now flows through these resistors. The resistors in this divider are paralleled to increase the power handling capabilities to allow adequate base drive using chip resistors. The base of Q201 is set to six volts. This pulls the emitter down toward seven volts. (The remaining voltage is dissipated by the transistor, primarily through the collector which is at ground potential.) This voltage differential, now appearing across the fan's terminals, starts the fan and pulls air through the station. Turning Q203 on also moves hystersis resistor R214 to the lower leg of the voltage divider.

The airflow cools the station, thereby increasing the resistance of the thermistor. Because R214 is now in parallel with the thermistor, the temperature must drop below the fan's turn on threshold point before the voltage is sufficient to turn Q202 on. With Q202 "on" Q203 is turned off, thus turning off the fan. Turning Q203 off also moves R214 to the upper leg of the divider, resetting the fan's turn on temperature. This hysteresis action keeps the fan from "chattering" on and off.

Fan Test

Operation of the fan can be tested by grounding pin J213-1. This will turn the fan on regardless of temperature. For more demanding applications it may be desirable to run the fan continuously. This can easily be done by placing a shorting plug across J213-1 & 2. In more extreme temperature situations it may be desirable to run the fan continuously at the full A+ voltage. This can be done by shorting pins two and three of Q201. This will greatly increase airflow and also fan noise.

RADIO PROGRAMMING

Personality programming, flash memory programming and cryptographic keyloading are done from the station mic connector through the radio serial port.

PROGRAMMING REQUIREMENTS & LEVELS

The ORION and MDX radios have different programming requirements. The MDX radio requires all TTL levels and is programmed either through a Radio Data Interface (RDI) box or through J209 to an internally mounted TQ-3370 board. The ORION radio has a true RS232 serial port. It requires only that the VPP flash voltage be on a dedicated pin.

In the ORION radio:

- the PTT line resides at +5 volts when inactive.
- two RS232 lines (handshake) are provided for use on the data port.

In the MDX radio:

- the signal levels at the station mic connector must be at TTL levels to interface with the TQ-3370 PC Programming Box or a TTL level keyloader.
- the TTL level signals along with the VPP flash voltage are multiplexed onto the PTT line.
- the PTT line resides at +12 Vdc when the FLASH VPP voltage is on.
- no handshaking lines to the data port are provided

In general, these voltage level differences are reconciled on the Interconnect board. This provides commonalty and allows the same programming and keyloader cables to be used for either application. They do not change with the radio being used. Refer to Figure 3 for program signal routing.

TTL level data is received by the mic connector at J201-5. It is then routed to the TTL input on RS232 converter chip U202-10 and to J218-1. The RS232 output of U202-7 is routed to J218-3. The center pin, J218-2, is designated KEYPAD SERIAL. The position of jumper plug P218 determines whether TTL levels from the mic connector or RS232 levels from converter IC U202 are passed on. Jumpering J218-1 & 2 provides TTL levels for MDX stations while jumpering J218-2 & 3 provides RS232 levels for the ORION station. This signal is labeled STA_KEY.

