Pipo Communications

Model ST-888

DTMF ANI/ENI Display Decoder

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Manual # 68-9888
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DESCRIPTION

The ST-888 Mobilecall Display Decoder is a desktop console for use in DTMF Automatic Number Identification (ANI) and Emergency Number Identification (ENI) applications. It is designed for installation at a dispatch office or other control point to decode and display incoming identification signals from mobile and other units equipped with Pipo Communications Model ST-804A or similar ANI encoders.

During normal operation, an encoded message is transmitted every time the mobile operator keys the radio microphone. The message (or sequence) contains the identification (ID) number of the transmitter. Upon receipt at the dispatch office or control point, the ST-888 decodes the message and displays it on a numerical read-out for positive identification of the sending unit without the need for voice call signs. The ST-888 can be used with a variety of DTMF digit rates and message lengths.

All setup and configuration requirements for the ST-888 are handled via a serial I/O port of a PC using Selectone's Product Manager, a Microsoft Windows based program. The ST-888 also has a parallel output port to drive a printer. Incoming messages from sending units may be printed along with the date and time of receipt. If the incoming sequence is an alarm report (ENI sequence), the word ALARM is added to the printout.

The ST-888 may be operated with almost any power supply within the operating voltage specification range. Because of our comprehensive warranty policy, you should not have to consider field repair. However, if repair is unavoidable, all parts are clearly identified in the board diagram and circuit schematic. Most parts used in the ST-888 are readily available through local component distributors.

OPERATING SPECIFICATIONS

PARAMETER	SPECIFICATION
Operating Voltage:	13.6Vdc ± 20%
Operating Current:	<50mAdc at all operating voltages
Signalling Format:	DTMF (16 available characters)
Sequence Length:	ANI or ENI prefix plus 1 to 8 ID digits
Signalling Input Level:	30mVrms to 2.5Vrms (composite)
Twist Acceptance:	-8 to +4 dB if lesser tone is > 30mVrms
Noise Tolerance:	-12dB referenced to lower amplitude tone
Decode Bandwidth:	± 2.3% of nominal DTMF frequency
Signalling Input Impedance:	>50K balanced
Digital Rate:	
Manual:	0.5 to 10 Digits/Sec. 80mS min. tone on time
5 Digits/Sec.:	4 to 10 Digits/Sec. 80mS min. tone on time
10 Digits/Sec.:	8 to 16 Digits/Sec. 45mS min. tone on time
15 Digits/Sec.:	11 to 20 Digits/Sec. 30mS min. tone on time
20 Digits/Sec.:	14 to 22 Digits/Sec. 25mS min. tone on time
Speaker Mute:	Form C Relay Energizes on receipt of DTMF
Alarm Output:	Open collector
Serial Port:	Standard RD-232C configured for DCE
Serial Baud Rate:	1200 baud, 8 bits 1 stop bit, no parity
Dimensions:	80"W x 4.3"D x 1.7"H 20.32cm x 10.92cm x 4.32cm

Specifications are subject to change without notice.

SETUP AND CONFIGURATION

Before operation is possible all operating parameters must be configured through Selectone Program Manager, available in both Windows and DOS versions. Setup and configuration details are documented in the HELP area of this program. Though setup and configuration involves the most detailed documentation for this product, it is quite probable that it may only be used once in the product lifetime. Using the HELP area as the primary documentation vehicle insures prompt availability of corrections or updates. After the initial purchase, updates are available at no charge via Pipo Communications web site at **www.pipo.cc.**

OPERATION

When power is applied to the ST-888, the version of the firmware is displayed for four seconds. If the MEMORY RECALL switch is pressed during the time the version is displayed, the serial number of the unit is displayed. This information should be available if it is necessary to call Selectone for technical assistance.

If the lithium cell for the time of day clock is low, LO CELL is displayed instead of the version of the firmware and the sounder is activated for four seconds. The ST-888 will operate normally but printout of the time and date may be incorrect. The lithium cell, BT1, should be replaced and, if necessary, the time and date set using the Program Manager software. Replacement lithium cells may be ordered from Selectone but it is a standard CR2032 coin cell which should be readily available locally.

NOTE: When a printer is connected to the model ST-888, observe the following precautions:

Always apply power to the ST-888 before applying power to the printer. If power is applied to the printer before the ST-888, the ST-888 will not initialize properly and will be inoperative. If this occurs, restore normal operation by preforming the following steps in the order shown:

1. Remove power from both the printer and the ST-888.
2. Apply power to the ST-888.
3. Apply power to the printer after power is applied to the ST-888.

