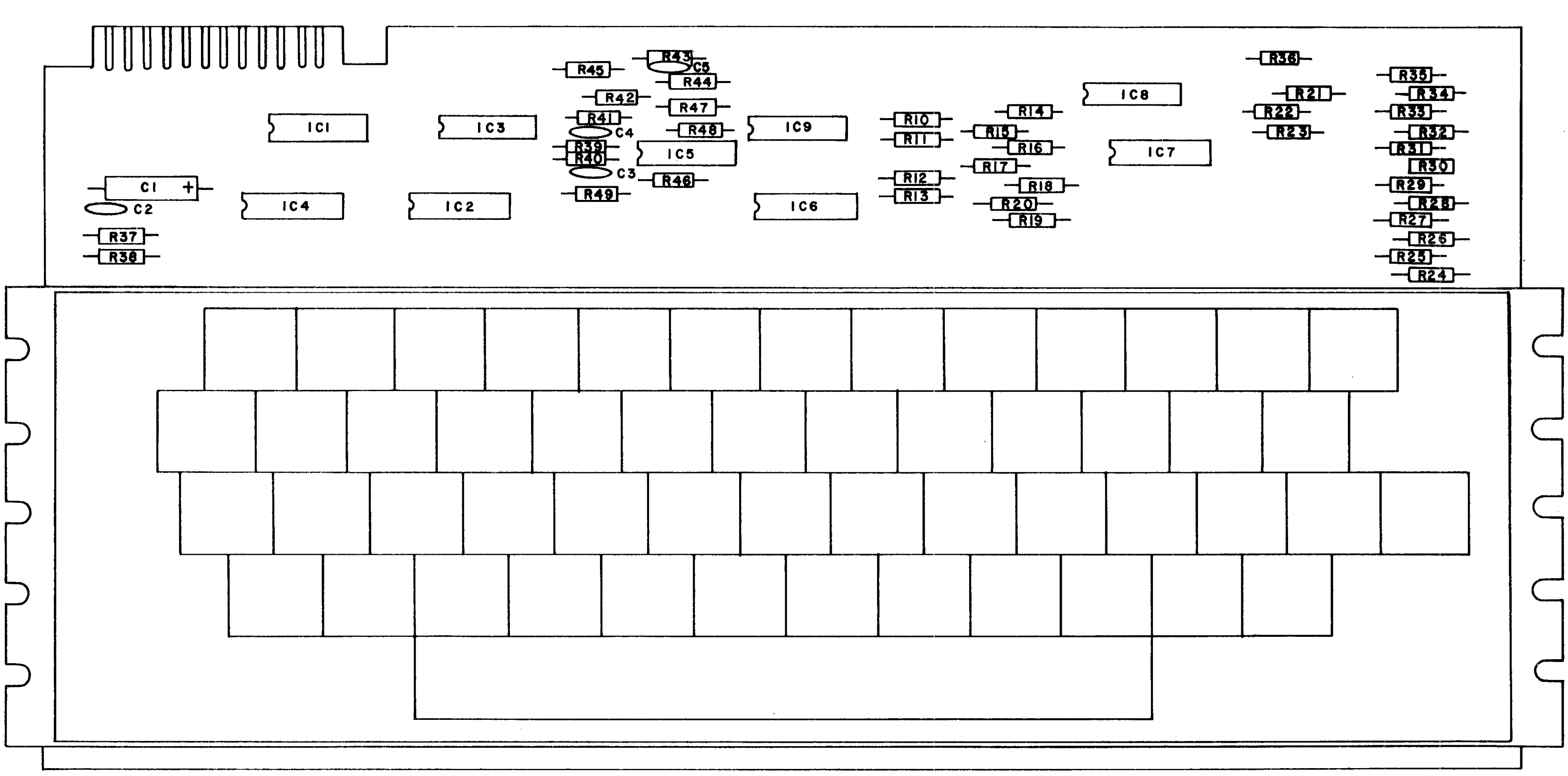
