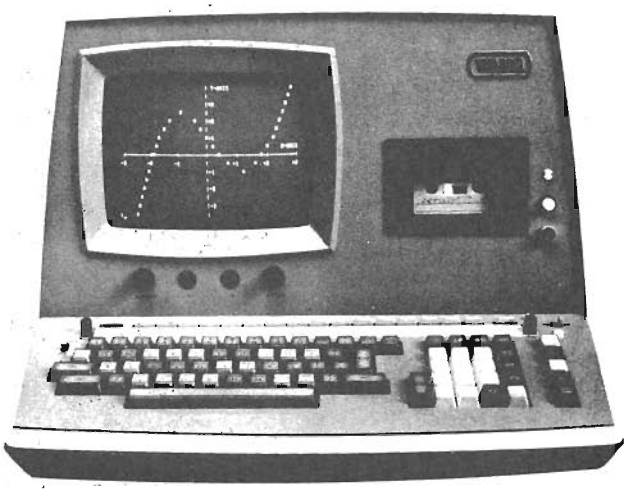
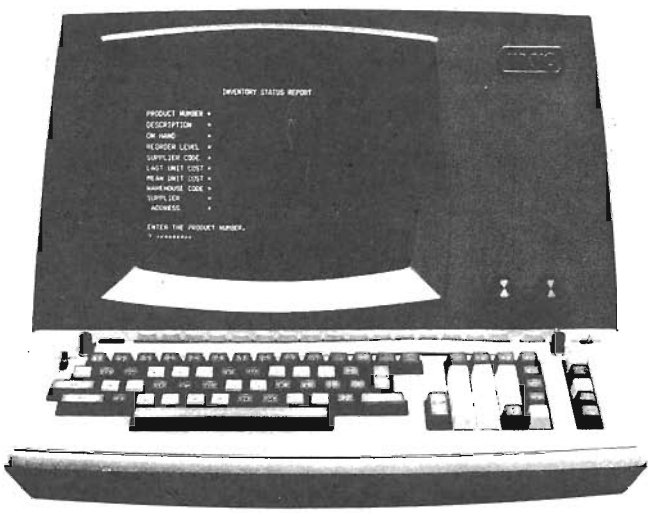
SERVICE BULLETIN NO.71

EDITED BY CUSTOMER ENGINEERING DIVISION

MODEL 2200E (PORTABLE COMPUTING SYSTEM)
MODEL 2200F (WORK STATION)

THE 2200
PORTABLE
COMPUTING SYSTEM





THE 2200
WORK STATION

WANG LABORATORIES, INC.
836 NORTH STREET, TEWKSBURY, MASSACHUSETTS 01876, TEL.(617) 851-4111, TWX 710 343-6769, TELEX 94-7421

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DESCRIPTION

1.1 GENERAL

1.1.1 *2200 PCS (2200E)*

The 2200E, marketed as a 2200 Portable Computing System (PCS), is a self contained CPU/Basic Keyword Keyboard/9 Inch Video Display/Tape Drive. The unit is intended to be a stand-alone, single-user computer, with provisions for two output writing peripherals. The 2200E has the programming capabilities of the present 2200T CPU, except that provisions are not made for disk support.

Supportable peripherals are the 2221W Printer, the 2231W Printer, and the 2272 Drum Plotter. The 2201 Output Writer can be supported with Option 61. Another option available is Option 60, comprised of an audio alarm, a keyboard 'clicker' and an auxiliary Video Display connection. RAM may be expanded in 8,192 (8K) byte increments to 32,768 (32K) bytes.

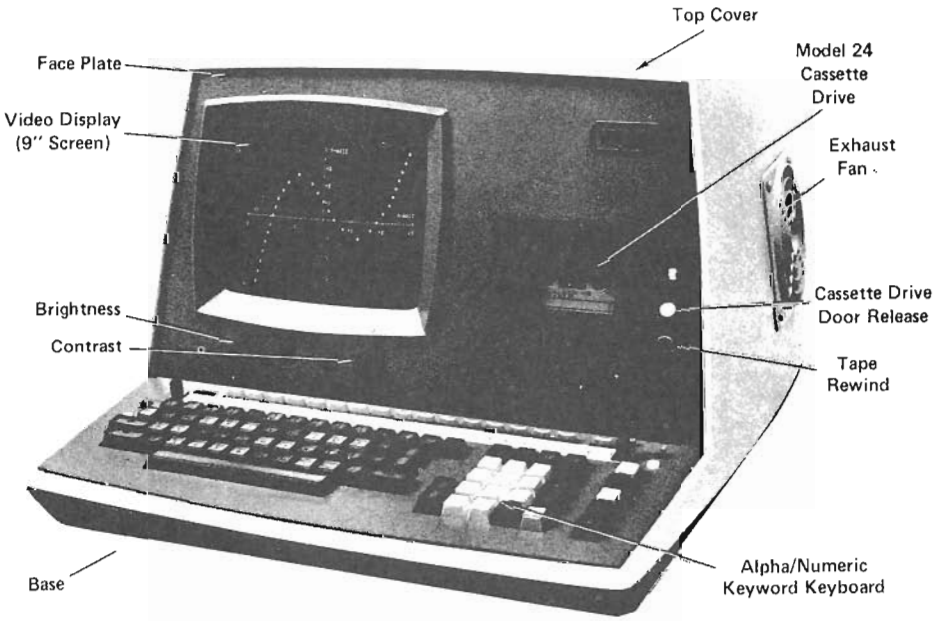


FIGURE 1 2200E(PORTABLE COMPUTER SYSTEM)

