MOTOROLA

STATION ACCESS MODULE (SAM)

MODEL TLN3221B

1. DESCRIPTION

The Station Access Module (SAM) is standard equipment in an *MSF 5000* or *MSF 10000* Data Station. It is also available with the Smart Wildcard Option (X233) or with the *MSF 5000/MSF 10000* Diagnostics Option (X34). The SAM consists of a microprocessor and associated circuitry, and occupies a single slot in the expansion tray. When operating in a data station or in a diagnostic station, it monitors the operational state of the station. It interprets information from various sources within the radio, and if a problem is detected, provides an alarm indication to the outside world.

The SAM card incorporates all functions of the previous Repeater Access Controller (RAC) and has replaced the C932 option with option X233. Configured as a software programmable wildcard the SAM provides 24 outputs and 16 inputs along with RS232, tone (Select5 and Single-Tone), *MDC1200*, and dual tone multi-frequency (DTMF) signaling capabilities. An additional relay output board is available (Option C975) which provides eight relay outputs as well as a "breadboard" area for special applications.

2. APPLICATION INFORMATION

2.1 DATA

When used in conjunction with the MSF Data Station, the SAM provides the interface between the BSC and the station. It provides control inputs to the station from the BSC and Alarm/Status Outputs from the station to the outside world. The SAM has the capability of identifying failed Field Replaceable Units (or FRUs) via alarms. Predefined setup keys are available on the RSS screens to configure all I/Os for operation with the BSC.

The following is the complete list of the Diagnostic Alarms which SAM is capable of reporting when used with a data station or a standard MSF station with the full diagnostics option (X34).

- DC Power
- Receive 1 Synthesizer
- Receiver 1
- Reduced Forward Power
- Intermediate RF Power Amplifier
- Driver RF PA
- Final RF PA
- Station Control Board (SSCB)
- Loopback Circuit
- Receiver 2
- Reverse Power/Feedline
- Receive 2 Synthesizer
- Battery Overvoltage
- Transmit Synthesizer
- Secure Board
- RSSI/Diversity Combiner Circuit
- PTT De-Key
- TTRC Board
- Battery Revert/AC Fail
- Alarm Interface Fault
- Re-program Station
- Door
- Access Disable

A detailed description of each of the alarm conditions is included in the Motorola Radio Service Software (RSS) Manual (68P81125E68). The full set or any subset of these alarms are available when programmed with the RSS.

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6/30/93-PHI

2.2 REPEATER ACCESS

Customers who have systems with large coverage needs often place multiple repeaters with overlapping coverage over the system area to guarantee total coverage. Typically these are low-traffic, frequency-limited areas. Because of frequency limitation, more than one repeater is placed on the same frequency.

When users are between repeaters in overlap zones, multiple repeaters may be keyed creating a poor simulcast system with multiple dead zones, resulting in limited or poor communications. To prevent these dead zones, signaling words may be sent by the mobile to address and access a single SAM-equipped repeater.

When used in Repeater Access applications, the SAM is primarily a signaling decoder. When programmed appropriately (see RSS manual for Repeater Access programming), it will decode the signaling word (Stat-Alert, Single-Tone/Select5 or DTMF) from the mobile and release the repeater from its knockdown state.

The SAM board also supports both encode and decode of Stat-Alert (*MDC1200*), Single-Tone/Select5 and DTMF signaling schemes. The SAM board is programmable to support a variety of system needs. It can be thought of as an interpreter between the MSF station and any source of Select5, DTMF or Stat-Alert signaling. The SAM can be programmed to decode these signalings and translate them into actions definable via RSS action table programming. A list of these actions is provided in the RSS manual.

2.3 SMART WILDCARD

The Station Access Module replaces all the hardwiring required to support many of the special product (SP) Options available previously with the TRN9754A (or previous version) Wildcard. This board had four inputs and four outputs which could be configured (via hardware jumpers and PC Board wiring modifications) to activate control and/or monitor status in the MSF. The SAM provides this capability all under software control, configurable via Motorola Radio Service Software (RSS). In addition, the SAM has a total of 16 inputs and 24 open-collector outputs, all of which are fully programmable to provide ACTIVE HIGH or ACTIVE LOW control and/or status, per customer requirements.

Also included directly on the SAM is RS232 capability. This replaces previous SP models of the station which involved the "piggyback" board mounted on top of the TRN9754A Wildcard board. This RS-232 port is tied directly into the MSF Inter-Processor Communications Bus (IPCB).

The MSF field programmer, version 5.00 and above, includes screens to configure the SAM. The field programmer manual describes, with examples, how to program the SAM to meet specific requirements.

2.4 DIAGNOSTICS

The SAM is available with the full diagnostics option (X34) to conventional or trunking MSF station models. It can be configured via the RSS to monitor the full set of diagnostics discussed under the Data Section or any subset of these diagnostics.

3. COMPATIBILITY WITH EXISTING MSF STATIONS

This module is compatible with all digital *MSF 5000* or *MSF 10000* models that include an Expansion Tray (option C695) that has at least one open slot. The SAM board requires version 5.xx station control firmware, and, if used with TTRC and secure, requires version 5.xx TTRC and 4.xx secure firmware. The SAM board is compatible with all of the currently available MSF options.

4. FUNCTIONAL DESCRIPTION

4.1 GENERAL

The Station Access Module is designed around a Motorola 8-bit HCMOS single chip microcontroller and two custom Application Specific Integrated Circuits (ASICs). These ASICs implement the "glue" circuitry commonly required to complete a microprocessor system. In addition to the 512 bytes of EEPROM inside the microprocessor, an 8K parallel EEPROM is used to store the field-programmable parameters of the board.

4.2 SAM INPUTS AND OUTPUTS

The Station Access Module has a total of 16 inputs and 24 outputs, totally programmable via RSS, for control and/or monitoring status of the MSF base station. Depending on the station configuration, these I/O control lines may appear at the station junction box in the form of two DB-25 connectors. They do not appear at the junction box, for example, in a data station for which the BSC is mounted inside the MSF cabinet.

All of the outputs are open collector, with no on-board pull-up resistor. The current sink capability of each of the outputs is 50 mA. Eight of these outputs appear at SAM connector P3203 (Wildcard Outputs 0, 1, 2, 14, 15, 16, 17, 18), and the remaining 16 appear at P3204. The function and active state of each of the outputs is individually configurable via RSS. See the RSS manual for further detail on how to set up any particular output.

Of the 16 inputs available, eight of them appear at SAM connector P3203 (Wildcard Inputs 0-7), and the remaining eight appear at P3204 (Wildcard Inputs 8-15). Wildcard Inputs 0-7 are equipped with opto-isolators to allow

interconnection with a multitude of external devices. For Wildcard Inputs 8–15, simple transistor–coupled inputs exist. Again, each input is individually configurable via RSS. Refer to the RSS manual for further detail on how to set up any particular input.

NOTE

Active levels for both the SAM inputs and outputs are defined as that appearing at the interface connector. Level inversions in any of the SAM I/O interface circuitry are included in the SAM software logic.

For Wildcard Inputs 0–7, two dc current sources, nominally set to 2.5 mA dc, are used in conjunction with diodes to control the direction of current. The operating range of these inputs is specified as any switched voltage in the range of –48 to + 48 volts dc. Two input jumper blocks are used on the SAM. JU3220 sets the operating mode for Wildcard Inputs 0–3, and JU3221 for Wildcard Inputs 4–7. With the jumper set to the normal position, 5 V dc is supplied to the base of the PNP current sources, and 9.6 V dc to the emitter. This is the position used to accept an open collector driver from the external device. If an open collector goes active at one of these inputs, current is drawn through the PNP current source and through the opto–isolator, thereby turning the opto–isolator on. With the opto–isolator on, a low logic level appears at the microprocessor input port, and this activates the user–programmed function specific to that wildcard input line. Note that the NPN current source does nothing in this mode. If JU3220/JU3221 are placed into the alternate position, a ground is placed on the base, and 5V is placed on the emitter. This effectively selects a lower threshold at which the PNP current source will begin to conduct (approximately 0 Volts and less. The upper threshold, set via the NPN current source, is approximately 2.9V (5V minus 3 diode drops) and is present at its base. A negative–going switched source at one of these inputs will draw current through the PNP current source and opto–isolator, whereas a positive going source will source current through the opto–isolator and the NPN current source. In either case, current in the opto–isolator turns on the programmed function. Note, the jumper selects the mode for the group of four inputs, however they are still individually configurable in regard to what control function is performed in the radio upon activation.

Since these inputs were designed to be "generic", active Hi/ active Lo, the active state may simply be changed via RSS if the actual function performed is exactly opposite to what the installer thought it should be.

4.3 FRONT PANEL SWITCH

Available on the front panel of the Station Access Module is a two position switch. The switch has no dedicated function, but is completely programmable in the same manner as any of the wildcard inputs. Possible usages include SP purposes or on–site troubleshooting.

4.4 V_B GENERATOR

The audio circuitry on the Station Access Module is powered by 9.6V dc. It is necessary to bias the audio amplifiers at the midway point between this supply and ground. This voltage is developed by the Vb (bias voltage) generator formed by voltage divider resistors R3323 and R3324 followed by a voltage follower U3214.

4.5 RS–232 PORT

An RS–232 port is available on the Station Access Module. It consists of an 8–conductor connector (P3205) which typically is cabled out to the junction box via cable kit TKN8421A (available with option C565). The RS–232 port is tied directly into the Inter–Processor Communication Bus (IPCB).

The RS–232 interface is provided by U3235 and associated circuitry. This IC converts the 0–5 Volt levels on the IPCB, to the (nominally) –12 Volt to + 12 Volt RS–232 levels required at the RS–232 transmit line (P3205–4). Conversely, it converts RS–232 levels appearing at the Received Data input (P3205–1), to 0–5 Volts levels compatible with the remainder of the IPCB interface circuitry on the Station Access Module.

Data Terminal Ready and Request to Send are also present at P3205; both are pulled to the active state with resistors. Also present at the connector is a ground. The SAM (and therefore the station) meets the definition for "Data Terminal Equipment".

4.6 SAM JUMPERS AND& MISCELLANEOUS CONNECTORS

JU3220	Normal	Selects Open Collector Inputs for WC Inputs 0–3
JU3220	Alt	Selects Switched Source Inputs for WC Inputs 0–3
JU3221	Normal	Selects Open Collector Inputs for WC Inputs 4–7
JU3221	Alt	Selects Switched Source Inputs for WC Inputs 4–7
JU3212	Normal	Makes SAM part of Expansion Reset (Wildcard)
JU3212	Alt	Selects SAM to be outside of Expansion Reset (Diagnostics / Data)
JU3222	Normal	Selects Data PTT Control to SSCB to allow Fast PTT (Data)
JU3222	Alt	No Fast PTT control to SSCB (Data PTT will not key station)

P3210 and P3211 are the connectors for Front and Rear Door alarm monitoring used for Data, Diagnostics, and

some wildcard applications. The cabling to these connectors are interchangeable.

J3207, J3208, and J3209 are the IPA Forward, IPA Reverse, and Driver Forward Power connectors, respectively. The IPA Forward Power and IPA Reverse Power signals are routed from the IPA output via a wattmeter (standard on data stations). The Driver Forward Power signal, in driver-equipped radios, comes from the driver power control connector.

4.7 DATA AND DIAGNOSTICS OPERATION

RECEIVE AUDIO ROUTING — Discriminator 1 Audio (Quad1) or Diversity Audio is selected via the U3232B analog switch. The audio signal is unfiltered, and buffered by voltage follower U3239A and output to the outside world at P3203–15.

TRANSMIT AUDIO ROUTING — Transmit data is input to SAM at P3203–17. It is buffered by U3200B but otherwise unprocessed. It is then passed through analog gate U3202B which selects between BSC transmit data and signaling encoder audio, and then through U3202A which can be programmed to provide a data mute function. This resultant signal then is routed to the station control board where it is summed with other transmit modulation audio, and routed to the VCO. For data operation, JU14 must be in the NORM position and JU6 must be ALT position on the Station Control Board in order for the BSC transmit data to bypass the splatter filter and limiter circuitry.

INPUT CONFIGURATION — Control inputs to the data station vary depending on which station controller is being used. Code plug programming can be viewed and/or modified using the RSS. See the RSS manual for further information on programming the inputs. For Fast Key Up, JU19 on the station control board must be in the NORM position, and proper programming on both the SAM and station control is required.

OUTPUT CONFIGURATION — Status/Alarm outputs from the data station vary depending on which station controller is being used. Code plug programming can be viewed and/or modified using the RSS. See the RSS manual for further information on programming the outputs.

4.8 SIGNALING OPERATION

The SAM board implements three signaling decoders: Stat-Alert (*MDC1200*), Single-Tone/Select5, and DTMF. Due to microprocessor loading, the Stat-Alert and Single-Tone/Select5 decoders can not be enabled simultaneously for a given mode.

A system of analog gates on the SAM allows either Quad1 Audio, Diversity Audio, Quad2 Audio, or Wireline Transmit Audio to feed any of the three signaling decoders on the SAM board. Of course, each decoder can look at only one audio source at a time; the decode source is mode-dependent.

The SAM also supports encode of all three signaling types. However, the SAM is half-duplex only - that is, it cannot decode while an encode is in process. The encode signaling may be routed to either the wireline or transmitter or both. The encode level is controlled by an EEPOT which may be accessed from the front panel (as potentiometer number F) or from the field programmer.

RECEIVE AUDIO ROUTING — U3201A, B, and C and U3232A, B, and C are transmission Gates, each of which acts as a single-pole double-throw switch to select which audio is used by each of the three SAM decoders. The audio selected is either Quad1 Audio, Diversity Audio, Quad2 Audio, or Wireline Transmit Audio.

TONE DECODER — Tone decoding on the SAM board is done in software. Before decoding, audio processing of the received signal is done by a bandpass filter consisting of operational amplifiers U3237A, B and U3238A, B, and limiter U3212. The processed audio is then fed to input capture port PA1 on the microprocessor (U3203–33).

The bandpass filter is three-stage, ten-pole filter, with 3 dB corners at approximately 250 Hz and 2900 Hz. This filter cleans up the received signal by removing frequency components which are outside the range of the tones to be decoded. The limiter takes the filtered sine wave and creates a square wave of the same frequency for input to the microprocessor.

TROUBLESHOOTING — When a carrier is modulated with a continuous tone and fed to the station receiver, and therefore to the SAM board, there should be a square wave at pin 1 of U3212. If that is not the case, check to see if there is a sine wave at U3237–1 and U3237–7.

BINARY DECODER — Binary decoding must be thought of as a two step process. The first step is demodulating, or determining what bits have been received. The second step is decoding, or determining what the bits mean. The SAM board implements both steps in software.

To determine what bits have been received, the SAM uses a software demodulator which uses the same microprocessor input pin as the tone decoder. This input is used to generate a clock signal at the output compare port at U3203–28. This clock drives the D-Flip-Flop, U3236, the output of which is then fed to the PA7 input port at U3203–27 via analog gate U3232C. Because the binary signaling used is in 1200 baud frequency shift keying format, where a logical "1" is represented by a full cycle of 1200 Hz and a logical "0" is represented by one and one half cycles of 1800 Hz, the software demodulator performs as a specialized tone decoder which translates 1200 and 1800 Hz tones (input to the μP at U3203–33 and U3203–27) into 1's and 0's. The resulting bit stream is decoded by the microprocessor. As each bit comes the mi-

croprocessor performs its decoding function, attempting to decode the bit pattern which has been demodulated into a valid received message.

BINARY ENCODER — When encoding, the binary modem IC (U3207) will take digital 1's and 0's from the microprocessor (input to the modem at U3207–15) and translates them into 1200 and 1800 Hz tones (output from the modem at U3207–6). The resulting output is then summed into the summing op–amplifier U3200D.

DTMF DECODER — The SAM DTMF decoder uses a specialized IC to do the translation from audio signals to digital signals. U3208 decodes the DTMF audio sequence and provides a four–bit nibble to the microprocessor specifying which of the 16 possible tone pairs was received.

TONE/DTMF ENCODER — Both of these signaling types are encoded on the SAM board by an 8–bit digital–to–analog converter (DAC) implemented as an R/2R ladder around op amp U3200A. A three–pole low–pass smoothing filter formed by U3200C follows the DAC.

TRANSMIT AUDIO ROUTING — Both the binary encode signal from the modem IC U3207 and the tone and DTMF signals from the DAC are summed by U3200–14. Variable gain is set by EEPOT U3209.

The output of the summer stage is fed to both analog gates U3202–13 and U3202–5. These gates control whether the encode audio will be passed to RAC Line Audio or RAC GCC Data Audio, or both. The RAC Line Audio signal feeds to the Line Summer stage on the Station Control Board (this requires jumper JU17 on SSCB to be in ALT position). The RAC GCC Data Audio line feeds to the splatter filter on the Station Control Board. Note that when encoding RAC tones or sequences, the jumpers on the Station Control Board must be set such that they go through the splatter filter, that is, JU14 in ALT position, and JU6 in NORM position.

ENCODER TROUBLESHOOTING — The SAM board will automatically encode a 1200 Hz signal when the SAM EEPOT (#F displayed on the front panel) is selected. A sine wave should be visible at U3200–1, U3200–8, and U3200–14. The amplitude of the signal at U3200–14 is adjusted by EEPOT U3209. The EEPOT should be adjusted to verify that the amplitude does change. If the signal is not present at any of these points, supply voltages should be checked, as well as a defective EEPOT.

5. LEVEL SETTING

Most of the level setting potentiometers in the Data station control tray are digitally controlled, solid state non-volatile potentiometers referred to as EEPOTs. These EEPOTs can be manipulated by using the Field Programmer or through a front panel switch toggling sequence.

Before setting SAM encode levels, the station Max Deviation EEPOT must already be set correctly. Also, if encoding to the wireline, the Line2/Line4 Level EEPOT must already be set correctly. After aligning the station according to the instructions given in the User Manual, use the following procedure set EEPOT #F (the SAM encode level potentiometer):

Step 1. Verify that all front panel switches are in their normal positions. The station should not be in PL DISABLE or ACCESS DISABLE.

Step 2. Hold the SELECT/SET switch in the SET position, and then move the PL DIS/XMIT switch to the PL DIS position. Be sure to move and hold the SET switch before the PL DIS switch. While both switches are active, three digits on the front panel STATUS display will show EEP.

Step 3. Release the SET switch, and then return the PL DIS switch to the normal position. After a few seconds, the leftmost digit of the STATUS display will show a 0 which represents the EEPOT number in hexadecimal (0 through hex F). The other two digits will show a decimal value from 00 to 99 which represents the current wiper position of the EEPOT.

Step 4. Toggle the SELECT/SET switch to the SELECT position. A decimal point on the display will light. Toggle the switch again to move the decimal point from one digit to another. Set the decimal point to the leftmost digit. Now toggle the switch to the SET position. Toggling to the SET position scans the current settings of the EEPOTs. A delay between toggles of more than five seconds times out the decimal point. To bring the decimal point back, toggle to the SELECT position. However, if the SET position is toggled after the decimal point times out, the display will exit the EEPOT setting mode and revert to normal operation. To re–enter the EEPOT mode, return to Step 1.

Step 5. Select EEPOT #F. When you do this the SAM board will encode a 1200 Hz tone. Move the decimal point to the next (tens) digit. Toggle to the SET position while monitoring the output you are trying to adjust. Toggling the switch to the SET position will increment the current digit by 1. If the SAM is encoding to the transmitter, hold the PL Dis/Xmit switch down (in the Xmit position) and monitor the Transmit Deviation while adjusting the EEPOT. If the SAM is encoding to the wireline, monitor the wireline level while adjusting the EEPOT. When the output gets close to the required level, move the decimal point to the third (ones) digit, and fine tune to the required level. If you overshoot the required level, scroll the wiper through position 99, and try again. The EEPOTs can be adjusted only in one direction from the front panel. When using the field programmer's alignment screens, the EEPOTs may be adjusted in either direction.

6. RELAY/SAM DAUGHTER BOARD OPTION (OPTION C975)

The C975 option can be ordered for any standard *MSF 5000/10000* Station which includes a SAM. This option consists of a daughter board which mounts directly on top of a SAM board. This option provides eight relay output drivers from wildcard outputs available at P3203 (0, 1, 2, 14, 15, 16, 17, 18). It also provides extra breadboarding space to be used for special applications.

7. STATION ACCESS MODULE (SAM) FACTORY DEFAULT PROGRAMMING

The Station Access Module (SAM) as shipped from the factory has several default programming configurations. The information in the following tables summarizes these configurations based upon the standard options available. The standard options are shown in Table 1 and the programming configurations for these options are shown in paragraphs 8 through 12. The BSC Function and DB-25/BSC Connector pin information (shown to the right of the SAM programming screen), is provided for reference.

Table 1. Standard SAM Module Options

OPTION NUMBER	DESCRIPTION
X470__	MMP Base Station Controller, with MSF5000 Data Station
X471__ X37__ X40__	MDC-4800 Base Station Controller, with MSF5000 Data Station RD LAP 9600 Base Station Controller, with MSF5000 Data Station RD LAP 19200 Base Station Controller, with MSF5000 Data Station
X233__	Smart Wildcard, with Standard MSF5000 Trunking or Conventional Station
X34__	Full Diagnostics, with Standard MSF5000 Trunking or Conventional Station
*X233__	'Data' -- Smart Wildcard w/ Data Interface, with Standard MSF5000 Trunking or Conventional Station

* Field configured

8. X470__ / C__CXB2106A DATA STATION WITH MMP 2100 BSC

8.1 SAM WILDCARD INPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS INPUT IS NOT PROGRAMMED)

I/O CONFIGURATION		EXP_DATA					
Wildcard Input	Input Type	Active	Input Response	Active Act Tbl	Inactive Act Tbl	BSC Function	DB-25/BSC Conn
0	Data	Low	TX PL INH	-	-	Tx PL INH	P16-10
1	-	-	-	-	-	GPO1	P16-11
2	-	-	-	-	-	n.c.	P16-12
3	-	-	-	-	-	Seize/Rel GPO3	P16-13
4	Wildcard	Low	-	01	02	Data PTT	P16-24
5	Data	Low	RX MUTE	-	-	Rx Mute	P16-25
6	-	-	-	-	-	Aud Gnd	P16-22
7	-	-	-	-	-	n.c.	P16-23
8	-	-	-	-	-	GPO5	P15-16
9	-	-	-	-	-	GPO4	P15-17
10	Data	Low	MAJORFAULT	-	-	Major Fault	P15-20
11	Data	Low	ALARM RES	-	-	Alarm Reset	P15-21
12	Data	Low	RFLOOP EN1	-	-	RF Loop En	P15-22
13	-	-	-	-	-	GPO2	P15-23
14	-	-	-	-	-	n.c.	P15-2
15	-	-	-	-	-	BSC 12V	P15-19

8.2 SAM ACTION TABLE SCREENS

NOTE

Table 2 and Table 3, the SAM Action Table Screens, are used to set DATA PTT on the Mux Bus instead of 'Fast Key' which was previously programmed. 'Fast Key' needs to be disabled for MMP operation.