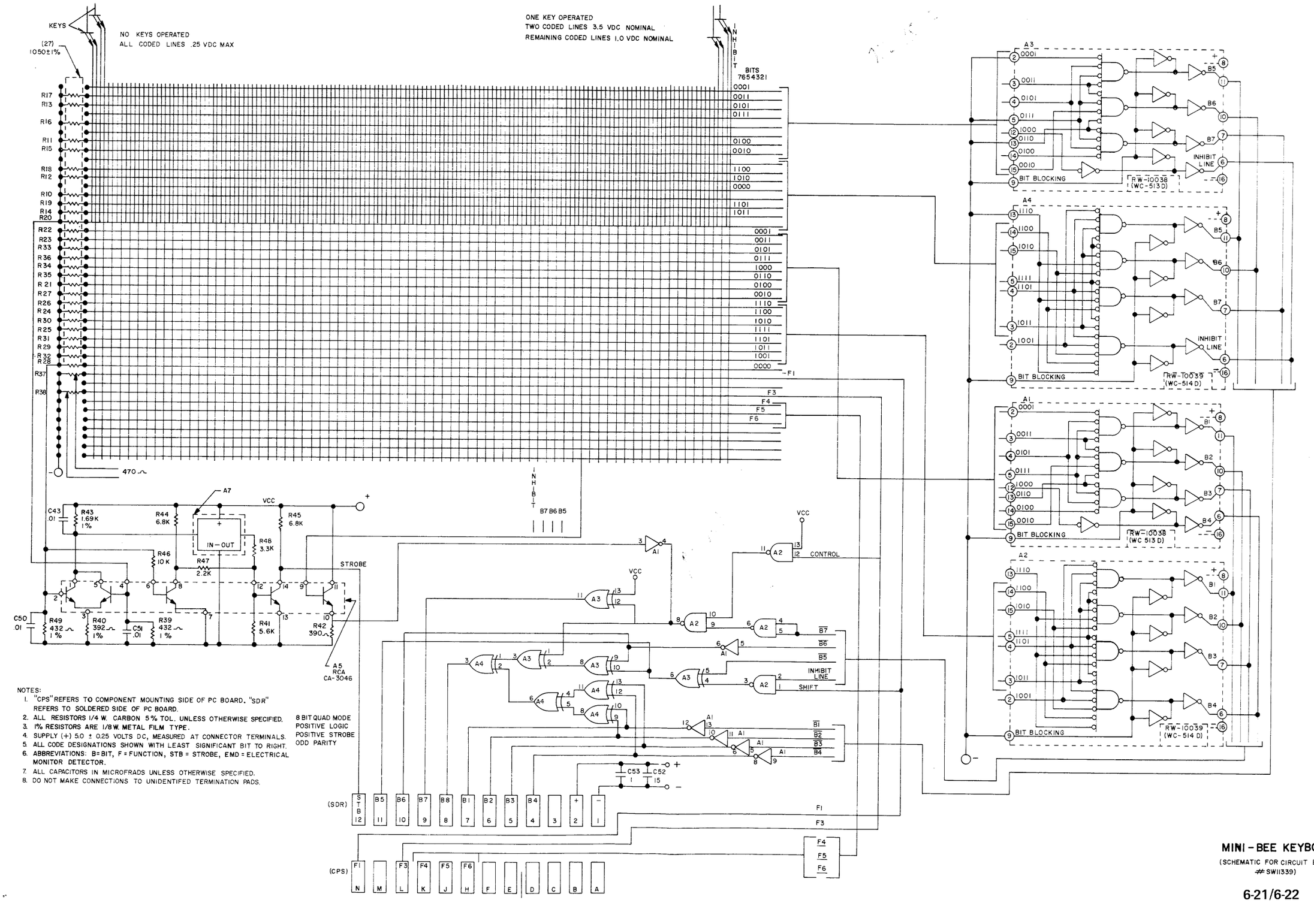