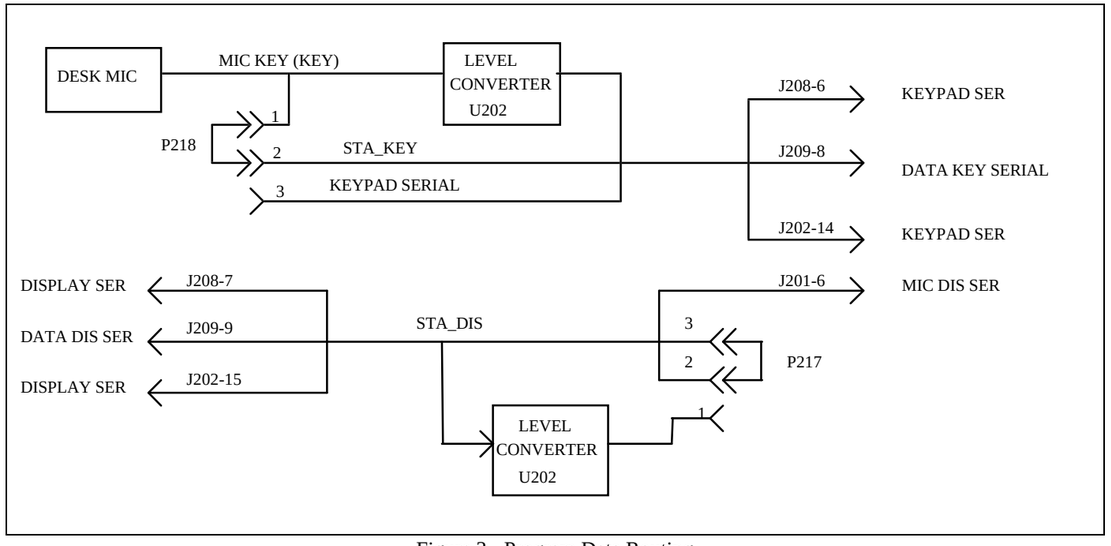


Figure 3 - Program Data Routing

STA_KEY is routed to the Keypad/Frequency Select board at J208-6 and re labeled KEYPAD SERIAL. It is also routed to J202-14 on the radio connector and through a 470 ohm resistor (R229) to the data port at J209-8. The resistor reduces the conflict between a device connected to the data options jack on the rear of the station and a programming or keyfill cable on the front mic connector.

DISPLAY SERIAL data is received from the station radio at radio connector J202-15, from the Keypad/Frequency Select board at J208-7, or from a data device connected to J209-9 through a 470 ohm resistor. As with KEYPAD SERIAL, the resistor reduces the conflicts between the front and rear connectors. DISPLAY SERIAL may be TTL or RS232 depending on the radio. Once on the Interconnect board, DISPLAY SERIAL is routed through STA_DIS pin to jumper P217-1 and to the input of RS232 converter chip U202-13. The TTL output at U202-12 is connected to J217-3. The center pin, J217-2, is routed through the DIS pin to the Display serial output of the mic connector at J201-6.

In MDX applications, J217-1 & 2 are jumpered, connecting the TTL radio output to the mic connector pin. In ORION applications, J217-2 is jumpered to J217-3. This connects the converted RS232 TTL output from the radio to mic connector J201-6.

PTT Isolation Circuit

The PTT line on mic connector, J201-7, is also used for the 12 volt PP flash programming voltage. In MDX applications, this multiplexed line is connected to the radio. In ORION applications, the functions must be separated. This is accomplished by a PTT isolation circuit consisting of Q204 and Q205. DESK MIC PTT, J201-7, is connected to transistors Q204 and Q205 through the MIC_PTT pin. (MIC_PTT is also connected to the VPP isolation circuit and to J219.) Q205 and Q204 convert the multiplexed signal to a +5 volt signal, representing the isolated PTT signal. This signal is connected to J219-3.

The jumper, P219, is used to rout the correct signals to the ORION or MDX radio. The line from the mic connector, MIC_PTT, is connected to J219-1. The center pin, J219-2, is labeled DESK_MIC_PTT. In MDX applications, J219-1 is jumpered to J219-2 to directly connect MIC_PTT from the mic connector to the radio PTT. In ORION applications, J219-2 is jumpered to J219-3 to use the isolated PTT. The connection is made through DESK_MIC_PTT and P204-5 & 6.

VPP Isolation Circuit

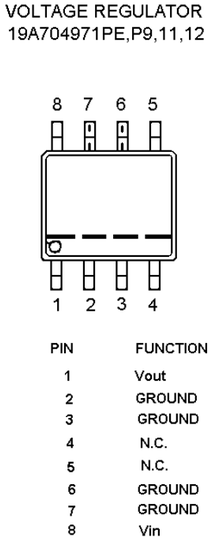
The MIC_PTT line from the mic connector (J201-7) is also routed to the VPP isolation circuit consisting of Q206 and Q207. MIC-PTT is connected to PNP transistor switch Q206 and to a voltage divider formed by R225 and R226. The output of Q206, VPP, is connected to the ORION VPP line at J215-7 through the VPP pin. The voltage divider is connected to the base of NPN switching transistor Q207. Q207 turns on when the voltage on DESK MIC PTT, J201-7, rises above 9 volts, turning on Q206 and connecting VPP to the radio at J215-7.

The VPP signal keeps the normal TTL level transitions on the PTT switch off the ORION VPP line.

5 Volt Regulator

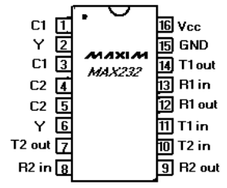
RS232 converter chip U202 and the various pull-up resistors on Interconnect board require a regulated five volt supply. This voltage is provided by 78L05 regulator U201. It receives A+ from Power Supply connector J206-3. Its' output is +5 volts at U201-1.