Table 2. SAM Action Table Screen 1 of 2

ACTION TABLES				
ACTION TABLE	01		ACTIVE ACTION	ACTION TABLE# 01 of 02
#	ACTION	MUXADDR	MUXDATA	
01	SETMUX	00	8	
#	ACTION			
02				
#	ACTION			
03				
#	ACTION			
04				

Table 3. SAM Action Table Screen 2 of 2

ACTION TABLES				
ACTION TABLE	02		ACTIVE ACTION	ACTION TABLE# 02 of 02
#	ACTION	MUXADDR	MUXDATA	
01	CLEARMUX	00	8	
#	ACTION			
02				
#	ACTION			
03				
#	ACTION			
04				

8.3 SAM OUTPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS OUTPUT IS NOT PROGRAMMED):

I/O CONFIGURATION		WILDCARD			
Wildcard Output	Output Type	Active	Output Enable Conditions	BSC Function	DB-25/BSC Conn
0	-	-	-	GSI2	P16-15
1	-	-	-	GSI3	P16-16
2	-	-	-	GSI4	P16-4
3	WILDCARD	LOW	ACC DIS	Local Disable	P15-5
4	WILDCARD	LOW	IPA RF ALM	Exc Pwr Alm	P15-3
5	WILDCARD	LOW	TX SYN ALM	Exc VCO Alm	P15-18
6	WILDCARD	LOW	PTT DEKEY	PTT Alm	P15-4
7	WILDCARD	LOW	AC MN FAIL	DC Alm	P15-13
8	WILDCARD	LOW	R1 SYN ALM	VCO1 Alm	P15-12
9	WILDCARD	LOW	R1 SYN ALM	VCO2 Alm	P15-11
10	WILDCARD	LOW	RED RF PWR	PA Fwd Alm	P15-10
11	WILDCARD	LOW	RV PWR ALM	PA Rev Alm	P15-9
12	WILDCARD	LOW	FIN PA RF	PA Temp Alm	P15-7
13	WILDCARD	LOW	12,X1XX	Ref Osc Alm	P15-6
14	WILDCARD	LOW	DOOR ALM	GSI1	P16-7
15	WILDCARD	LOW	LN PTT SEN	Line PTT Sense	P16-3
16	-	-	-	GSI5	P16-5
17	WILDCARD	LOW	RX PL DET	Rx PL Det	P16-6
18	-	-	-	Aud Gnd	P16-21
19	WILDCARD	LOW	CARR DET	Carrier Detect	P15-24
20	WILDCARD	LOW	RPTR PTT	Rptr PTT Sen	P15-25
21	WILDCARD	LOW	LOOPB CIRC	RF Loop Alm	P15-1
22	-	-	-	Digital Gnd	P15-14
23	-	-	-	Digital Gnd	P15-15

9. X471__ , X37__ , X40__ / C__CXB2106A DATA STATION WITH MDC–4800 , RD LAP 9600 , RD LAP 19200 2100 BSC

9.1 SAM INPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS INPUT IS NOT PROGRAMMED):

I/O CONFIGURATION	EXP_DATA						
Wildcard Input	Input Type	Active	Input Response	Active Act Tbl	Inactive Act Tbl	BSC Function	DB-25/BSC Conn
0	Exp_Data	Low	TX PL INH	-	-	Tx PL INH	P16-10
1	Exp_Data	Low	RFLOOP EN2	-	-	RF Loop En2 GP01	P16-11
2	-	-	-	-	-	n.c.	P16-12
3	Exp_Data	Low	SEIZE/REL	-	-	Seize/Rel GPO3	P16-13
4	Exp_Data	Low	DATA PTT	-	-	Data PTT	P16-24
5	Exp_Data	Low	RX MUTE	-	-	Rx Mute	P16-25
6	-	-	-	-	-	Aud Gnd	P16-22
7	-	-	-	-	-	n.c.	P16-23
8	-	-	-	-	-	GPO5	P15-16
9	-	-	-	-	-	GPO4	P15-17
10	Exp_Data	Low	MAJORFAULT	-	-	Major Fault	P15-20
11	Exp_Data	Low	ALARM RES	-	-	Alarm Reset	P15-21
12	Exp_Data	Low	RFLOOP EN1	-	-	RF Loop En1	P15-22
13	Exp_Data	Low	STN RESET	-	-	MSF Reset GPO2	P15-23
14	-	-	-	-	-	n.c.	P15-2
15	-	-	-	-	-	BSC 12V	P15-19

9.2 SAM OUTPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS OUTPUT IS NOT PROGRAMMED):

I/O CONFIGURATION		EXP_DATA			
Wildcard Output	Output Type	Active	Output Enable Conditions	BSC Function	DB-25/BSC Conn
0	Exp_Data	LOW	ALM BIT 0	* Base Alarm Bit 0	P16-15
1	Exp_Data	LOW	ALM BIT 1	* Base Alarm Bit 1	P16-16
2	Exp_Data	LOW	ALM BIT 2	* Base Alarm Bit 2	P16-4
3	Exp_Data	LOW	ALM BIT 3	* Base Alarm Bit 3	P15-5
4	Exp_Data	LOW	ALM BIT 4	* Base Alarm Bit 4	P15-3
5	Exp_Data	LOW	ALM BIT 5	* Base Alarm Bit 5	P15-18
6	Exp_Data	LOW	ALM BIT 6	* Base Alarm Bit 6	P15-4
7	Exp_Data	LOW	ALM BIT 7	* Base Alarm Bit 7	P15-13
8	Exp_Data	LOW	ALM BIT 8	* Base Alarm Bit 8	P15-12
9	Exp_Data	LOW	ALM BIT 9	* Batt Rev/AC Fail	P15-11
10	Exp_Data	LOW	ALM BIT 10	* SAM Alarm	P15-10
11	Exp_Data	LOW	ALM BIT 11	* Reprog Station	P15-9
12	Exp_Data	LOW	ALM BIT 12	* Door Alarm	P15-7
13	Exp_Data	LOW	ALM BIT 13	* Access Disable	P15-6
14	Exp_Data	LOW	ALM BIT 14	* Alarm Expansion	P16-7
15	Exp_Data	LOW	LN PTT SEN	Line PTT Sense	P16-3
16	-	-	-	GSI5	P16-5
17	Exp_Data	LOW	RX PL DET	Rx PL Det	P16-6
18	-	-	-	Aud Gnd	P16-21
19	Exp_Data	LOW	CARR DET	Carrier Detect	P15-24
20	Exp_Data	LOW	RPTR PTT	Rptr PTT Sen	P15-25
21	-	-	-	GSI4	P15-1
22	-	-	-	Digital Gnd	P15-14
23	-	-	-	Digital Gnd	P15-15

* Expanded Data alarm set / bit definition shown in the following table (next page):

9.3 DEFAULT ALARM MAPPING FOR X471, X37, AND X40 OPTIONS

Field	Diagnostic/ Alarm Indication pg 0, Base Alarm Word b14 = 0	# Items flagged Base Alarm	# Bits Word	Binary Pattern b2,b1,b0	Definition
01				000	No Alarms set in this field
	DC Power	7	3	001	DC Power Alarm
	Rx 1 Synthesizer			010	Receive 1 Synthesizer Alarm
	Receiver 1			011	Receiver 1 Alarm
	Reduced RF Power			100	Reduced Forward RF Power Alarm
	Intermediate RF Power Amplifier			101	Intermed RF Power Amplifier Alarm
	Driver RF Power Amplifier			110	Driver RF Power Amplifier Alarm
	Final RF Power Amplifier			111	Final RF Power Amplifier Alarm
		Base Alarm	Word	b5,b4,b3	
02				000	No Alarms set in this field
	Station Control	6	3	001	Station Control Board Alarm
	Loopback Circuit			010	Loopback Circuit Alarm
•	Receiver 2			011	Receiver 2 Alarm
	Reverse Power / Feedline			100	Reverse Power / Feedline Alarm
				101	
•	Rx 2 Synthesizer			110	Rx 2 Synthesizer Alarm
	General #2			111	General #2 Alarm
		Base Alarm	Word	b8,b7,b6	
03				000	No Alarms set in this field
	Battery Overvoltage	6	3	001	Battery Overvoltage Alarm
	Tx Synthesizer			010	Tx Synthesizer Alarm
	Secure Board			011	Secure Board Alarm
•	RSSI / Div Circuit			100	RSSI / Diversity Circuit Alarm
	PTT De-Key			101	PTT De-Key Alarm
	TTRC Board			110	TTRC Board Alarm
				111	TTRC Bd & Secure Bd Alarm
		Base Alarm	Word	b11,b10,b9	
04				000	No Alarms set in this field
	Battery Revert / AC Fail	3	3	xx1	Battery Revert / AC Fail Alarm
	Alarm Interface Fault			x1x	Station Access Module Alarm
	Reprogram Station			1xx	Reprogram Station Alarm
		Base Alarm	Word	b13,b12	
05				00	No Alarms set in this field
	General #1 / Door	2	2	x1	General #1 / Door Alarm
	Access Disable			1x	Access Disable Alarm

Base Alarm Word ... b14 = 0, Page Bit = 0, Alarms as Defined on this Page

Totals 24 15 (Including Page bit, b14)

• Additional Diagnostic Available in Two Receiver Stations Only

10. X233__ / C__CXB7106B/BT OR C__CXB5103BT CONVENTIONAL OR TRUNKING STATION WITH SMART WILDCARD

10.1 SAM INPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS INPUT IS NOT PROGRAMMED):

I/O CONFIGURATION		WILDCARD				
Wildcard Input	Input Type	Active	Input Response	Active Act Tbl	Inactive Act Tbl	DB-25/J1 Conn
0	-	-	-	-	-	J1-10
1	-	-	-	-	-	J1-11
2	-	-	-	-	-	J1-12
3	-	-	-	-	-	J1-13
4	-	-	-	-	-	J1-24
5	-	-	-	-	-	J1-25
6	-	-	-	-	-	J1-22
7	-	-	-	-	-	J1-23
8	-	-	-	-	-	J3-16
9	-	-	-	-	-	J3-17
10	-	-	-	-	-	J3-20
11	-	-	-	-	-	J3-21
12	-	-	-	-	-	J3-22
13	-	-	-	-	-	J3-23
14	-	-	-	-	-	J3-2
15	-	-	-	-	-	J3-19

10.2 SAM ACTION TABLE SCREENS

No action tables are defined for this default SAM programming

10.3 SAM OUTPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS OUTPUT IS NOT PROGRAMMED):

I/O CONFIGURATION		WILDCARD		
Wildcard Output	Output Type	Active	Output Enable Conditions	DB-25 Conn
0	WILDCARD	HIGH		J1-15
1	-	-	-	J1-16
2	-	-	-	J1-4
3	-	-	-	J3-5
4	-	-	-	J3-3
5	-	-	-	J3-18
6	-	-	-	J3-4
7	-	-	-	J3-13
8	-	-	-	J3-12
9	-	-	-	J3-11
10	-	-	-	J3-10
11	-	-	-	J3-9
12	-	-	-	J3-7
13	-	-	-	J3-6
14	-	-	-	J1-7
15	-	-	-	J1-3
16	-	-	-	J1-5
17	-	-	-	J1-6
18	-	-	-	J1-21
19	-	-	-	J3-24
20	-	-	-	J3-25
21	-	-	-	J3-1
22	-	-	-	J3-14
23	-	-	-	J3-15

11. X34__ / C__CXB7106B/BT OR C__CXB5103BT CONVENTIONAL OR TRUNKING STATION WITH FULL DIAGNOSTICS

11.1 SAM INPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS INPUT IS NOT PROGRAMMED):

I/O CONFIGURATION	WILDCARD					
Wildcard Input	Input Type	Active	Input Response	Active Act Tbl	Inactive Act Tbl	DB-25/J1 Conn
0	-	-	-	-	-	J1-10
1	Diagnostic	Low	RFLOOP EN2	-	-	J1-11
2	-	-	-	-	-	J1-12
3	-	-	-	-	-	J1-13
4	-	-	-	-	-	J1-24
5	-	-	-	-	-	J1-25
6	-	-	-	-	-	J1-22
7	-	-	-	-	-	J1-23
8	-	-	-	-	-	J3-16
9	-	-	-	-	-	J3-17
10	-	-	-	-	-	J3-20
11	Diagnostic	Low	ALARM RES	-	-	J3-21
12	Diagnostic	Low	RFLOOP EN1	-	-	J3-22
13	Diagnostic	Low	STN RESET	-	-	J3-23
14	-	-	-	-	-	J3-2
15	-	-	-	-	-	J3-19

11.2 SAM ACTION TABLE SCREENS

No action tables defined for this default SAM programming.

11.3 SAM OUTPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS OUTPUT IS NOT PROGRAMMED):

I/O CONFIGURATION		DIAGNOSTIC		
Wildcard Output	Output Type	Active	Output Enable Conditions	DB-25 Conn
0	Diagnostic	HIGH	DC PWR ALM	J1-15
1	Diagnostic	LOW	R1 SYN ALM	J1-16
2	Diagnostic	LOW	RCVR1 ALM	J1-4
3	Diagnostic	LOW	AC MN FAIL	J3-5
4	Diagnostic	LOW	IPA RF ALM	J3-3
5	Diagnostic	LOW	RSSI/DIV	J3-18
6	Diagnostic	LOW	FIN PA RF	J3-4
7	Diagnostic	LOW	SSCB ALM	J3-13
8	Diagnostic	LOW	LOOPB CIRC	J3-12
9	Diagnostic	LOW	RCVR2 ALM	J3-11
10	Diagnostic	LOW	ALM INT F	J3-10
11	Diagnostic	LOW	R2 SYN ALM	J3-9
12	Diagnostic	LOW	RV PWR ALM	J3-7
13	Diagnostic	LOW	BATT OVOLT	J3-6
14	Diagnostic	LOW	TX SYN ALM	J1-7
15	Diagnostic	LOW	SEC BD ALM	J1-3
16	Diagnostic	LOW	PTT DEKEY	J1-5
17	Diagnostic	LOW	DR RF PWR	J1-6
18	Diagnostic	LOW	TTRC ALM	J1-21
19	Diagnostic	LOW	RED RF PWR	J3-24
20	-	-	-	J3-25
21	Diagnostic	LOW	RPGM STN	J3-1
22	Diagnostic	LOW	DOOR ALM	J3-14
23	Diagnostic	LOW	ACC DIS	J3-15

12. X233__ 'DATA' / C__CXB7106B/BT OR C__CXB5103BT CONVENTIONAL OR TRUNKING STATION WITH 'DATA' SMART WILDCARD (FIELD PROGRAMMED)

12.1 SAM INPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS INPUT IS NOT PROGRAMMED):

I/O CONFIGURATION	DATA					
Wildcard Input	Input Type	Active	Input Response	Active Act Tbl	Inactive Act Tbl	DB-25/J1 Conn
0	Data	Low	TX PL INH	-	-	J1-10
1	Data	Low	RFLOOP EN2	-	-	J1-11
2	-	-	-	-	-	J1-12
3	Data	Low	SEIZE/REL	-	-	J1-13
4	Data	Low	DATA PTT	-	-	J1-24
5	Data	Low	RX MUTE	-	-	J1-25
6	-	-	-	-	-	J1-22
7	-	-	-	-	-	J1-23
8	-	-	-	-	-	J3-16
9	-	-	-	-	-	J3-17
10	Data	Low	MAJORFAULT	-	-	J3-20
11	Data	Low	ALARM RES	-	-	J3-21
12	Data	Low	RFLOOP EN1	-	-	J3-22
13	Data	Low	STN RESET	-	-	J3-23
14	-	-	-	-	-	J3-2
15	-	-	-	-	-	J3-19

12.2 SAM ACTION TABLE SCREENS

No action tables defined for this default SAM programming.

12.3 SAM OUTPUT SCREEN (NO ENTRY UNDER 'TYPE'/'FUNCTION' MEANS OUTPUT IS NOT PROGRAMMED):

I/O CONFIGURATION		DATA		
Wildcard Output	Output Type	Active	Output Enable Conditions	DB-25 Conn
0	Data	HIGH	DC PWR ALM	J1-15
1	Data	LOW	R1 SYN ALM	J1-16
2	Data	LOW	RCVR1 ALM	J1-4
3	Data	LOW	AC MN FAIL	J3-5
4	Data	LOW	IPA RF ALM	J3-3
5	Data	LOW	RSSI/DIV	J3-18
6	Data	LOW	FIN PA RF	J3-4
7	Data	LOW	SSCB ALM	J3-13
8	Data	LOW	LOOPB CIRC	J3-12
9	Data	LOW	RCVR2 ALM	J3-11
10	Data	LOW	ALM INT F	J3-10
11	Data	LOW	R2 SYN ALM	J3-9
12	Data	LOW	RV PWR ALM	J3-7
13	Data	LOW	BATT OVOLT	J3-6
14	Data	LOW	TX SYN ALM	J1-7
15	Data	LOW	LN PTT SEN	J1-3
16	Data	LOW	PTT DEKEY	J1-5
17	Data	LOW	RX PL DET	J1-6
18	-	-	-	J1-21
19	Data	LOW	CARR DET	J3-24
20	Data	LOW	RPTR PTT	J3-25
21	Data	LOW	RPGM STN	J3-1
22	Data	LOW	DOOR ALM	J3-14
23	Data	LOW	ACC DIS	J3-15

13. CONNECTOR SIGNAL NAMES

Table 4. P3200 Pin Assignments

P3200 Pin No.	Signal Name
1	+5 V
2	+5 V
3	IPCB
4	Exp_Reset*
5	BA0
6	BA1
7	BA2
8	BA3
9	BD0*
10	BD1*
11	BD2*
12	BD3*
13	Logic Gnd
14	DS*
15	Logic Gnd
16	Data PTT
17	H10/Logic Sp
18	H9/Logic Sp
19	RAC_Ln_Audio
20	H7/Audio Sp
21	Quad_2_Audio
22	Diversity Audio
23	GCC_Data_Audio
24	N.C. (Select Audio)
25	N.C. (Local Audio)
26	N.C. (Tx Data Audio)
27	N.C. (Rx 2 Audio)
28	N.C. (Tx Audio)
29	Audio Gnd
30	Rx1 Audio
31	Quad_1_Audio
32	Gnd (Audio Ref)
33	+9.6 V
34	A+

Table 5. P3203 Pin Assignments

P3203 Pin No.	Signal Name
1	Gnd
2	RSSI
3	Audio Gnd
4	WC Output 0
5	WC Output 15
6	WC Output 1
7	WC Output 2
8	+5 V
9	WC Output 16
10	Logic Gnd
11	WC Output 17
12	+13.8 V
13	WC Output 14
14	Audio Gnd
15	Disc Audio Out
16	WC Output 18
17	Tx Mod Data In
18	WC Input 6
19	WC Input 0
20	WC Input 7
21	WC Input 1
22	WC Input 4
23	WC Input 2
24	WC Input 5
25	WC Input 3
26	Static Gnd

Table 6. P3204 Pin Assignments

P3204 Pin No.	Signal Name
1	WC Output 21
2	WC Output 22
3	WC Input 14
4	WC Output 23
5	WC Output 4
6	WC Input 8
7	WC Output 6
8	WC Input 9
9	WC Output 3
10	WC Output 5
11	WC Output 13
12	WC Input 15
13	WC Output 12
14	WC Input 10
15	Digital Gnd
16	WC Input 11
17	WC Output 11
18	WC Input 12
19	WC Output 10
20	WC Input 13
21	WC Output 9
22	WC Output 19
23	WC Output 8
24	WC Output 20
25	WC Output 7
26	+ 9.6 V

Table 7. P3206 Pin Assignments

P3206 Pin No.	Signal Name
1	Loopback_on*
2	Logic Gnd
3	Loopback_sense*
4	Logic Gnd
5	N.C.
6	N.C.
7	N.C.
8	N.C.
9	RSSI_1
10	Gnd
11	RSSI_2
12	Gnd
13	N.C.
14	Rx1/Rx2*
15	N.C.
16	Force_1*
17	N.C.
18	Force_2*
19	N.C.
20	RSSI
21	N.C.
22	N.C.
23	N.C.
24	N.C.
25	N.C.
26	N.C.