1.1.2 *2200 WS (2200F)*

The 2200F, marketed as a 2200 Work Station (WS), is a self-contained CPU/Basic Keyword/Keyboard/12 Inch Video Display. This unit is intended to be used as a Disk Work Station, but is also a stand-alone computer. It has provisions for one output writer (a 2201 may be added with Option 61) and interfaces directly to the present 2230MXA or MXB Multiplexers. The 2200F has the programming capabilities of the present 2200T CPU including disk statements. Inclusion of disk capability in the 2200F represents one major functional difference between 2200E and 2200F. As with 2200 PCS, RAM may be expanded in 8,192 (8K) byte increments to 32,768 (32K) bytes.

The 2200F also supports the 2221W and 2231W Printers, the 2272 Drum Plotter and the 2201 (Option 61). An 80 x 24 display with underline capability is also available as Option 66.

The 2200F can be attached to an existing WCS-30 by adding a 2230MXA Multiplexer Master to the WCS-30 CPU. Additional 2200F Work Stations can be added with the addition of a special 'T' connector (WL #120-4010). Additions of up to three Work Stations are possible. Configuration guidelines are provided in paragraph 2.5. The 2200F is not compatible with the 2224 Multiplexer.

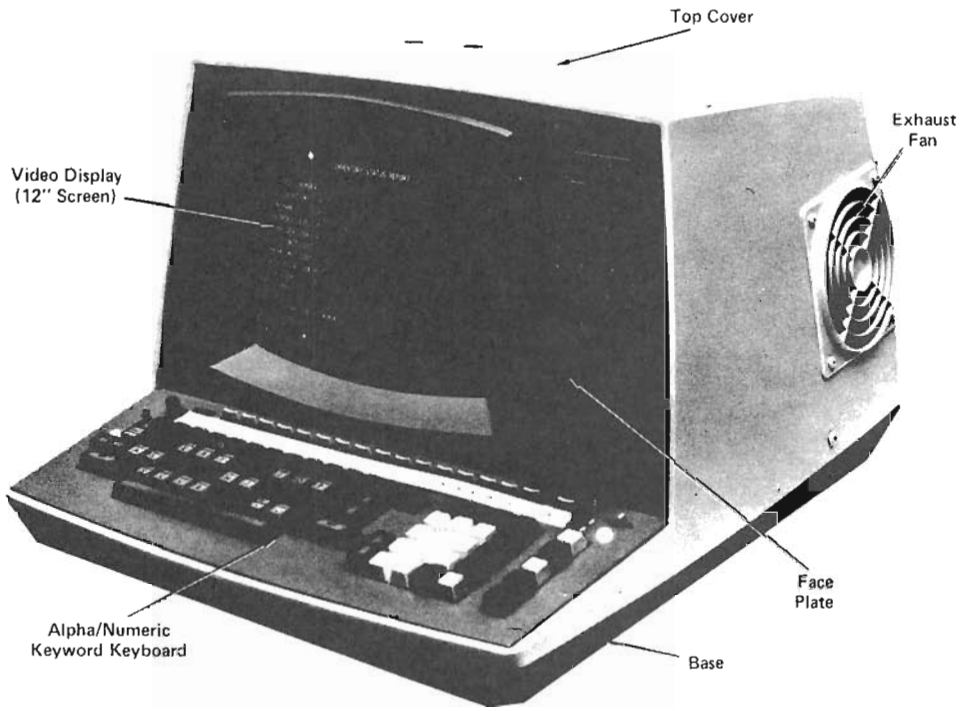


FIGURE 2 2200F(DISK WORK STATION)

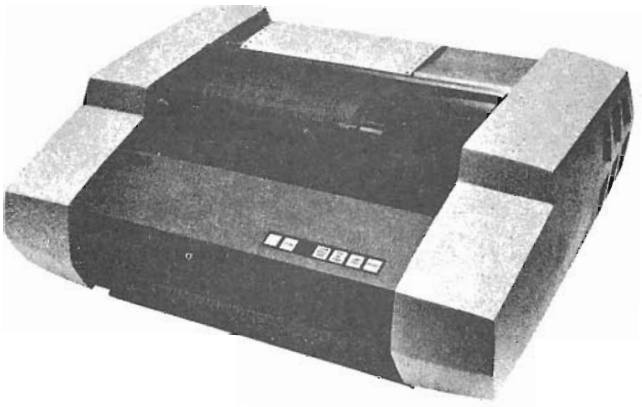


FIGURE 3 2231W HIGH SPEED PRINTER
(ALSO SUPPORTS 2221W)