ANI - AUTOMATIC NUMBER IDENTIFICATION

When the ST-888 receives an ANI sequence from a mobile unit equipped with a DTMF ANI encoder such as the ST-804, it decodes the sequence and displays it as the sending unit's identification number. The internal sounder will be heard momentarily, if enabled.

Incoming ANI sequences are evaluated for speed and sequence length. Sequences may be sent manually or automatically with speeds ranging from less than 1 digit per second for manual encoders to 20 digits per second for automatic encoders. Sequence lengths may be two to eight digits in length, not counting the start prefix digit. Both speed and sequence length must be selected during configuration. Automatically sent sequences will be rejected if they contain more or less digits than the programmed length. When in the Manual Data Rate, sequences must contain at least the number of digits programmed as the sequence length to be accepted, but they are not rejected if they are over length. Instead, digits received after the selected sequence length are ignored.

Only the characters received after the start prefix are displayed.

The configuration of the unit determines whether each ANI sequence continues to be displayed until replaced by a new sequence, or blanks after the period selected during configuration.

ENI - EMERGENCY NUMBER IDENTIFICATION

ENI sequences follow the same validation requirements as an ANI sequence. When an alarm sequence is received, the display flashes to indicate that it is an alarm sequence on display. Display blanking, if enabled, does not blank the display. The internal buzzer and external alarm, if used, sound and the unit will not accept normal ANI sequences until manually reset. If a printer is connected to the ST-888, the alarm sequence printout will include the word ALARM after the date.

ALARM RESET

After receipt of an alarm report, pressing the ALARM RESET switch on the front panel returns the unit to normal operation. If a printer is used, ALARM RESET and the time and date is printed.

If a second alarm sequence is received before the first has been reset, the first is pushed into the memory stack and the new one is displayed. When the alarm is reset, the buzzer sounds at twice the previous rate (one quarter second on, one quarter second off) to indicate that one or more alarms in the memory stack were not acknowledged by resetting. Pressing the ALARM RESET switch a second time silences the buzzer (this causes a TIME message to be printed, if a printer is used).

ANI/ENI MEMORY AND RECALL

Whenever a displayed sequence is replaced by a new sequence, it is moved into the memory storage stack. The memory capacity is eight sequences, not including the most recent sequence which is on display. When the memory is full (i.e., eight sequences have been stored), a new sequence pushes the FIRST-IN (or oldest) sequence out of memory, and each sequence steps down one position with the LAST-IN (or newest) being the first sequence in the memory stack.

Pressing the MEMORY RECALL switch, then releasing it scans through the memory. Each time the switch is pressed and released, the next sequence in memory will be displayed, starting with the last in. The entire memory may be examined with return to the real-time display by pressing the switch one more time.

Alarm messages stored in memory will flash when displayed. During memory display, a decimal point is added to the display at the far left. The decimal is a counter to indicate the position of the sequence in memory. The last-in sequence is indicated with the decimal at the far left. Each time the switch is pressed the decimal moves progressively to the right with the first-in (oldest) sequence indicated by the decimal at the right. The decimal blanks out when the display returns to the real-time display. A pause of five seconds or more between pressing the MEMORY RECALL switch will cause the memory display to time out and the unit will return to the real-time display. A new ANI sequence received while scanning the memory immediately returns the unit to real-time, and the new ANI sequence will be

displayed.

TIME OF DAY

The clock setting can be checked at any time by pressing and holding the ALARM RESET switch when the internal alarm buzzer is not active. The time will be displayed in 12-hour or 24-hour format on the ST-888. If the unit is set for 12-hour format, the leftmost decimal point indicates PM. The printer, if used, will print TIME [time date]. This can be used as an event marker and annotated as appropriate.

If the ALARM RESET switch is pressed while the leftmost decimal point is on, the time of day clock is retarded to the previous minute. (Example, if the clock is at 09:45:40, it will go to 09:45:00.

If the ALARM RESET is pressed while the second decimal point from the left is on, the time of day clock is advanced next minute. (Example, if the clock is 09:45:40, it will go to 09:45:59.

If the ALARM RESET switch is pressed while the third decimal point from the left is on, the time of day clock is retarded by one hour. This function is disabled in the hour between midnight and 1 AM to prevent corrupting the date.

If the ALARM RESET switch is pressed while the fourth decimal point from the left is on, the time of day clock is advanced by one hour. This function is disabled in the hour between 11 PM and midnight to prevent corrupting the date.