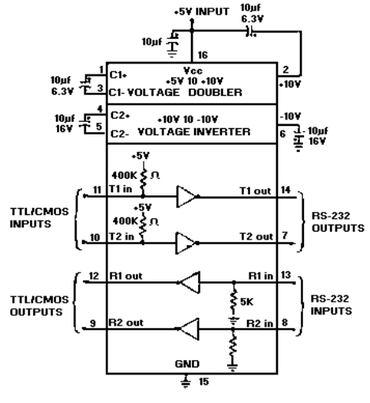
U201, 5-VOLT REGULATOR
19A70491P3

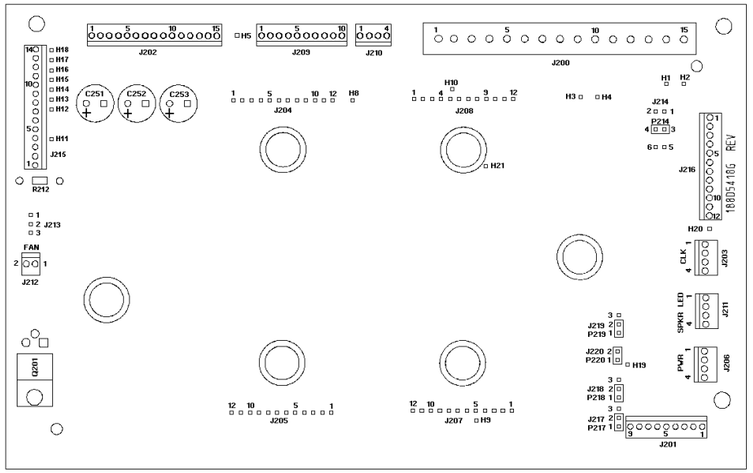


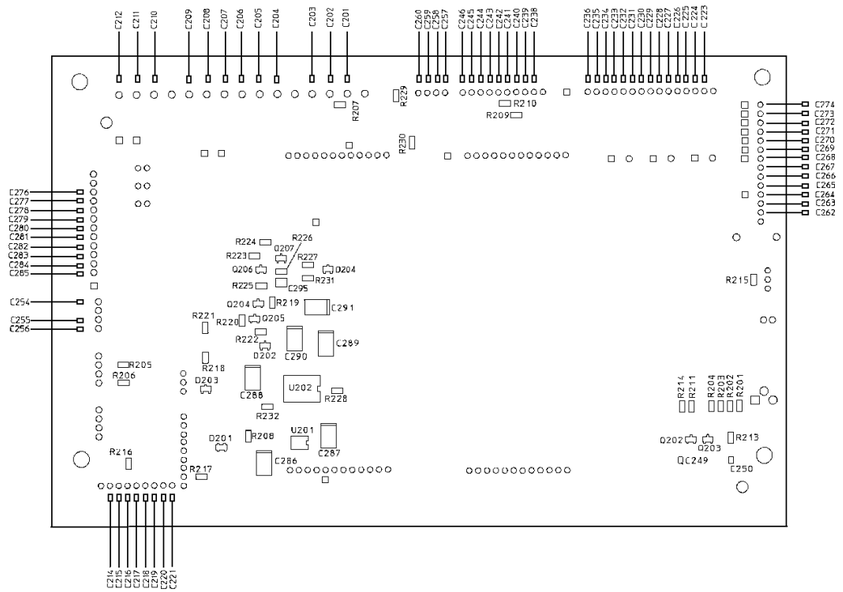
PIN	FUNCTION
1	Vout
2	GROUND
3	GROUND
4	N.C.
5	N.C.
6	GROUND
7	GROUND
8	Vin

U202, TRANSMITTER/RECEIVER - RS-232
19A149446P2

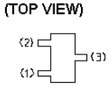








LEAD IDENTIFICATION FOR
Q202, Q203, Q204, Q205,
Q026 AND Q207
(SOT) TRANSISTORS
(TOP VIEW)



CAUTION
OBSERVE PRECAUTIONS FOR HANDLING
ELECTROSTATIC SENSITIVE DEVICES

DESKTOP STATION
Interconnect Board

(188D5418, Rev. 1)

SERIAL PORT APPLICATIONS

IN THE MDX APPLICATION, THE KEYPAD SERIAL AND DISPLAY SERIAL LINES OF THE MIC CONNECTOR ARE TIED DIRECTLY TO THE KEYPAD SERIAL AND DISPLAY SERIAL LINES OF THE DESKTOP BY JUMPERS J217, J218 AND J220. THE LINES ON THE DESKTOP ARE TTL LEVELS. THE DATA PORT MUST GO TO A 3370 BOX BEFORE GOING TO A RS232 DEVICE.