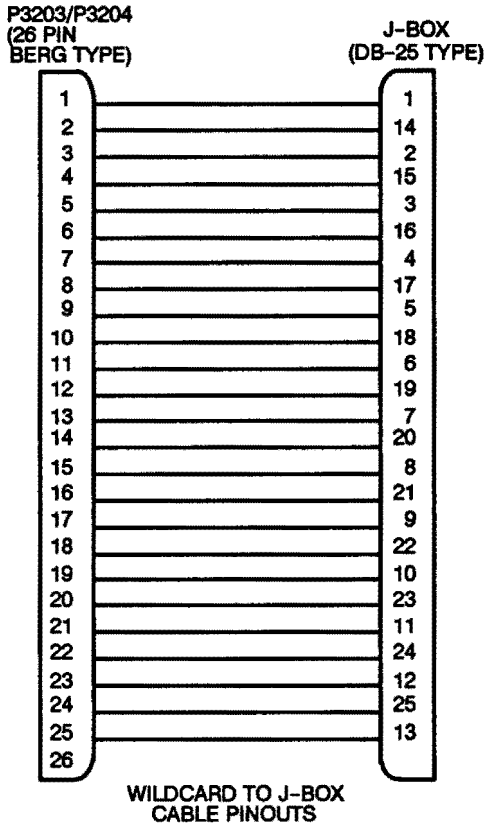
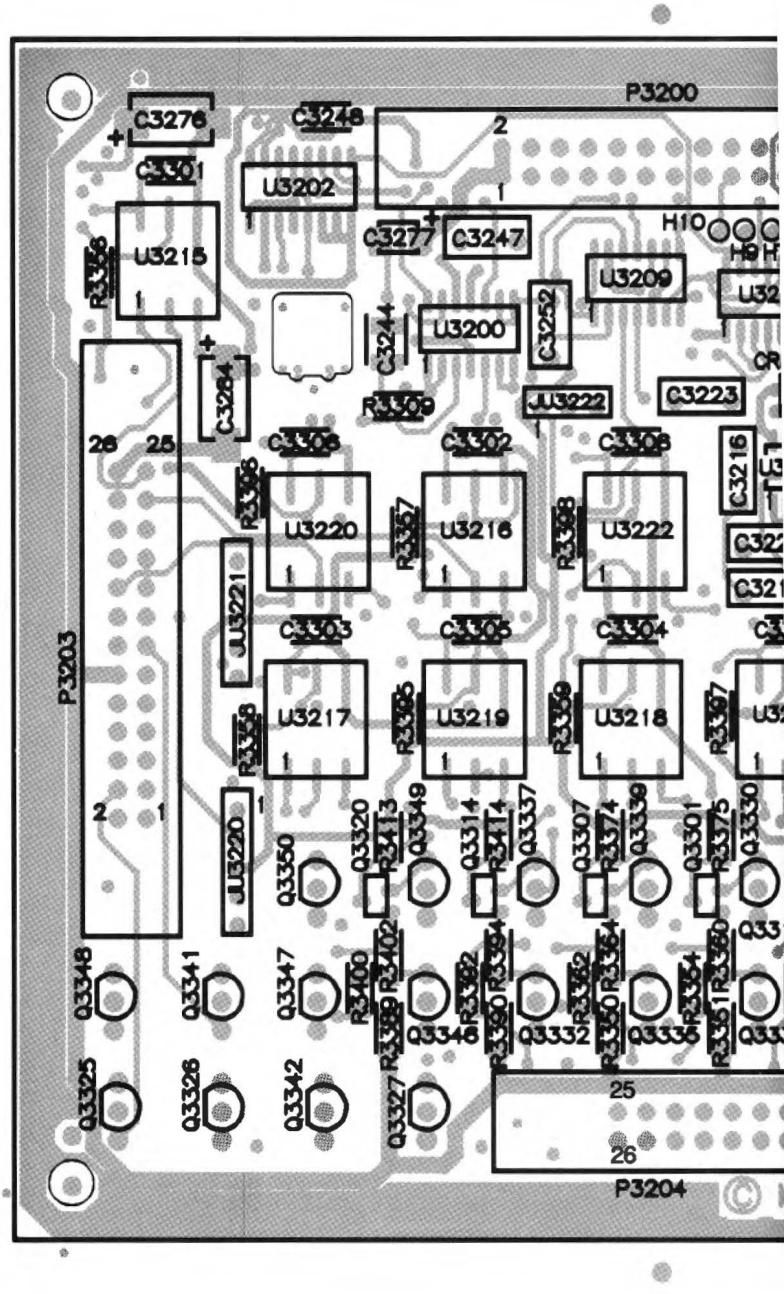


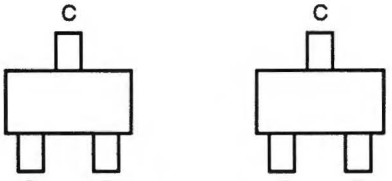
Figure 1. Wildcard to Junction Box Cabling Detail

STATION ACCESS MODULE (SAM)

MODEL TLN3221B
CIRCUIT BOARD DETAIL

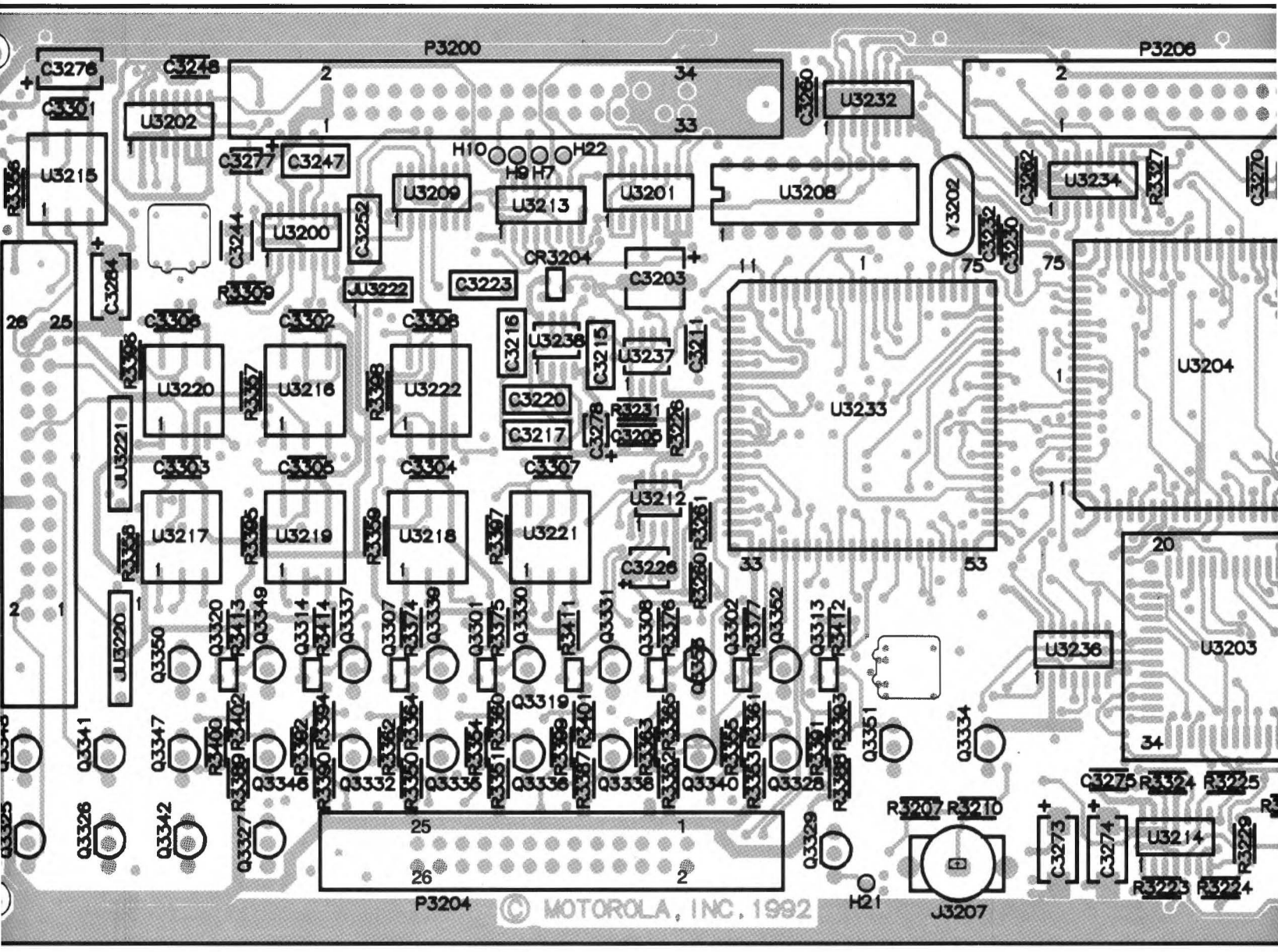


TRANSISTOR BASE DETAILS
(TOP VIEW)

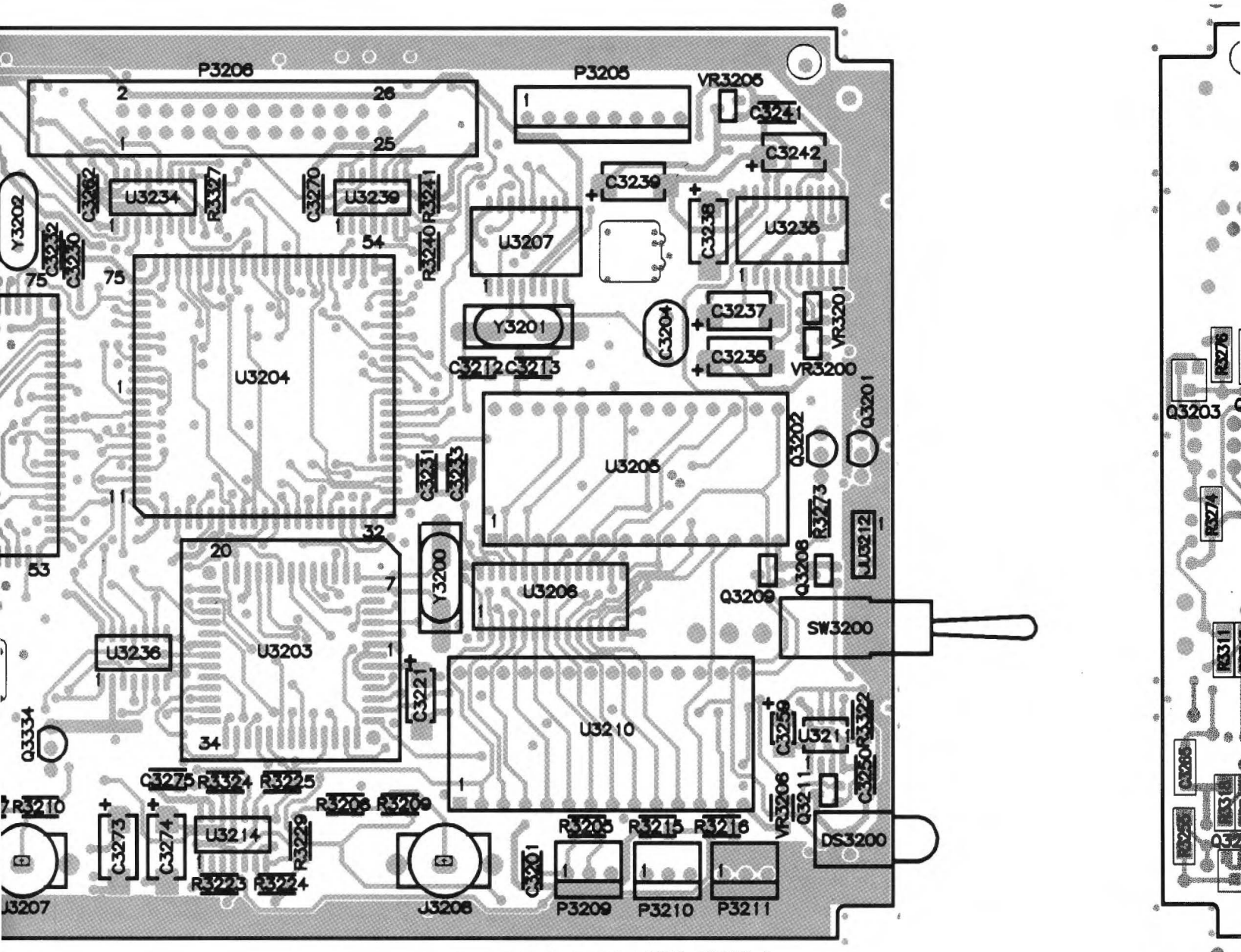


4811056A03
4800869648

4811056A08

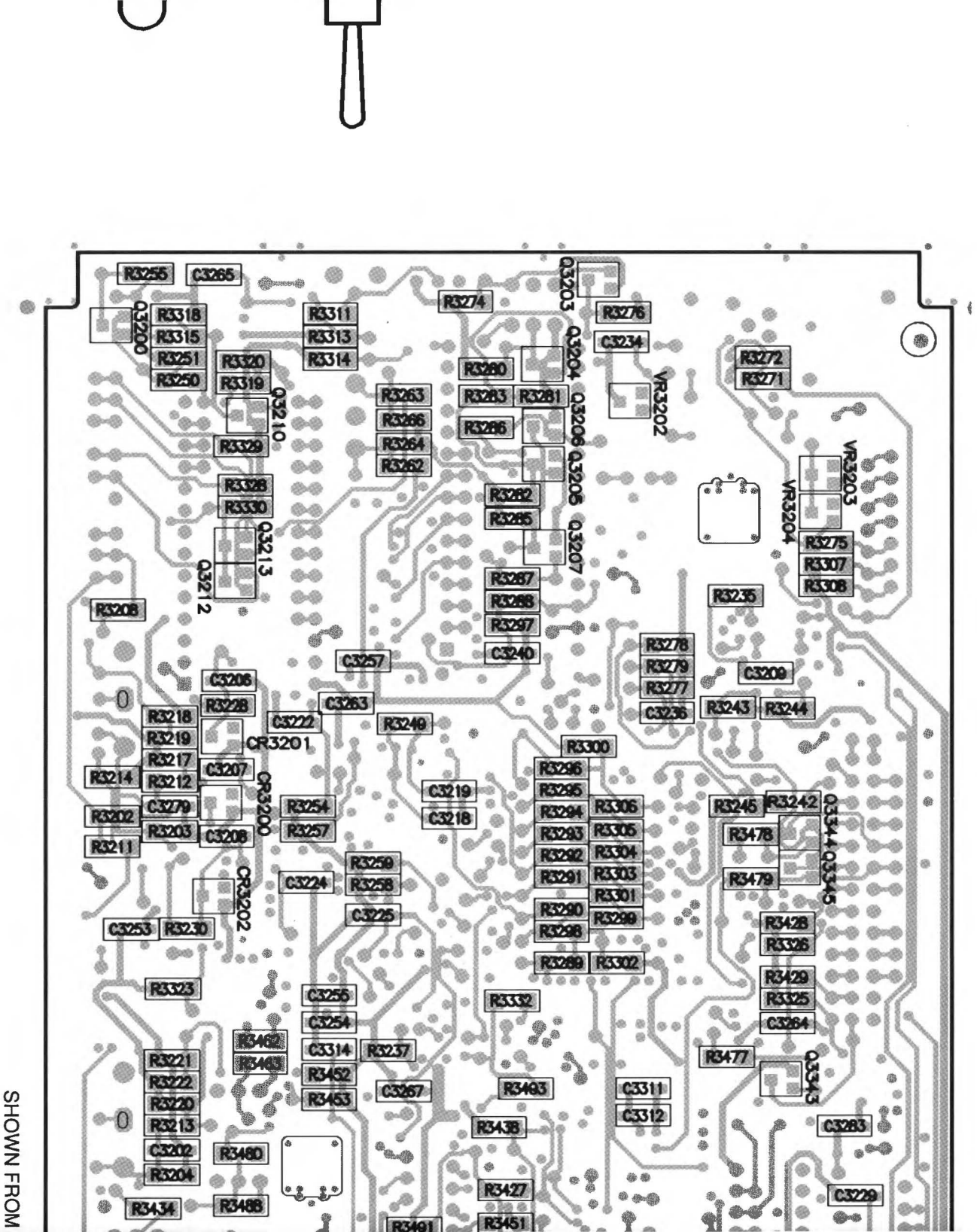


SHOWN FROM COMPONENT SIDE

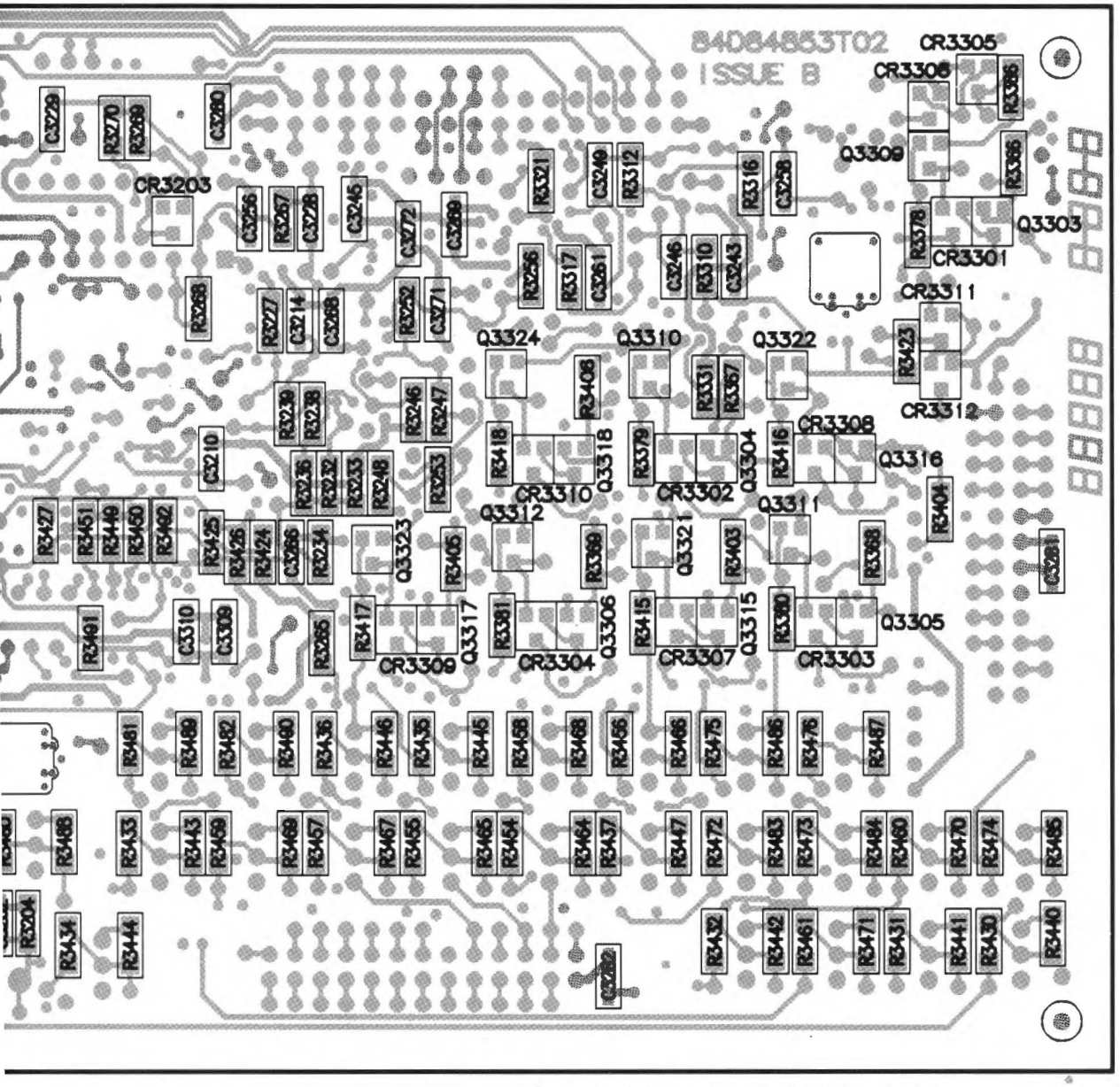


SIDE

COMPONENT SIDE BD-TEPS-48483-A
OL-TEPS-48485-B

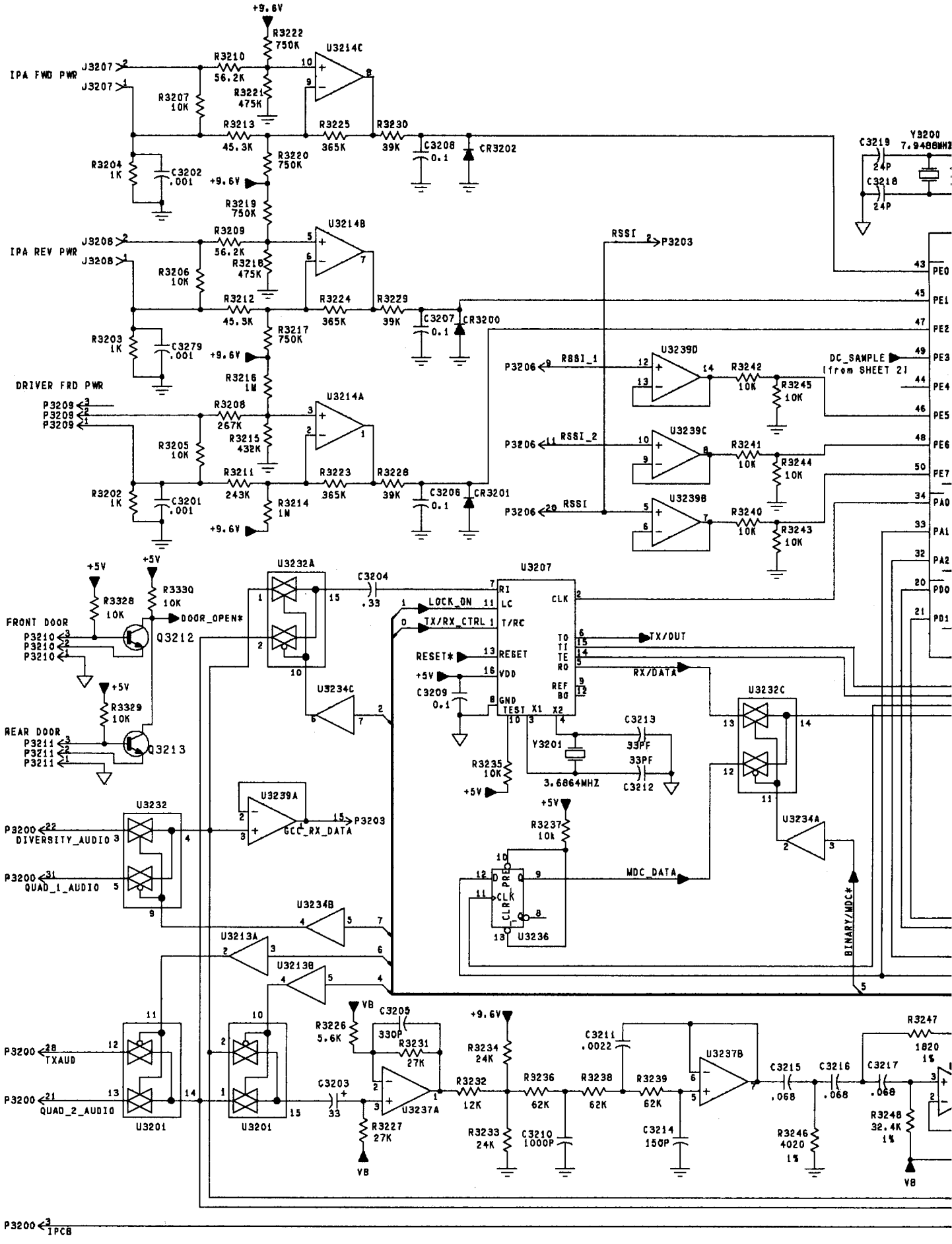

R3255
C3265
Q3200
R3318
R3315
R3251
R3250
R3320
R3319
Q3210
R3329
R3328
R3330
Q3213
Q3212
R3208
R3311
R3313
R3314
R3263
R3266
R3264
R3262
R3274
Q3203
Q3204
R3280
R3283
R3281
R3286
Q3206
Q3205
R3282
R3285
Q3207
R3287
R3288
R3297
C3240
R3276
C3234
VR3202
R3272
R3271
VR3203
VR3204
R3275
R3307
R3308
R3235
R3278
R3279
R3277
C3236
C3209
R3243
R3244
C3257
C3206
R3228
C3263
R3249
C3222
CR3201
R3218
R3219
R3217
R3214
R3212
C3207
CR3200
C3279
R3202
R3203
C3208
R3211
R3254
R3257
C3219
C3218
R3300
R3296
R3295
R3294
R3293
R3292
R3291
R3290
R3298
R3289
R3306
R3305
R3304
R3303
R3301
R3299
R3302
R3245
R3242
Q3344
Q3345
R3478
R3479
R3428
R3326
R3429
R3325
C3264
R3477
Q3343
C3283
C3311
C3312
R3259
R3258
C3224
C3225
CR3202
C3253
R3230
R3323
C3256
C3254
C3314
R3237
R3452
R3453
R3462
R3463
C3267
R3332
R3493
R3438
R3221
R3222
R3220
R3213
C3202
R3204
R3480
R3434
R3488
R3427
R3451
R3491
C3229