Circuit Board (SW11339) Keyboard Assembly



NOTES:

1. "CPS" REFERS TO COMPONENT MOUNTING SIDE OF PC BOARD. "SDR" REFERS TO SOLDERED SIDE OF PC BOARD.
2. ALL RESISTORS 1/4 W. CARBON 5% TOL. UNLESS OTHERWISE SPECIFIED.
3. 1% RESISTORS ARE 1/8W. METAL FILM TYPE.
4. SUPPLY (+) 5.0 ± 0.25 VOLTS DC, MEASURED AT CONNECTOR TERMINALS.
5. ALL CODE DESIGNATIONS SHOWN WITH LEAST SIGNIFICANT BIT TO RIGHT.
6. ABBREVIATIONS: B=BIT, F=FUNCTION, STB=STROBE, EMD=ELECTRICAL MONITOR DETECTOR.
7. ALL CAPACITORS IN MICROFRADS UNLESS OTHERWISE SPECIFIED.
8. DO NOT MAKE CONNECTIONS TO UNIDENTIFED TERMINATION PADS.

8 BIT QUAD MODE
POSITIVE LOGIC
POSITIVE STROBE
ODD PARITY

MINI-BEE KEYBOARD

(SCHEMATIC FOR CIRCUIT BOARD #SWII339)

6-21/6-22

TABLE C-2: 1A2A1A1 - KEYBOARD P.C. BOARD ASSEMBLY - MICRO SWITCH #SW11339

Reference Designation	Beehive Part No.	Qty.	Description	Mfr. Code	Manufacturer Part No.
1A2A1A1IC1		1	Integrated Circuit	91929	936PC F7321
1A2A1A1IC2		1	Integrated Circuit	04713	MC 846L
1A2A1A1IC3		1	Integrated Circuit	04713	MC 1812L
1A2A1A1IC4		1	Integrated Circuit	04713	MC 1812L
1A2A1A1IC5		1	Integrated Circuit	95303	CA3046 H218
1A2A1A1IC6		1	Integrated Circuit	91929	RW 10039
1A2A1A1IC7		1	Integrated Circuit	91929	RW 10039
1A2A1A1IC8		1	Integrated Circuit	91929	RW 10038
1A2A1A1IC9		1	Integrated Circuit	91929	RW 10038
1A2A1A1R10		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R11		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R12		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R13		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R14		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R15		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R16		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R17		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R18		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R19		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R20		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R21		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R22		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R23		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R24		1	Resistor 10K, ±5%	81349	RC07GF103J
1A2A1A1R25		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R26		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R27		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R28		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R29		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R30		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R31		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R32		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R33		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R34		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R35		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R36		1	Resistor 10K, ± 5%	81349	RC07GF103J
1A2A1A1R37		1	Resistor 470 ohms ± 5%	81349	RC07GF471J
1A2A1A1R38		1	Resistor 470 ohms ± 5%	81349	RC07GF471J
1A2A1A1R39		1	Resistor 432 ohms ± 1%	81349	RN55D4320F
1A2A1A1R40		1	Resistor 392 ohms ± 1%	81349	RN55D3920F
1A2A1A1R41		1	Resistor 5.6K, ± 5%	81349	RC07GF562J
1A2A1A1R42		1	Resistor 390 ohms ± 5%	81349	RC07GF391J
1A2A1A1R43		1	Resistor 1,690 ohms ± 1%	81349	RN55D1691F
1A2A1A1R44		1	Resistor 6.8K, ± 5%	81349	RC07GF682J
1A2A1A1R45		1	Resistor 6.8K, ± 5%	81349	RC07GF682J
1A2A1A1R46		1	Resistor 10K, ± 5%	81349	RC07GF103J

TABLE C-2: 1A2A1A1 - KEYBOARD P.C. BOARD ASSEMBLY - MICRO SWITCH #SW11339 (cont.)

Reference Designation	Beehive Part No.	Qty.	Description	Mfr. Code	Manufacturer Part No.
1A2A1A1R47		1	Resistor 2.2K, ± 5%	81349	RC07GF222J
1A2A1A1R48		1	Resistor 3.3K, ± 5%	81349	RC07GF332J
1A2A1A1R49		1	Resistor 432 ohms ± 1%	81349	RN5 D4320F
1A2A1A1C1		1	Capacitor 15uf, 35 VDC	91929	
1A2A1A1C2		1	Capacitor .1uf, 16 VDC	91929	
1A2A1A1C3		1	Capacitor .01uf, 16 VDC	91929	
1A2A1A1C4		1	Capacitor .01uf, 16 VDC	91929	
1A2A1A1C5		1	Capacitor .01uf, 16 VDC	91929	

4-19. RECTIFIER

4-20 The Transforemd voltages are rectified in the rectifier block. The output from the rectifier and filter supplies provide power to the +5VDC, +15VDC, and −12VDC regulator circuits.

4-21. +5VDC, +15VDC, −12VDC REGULATION CIRCUITS

4-22. The Voltage received from the rectifier and filter circuit is applied to an IC regulating Chip, a pre-regulator transistor, and a series pass transistor to provide regulated voltages. In addition voltages are applied to the current sense and over voltage protect circuit for short circuit and over voltage protection.

4-23. MONITOR

4-24. The function of the monitor is to display data on the face of the CRT in an organized manner determined by the design of the logic driving the monitor and requires three separate signals to cause proper operation. These signals are:

1. Vertical synchronization.
2. Horizontal synchronization.
3. Video information.

Positive 15 VDC is applied through the MINI BEE LOGIC CARD from the POWER SUPPLY to the various amplifying circuits for their low voltage operating potential.

NOTE: A low voltage power supply is shown in the Ball Monitor Manual. This supply is not used or provided in the monitor assembly that is currently used in the MINI BEE terminal.

4-25. VERTICAL SYNCHRONIZATION

4-26. Vertical synchronization is applied to the vertical oscillator and triggers it at the vertical refresh rate as determined by the driving logic. The vertical frequency is stabilized by the vertical frequency control, which determines the point of oscillation. The output pulse of the vertical oscillator is applied to the driver amplifier which shapes the pulse and is controlled by the vertical linearity control. The output of the driver amplifier is applied to the vertical driver, by way of the height control. The vertical drivers output pulse is applied to the yoke of the CRT and causes vertical deflection.