IN THE ORION APPLICATION, THE KEYPAD SERIAL AND DISPLAY SERIAL OF THE MIC CONNECTOR PASS THROUGH A RS232 CONVERTER CHIP (U202) BEFORE CONNECTING TO THE DESKTOP'S KEYPAD SERIAL AND DISPLAY SERIAL LINES. THE DESKTOP'S LINES AND THE RADIO LINES ARE AT RS232 LEVELS. A RS232 DEVICE CAN BE CONNECTED TO THE DATA PORT WITHOUT A 3370 BOX. JUMPERS J217, J218 AND J220 MUST BE SET TO PUT THE RS232 CONVERTER CHIP IN THE CIRCUIT. THE LINES AT THE DESK MIC CONNECTOR ARE TTL LEVEL LINES.

JUMPER J217 DETERMINES IF THE DISPLAY SERIAL LINE AT THE MIC CONNECTION IS TTL OR RS232. JUMPER J218 DETERMINES IF THE KEYPAD SERIAL LINE AT THE MIC CONNECTOR IS TTL OR RS232. AND J220 CONNECTS THE RADIO DISPLAY SERIAL TO THE INPUT OF THE MAX232 CHIP. IT IS NEEDED BECAUSE THE MAX232 IC HAS AN INTERNAL 5K OHM PULL-DOWN RESISTOR THAT LOADS THE MDX SERIAL BUS INTO UNRELIABLE OPERATION.

PTT PATHS

THE PTT LINE AT THE MIC CONNECTOR IS A MULTIPLEXED PTT AND FLASH PROGRAMMING LINE. IN THE MDX APPLICATION, THIS COMBINED LINE IS RUN THROUGHOUT THE DESKTOP TO THE RADIO. IN THE ORION APPLICATION, THE SIGNALS ARE SEPARATED BEFORE THE LINE RUNS THROUGH THE DESKTOP. THIS IS DONE WITH JUMPER J219. THE OUTPUT OF JUMPER J219 IS CALLED 'DESK MIC PTT'.

DESK MIC PTT IS AN INPUT TO THE KEYPAD/FREQUENCY SELECT BOARD. IT GOES TO THE EXTERNAL DEVICE TERMINAL BLOCK. IT ALSO GOES TO AN INPUT TO THE REMOTE INTERFACE BOARD. THIS BOARD (OR JUMPER P204) CONNECTS THE INPUT DESKMIC PTT TO THE OUTPUT 'PTT. IN THE CASE OF THE REMOTE INTERFACE BOARD, THE REMOTE PTT SIGNAL FROM THE IDA BOARDS WILL ALSO BE ADDED TO THE PTT OUTPUT. THE KEYPAD/FREQUENCY SELECT BOARD ALSO HAS THE CAPABILITY TO ADD A REMOTE PTT TO THE 'PTT LINE.

THE PTT LINE COMES OFF OF THE REMOTE INTERFACE BOARD OR THE KEYPAD FREQUENCY SELECT BOARD AND GOES AS AN INPUT TO THE DATA PORT CONNECTOR. THE OUTPUT OF THE DATA PORT CONNECTOR THEN GOES TO THE RADIO PTT. THIS ALLOWS A DATA MODEM TO BREAK THE RADIO PTT LINE. IN THE STANDARD APPLICATION, WHERE THERE IS NO MODEM, A ZERO OHM RESISTOR (R209) IS USED TO TIE THE DATA PORT'S INPUT AND OUTPUT TOGETHER SO THAT THE PTT LINE FROM THE REMOTE INTERFACE BOARD OR KEYPAD/FREQUENCY SELECT BOARD TIES TO THE RADIO PTT.

MIC AUDIO PATHS

MIC AUDIO COMES INTO THE STATION ON J201 AS 'DESK MIC AUDIO. IT THEN GOES OUT TO TERMINAL BLOCK J200. PROVISIONS ARE MADE TO BREAK THE LINE HERE. THE AUDIO COMES FROM THE TERMINAL BLOCK AS 'SW DESK MIC HI. A 0 OHM RESISTOR, R207 TIES 'DESK MIC HI TO 'SW DESK MIC HI WHEN THE TERMINAL BLOCK IS NOT IN USE.

SIGNAL 'SW DESK MIC HI THEN GOES TO THE REMOTE INTERFACE BOARD ON J204. IT COMES OFF OF THE BOARD ON J204 AS 'MIC HI. THE BOARD WILL ALSO SUM AUDIO FORM THE REMOTE PANELS HERE. THE SIGNAL 'MIC HI THEN GOES TO THE DATA PORT CONNECTOR. MIC AUDIO CAN ALSO BE FROKEN AT THE DATA PORT. IT THEN COMES OFF THE DATA PORT CONNECTOR AS 'RADIO MIC HI. A 0 OHM RESISTOR R210 TIES 'MIC HI TO 'RADIO HIC HI WHEN THIS FEATURE OF THE DATA PORT IS NOT USED. THE SIGNAL 'RADIO MIC HI THEN GOES TO THE RADIO CONNECTOR.