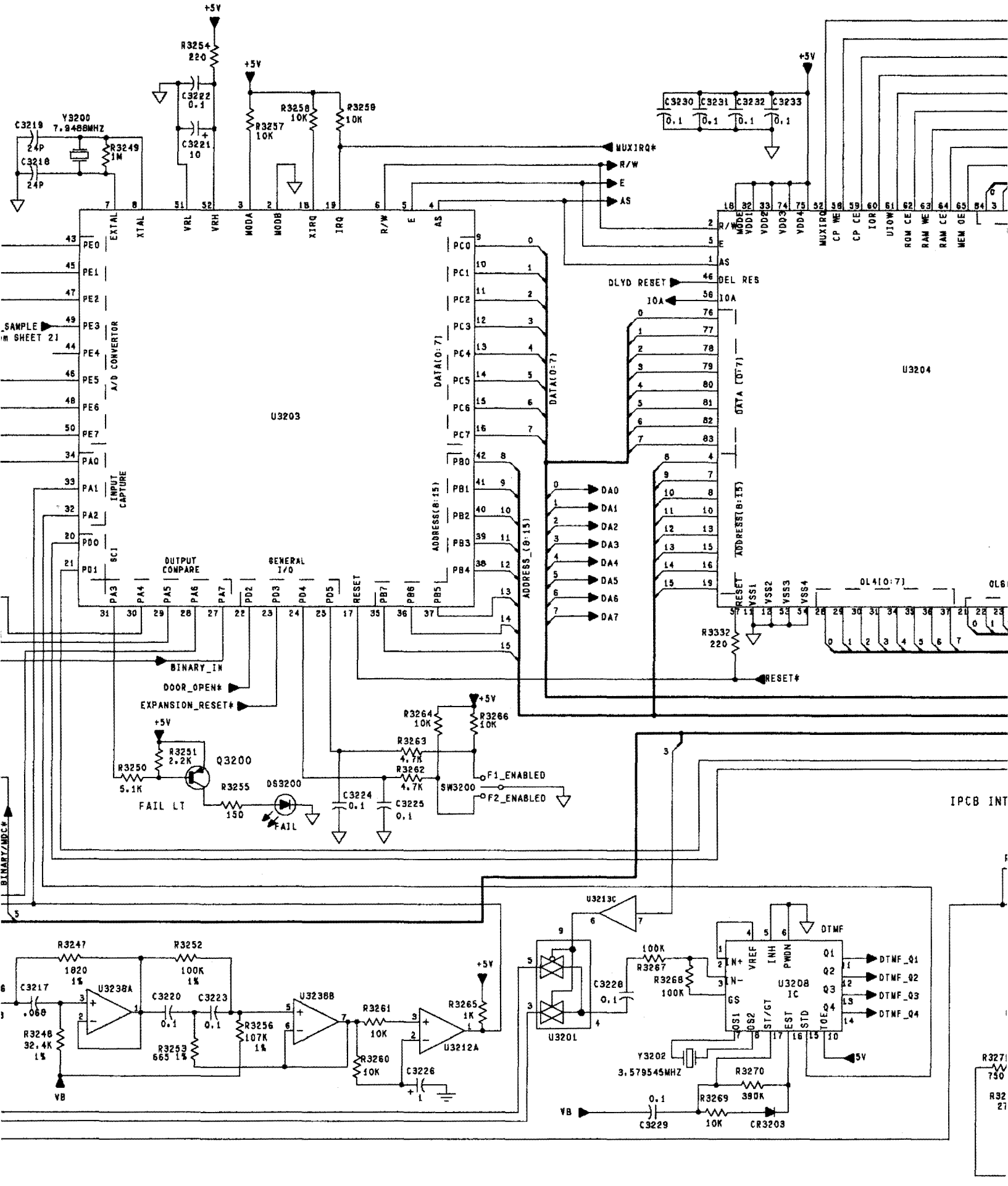
SHOWN FROM

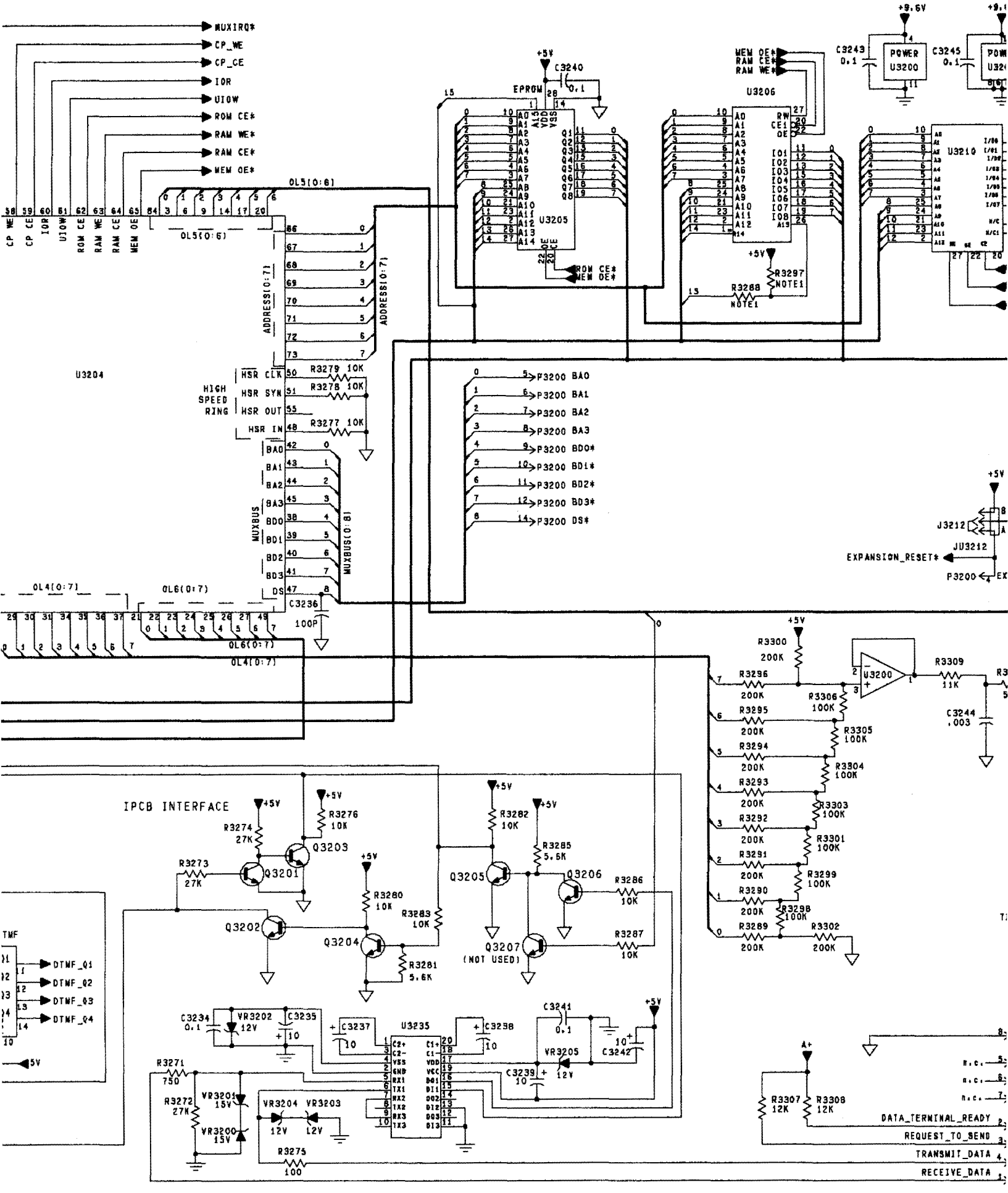


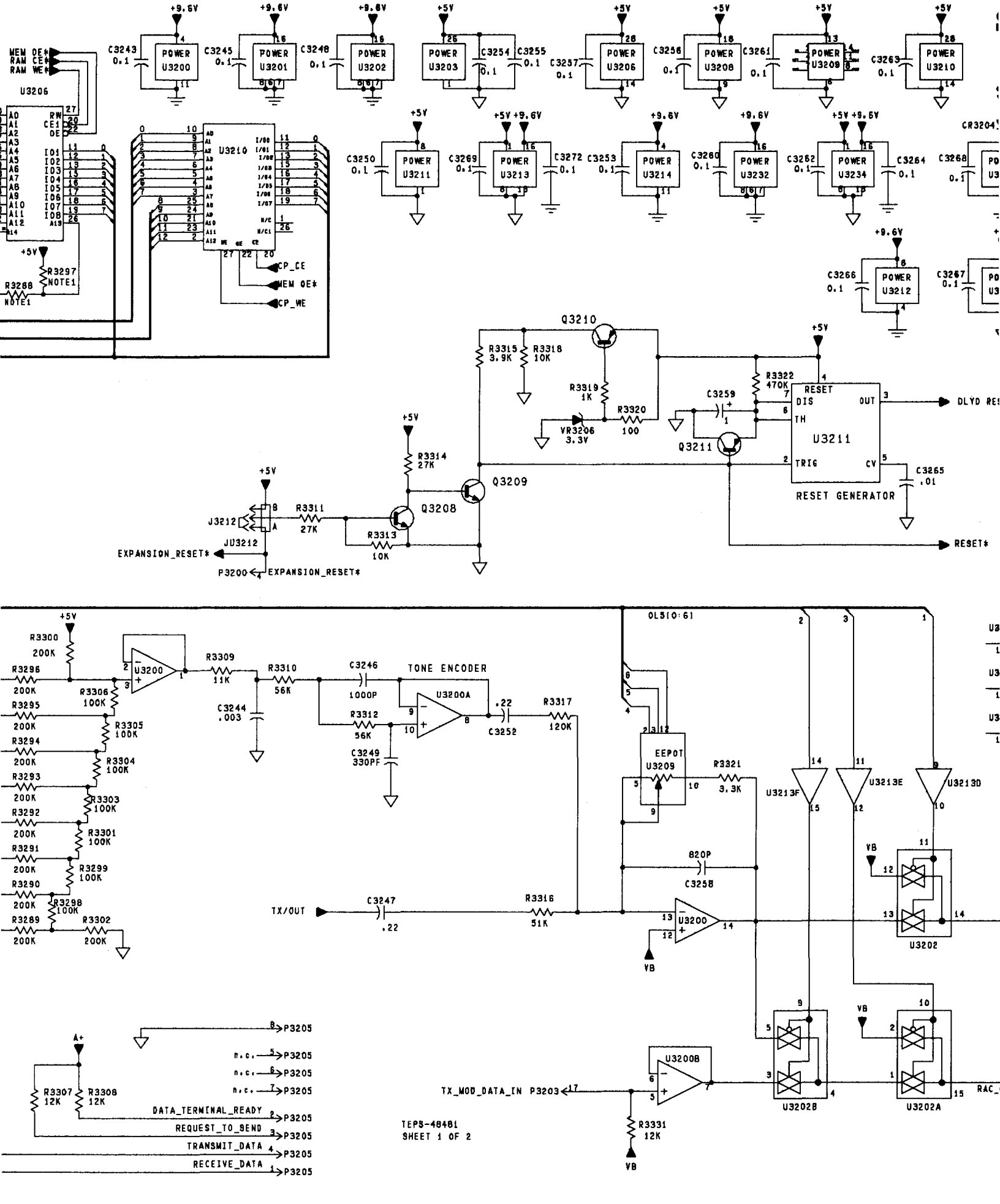
N FROM SOLDER SIDE

SOLDER SIDE BD-TEPS-48484-A
OL-TEPS-48486-A


+9.6V
R3222 750K
U3214C
IPA FWD PWR
J3207
R3210 56.2K
R3221 475K
R3207 10K
R3213 45.3K
R3225 365K
R3230 39K
C3208 0.1
CR3202
R3204 1K
C3202 .001
R3220 750K
R3219 750K
U3214B
IPA REV PWR
J3208
R3209 56.2K
R3218 475K
R3206 10K
R3212 45.3K
R3224 365K
R3229 39K
C3207 0.1
CR3200
R3203 1K
C3279 .001
R3217 750K
R3216 1M
U3214A
DRIVER FRD PWR
P3209
R3208 267K
R3215 432K
R3205 10K
R3211 243K
R3223 365K
R3228 39K
C3206 0.1
CR3201
R3202 1K
C3201 .001
R3214 1M
RSSI
P3203
U3239D
U3239C
U3239B
P3206
RSSI_1
RSSI_2
RSSI
R3242 10K
R3245 10K
R3241 10K
R3244 10K
R3240 10K
R3243 10K
DC_SAMPLE
(from SHEET 2)
Y3200 7.9488MHZ
C3219 24P
C3218 24P
PE0
PE1
PE2
PE3
PE4
PE5
PE6
PE7
PA0
PA1
PA2
PD0
PD1
+5V
R3328 10K
R3330 10K
DOOR_OPEN*
FRONT DOOR
P3210
Q3212
R3329 10K
REAR DOOR
P3211
Q3213
U3232A
C3204 .33
U3207
LOCK_ON
TX/RX_CTRL
RESET*
C3209 0.1
TX/OUT
RX/DATA
U3234C
U3232C
C3213 33PF
Y3201 3.6864MHZ
C3212 33PF
R3235 10K
U3232
P3200
DIVERSITY_AUDIO
QUAD_1_AUDIO
U3239A
GCC_RX_DATA
R3237 10k
MDC_DATA
U3236
U3234A
BINARY/MDC*
U3234B
U3213A
U3213B
VB
R3226 5.6K
C3205 330P
R3231 27K
C3203 33
R3227 27K
U3237A
R3234 24K
R3232 12K
R3233 24K
R3236 62K
C3210 1000P
R3238 62K
C3211 .0022
R3239 62K
C3214 150P
U3237B
C3215 .068
C3216 .068
C3217 .068
R3247 1820 1%
R3248 32.4K 1%
R3246 4020 1%
TXAUD
QUAD_2_AUDIO
U3201
P3200
IPCB

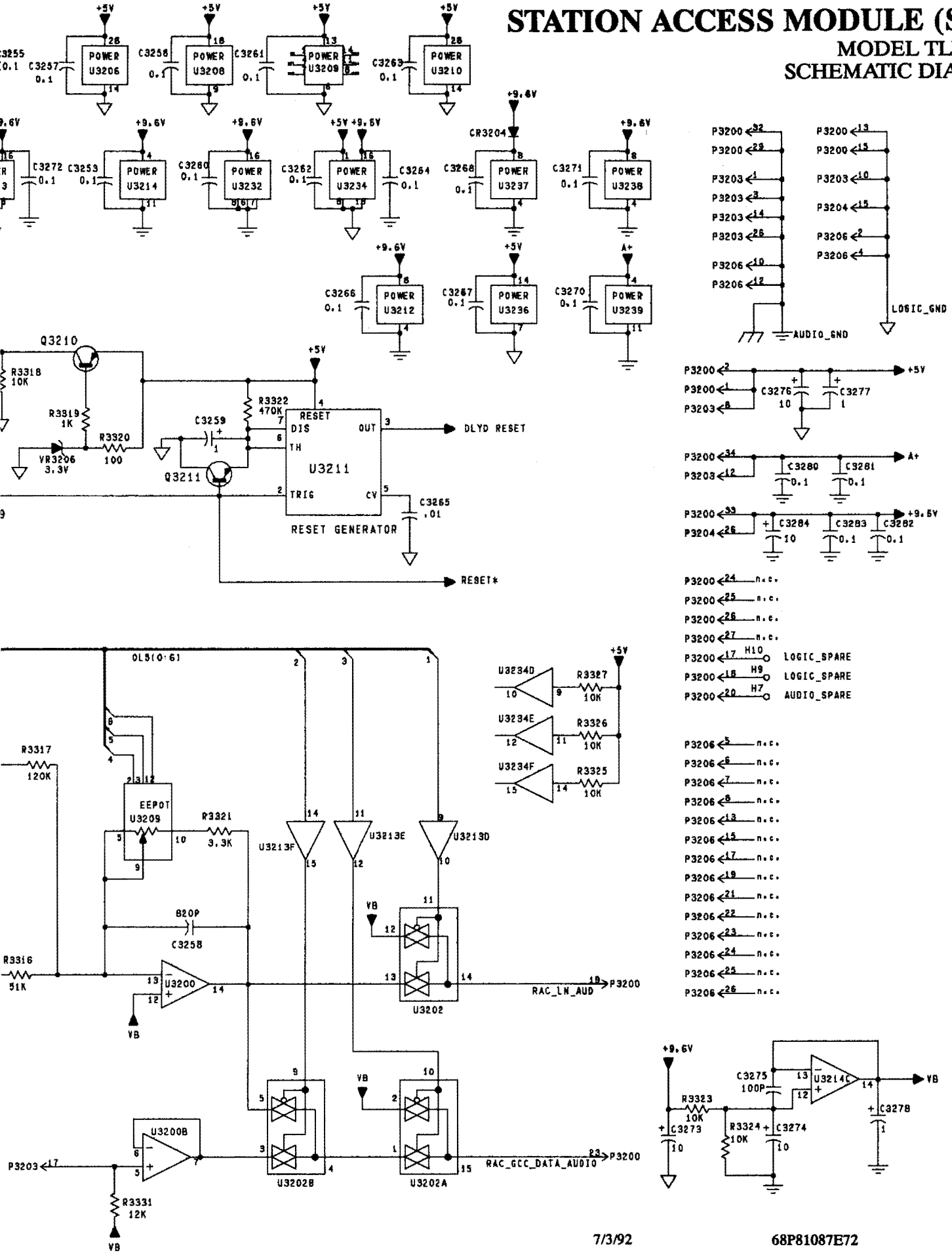

+5V
R3254 220
C3222 0.1
C3221 10
R3257 10K
R3258 10K
R3259 10K
C3219 24P
Y3200 7.9488MHZ
C3218 24P
R3249 1M
C3230 0.1
C3231 0.1
C3232 0.1
C3233 0.1
MUXIRQ*
R/W
E
AS
EXTAL
XTAL
VRL
VRH
MODA
MODB
XIRQ
IRQ
U3203
A/D CONVERTOR
INPUT CAPTURE
SCI
OUTPUT COMPARE
GENERAL I/O
DATA(0:7)
ADDRESS(8:15)
ADDRESS_(0:15)
U3204
DLYD RESET
DEL RES
IOA
DA0
DA1
DA2
DA3
DA4
DA5
DA6
DA7
RESET
R3332 220
RESET*
SAMPLE
SHEET 21
BINARY_IN
DOOR_OPEN*
EXPANSION_RESET*
R3264 10K
R3266 10K
R3263 4.7K
R3262 4.7K
R3251 2.2K
Q3200
R3250 5.1K
FAIL LT
R3255 150
DS3200
FAIL
C3224 0.1
C3225 0.1
SW3200
F1_ENABLED
F2_ENABLED
IPCB INT
BINARY/MDC*
U3213C
U3201
R3247 1020 1%
R3252 100K 1%
C3217 .068
U3238A
C3220 0.1
C3223 0.1
U3238B
R3256 107K 1%
R3253 665 1%
R3248 32.4K 1%
VB
R3261 10K
R3260 10K
C3226
U3212A
R3265 1K
100K R3267
R3268 100K
C3228 0.1
U3208 IC
DTMF
DTMF_Q1
DTMF_Q2
DTMF_Q3
DTMF_Q4
Y3202 3.579545MHZ
R3270 390K
R3269 10K
CR3203
C3229 0.1