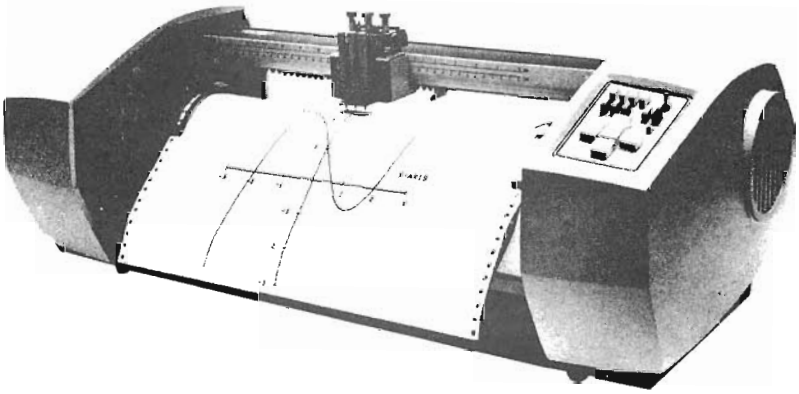


FIGURE 4 2272 DRUM PLOTTER

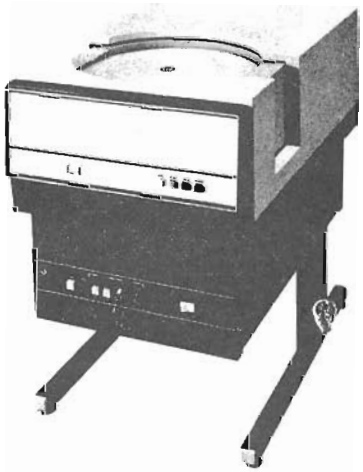


FIGURE 5 2230/2260 DISK DRIVE

1.2 MODEL INFORMATION

1.2.1 *PORTABLE COMPUTER SYSTEMS*

MODEL	DESCRIPTION
2200-PCS-2 (E)	Portable Computing System with 8K bytes, 9 inch CRT (64 x 16 Upper/Lower Case Display) Single Cassette Drive and Keyboard
2200-PCS-4 (E)	Portable Computing System with 16K bytes, 9 inch CRT (64 x 16 Upper/Lower Case Display) Single Cassette Drive and Keyboard
2200-PCS-6 (E)	Portable Computing System with 24K bytes, 9 inch CRT (64 x 16 Upper/Lower Case Display) Single Cassette Drive and Keyboard
2200-PCS-8 (E)	Portable Computing System with 32K bytes, 9 inch CRT (64 x 16 Upper/Lower Case Display) Single Cassette Drive and Keyboard
- -	Upgrade of 8K Bytes of Memory
- -	Upgrade of 16K Bytes of Memory

OPTIONS

OP-60	Keyboard Clicker, Audio Alarm, and Auxiliary CRT Connector
OP-61	Selectric [R] Output Writer

1.2.2 *DISK WORK STATIONS*

MODEL	DESCRIPTION
2200-WS-2 (F)	Disk Work Station with 8K, Keyboard, 12 inch CRT (64 x 16 Upper/Lower Case) and Disk Multiplexer Interface

[R] Registered Trademark, IBM.

MODEL	DESCRIPTION
2200-WS-4 (F)	Disk Work Station with 16K, Keyboard, 12 inch CRT (64 x 16 Upper/Lower Case) and Disk Multiplexer Interface
2200-WS-6 (F)	Disk Work Station with 24K, Keyboard, 12 inch CRT (64 x 16 Upper/Lower Case) and Disk Multiplexer Interface
2200-WS-8 (F)	Disk Work Station with 32K, Keyboard, 12 inch CRT (64 x 16 Upper/Lower Case) and Disk Multiplexer Interface

NOTE: Work Stations are to be used with Hard Disk only.

OPTIONS

OP-60	Keyboard Clicker, Audio Alarm & Auxiliary CRT Connector
OP-61	Selectric® Output Writer
OP-66	80 x 24 Upper/Lower Case CRT (2200F only)
- -	Work Station T Connector (Required on 2nd and subsequent Work Stations; see paragraph 2.5)