SPEAKER AUDIO PATHS

SPEAKER AUDIO COMES FORM RADIO CONNECTOR J202 IN TWO PLACES. THE FIRST, 'SPKR HI, JUST GOES TO THE EARPIECE AUDIO OF MIC CONNECTOR J201. THE SECOND, 'SW SPKR HI GOES TO REMOTE INTERFACE BOARD CONNECTOR J204. REMOTE AUDIO WILL ALSO BE ADDED BY THE REMOTE INTERFACE BOARD. THE DESKTOP'S AUDIO AMP WILL ALSO BE ON THE REMOTE INTERFACE BOARD. THE SIGNAL COMES OFF OF THIS BOARD AS 'STA SPKR HI.

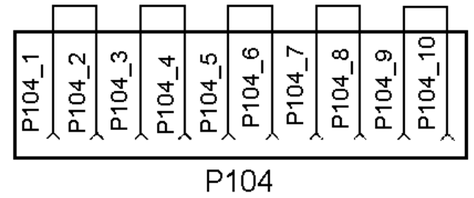
THE AUDIO THEN GOES TO TERMINAL BLOCK J200. PROVISION IS MADE TO BREAK THE PATH HERE. THE SIGNAL COMES FROM THE TERMINAL BLOCK AS 'SW STA SPKR HI. DUE TO THE POWER LEVELS OF THE AUDIO, ONE CAN NOT TIE 'STA SPKR HI TO 'SW STA SPKR HI WITH A 0 OHM RESISTOR. INSTEAD, THERE IS A PWB BOARD RUN BETWEEN HOLES H3 AND H4. IF IT IS DESIRED TO BREAK THE AUDIO AT THE TERMINAL BLOCK, THEN THIS RUN MUST BE CUT. SIGNAL 'SW STA SPKR HI THEN GOES TO THE SPEAKER BY WAY OF J211.

NOTE THAT THE SPEAKER LINES FROM THE RADIO ARE DC ISOLATED BY 470 uF CAPACITORS. HOWEVER, THE REMOTE INTERFACE BOARD WILL GROUND 'SPKR LO AND STA SPKR LO.

J204 JUMPER BLOCK

WHEN NO REMOTE INTERFACE BOARD IS USED, A JUMPER BLOCK P104 IS PUT OVER J204. THIS BLOCK CONSISTS OF WIRES BETWEEN:

PIN 1 TO PIN 2 (SW DESK MIC HI TO MIC HI)
PIN 3 TO PIN 4 (DESK MIC LO TO MIC LO)
PIN 5 TO PIN 6 (DESK MIC PTT TO PTT)
PIN 7 TO PIN 8 (SW SPKR HI TO STA SPKR HI)
PIN 9 TO PIN 10 (SPKR LO TO STA SPKR LO)



J214 VU METER JUMPER BLOCK

THIS CONNECTOR DETERMINES WHEN THE VU METER IS ENABLED

PIN 1 TO PIN 2 (METER IS ALWAYS ENABLED)
PIN 3 TO PIN 4 (METER IS ENABLED ON ALL RADIO PTT ACTIONS)
PIN 5 TO PIN 6 (METER IS ONLY ENABLED BY DESKTOP PTT)

"PROGRAMMING JUMPER CHART"