MUXIRQ*
CP_WE
CP_CE
IOR
IOW
ROM CE*
RAM WE*
RAM CE*
MEM OE*
OL5[0:6]
ADDRESS[0:7]
ADDRESS[0:7]
U3204
HSR CLK
HSR SYN
HSR OUT
HSR IN
HIGH SPEED RING
R3279 10K
R3278 10K
R3277 10K
BA0
BA1
BA2
BA3
BD0
BD1
BD2
BD3
DS
MUXBUS
MUXBUS[0:8]
C3236
100P
OL4[0:7]
OL6[0:7]
OL6[0:7]
OL4[0:7]
EPROM
C3240
0.1
U3205
ROM CE*
MEM OE*
U3206
MEM OE*
RAM CE*
RAM WE*
R3297
NOTE1
R3288
NOTE1
+9.6V
C3243
0.1
POWER
U3200
C3245
0.1
U3210
P3200 BA0
P3200 BA1
P3200 BA2
P3200 BA3
P3200 BD0*
P3200 BD1*
P3200 BD2*
P3200 BD3*
P3200 DS*
J3212
JU3212
EXPANSION_RESET*
P3200
IPCB INTERFACE
R3276 10K
R3274 27K
Q3203
R3273 27K
Q3201
Q3202
R3280 10K
R3283 10K
Q3204
R3281 5.6K
R3282 10K
R3285 5.6K
Q3205
Q3206
R3286 10K
Q3207 (NOT USED)
R3287 10K
C3234 0.1
VR3202 12V
C3235 10
C3237 10
U3235
C3238 10
C3241 0.1
VR3205 12V
C3239 10
C3242 10
R3271 750
R3272 27K
VR3201 15V
VR3200 15V
VR3204 12V
VR3203 12V
R3275 100
R3300 200K
R3296 200K
R3295 200K
R3294 200K
R3293 200K
R3292 200K
R3291 200K
R3290 200K
R3289 200K
R3306 100K
R3305 100K
R3304 100K
R3303 100K
R3301 100K
R3299 100K
R3298 100K
R3302 200K
U3200
R3309 11K
C3244 .003
R3307 12K
R3308 12K
DATA_TERMINAL_READY
REQUEST_TO_SEND
TRANSMIT_DATA
RECEIVE_DATA
DTMF_Q1
DTMF_Q2
DTMF_Q3
DTMF_Q4


MEM OE*
RAM CE*
RAM WE*
U3206
U3210
CP_CE
MEM OE*
CP_WE
R3297
NOTE1
R3288
NOTE1
POWER U3200
POWER U3201
POWER U3202
POWER U3203
POWER U3206
POWER U3208
POWER U3209
POWER U3210
POWER U3211
POWER U3213
POWER U3214
POWER U3232
POWER U3234
POWER U3212
Q3210
R3315 3.9K
R3318 10K
R3319 1K
VR3206 3.3V
R3320 100
R3322 470K
C3259
Q3211
RESET
DIS
TH
TRIG
OUT
CV
U3211
RESET GENERATOR
C3265 .01
DLYD RES
RESET*
Q3209
Q3208
R3314 27K
R3311 27K
R3313 10K
J3212
JU3212
EXPANSION_RESET*
P3200
R3300 200K
R3296 200K
R3295 200K
R3294 200K
R3293 200K
R3292 200K
R3291 200K
R3290 200K
R3289 200K
R3306 100K
R3305 100K
R3304 100K
R3303 100K
R3301 100K
R3299 100K
R3298 100K
R3302 200K
U3200
R3309 11K
R3310 56K
C3244 .003
C3246 1000P
TONE ENCODER
U3200A
R3312 56K
C3249 330PF
.22
C3252
R3317 120K
OL5[0:6]
EEPOT U3209
R3321 3.3K
U3213F
U3213E
U3213D
820P
C3258
TX/OUT
C3247 .22
R3316 51K
U3202
U3202B
U3202A
U3200B
TX_MOD_DATA_IN P3203
R3331 12K
R3307 12K
R3308 12K
DATA_TERMINAL_READY
REQUEST_TO_SEND
TRANSMIT_DATA
RECEIVE_DATA
P3205
TEPS-48481
SHEET 1 OF 2

STATION ACCESS MODULE (SAM)

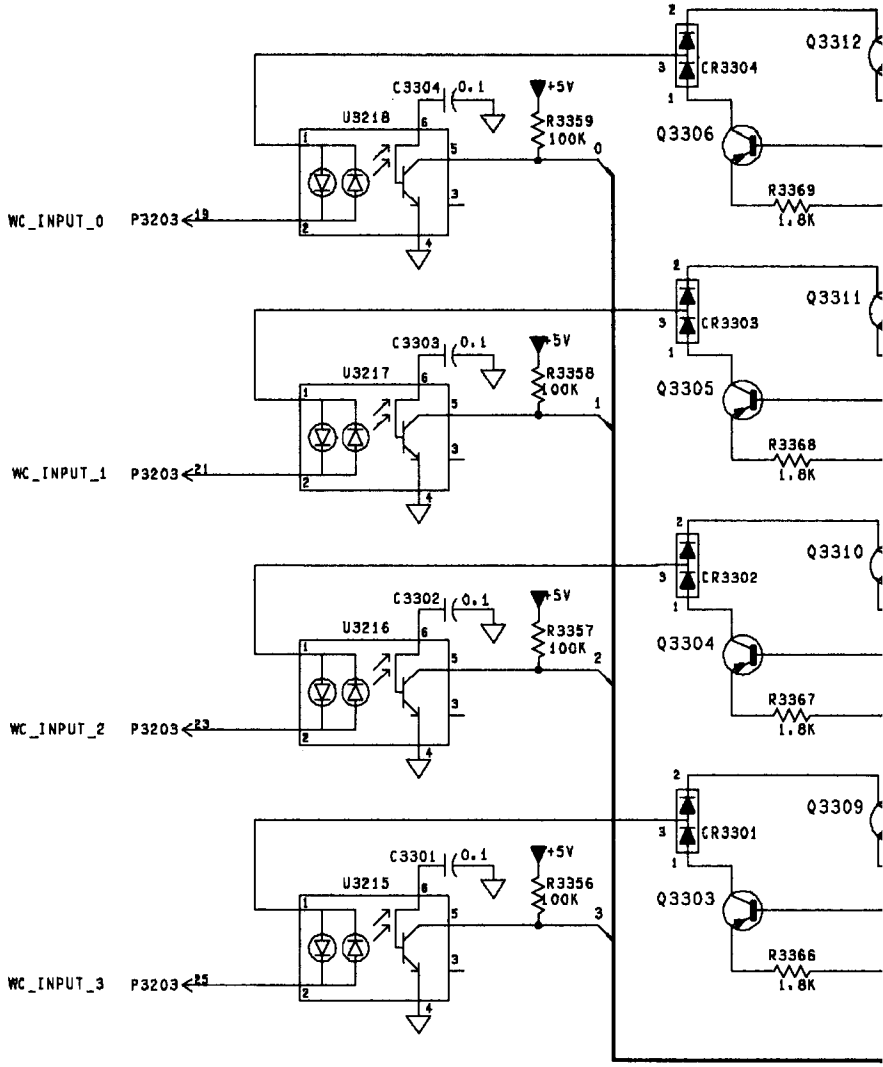
MODEL TLN3221B
SCHEMATIC DIAGRAM

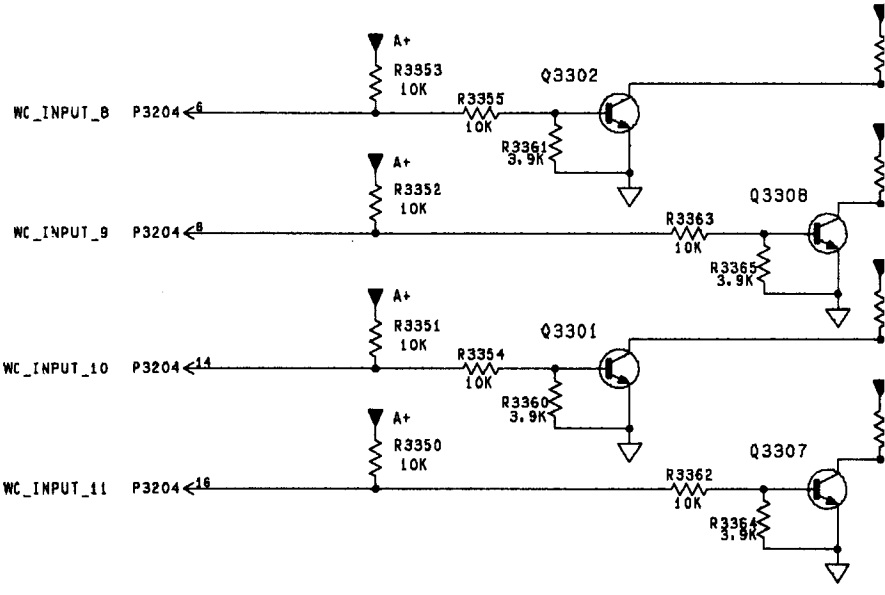


STATION ACCESS MODULE (SAM)