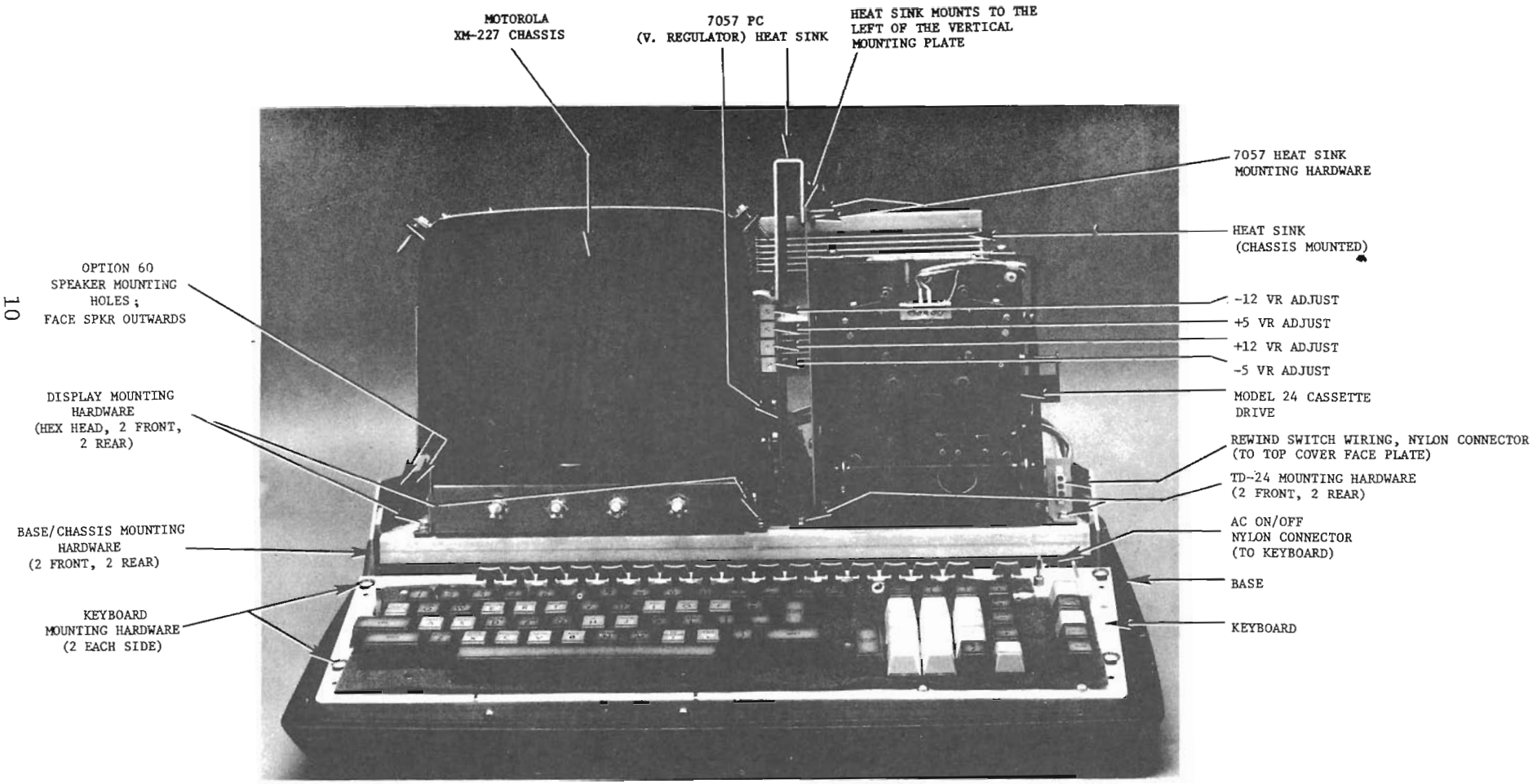


FIGURE 6 2200E; FRONT VIEW/COVER REMOVED

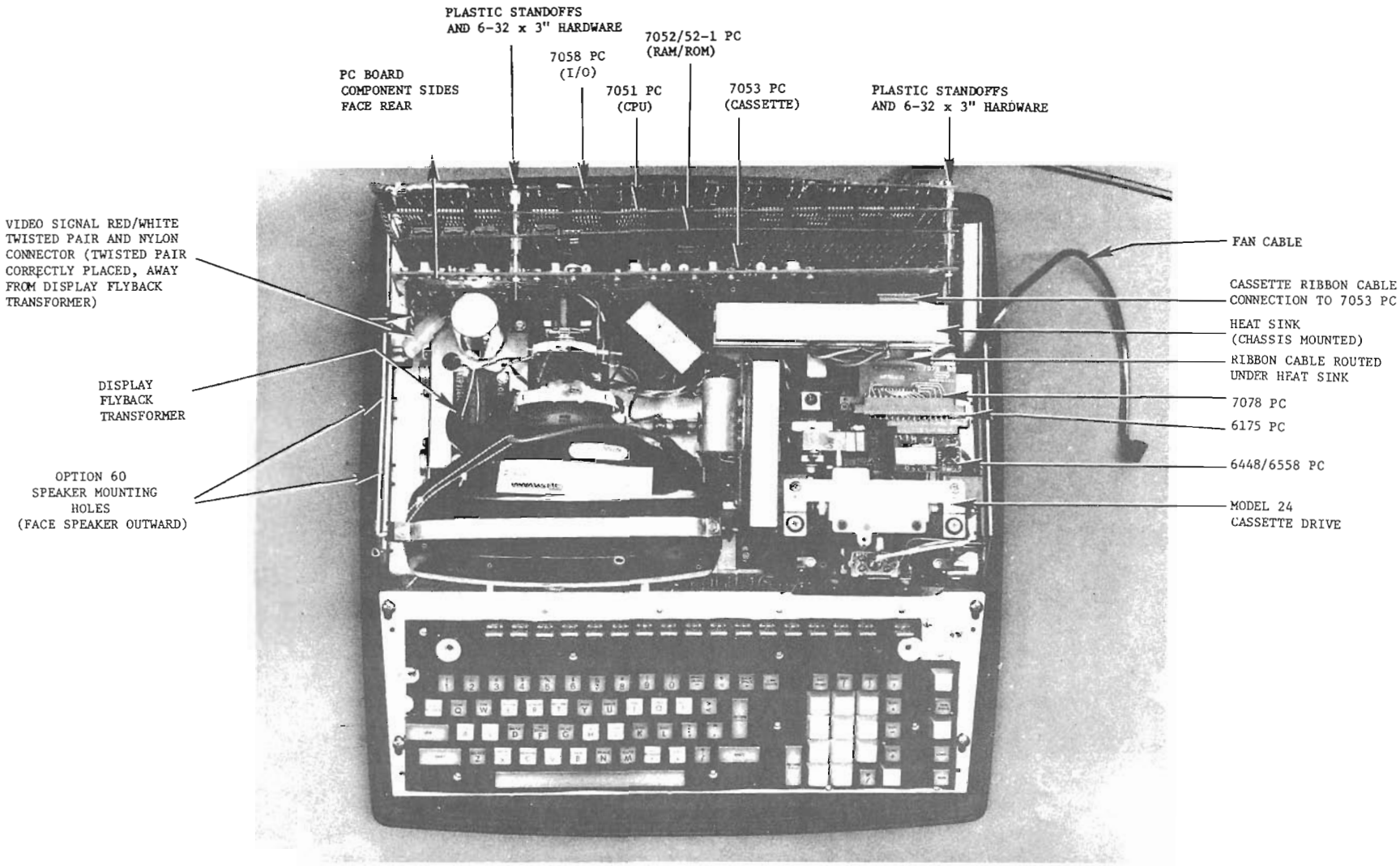