4-27. HORIZONTAL SYNCHRONIZATION

4-28. The horizontal synchronization pulses are applied to the horizontal amplifier where they are amplified and applied to the horizontal driver. The output of the horizontal drive is applied through the width coil to the yoke, where it causes the horizontal deflection. The horizontal deflection signal is also applied to the flyback transformer. The horizontal deflection signal is stepped-up to approximately +12KV where it is then rectified, filtered, and applied to the anode cap of the CRT to provide the high voltage required.

4-29. VIDEO INFORMATION

4-30. The video information is applied to the video amplifier by way of the contrast control, external to the monitor. From the video amplifier, the signal is applied to the cathode of the CRT gun to cause an on/off condition corresponding to light patterns on the screen.

The brightness control is external to the monitor and varies the voltage on the acceleration grid of the CRT gun. The focus control varies the voltage on the focusing grid of the CRT gun.

4-31. KEYBOARD

4-32. The keyboard enables the operator to manually input information to the terminal and is comprised of the following assemblies:

1. Key-switch matrix
2. Two ½ word (4 bit) encoders
3. Output Network
4. Strobe Level Generator
5. On Line/Local Switch
6. Indicators

4-33. KEY-SWITCH MATRIX

4-34. The KEY-SWITCH MATRIX is sensed by the STROBE LEVEL GENERATOR for the operation of any key. Depressing a key raises the level of the proper output code lines which are fed to the ½ (one half) word encoders.

4-35. ½ (ONE HALF) WORD ENCODERS

4-36 The code lines are processed by the two ½ WORD ENCODERS which are 4 bits wide each and are assembled into the proper ASCII code for the key that was exercized and sends it to the OUTPUT NETWORK.

4-37. OUTPUT NETWORK

4-38. Once in the OUTPUT NETWORK the assembled data word is scrutinized and assigned the desired parity. The OUTPUT NETWORK is also responsive to a control code line from the KEY-SWITCH MATRIX to identify control codes. The completed data word is then sent to the MINI BEE LOGIC CARD with the appropriate strobe level.

NOTE: The eight bit (parity) is provided by the OUTPUT NETWORK, but not used in the MINI BEE.

4-39. STROBE LEVEL GENERATOR

4-40. The STROBE LEVEL GENERATOR senses the execution of any key. As a product of sensing key operation, the proper strobe level is then generated and is sent to the MINI BEE LOGIC CARD with one exception; when a two key roll-over condition exists, i.e. two keys depressed at one time, the strobe level reverts to its idle state and only the first key struck will be processed.

4-41. ON LINE/LOCAL SWITCH

4-42. The output of the ON LINE/LOCAL SWITCH is directly coupled to the MINI BEE LOGIC CARD where it is applied to the appropriate logic to execute one of the two major modes of the MINI BEE terminal.

4-43. INDICATORS

4-44. The POWER ON INDICATOR tells the operator that the MINI BEE terminal has power applied and is in an operational state.

4-45. The PARITY INDICATOR makes the operator cognizant of the reception of a character from an external device having improper parity assignment. The ON condition can be reset by operating any key on the KEYBOARD with the exception of the break key.

4-46. MINI BEE LOGIC CARD

4-47. The MINI BEE LOGIC CARD is the logical and operational heart of the MINI BEE terminal. It controls and initiates all of the major functions as well as distributes operating potentials. The following paragraphs explain the major functions carried on within the MINI BEE LOGIC CARD.

4-48. DISPLAY ORGANIZATION

4-49. The main timing chain (Oscillator, Dot Counter, Character Counter, Scan Counter, and Line Counter) defines the configuration of the display on the CRT. There are 27 lines, two of which are used for vertical retrace and 25 of which are used to display characters. The 27 lines are composed of ten scans each, each scan being composed of 100 characters, 80 for display and 20 for horizontal retrace, each character being composed of a 5 x 7 character dot matrix (refer to Figure 4-4).

4-50. OSCILLATOR

4-51. The Oscillator is a standard crystal oscillator with a frequency of 11.34 MHZ. Two 7404's are connected in series by a .002 microfarad capacitor. Each 7404 is biased with a 1Kohm resistor connected from their input to their output. A 11.34 MHz crystal is connected from the input of the first 7404 to the output of the second 7404. The output of the oscillator is inverted and feed to the dot counter.

4-52. DOT COUNTER

4-53. The Dot Counter defines each of the seven dots required to compose one character. The Dot Counter is a shift register that operates as a ring counter. The Dot Counter has available on any output a low which is two dots wide. The outputs are labeled 6 and 0, 0 and 1, 1 and 2, etc. The divide-