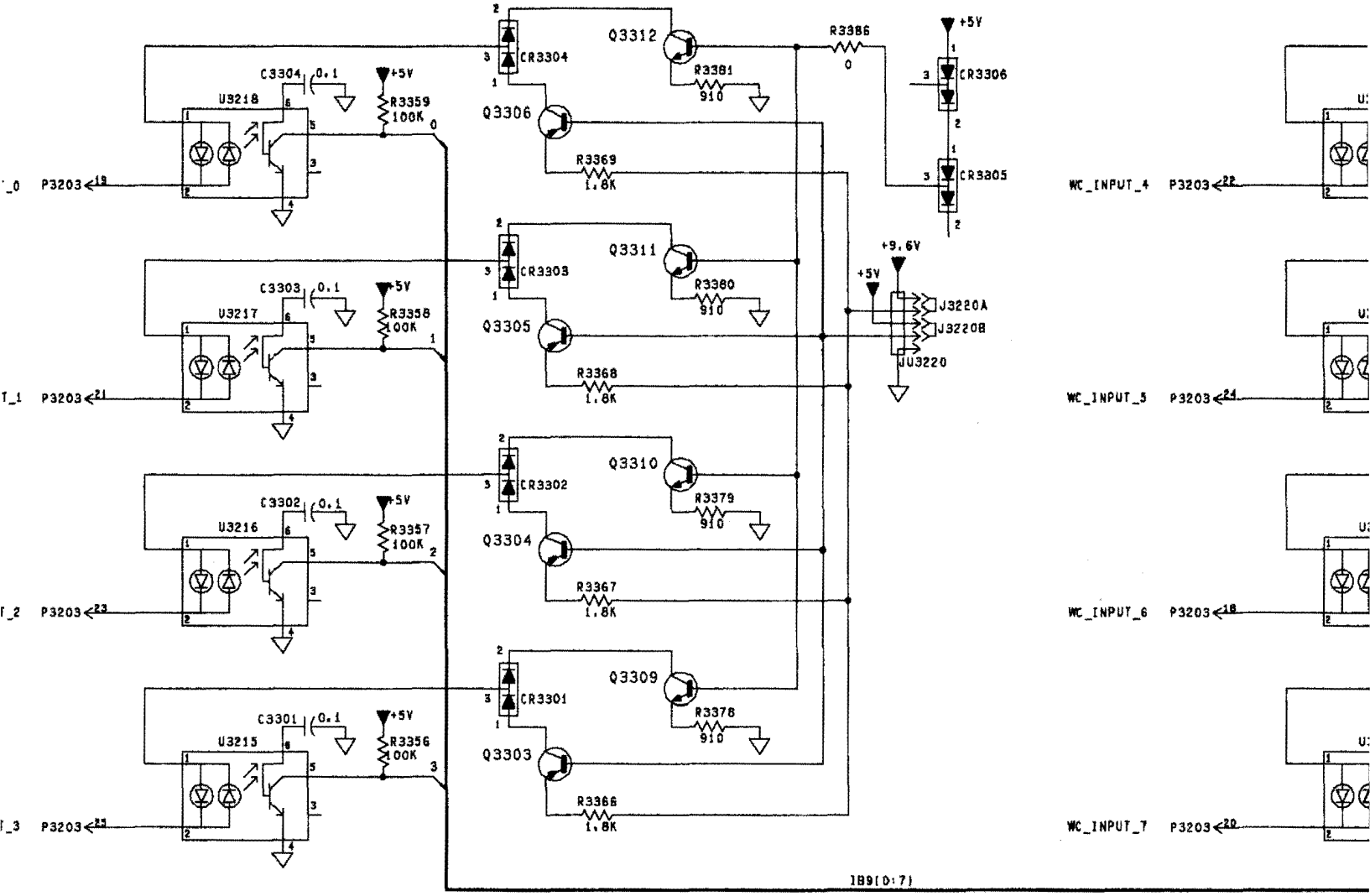
MODEL TLN3221B

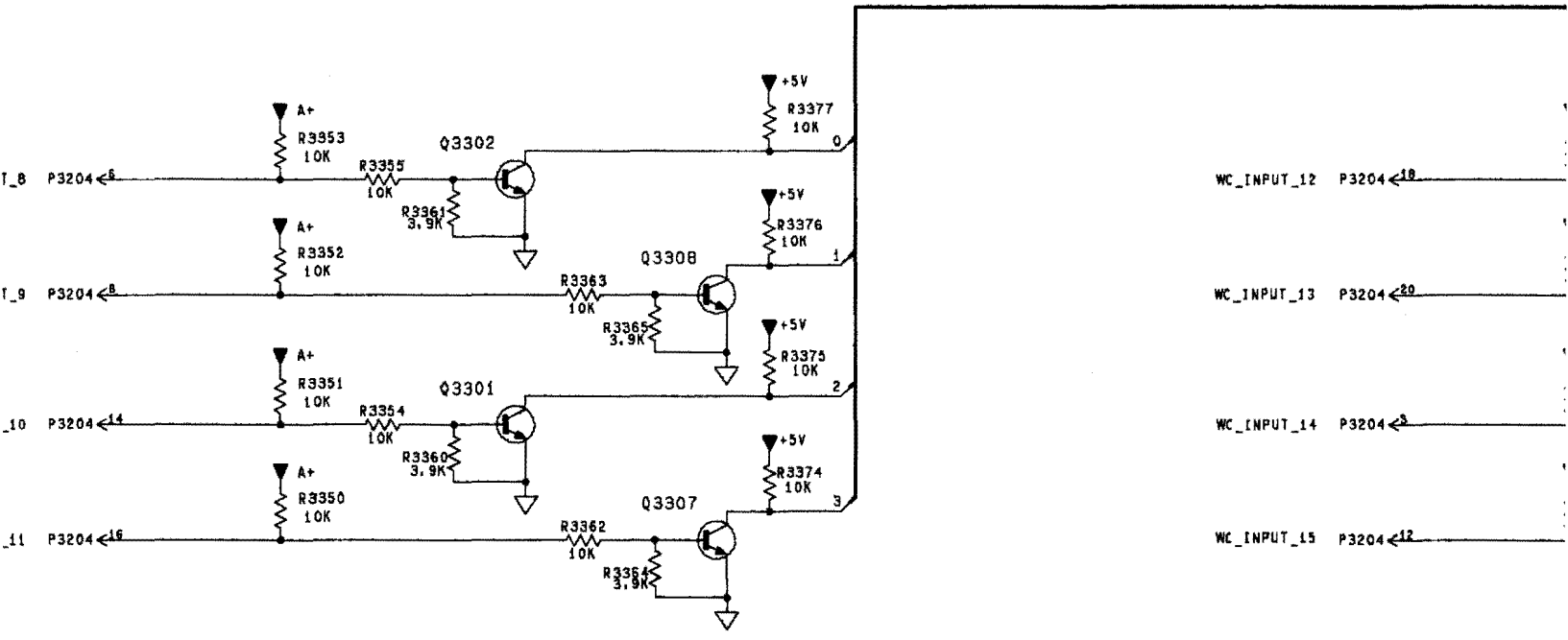
SCHEMATIC DIAGRAM

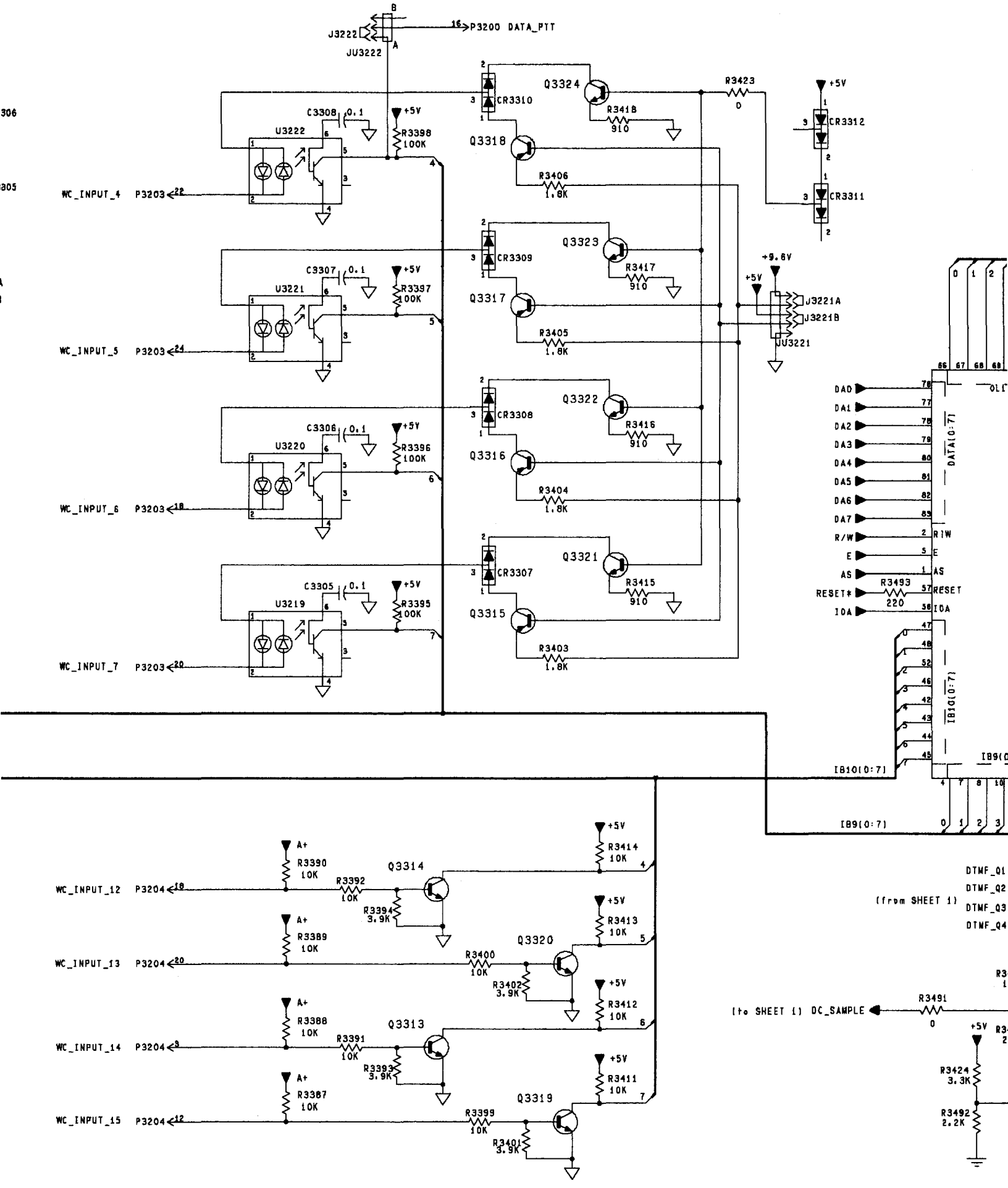


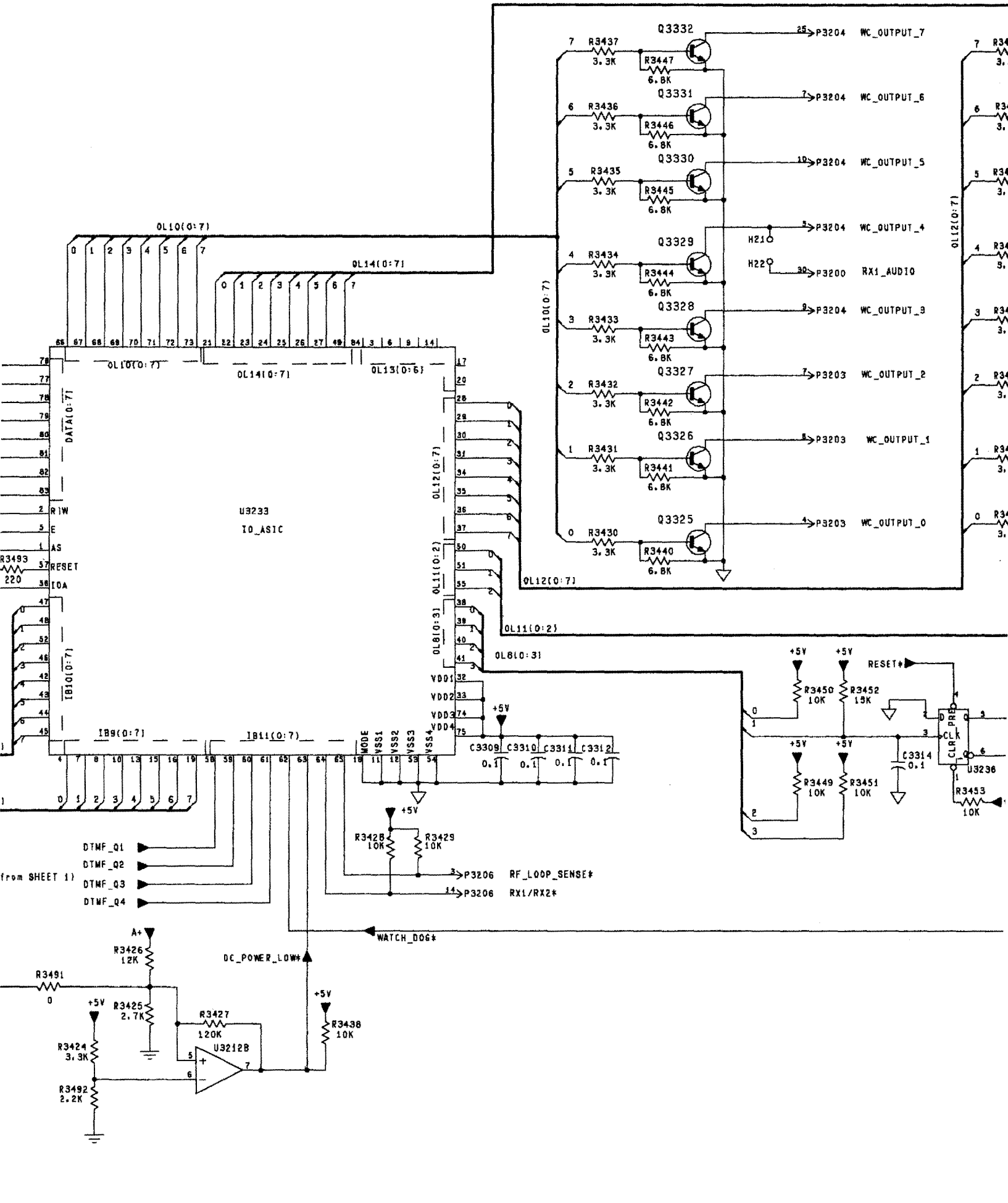


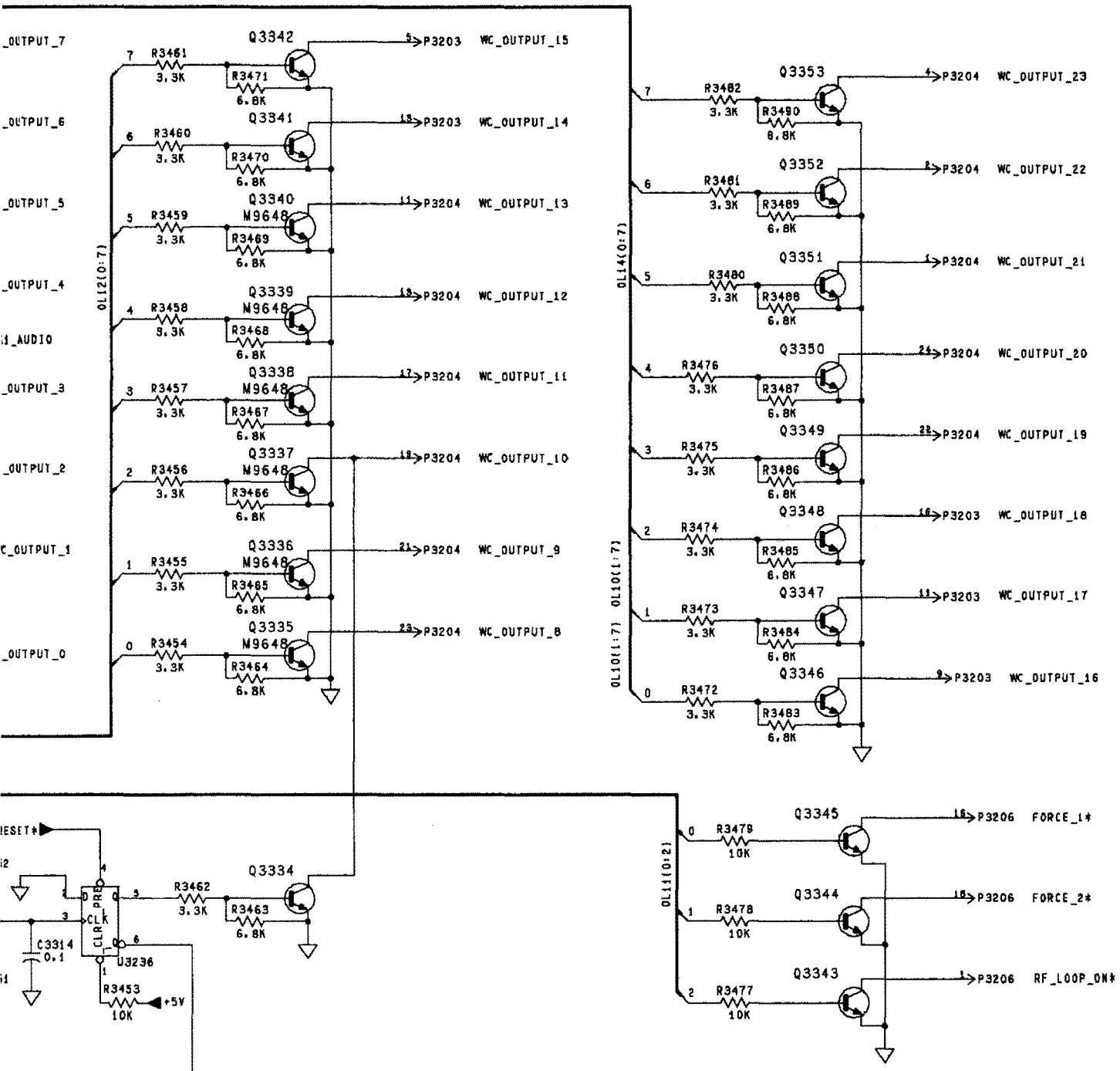
I)


Q3312
R3386
0
+5V
CR3306
CR3305
C3304
0.1
U3218
R3359
100K
R3381
910
Q3306
R3369
1.8K
WC_INPUT_4
P3203
Q3311
CR3303
C3303
U3217
R3358
100K
R3380
910
Q3305
R3368
1.8K
+9.6V
J3220A
J3220B
JU3220
WC_INPUT_5
Q3310
CR3302
C3302
U3216
R3357
100K
R3379
910
Q3304
R3367
1.8K
WC_INPUT_6
Q3309
CR3301
C3301
U3215
R3356
100K
R3378
910
Q3303
R3366
1.8K
WC_INPUT_7
1B9[0:7]


A+
R3353
10K
R3355
10K
Q3302
R3361
3.9K
R3377
10K
WC_INPUT_12
P3204
R3352
10K
Q3308
R3363
10K
R3365
3.9K
R3376
10K
WC_INPUT_13
R3351
10K
R3354
10K
Q3301
R3360
3.9K
R3375
10K
WC_INPUT_14
R3350
10K
Q3307
R3362
10K
R3364
3.9K
R3374
10K
WC_INPUT_15


J3222
JU3222
P3200 DATA_PTT
CR3310
CR3309
CR3308
CR3307
CR3312
CR3311
Q3324
Q3323
Q3322
Q3321
Q3318
Q3317
Q3316
Q3315
R3423
R3418
R3417
R3416
R3415
R3406
R3405
R3404
R3403
U3222
U3221
U3220
U3219
C3308
C3307
C3306
C3305
R3398
R3397
R3396
R3395
+5V
+9.6V
J3221A
J3221B
JU3221
WC_INPUT_4
WC_INPUT_5
WC_INPUT_6
WC_INPUT_7
P3203
DA0
DA1
DA2
DA3
DA4
DA5
DA6
DA7
R/W
E
AS
RESET*
IOA
R3493
DATA[0:7]
IB10[0:7]
IB9[0:7]
WC_INPUT_12
WC_INPUT_13
WC_INPUT_14
WC_INPUT_15
P3204
Q3314
Q3320
Q3313
Q3319
R3390
R3389
R3388
R3387
R3392
R3391
R3400
R3399
R3394
R3393
R3402
R3401
R3414
R3413
R3412
R3411
10K
3.9K
A+
DTMF_Q1
DTMF_Q2
DTMF_Q3
DTMF_Q4
(from SHEET 1)
(to SHEET 1) DC_SAMPLE
R3491
R3424
3.3K
R3492
2.2K


Q3332
Q3331
Q3330
Q3329
Q3328
Q3327
Q3326
Q3325
R3437 3.3K
R3436 3.3K
R3435 3.3K
R3434 3.3K
R3433 3.3K
R3432 3.3K
R3431 3.3K
R3430 3.3K
R3447 6.8K
R3446 6.8K
R3445 6.8K
R3444 6.8K
R3443 6.8K
R3442 6.8K
R3441 6.8K
R3440 6.8K
P3204 WC_OUTPUT_7
P3204 WC_OUTPUT_6
P3204 WC_OUTPUT_5
P3204 WC_OUTPUT_4
P3204 WC_OUTPUT_3
P3203 WC_OUTPUT_2
P3203 WC_OUTPUT_1
P3203 WC_OUTPUT_0
H21
H22
P3200 RX1_AUDIO
OL10(0:7)
OL12(0:7)
OL14(0:7)
OL13(0:6)
OL11(0:2)
OL8(0:3)
U3233
IO_ASIC
DATA(0:7)
IB10(0:7)
IB9(0:7)
IB11(0:7)
R/W
E
AS
RESET
IOA
R3493 220
VDD1
VDD2
VDD3
VDD4
MODE
VSS1
VSS2
VSS3
VSS4
C3309 0.1
C3310 0.1
C3311 0.1
C3312 0.1
C3314 0.1
R3450 10K
R3452 15K
R3449 10K
R3451 10K
R3453 10K
U3236
RESET*
CLR
PRE
CLK
R3428 10K
R3429 10K
P3206 RF_LOOP_SENSE*
P3206 RX1/RX2*
DTMF_Q1
DTMF_Q2
DTMF_Q3
DTMF_Q4
(from SHEET 1)
WATCH_DOG*
DC_POWER_LOW*
A+
R3426 12K
R3491 0
R3425 2.7K
R3427 120K
R3424 3.3K
R3492 2.2K
U3212B
R3438 10K



TEPS-48481-8
SHEET 2 OF 2

parts lists

TRN7537B Station Access Board — PL-11882-A

REF. SYMBOL	PART NO.	DESCRIPTION
		capacitor, fixed:
C3201,3202	2113740B73	1000 pF, ±5%; 50V
C3203	2380090M11	33 uF, ±20%; 25V
C3204	0811051A16	0.33 uF, ±5%; 63V
C3205	2113740B61	330 pF, ±5%; 50V
C3206 thru 3209	2113741B69	0.1 uF, ±5%; 50V
C3210	2113740B73	1000 pF, ±5%; 50V
C3211	2113740B80	2200 pF, ±5%; 50V
C3212,3213	2113740B37	33 pF, ±5%; 50V
C3214	2113740B53	150 pF, ±5%; 50V
C3215 thru 3217	0811051A12	0.068 uF, ±5%; 63V
C3218,3219	2113740B34	24 pF, ±5%; 50V
C3220	0811051A13	0.1 uF, ±5%; 63V
C3221	2311049A18	10 uF, ±10%; 16V
C3222	2113741B69	0.1 uF, ±5%; 50V
C3223	0811051A13	0.1 uF, ±5%; 63V
C3224,3225	2113741B69	0.1 uF, ±5%; 50V
C3226	2380090M18	1 uF, ±20%; 50V
C3228 thru 3234	2113741B69	0.1 uF, ±5%; 50V
C3235	2311049A19	10 uF, ±10%; 25V
C3236	2113740B49	100 pF, ±5%; 50V
C3237 thru 3239	2311049A19	10 uF, ±10%; 25V
C3240,3241	2113741B69	0.1 uF, ±5%; 50V
C3242	2311049A19	10 uF, ±10%; 25V
C3243	2113741B69	0.1 uF, ±5%; 50V
C3244	2113740C28	3000 pF, ±5%; 50V
C3245	2113741B69	0.1 uF, ±5%; 50V
C3246	2113740B73	1000 pF, ±5%; 50V
C3247	0811051A15	0.22 uF, ±5%; 63V
C3248	2113741B69	0.1 uF, ±5%; 50V
C3249	2113740B61	330 pF, ±5%; 50V
C3250	2113741B69	0.1 uF, ±5%; 50V
C3252	0811051A15	0.22 uF, ±5%; 63V
C3253 thru 3257	2113741B69	0.1 uF, ±5%; 50V
C3258	2113740B71	820 pF, ±5%; 50V
C3259	2311049A08	1 uF, ±10%; 35V
C3260 thru 3264	2113741B69	0.1 uF, ±5%; 50V
C3265	2113741B45	0.01 uF, ±5%; 50V
C3266 thru 3272	2113741B69	0.1 uF, ±5%; 50V
C3273,3274	2311049A19	10 uF, ±10%; 25V
C3275	2113740B49	100 pF, ±5%; 50V
C3276	2311049A19	10 uF, ±10%; 25V
C3277,3278	2311049A08	1 uF, ±10%; 35V
C3279	2113740B73	1000 pF, ±5%; 50V
C3280 thru 3283	2113741B69	0.1 uF, ±5%; 50V
C3284	2111049A19	10 uF, ±10%; 25V
C3301 thru 3307	2113741B69	0.1 uF, ±5%; 50V
C3308	2113741B21	1000 pF, ±5%; 50V
C3309 thru 3312	2113741B69	0.1 uF, ±5%; 50V
C3314	2113741B69	0.1 uF, ±5%; 50V

REF. SYMBOL	PART NO.	DESCRIPTION
		diode: (see note)
CR3200 thru 3202	4805129M41	type MMBD501 (RH)
CR3203,3204	4813833C09	general purpose, .1A 100V
CR3301 thru 3312	4884336R03	silicon
		light emitting diode: (see note)
DS3200	4888245C24	red
		connector:
J3207,3208	0984231B03	receptacle: phono jack
		jumper, connector:
JU3212	2880002R03	plug: 3-contact
JU3220,3221	2880002R05	plug: 5-contact
JU3222	2880002R03	plug: 3-contact
		connector:
P3200	2882505T04	plug: 34-contact
P3203,3204	2882505T03	plug: 26-contact
P3205	2884324M13	plug: 8-contact
P3206	2882505T03	plug: 26-contact
P3209 thru 3211	2884324M08	plug: 3-contact
		transistor: (see note)
Q3200	4811056A08	PNP
Q3201,3202	4800869648	NPN
Q3203 thru 3209	4811056A03	NPN
Q3210,3211	4811056A08	PNP
Q3212,3213	4811056A03	NPN
Q3301,3302	4811056A03	NPN
Q3303 thru 3306	4811056A08	PNP
Q3307 thru 3314	4811056A03	NPN
Q3315 thru 3318	4811056A08	PNP
Q3319 thru 3324	4811056A03	NPN
Q3325 thru 3332	4800869648	NPN
Q3334 thru 3342	4800869648	NPN
Q3343 thru 3345	4811056A03	NPN
Q3346 thru 3353	4800869648	NPN
		resistor, fixed:
R3202 thru 3204	0611077A74	1K, ±5%; 1/8W
R3205 thru 3207	0611077A98	10K, ±5%; 1/8W
R3208	0611077H30	267K, ±1%; 1/8W
R3209,3210	0611077G64	56.2K, ±1%; 1/8W
R3211	0611077H26	243K, ±1%; 1/8W
R3212,3213	0611077G55	45.3K, ±1%; 1/8W
R3214	0611077H85	1 meg, ±1%; 1/8W
R3215	0611077H50	432K, ±1%; 1/8W
R3216	0611077H85	1 meg, ±1%; 1/8W
R3217	0611077H73	750K, ±1%; 1/8W
R3218	0611077H54	475K, ±1%; 1/8W
R3219,3220	0611077H73	750K, ±1%; 1/8W
R3221	0611077H54	475K, ±1%; 1/8W
R3222	0611077H73	750K, ±1%; 1/8W

TRN7537B Station Access Board PL-11882-A

REF. SYMBOL	PART NO.	DESCRIPTION
R3223 thru 3225	0611077H43	365K, ±1%; 1/8W
R3226	0611077A92	5.6K, ±5%; 1/8W
R3227	0611077B09	27K, ±5%; 1/8W
R3228 thru 3230	0611077A90	4.7K, ±5%; 1/8W
R3231	0611077B09	27K, ±5%; 1/8W
R3232	0611077B01	12K, ±5%; 1/8W
R3233,3234	0611077B08	24K, ±5%; 1/8W
R3235	0611077A98	10K, ±5%; 1/8W
R3236	0611077B18	62K, ±5%; 1/8W
R3237	0611077A98	10K, ±5%; 1/8W
R3238,3239	0611077B18	62K, ±5%; 1/8W
R3240 thru 3245	0611077A98	10K, ±5%; 1/8W
R3246	0611077F53	4.02K, ±1%; 1/8W
R3247	0611077F20	1.82K, ±1%; 1/8W
R3248	0611077G41	32.4K, ±1%; 1/8W
R3249	0611077B47	1 meg, ±5%; 1/8W
R3250	0611077A91	5.1K, ±5%; 1/8W
R3251	0611077A82	2.2K, ±5%; 1/8W
R3252	0611077G88	100K, ±1%; 1/8W
R3253	0611077E77	665 ohms, ±1%; 1/8W
R3254	0611077A58	220 ohms, ±5%; 1/8W
R3255	0611077A54	150 ohms, ±5%; 1/8W
R3256	0611077G91	107K, ±1%; 1/8W
R3257 thru 3261	0611077A98	10K, ±5%; 1/8W
R3262,3263	0611077A90	4.7K, ±5%; 1/8W
R3264	0611077A98	10K, ±5%; 1/8W
R3265	0611077A74	1K, ±5%; 1/8W
R3266	0611077A98	10K, ±5%; 1/8W
R3267,3268	0611077B23	100K, ±5%; 1/8W
R3269	0611077A98	10K, ±5%; 1/8W
R3270	0611077B37	390K, ±5%; 1/8W
R3271	0611077A71	750 ohms, ±5%; 1/8W
R3272 thru 3274	0611077B09	27K, ±5%; 1/8W
R3275	0611077A50	100 ohms, ±5%; 1/8W
R3276 thru 3280	0611077A98	10K, ±5%; 1/8W
R3281	0611077A92	5.6K, ±5%; 1/8W
R3282,3283	0611077A98	10K, ±5%; 1/8W
R3285	0611077A92	5.6K, ±5%; 1/8W
R3286,3287	0611077A98	10K, ±5%; 1/8W
R3289 thru 3296	0611077H18	200K, ±1%; 1/8W
R3297	0611077A01	0 ohm, ±5%; 0W
R3298,3299	0611077G88	100K, ±1%; 1/8W
R3300	0611077H18	200K, ±1%; 1/8W
R3301	0611077G88	100K, ±1%; 1/8W
R3302	0611077H18	200K, ±1%; 1/8W
R3303 thru 3306	0611077G88	100K, ±1%; 1/8W
R3307,3308	0611077B01	12K, ±5%; 1/8W
R3309	0611077A99	11K, ±5%; 1/8W
R3310	0611077B17	56K, ±5%; 1/8W
R3311	0611077B19	68K, ±5%; 1/8W
R3312	0611077B17	56K, ±5%; 1/8W
R3314	0611077B09	27K, ±5%; 1/8W
R3315	0611077A88	3.9K, ±5%; 1/8W
R3316	0611077B16	51K, ±5%; 1/8W

REF. SYMBOL	PART NO.	DESCRIPTION
		resistor, fixed: (cont.)
R3317	0611077B25	120K, ±5%; 1/8W
R3318	0611077A98	10K, ±5%; 1/8W
R3319	0611077A74	1K, ±5%; 1/8W
R3320	0611077A50	100 ohms, ±5%; 1/8W
R3321	0611077A86	3.3K, ±5%; 1/8W
R3322	0611077B39	470K, ±5%; 1/8W
R3323 thru 3330	0611077A98	10K, ±5%; 1/8W
R3331	0611077B01	12K, ±5%; 1/8W
R3332	0611077A58	220 ohms, ±5%; 1/8W
R3350 thru 3355	0611077A98	10K, ±5%; 1/8W
R3356 thru 3359	0611077B23	100K, ±5%; 1/8W
R3360,3361	0611077A88	3.9K, ±5%; 1/8W
R3362,3363	0611077A98	10K, ±5%; 1/8W
R3364,3365	0611077A88	3.9K, ±5%; 1/8W
R3366 thru 3369	0611077A80	1.8K, ±5%; 1/8W
R3374 thru 3377	0611077A98	10K, ±5%; 1/8W
R3378 thru 3381	0611077A73	910 ohms, ±5%; 1/8W
R3386	0611077A01	0 ohm, ±5%; 0W
R3387 thru 3392	0611077A98	10K, ±5%; 1/8W
R3393,3394	0611077A88	3.9K, ±5%; 1/8W
R3395 thru 3398	0611077B23	100K, ±5%; 1/8W
R3399,3400	0611077A98	10K, ±5%; 1/8W
R3401,3402	0611077A88	3.9K, ±5%; 1/8W
R3403 thru 3406	0611077A80	1.8K, ±5%; 1/8W
R3411 thru 3414	0611077A98	10K, ±5%; 1/8W
R3415 thru 3418	0611077A73	910 ohms, ±5%; 1/8W
R3423	0611077A01	0 ohm, ±5%; 0W
R3424	0611077A86	3.3K, ±5%; 1/8W
R3425	0611077A84	2.7K, ±5%; 1/8W
R3426	0611077B01	12K, ±5%; 1/8W
R3427	0611077B25	120K, ±5%; 1/8W
R3428	0611077A98	10K, ±5%; 1/8W
R3429	0611077B23	100K, ±5%; 1/8W
R3430 thru 3437	0611077A86	3.3K, ±5%; 1/8W
R3438	0611077A98	10K, ±5%; 1/8W
R3440 thru 3447	0611077A94	6.8K, ±5%; 1/8W
R3449 thru 3451	0611077A98	10K, ±5%; 1/8W
R3452	0611077B03	15K, ±5%; 1/8W
R3453	0611077A98	10K, ±5%; 1/8W
R3454 thru 3462	0611077A86	3.3K, ±5%; 1/8W
R3463 thru 3471	0611077A94	6.8K, ±5%; 1/8W
R3472 thru 3476	0611077A86	3.3K, ±5%; 1/8W
R3477 thru 3479	0611077A98	10K, ±5%; 1/8W
R3480 thru 3482	0611077A86	3.3K, ±5%; 1/8W

TRN7537B Station Access Board PL-11882-A

REF. SYMBOL	PART NO.	DESCRIPTION
		resistor, fixed: (cont.)
R3483 thru 3490	0611077A94	6.8K, ±5%; 1/8W
R3491	0611077A01	0 ohm, ±5%; 0W
R3492	0611077A82	2.2K, ±5%; 1/8W
R3493	0611077A58	220 ohms, ±5%; 1/8W
		switch:
SW3200	4083980R12	toggle: sp3t
		integrated circuit: (see note)
U3200	5113819A04	Quad Operational Amplifier
U3201,3202	5182316T09	Multiplexer/Demultiplexer
U3203	5197024A01	8 Bit MCU 2.1 MHZ Max Interclock
U3204	5184494R03	ASIC Station Control
U3206	5113804A03	8Kx8 SRAM
U3207	5102071P09	1200 Baud Mask Modem
U3208	5184704M82	DTMF Receiver
U3209	5184406T01	EEPOT
U3210	5184245T01	8Kx8 EEPROM
U3211	5113815G02	Timer
U3212	5113820A02	Low Power Dual Single Supply
U3213	5184704M90	Hex Level Shifter
U3214	5113819A04	Quad Operational Amplifier
U3215 thru 3222	5184742T02	Optoelectronic
U3232	5182316T09	Multiplexer/Demultiplexer
U3233	5184494R03	ASIC Station Control
U3234	5184704M90	Hex Level Shifter
U3235	5113811A11	Single Supply Driver/Reciver
U3236	5113805A18	Dual D-Type Flip-Flop
U3237,3238	5113818G01	Low Power Operational Amplifier
U3239	5113819A04	Quad Operational Amplifier
		voltage regulator: (see note)
VR3200,3201	4813830A28	Zener 15V
VR3202 thru 3205	4813830A25	Zener 12V
VR3206	4813830B09	Zener 3.3V
		crystal:
Y3200	4883793T06	7.9488 MHZ
Y3201	4883793T04	4.096 MHZ
Y3202	4882611M44	3.580 MHZ
		non-referenced items:
	0913900A05	SOCKET, IC: 52-contact (used with U3203)
	0982808R10	SOCKET, IC: 28-contact (2 used with U3205 & U3210)
	0984181L01	SHORTING JUMPER: 2-contact (4 used with JU3212,3220,3221,3222)
	4380054K02	SPACER, support (3 used)
		non-referenced items: (cont.)
	5483865R01	LABEL, bar code: 1/4" wide, white
	5484246T01	LABEL, bar code: 6.6x10.2MM

NOTE: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part number.