FIGURE 7 2200E;TOP VIEW/COVER REMOVED

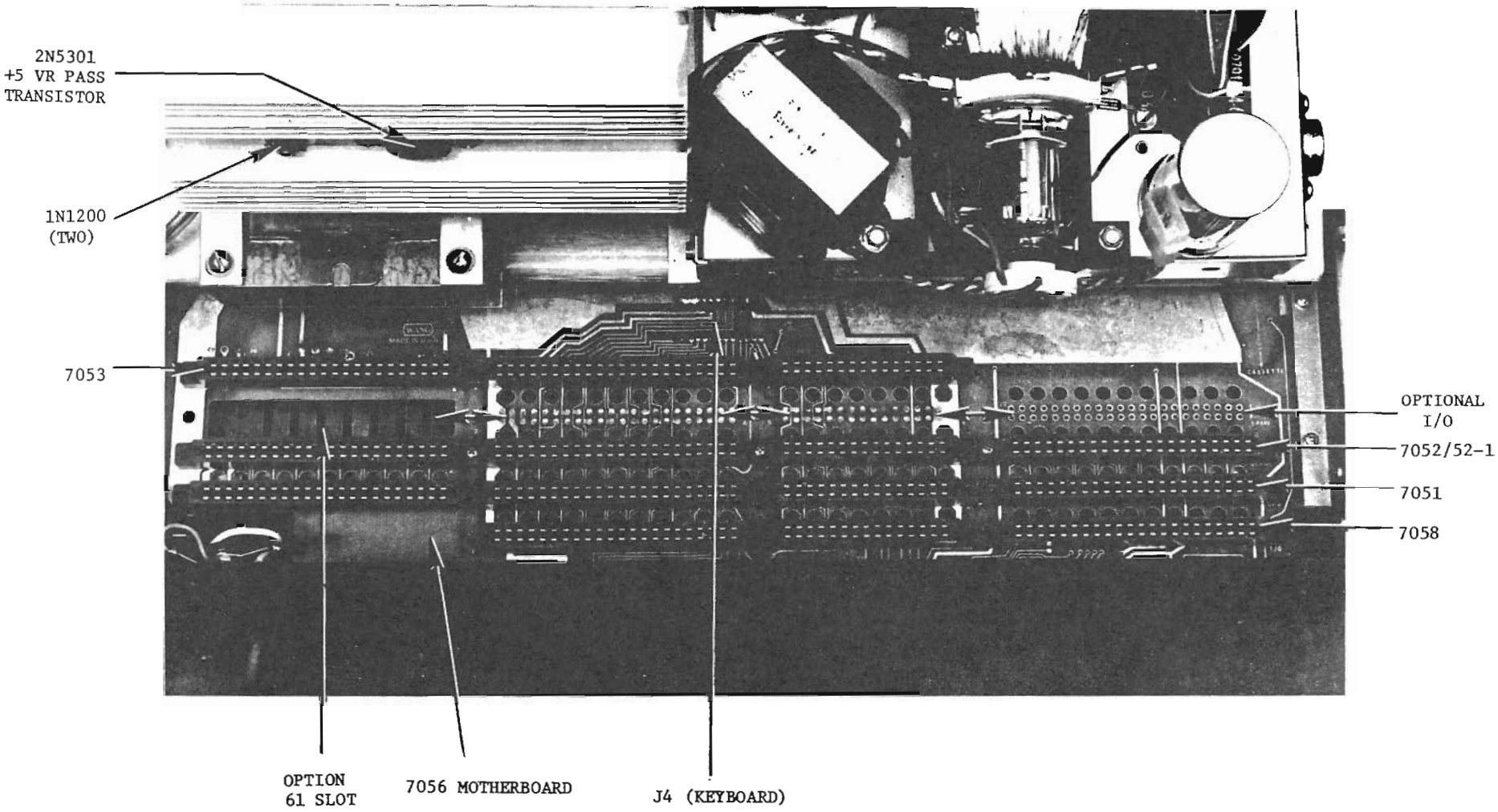