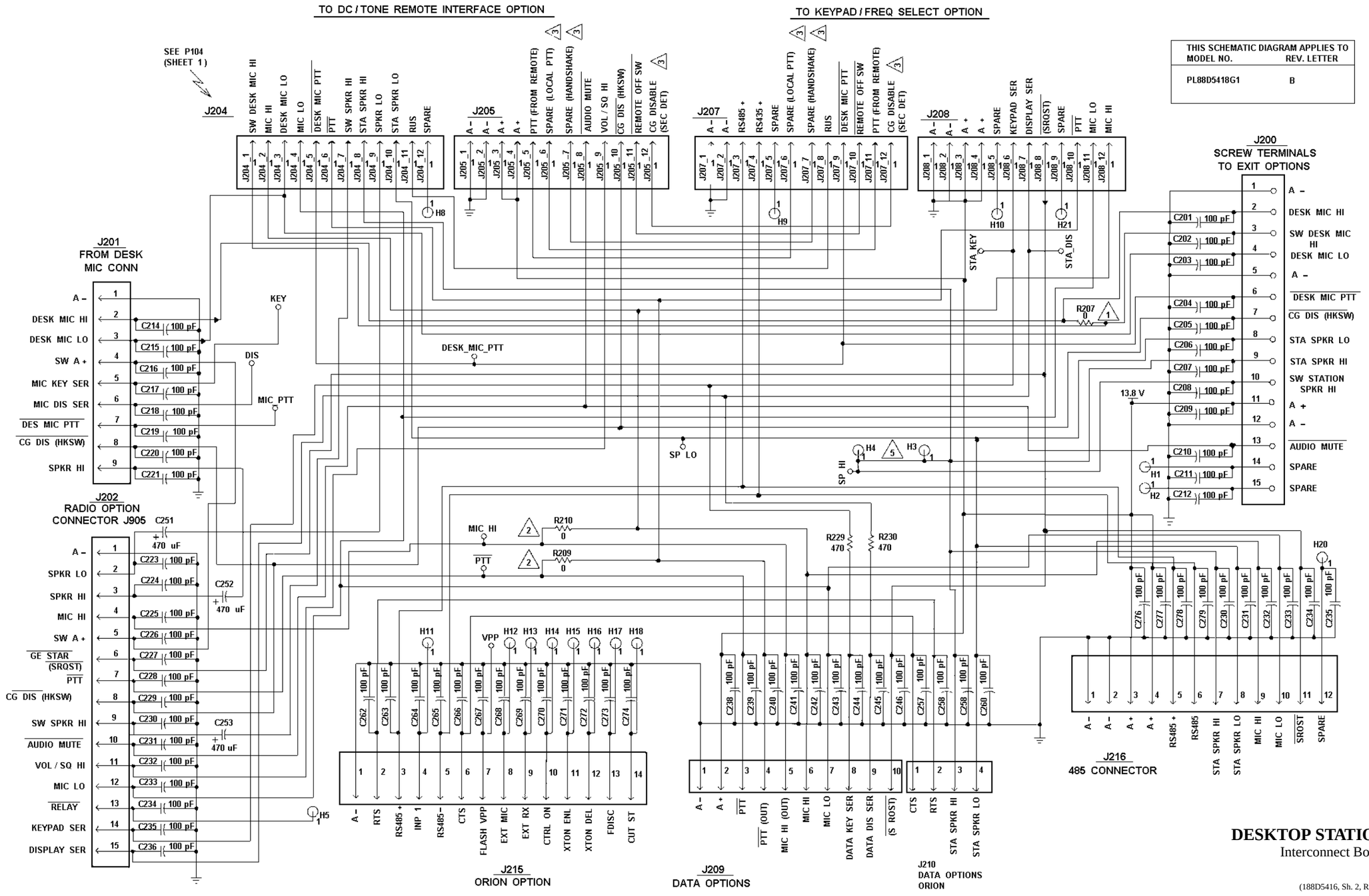
JUMPER	MDX	ORION
P217 TO J217	PINS 1&2	PINS 2&3
P218 TO J218	PINS 1&2	PINS 2&3
P219 TO J219	PINS 1&2	PINS 2&3
P220 TO J220	PINS 1&2	PINS 2&3