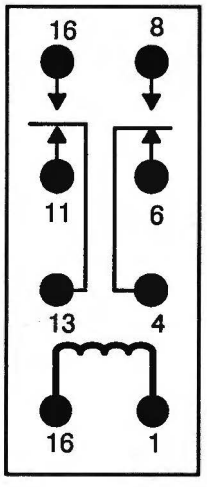
WILDCARD INTERFACE BOARD

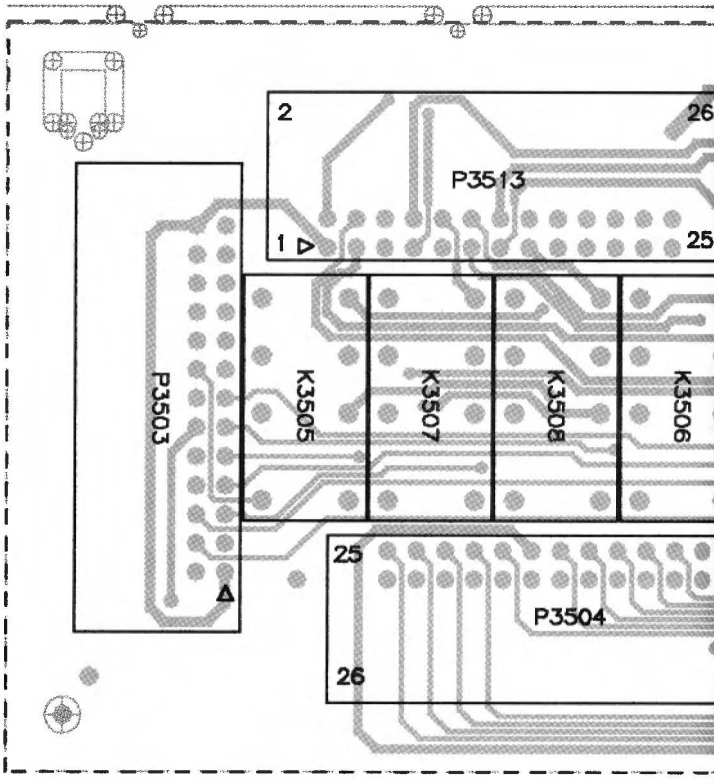
MODEL TRN7565A

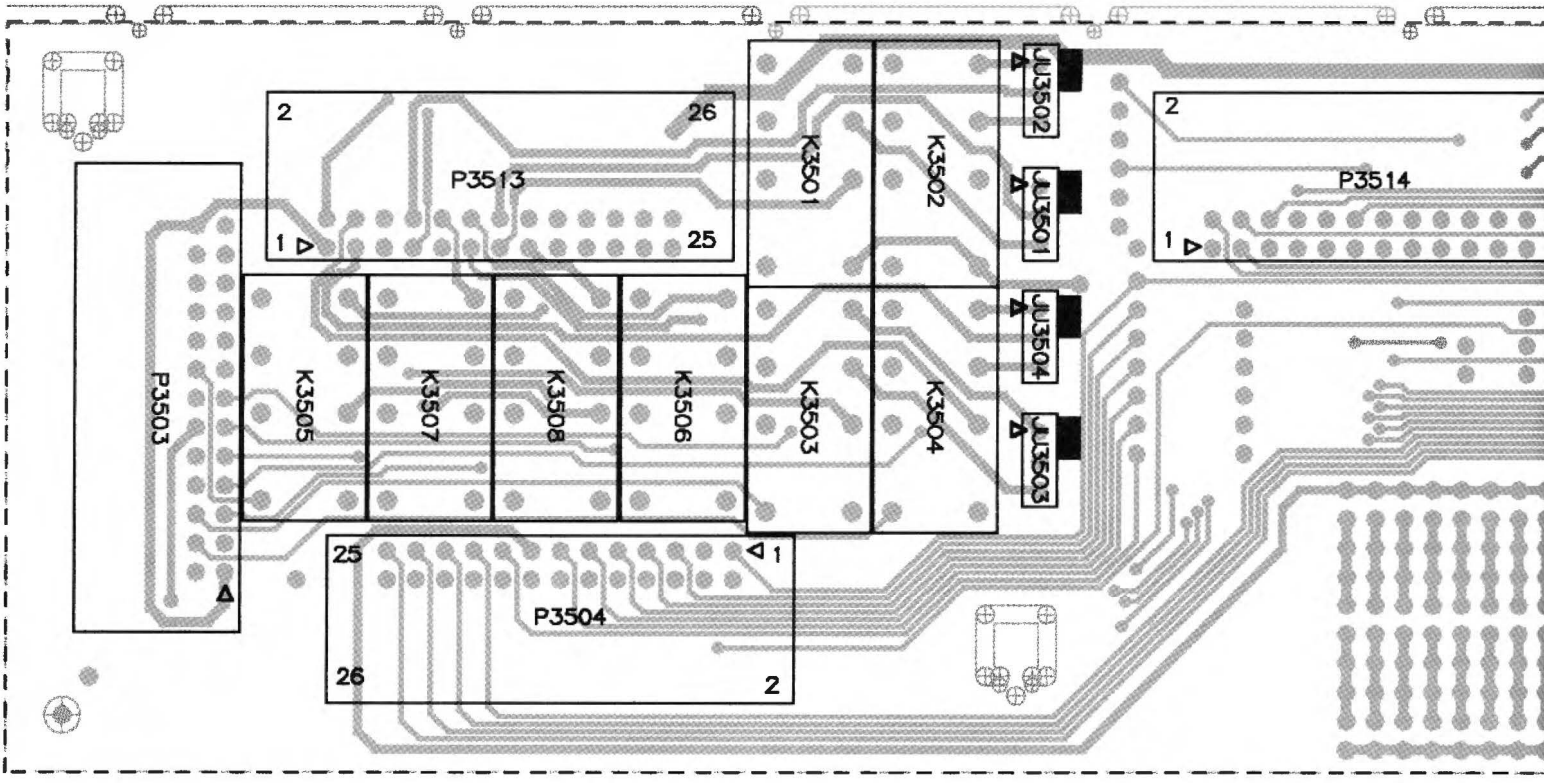
CIRCUIT BOARD DETAILS

K3501 THRU K3508 RELAY BASE DETAIL

(TOP VIEW)