FIGURE 8 2200E; TOP/REAR VIEW/COVER REMOVED

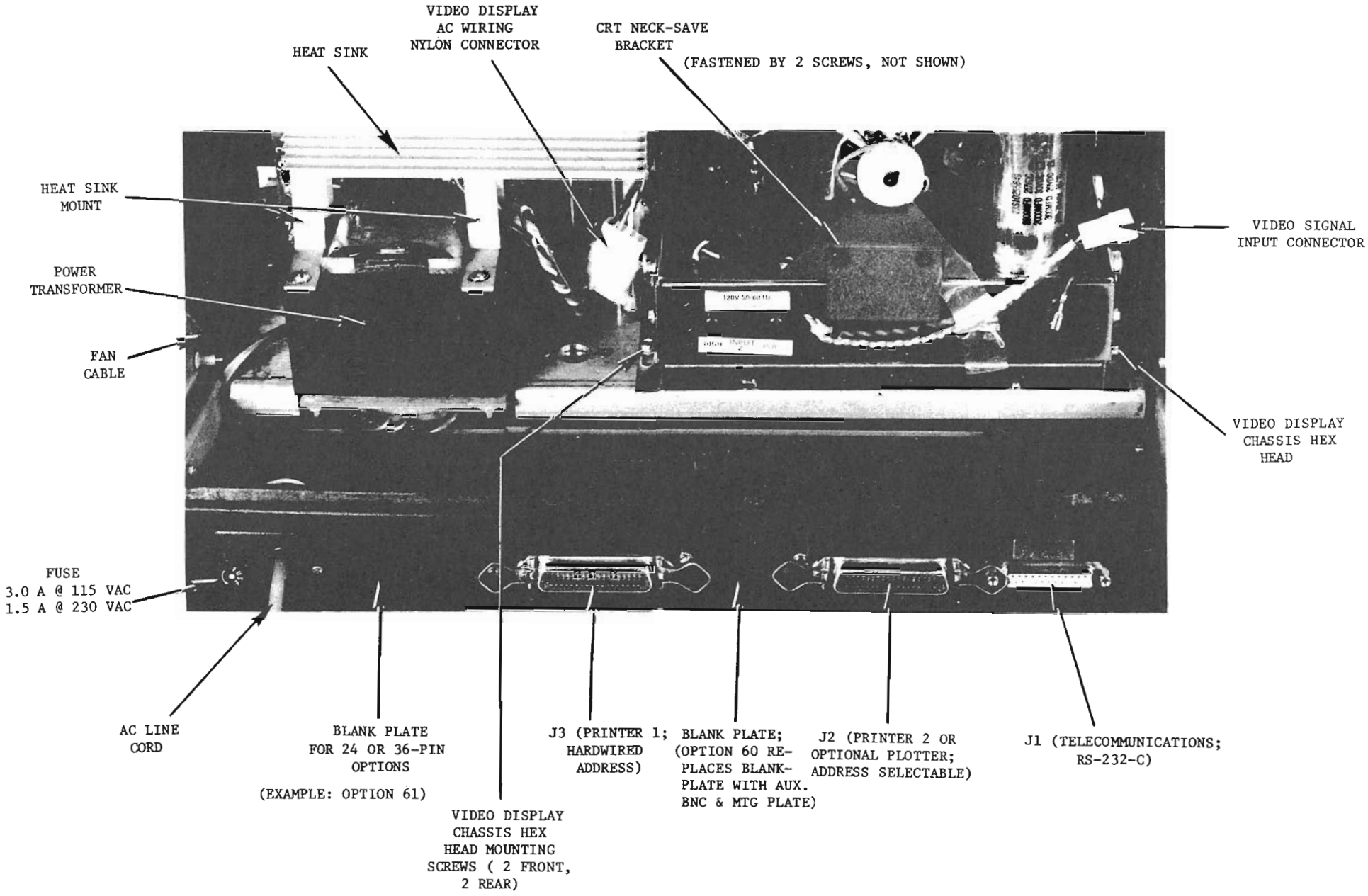


FIGURE 9 2200E; REAR