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

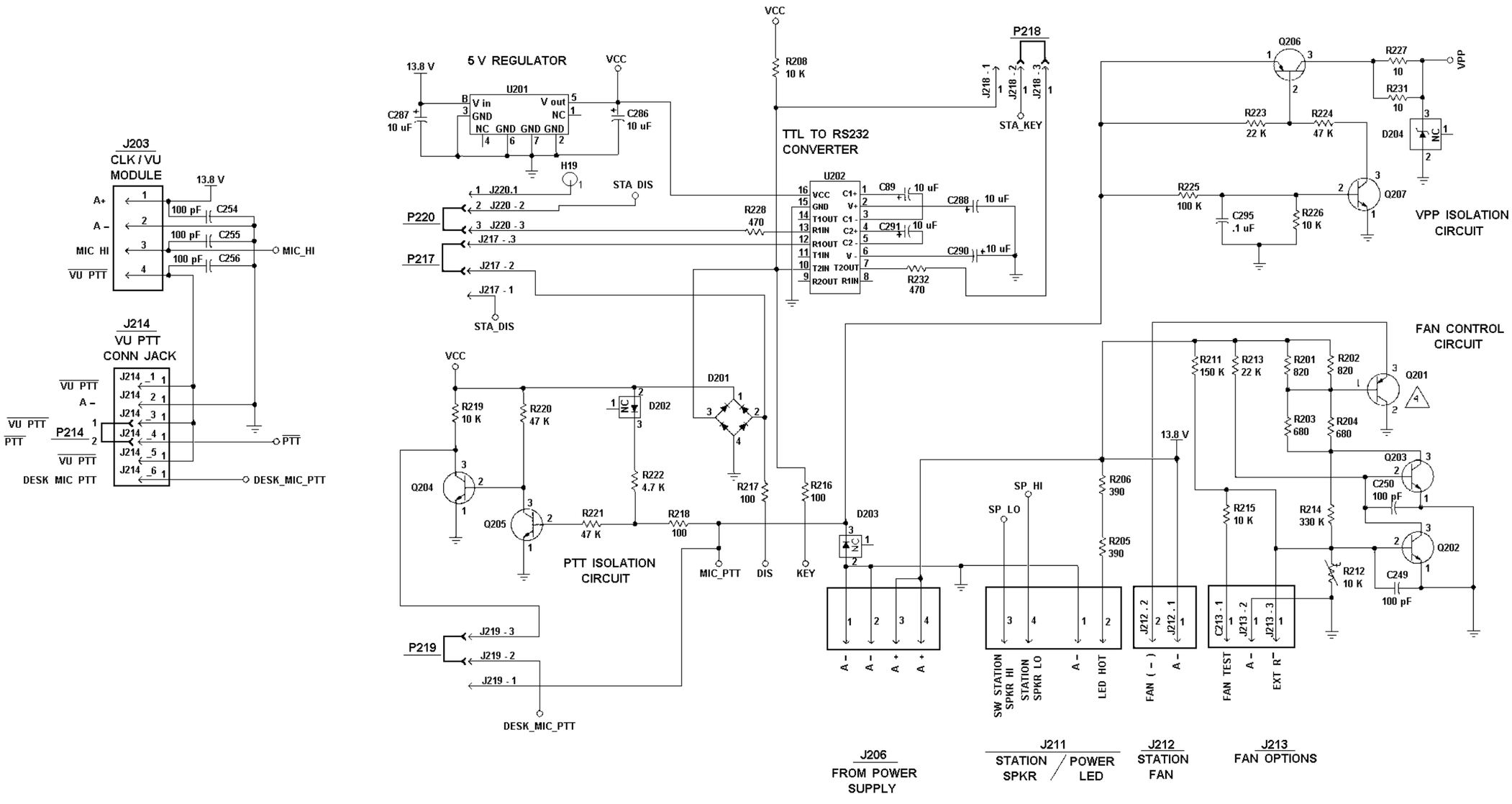
DESKTOP STATION
Interconnect Board

(188D5416, Sh. 1, Rev. 1)



DESKTOP STATION
Interconnect Board

(188D5416, Sh. 2, Rev. 2)



DESKTOP STATION
Interconnect Board

(188D5416, Sh. 3, Rev. 2)

INTERCONNECT BOARD
ORION Desktop Station
188D5418G1

SYMBOL	PART NO.	DESCRIPTION
C201 thru C250	19A702061P61	Capacitor, Cer.: 100 pF 10%, 50 DCWV.
C251 thru C253	344A4194P471160	Capacitor,Electrolytic: 470 F 20%, 16 DCWV; sim to United Chemicon SME.
C254 thru C285	19A702061P61	Capacitor, Cer.: 100 pF 10%, 50 DCWV.
C286 thru C291	19A705205P7	Capacitor, Tantalum: 10F 20%, 25 DCWV.
C295	19A702052P26	Capacitor, Cer.: 0.1F 10%, 50 DCWV.
		- - - - - - - - - DIODES - - - - - - - - - -
D201	19A149615P1	Diode, Silicon Array; sim to Siemens BGX50A.
D202	19A700155P2	Diode, Silicon switching; sim to BAT 18.
D203		
D204	19A700083P108	Diode, Silicon Zener: 13.8 Volts; sim to BZx84-C15.
		- - - - - - JACKS - - - - - - -
J200	344A3197P1	Terminal Block, 15 positions; sim to Electrovert 25.106.1553.
J201	19A704852P35	Connector, PWB two part, 9 ckt; sim to Molex 22-229-2091.
J202	19A704852P41	Connector, PWB two part, 15 ckt; sim to Molex 22-229-2151.
J203	19A704852P30	Connector, PWB two part, 4 ckt; J206 sim to Molex 22-229-2041.
J204 and J205	19A703248P18	Contact, Electrical.
J206	19A704852P30	Connector, PWB two part, 4 ckt; J206 sim to Molex 22-229-2041.
J207 and J208	19A703248P18	Contact, Electrical.
J209	19A704852P41	Connector, PWB two part, 15 ckt; sim to Molex 22-229-2151.
J211	19A704852P30	Connector, PWB two part, 4 ckt; sim to Molex 22-229-2041.
J212	19A704852P28	Connector, PWB two part, 2 ckt; sim to Molex 22-229-2021.
J213 and J214	19A703248P11	Contact, Electrical (Gold Plated).
J215	19A704852P40	Connector, PWB two part, 14 ckt; sim to Molex 22-229-2141.
J216 thru J219	19A704852P38	Connector, PWB two part, 12 ckt; sim to Molex 22-229-2121.
J220	19A703248P11	Contact, Electrical (Gold Plated).