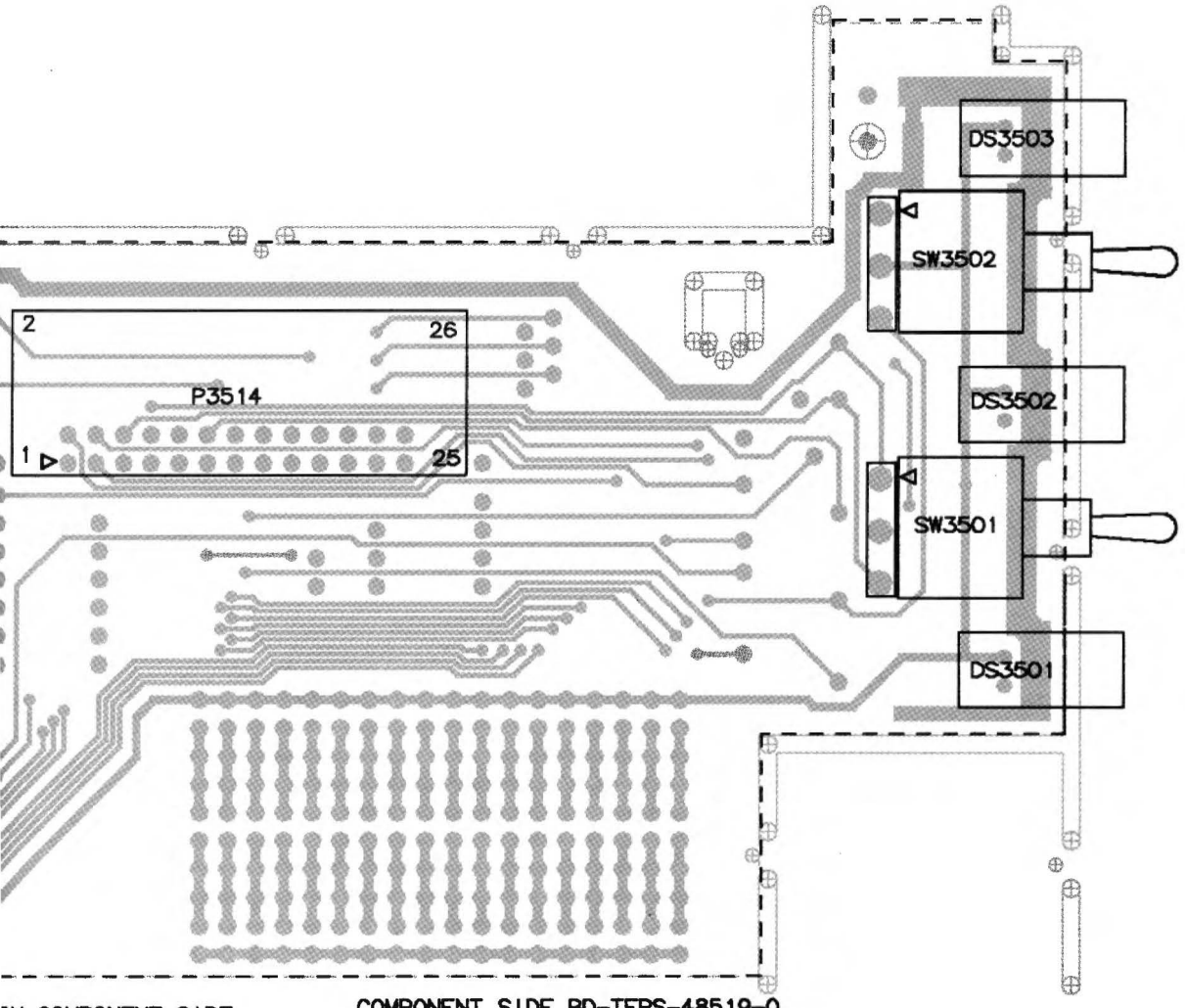






SHOWN FROM COMPONENT SIDE

COM

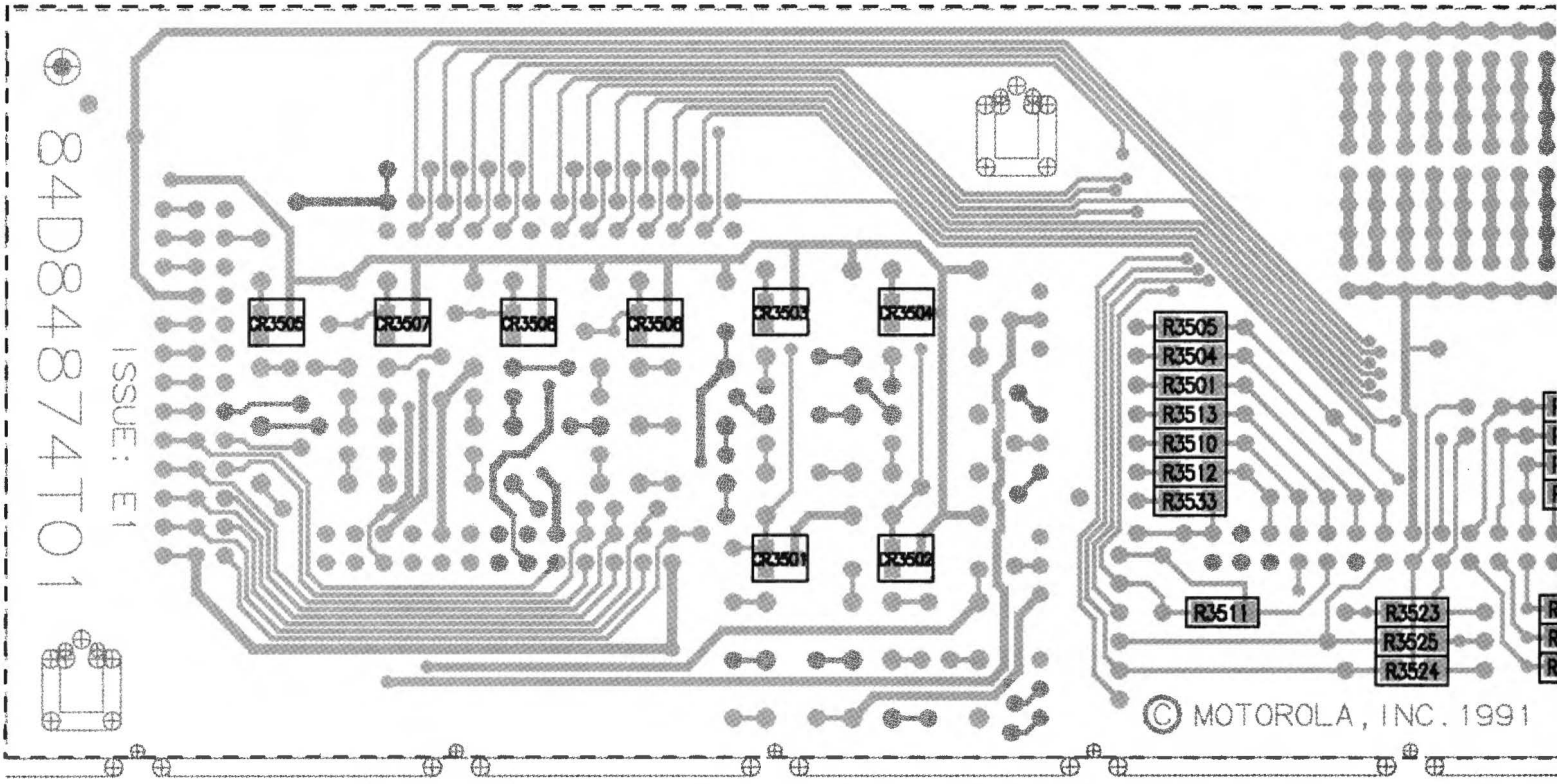


ISSUE: E1

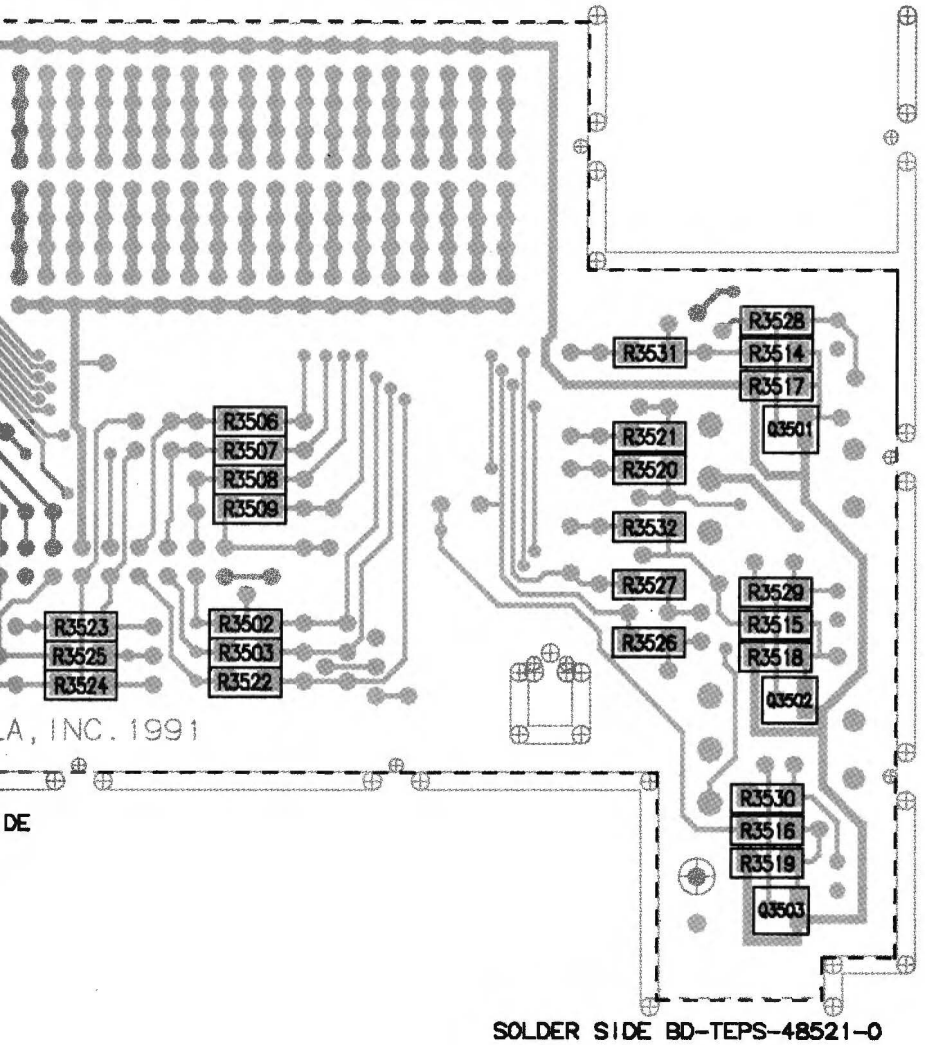
84D84874T01

ОМ COMPONENT SIDE

COMPONENT SIDE BD-TEPS-48519-0
OL-TEPS-48520-0

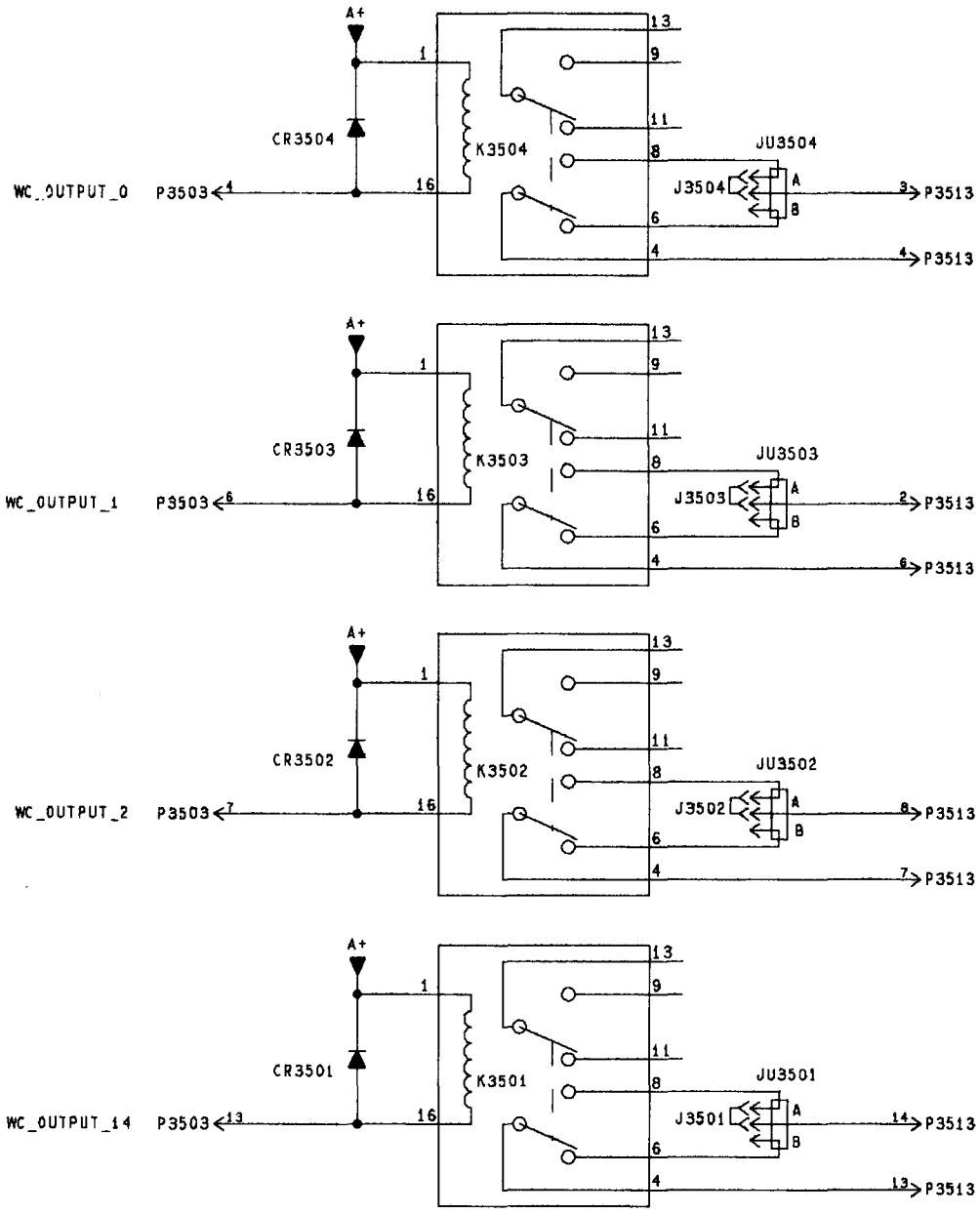


SHOWN FROM SOLDER SIDE

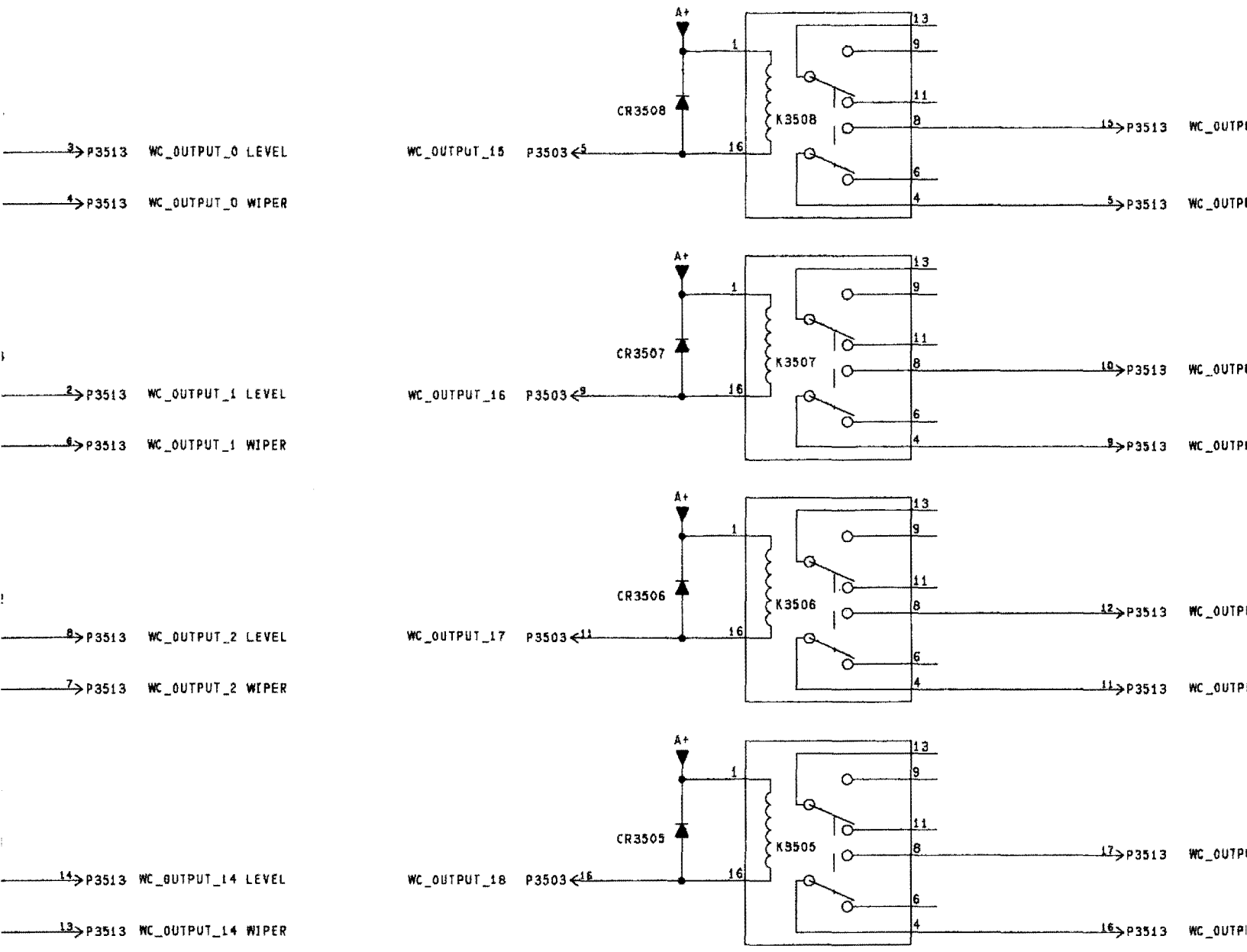


SOLDER SIDE BD-TEPS-48521-0

OL-TEPS-48522-0



WC_INPUT_0	P3513	19	P3503	WC_INPUT_0
WC_INPUT_1	P3513	21	P3503	WC_INPUT_1
WC_INPUT_2	P3513	23	P3503	WC_INPUT_2
WC_INPUT_3	P3513	25	P3503	WC_INPUT_3
WC_INPUT_4	P3513	22	P3503	WC_INPUT_4
WC_INPUT_5	P3513	24	P3503	WC_INPUT_5
WC_INPUT_6	P3513	18	P3503	WC_INPUT_6
WC_INPUT_7	P3513	20	P3503	WC_INPUT_7

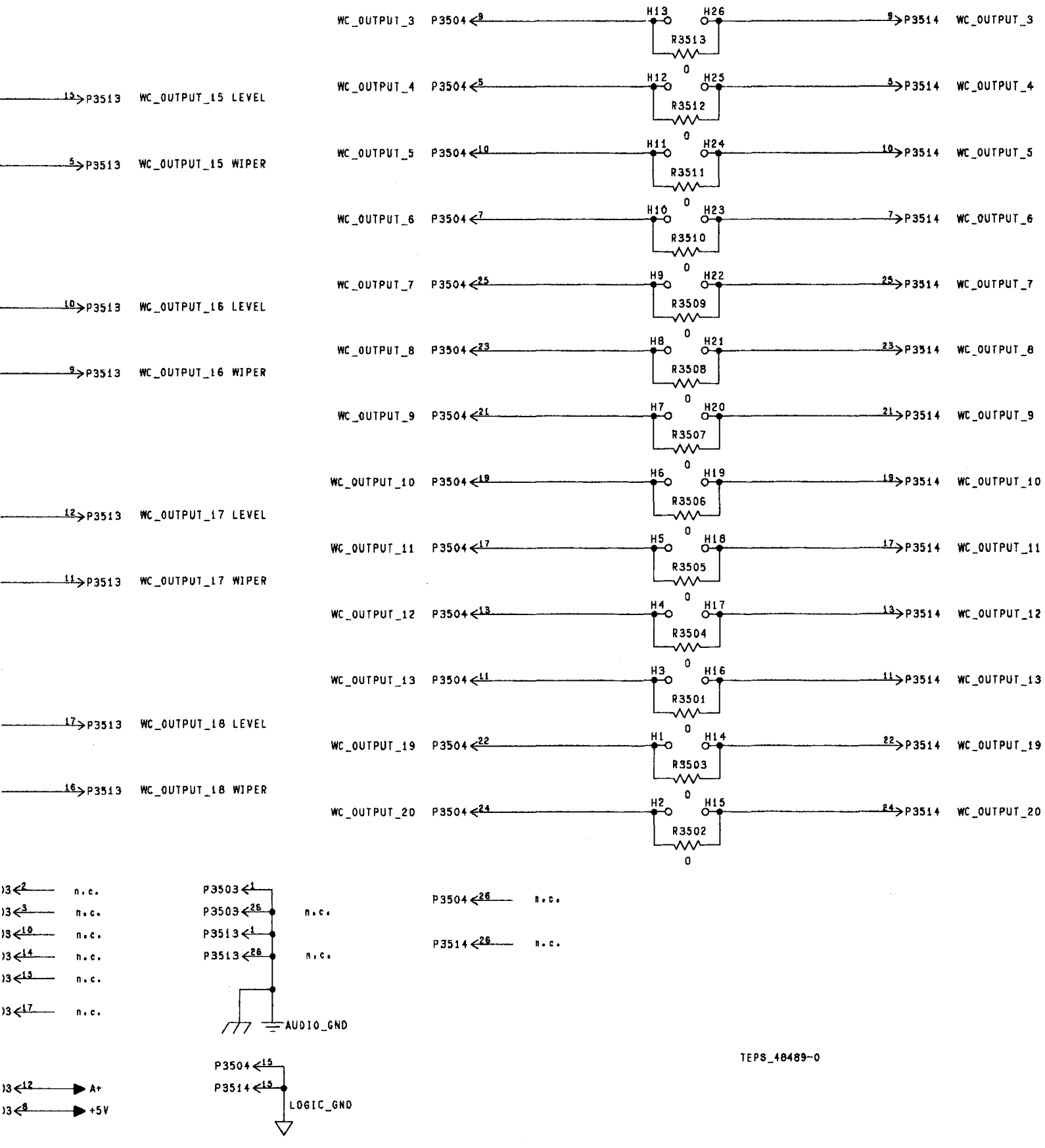


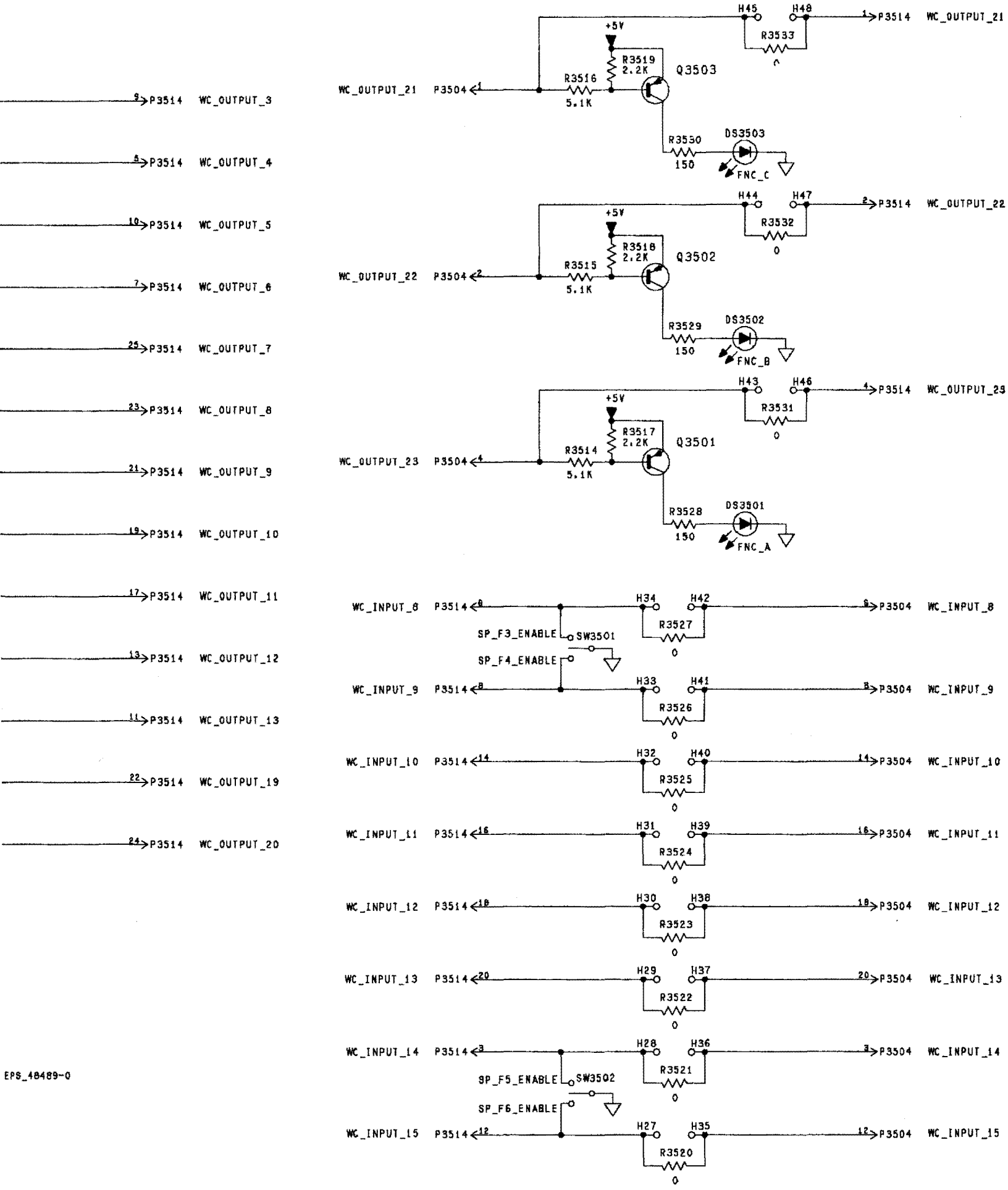
NOTE:

1. UNLESS OTHERWISE SPECIFIED, ALL RESISTOR VALUES ARE IN OHMS.

P3503 2 n.c.
P3503 3 n.c.
P3503 10 n.c.
P3503 14 n.c.
P3503 15 n.c.
P3503 17 n.c.

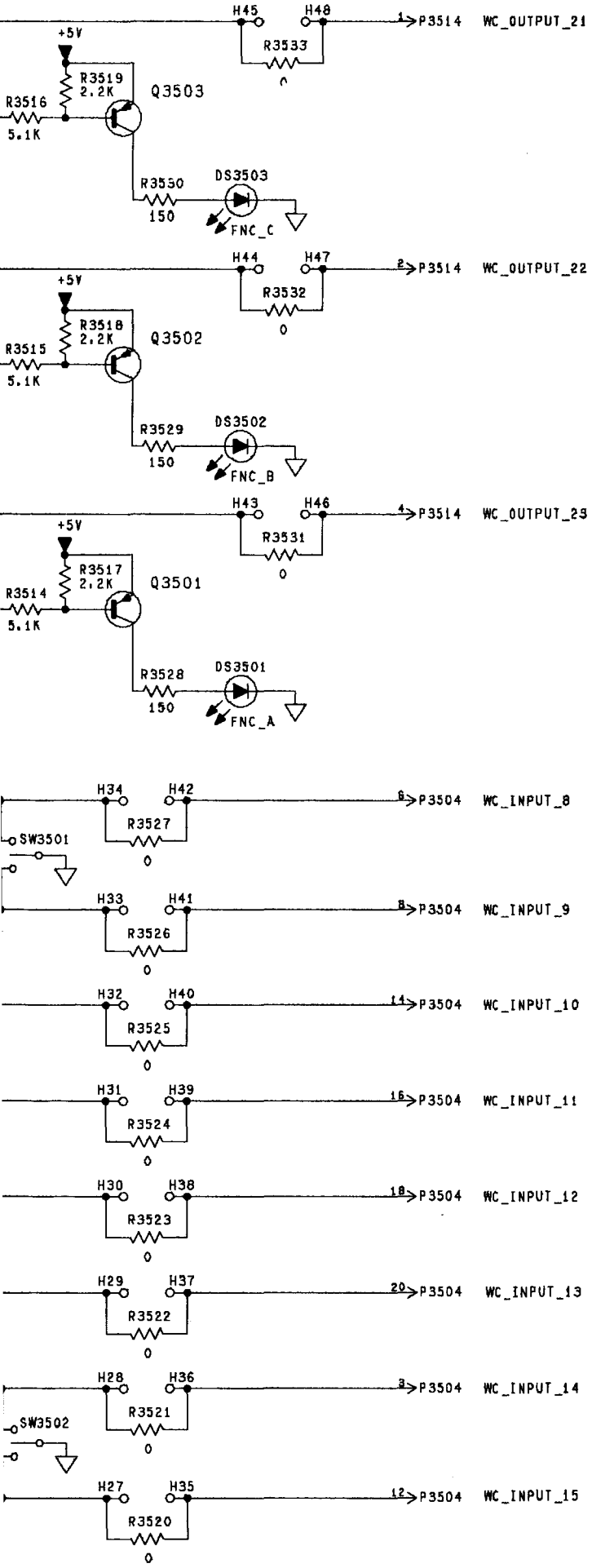
P3503 12 → A+
P3503 8 → +5V


WC_OUTPUT_3 P3504 9 H13 H26 9 P3514 WC_OUTPUT_3
R3513 0
WC_OUTPUT_4 P3504 5 H12 H25 5 P3514 WC_OUTPUT_4
R3512 0
WC_OUTPUT_5 P3504 10 H11 H24 10 P3514 WC_OUTPUT_5
R3511 0
WC_OUTPUT_6 P3504 7 H10 H23 7 P3514 WC_OUTPUT_6
R3510 0
WC_OUTPUT_7 P3504 25 H9 H22 25 P3514 WC_OUTPUT_7
R3509 0
WC_OUTPUT_8 P3504 23 H8 H21 23 P3514 WC_OUTPUT_8
R3508 0
WC_OUTPUT_9 P3504 21 H7 H20 21 P3514 WC_OUTPUT_9
R3507 0
WC_OUTPUT_10 P3504 19 H6 H19 19 P3514 WC_OUTPUT_10
R3506 0
WC_OUTPUT_11 P3504 17 H5 H18 17 P3514 WC_OUTPUT_11
R3505 0
WC_OUTPUT_12 P3504 13 H4 H17 13 P3514 WC_OUTPUT_12
R3504 0
WC_OUTPUT_13 P3504 11 H3 H16 11 P3514 WC_OUTPUT_13
R3501 0
WC_OUTPUT_19 P3504 22 H1 H14 22 P3514 WC_OUTPUT_19
R3503 0
WC_OUTPUT_20 P3504 24 H2 H15 24 P3514 WC_OUTPUT_20
R3502 0
13 P3513 WC_OUTPUT_15 LEVEL
5 P3513 WC_OUTPUT_15 WIPER
10 P3513 WC_OUTPUT_16 LEVEL
9 P3513 WC_OUTPUT_16 WIPER
12 P3513 WC_OUTPUT_17 LEVEL
11 P3513 WC_OUTPUT_17 WIPER
17 P3513 WC_OUTPUT_18 LEVEL
16 P3513 WC_OUTPUT_18 WIPER
)3 2 n.c.
)3 3 n.c.
)3 10 n.c.
)3 14 n.c.
)3 15 n.c.
)3 17 n.c.
P3503 1
P3503 26 n.c.
P3513 1
P3513 26 n.c.
AUDIO_GND
P3504 26 n.c.
P3514 26 n.c.
)3 12 A+
)3 8 +5V
P3504 15
P3514 15
LOGIC_GND
TEPS_48489-0


H45
H48
1 P3514 WC_OUTPUT_21
+5V
R3533
0
R3519
2.2K
Q3503
WC_OUTPUT_21 P3504 1
R3516
5.1K
R3530
150
DS3503
FNC_C
H44
H47
2 P3514 WC_OUTPUT_22
R3532
0
R3518
2.2K
Q3502
WC_OUTPUT_22 P3504 2
R3515
5.1K
R3529
150
DS3502
FNC_B
H43
H46
4 P3514 WC_OUTPUT_23
R3531
0
R3517
2.2K
Q3501
WC_OUTPUT_23 P3504 4
R3514
5.1K
R3528
150
DS3501
FNC_A
9 P3514 WC_OUTPUT_3
5 P3514 WC_OUTPUT_4
10 P3514 WC_OUTPUT_5
7 P3514 WC_OUTPUT_6
25 P3514 WC_OUTPUT_7
23 P3514 WC_OUTPUT_8
21 P3514 WC_OUTPUT_9
19 P3514 WC_OUTPUT_10
17 P3514 WC_OUTPUT_11
13 P3514 WC_OUTPUT_12
11 P3514 WC_OUTPUT_13
22 P3514 WC_OUTPUT_19
24 P3514 WC_OUTPUT_20
WC_INPUT_8 P3514 6
H34
H42
R3527
0
6 P3504 WC_INPUT_8
SP_F3_ENABLE
SW3501
SP_F4_ENABLE
WC_INPUT_9 P3514 8
H33
H41
R3526
0
8 P3504 WC_INPUT_9
WC_INPUT_10 P3514 14
H32
H40
R3525
0
14 P3504 WC_INPUT_10
WC_INPUT_11 P3514 16
H31
H39
R3524
0
16 P3504 WC_INPUT_11
WC_INPUT_12 P3514 18
H30
H38
R3523
0
18 P3504 WC_INPUT_12
WC_INPUT_13 P3514 20
H29
H37
R3522
0
20 P3504 WC_INPUT_13
WC_INPUT_14 P3514 3
H28
H36
R3521
0
3 P3504 WC_INPUT_14
SP_F5_ENABLE
SW3502
SP_F6_ENABLE
WC_INPUT_15 P3514 12
H27
H35
R3520
0
12 P3504 WC_INPUT_15
EPS_48489-0

WILDCARD INTERFACE BOARD

MODEL TRN7565A
SCHEMATIC DIAGRAM



TRN7565A Wildcard Interface Board PL-11885-O

REF. SYMBOL	PART NO.	DESCRIPTION
		resistor:
		diode: (see note)
CR3501 thru 3508	4805129M23	silicon
		light emitting diode: (see note)
DS3501 thru 3503	4888245C24	RED (Not placed in standard kit)
		connector:
JU3501 thru 3504	2880002R03	plug: 3-contact
		relay:
K3501 thru 3508	8084090N03	12 VDC, 2A
		connector:
P3503,3504	2883290P13	plug: 26-contact
P3513,3514	2883290P13	plug: 26-contact
		transistor: (see note)
Q3501 thru 3503	4811056A08	PNP
		resistor, fixed:
R3501 thru 3513	0611077A01	0 ohm, ±5%; 0W
R3514 thru 3516	0611077A91	5.1K, ±5%; 1/8W
R3517 thru 3519	0611077A82	2.2K, ±5%; 1/8W
R3520 thru 3527	0611077A01	0 ohm, ±5%; 0W
R3528 thru 3530	0611077A54	150 ohms, ±5%; 1/8W
R3531 thru 3533	0611077A01	0 ohm, ±5%; 0W
		switch:
SW3501, 3502	4083980R10	toggle, SPST momentary (not placed in standard kit)
		non-referenced items:
	0984181L01	SHORTING JUMPER: 2-contact (4 used with JU3501 thru JU3504)
	4380054K01	SPACER, pcb support (3 used)

NOTE: For optimum performance, diodes, transistors, and integrated circuits must be ordered by Motorola part number.