VIEW/COVER REMOVED

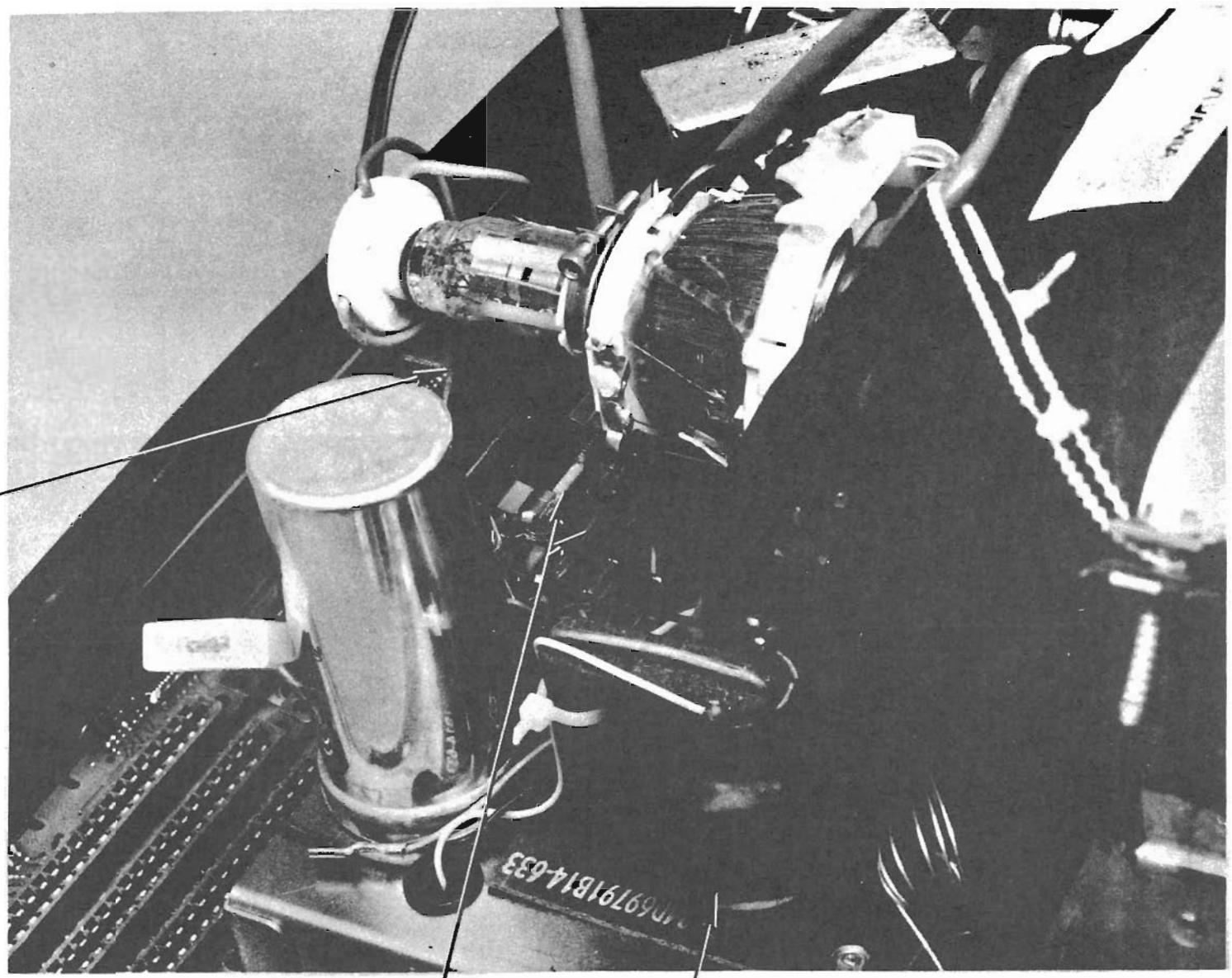


FIGURE 10 2200E; VIDEO DISPLAY (XM-227)