Note: The time/date function in the ST-888 is Y2K compatible.

TEST MODE

If both the MEMORY RECALL and ALARM RESET switches are pressed for 4 seconds, the unit will enter the test mode. While in test mode the unit will display every DTMF digit as it is received. While in test mode, all other functions are disabled. To exit test mode and return to normal operation, again press both switches for four seconds. **NOTE:** Test mode is for **system trouble shooting only.** No timing or sequence length checking is done so the unit is prone to false detection of digits.

INSTALLATION

Interface to the host radio equipment is made using a supplied cable connected to the DB15 RADIO INTERFACE CONNECTOR on the rear of the ST-888. The following table details the connector pinout, and connections. Contact Pipo Communications for additional details.

ELECTRICAL INTERFACE

The following section describes all wires on the interface cable for the ST-888. The connector pin numbers are shown in brackets [] and the wire colors are shown in parentheses ().

[1] (BROWN) Negative (-) Supply GND.

[9] (LIGHT BLUE) (-) Supply GND

[2] (RED) Signalling audio input balanced input. Connect to GND for unbalanced input.

[10] (PURPLE) Signalling audio input

[3] (ORANGE) Not used

[11] (GRAY) (-) Supply GND

[4] (PINK) External alarm. Open collector saturates to (-) supply during alarm condition.

[12] (WHITE) Receiver mute relay N.O. For speaker muting during ANI/ENI sequences.

[5] (YELLOW) Receiver mute relay N.C. For speaker muting during ANI/ENI sequences.

[13] (BLACK) Receiver mute relay common. For speaker muting during ANI/ENI sequences.

[6] (DARK GREEN) (-) Supply GND

[14] (BROWN/BLACK) Not used

[7] (LIGHT GREEN) Not used

[15] (RED/BLACK) (+) Supply 13.6 Vdc

[8] (DARK BLUE) (+) Supply 13.6 Vdc ± 20%

WARRANTY POLICY

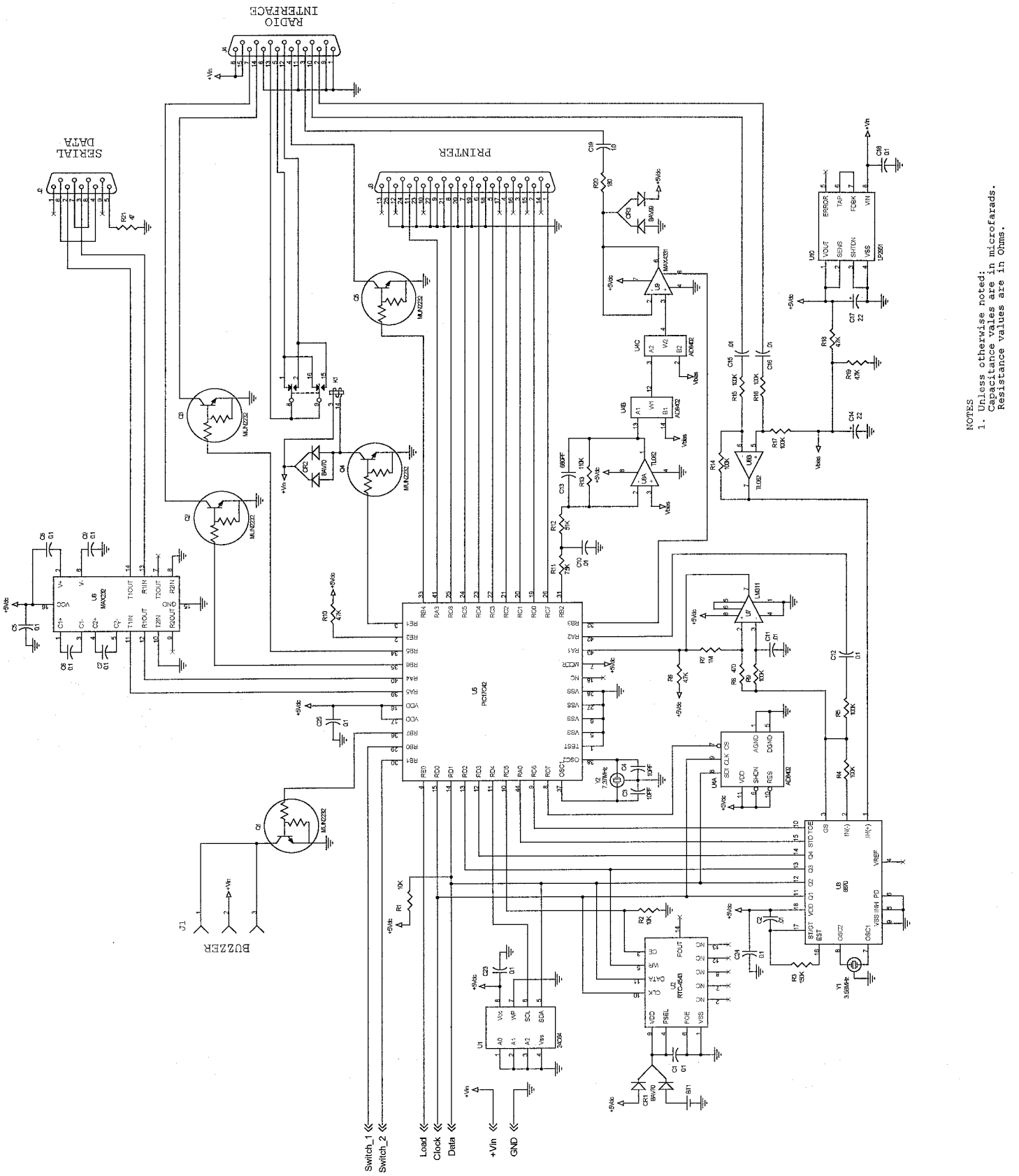
All of Pipo Communications products are guaranteed to meet or exceed published performance specifications and are warranted against defects in material and workmanship for a period of two (2) years from date of purchase. Third party equipment such as radios, power supplies, antennas, etc., carry the factory warranty of their respective manufacturers.