*COMPONENTS, ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	PART NO.	DESCRIPTION
		- - - - - - - - PLUGS - - - - - - - - - -
P214 thru P220	19A702104P2	Connector, 2 pin jumper; sim to AMP - 530153-1.
		- - - - - RESISTORS - - - - -
R201 and R202	19B800607P821	Resistor, Metal film: 820 ohms 5%, 1/8 w.
R203 and R204	19B800607P681	Resistor, Metal film: 680 ohms 5%, 1/8 w.
R205 and R206	19B800607P391	Resistor, Metal film: 390 ohms 5%, 1/8 w.
R207	19B800607P1	Resistor, Metal film: 0 ohms (50 milliohms max.).
R208	19B800607P103	Resistor, Metal film: 10K ohms 5%, 1/8 w.
R209 and R210	19B800607P1	Resistor, Metal film: 0 ohms (50 milliohms max.).
R211	19B800607P154	Resistor, Metal film: 150K ohms 5%, 1/8 w.
R212	19A701864P4	Resistor, Thermistor, 10K ohms 10%, NTC; sim to Midwest 2H-103.
R213	19B800607P223	Resistor, Metal film: 22K ohms 5%, 1/8 w.
R214	19B800607P334	Resistor, Metal film: 330K ohms 5%, 1/8 w.
R215	19B800607P103	Resistor, Metal film: 10K ohms 5%, 1/8 w.
R216 thru R218	19B800607P101	Resistor, Metal film: 100 ohms 5%, 1/8 w.
R219	19B800607P103	Resistor, Metal film: 10K ohms 5%, 1/8 w.
R220 and R221	19B800607P473	Resistor, Metal film: 47K ohms 5%, 1/8 w.
R222	19B800607P472	Resistor, Metal film: 4.7K ohms 5%, 1/8 w.
*R223	19B800607P223	Resistor, Metal film: 22K ohms 5%, 1/8 w.
*R224	19B800607P473	Resistor, Metal film: 47K ohms 5%, 1/8 w.
*R225	19B800607P104	Resistor, Metal film: 100K ohms 5%, 1/8 w.
R226	19B800607P103	Resistor, Metal film: 10K ohms 5%, 1/8 w.
R227	19B800607P100	Resistor, Metal film: 10 ohms 5%, 1/8 w.
R228 thru R230	19B800607P471	Resistor, Metal film: 470 ohms 5%, 1/8 w.
R231	19B800607P100	Resistor, Metal film: 10 ohms 5%, 1/8 w.
R232	19B800607P471	Resistor, Metal film: 470 ohms 5%, 1/8 w.
		- - - - TRANSISTORS - - - - -
Q201	19A116942P1	Transistor, Silicon, PNP; sim to Motorola 2N6490.
Q202 thru Q205	19A700076P2	Transistor, Silicon, NPN; sim to Motorola MMBT39044.
Q206	19A700059P2	Transistor, Silicon, PNP; sim to Motorola MMBT3906.
Q207	19A700076P2	Transistor, Silicon, NPN; sim to Motorola MMBT39044.
		- - - - - -INTEGRATED CIRCUITS - - - - - -
U201	19A704971P9	Voltage Regulator, 5 V (POS & NEG); to MC78L05ACD.
U202	19A149446P2	Transmitter/ Receiver RS-232.

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. Refer to the Parts List for the descriptions of parts affected by these revisions.

REV A. INTERCONNECT BOARD 188D5418G1
To prevent unreliable operation due to U202, J220 and P220 added.

REV B. INTERCONNECT BOARD 188D5418G1

To improve unit programmability at low temperatures.

R223 was 47K ohm (19B800607p473).
R224 was 100K ohm (19B800607P104).
R225 was 180K ohm (19B800607P184).