All warranty repairs must be performed by Pipo Communications. Any unauthorized repair attempted by the customer, alteration or modification of the equipment, damage by external sources, or removal or alteration of the serial number label or date code, will void the warranty. Specifically excluded from this warranty are batteries, fuses, lamps, and damage caused by lightning, power surges, or mechanical abuse.

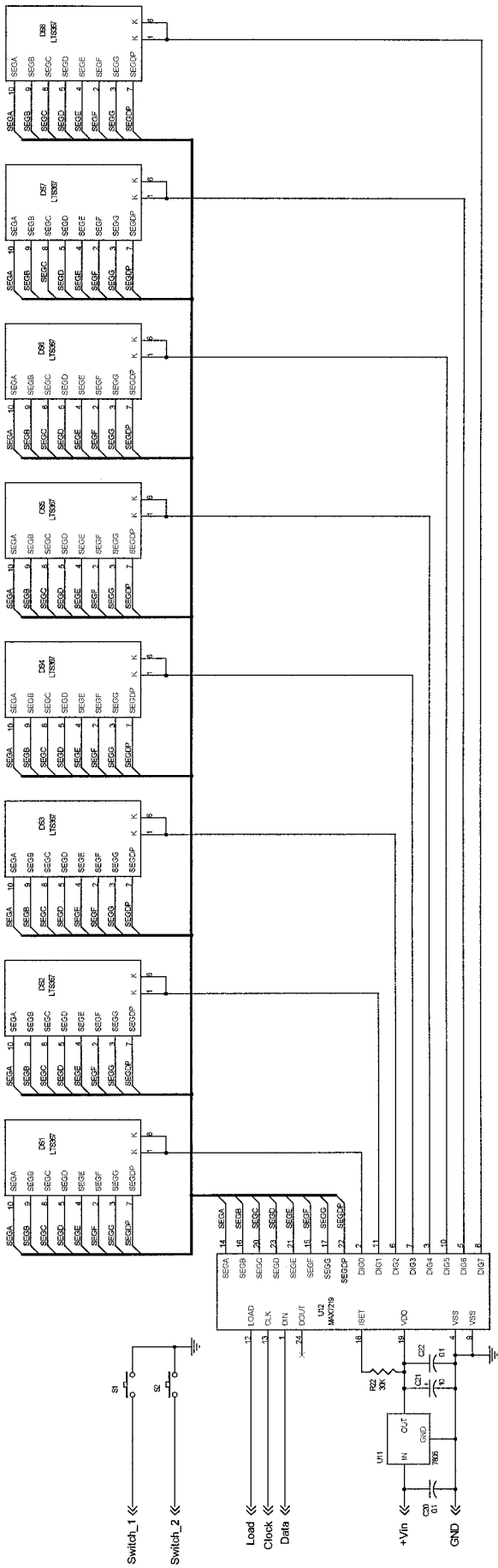
Equipment for repair may be returned to the factory without prior written authorization; however, a note must be sent with the packing list briefly describing the nature of the defect. Repairs must be shipped freight prepaid and will be returned freight prepaid. Shipments should be directed to:

Pipo Communications
Attn: Repair Department
1516 Cassil Place
Hollywood, California
90028-7106

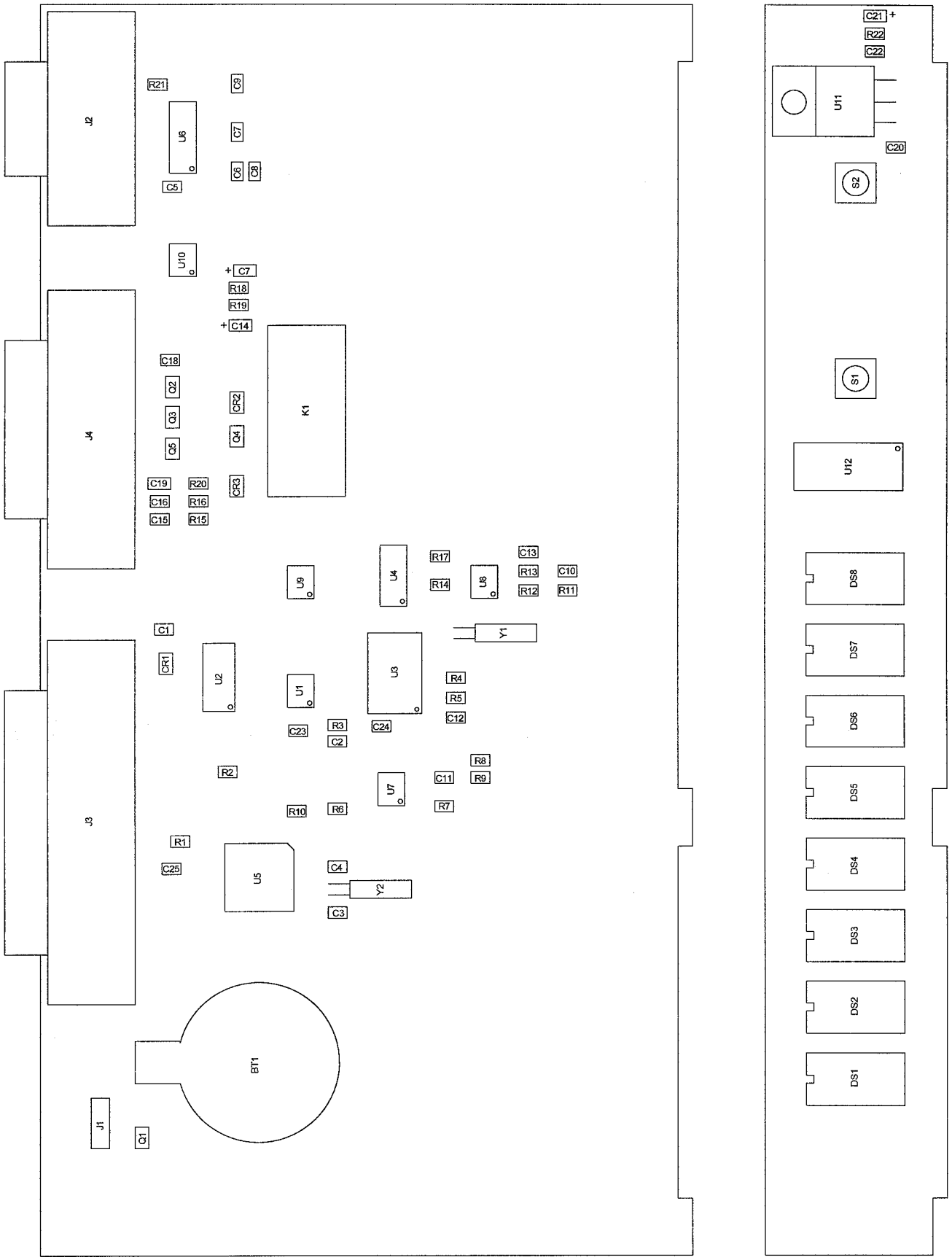
Schematic - ST-888 Display Decoder



Schematic - ST-888 Display Decoder



ST-888 Component Locator



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