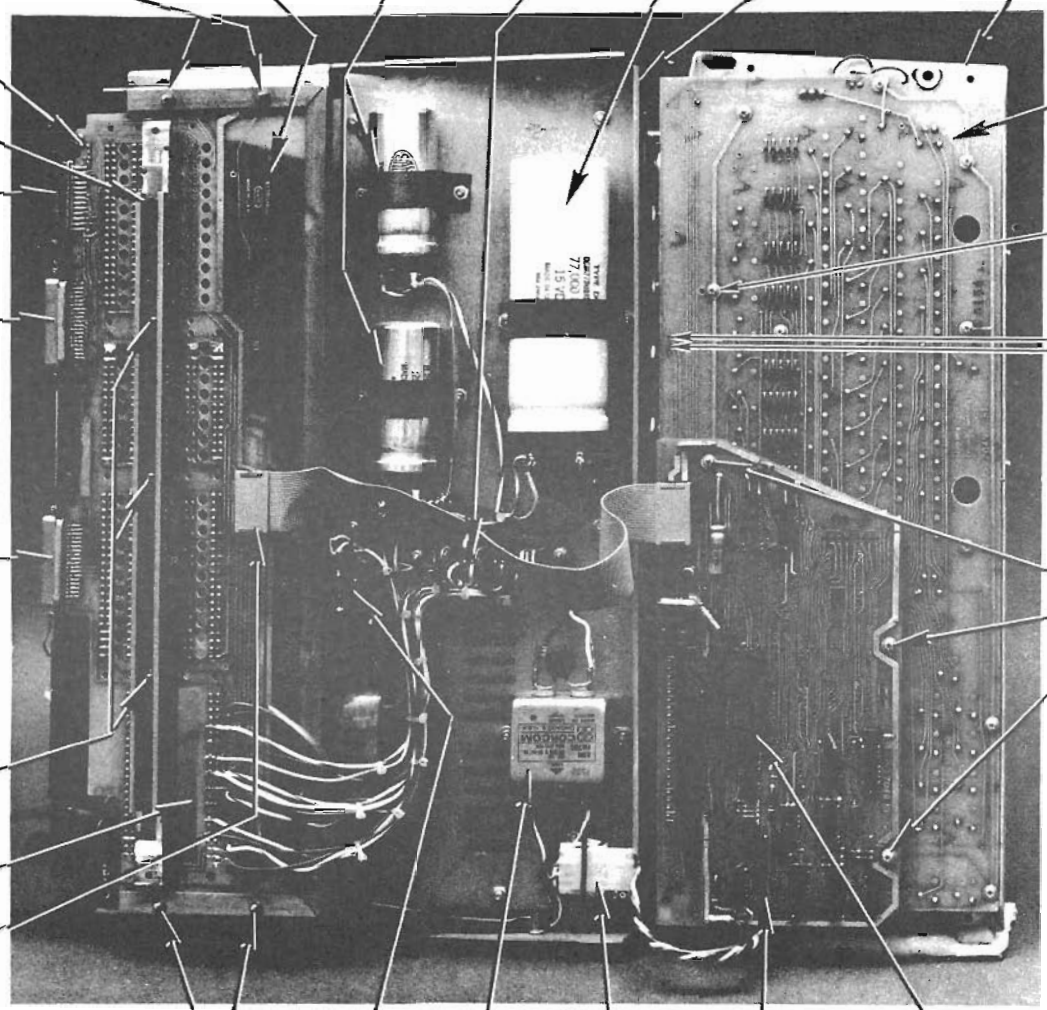


FIGURE 11 2200E; UNDERSIDE VIEW

1.3.2 *DISK WORK STATION (2200F)*

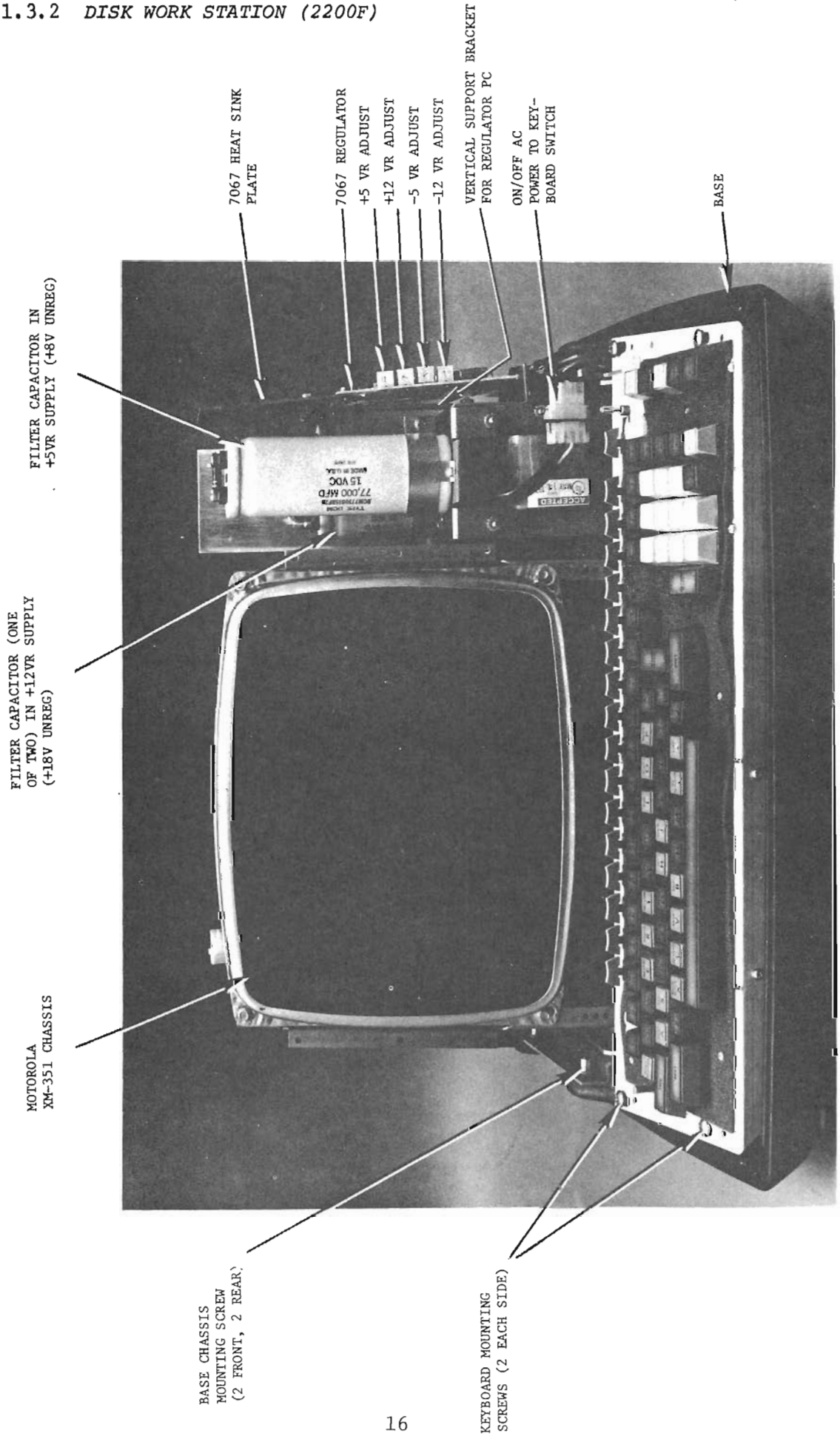


FIGURE 12 2200F; FRONT VIEW/COVER REMOVED

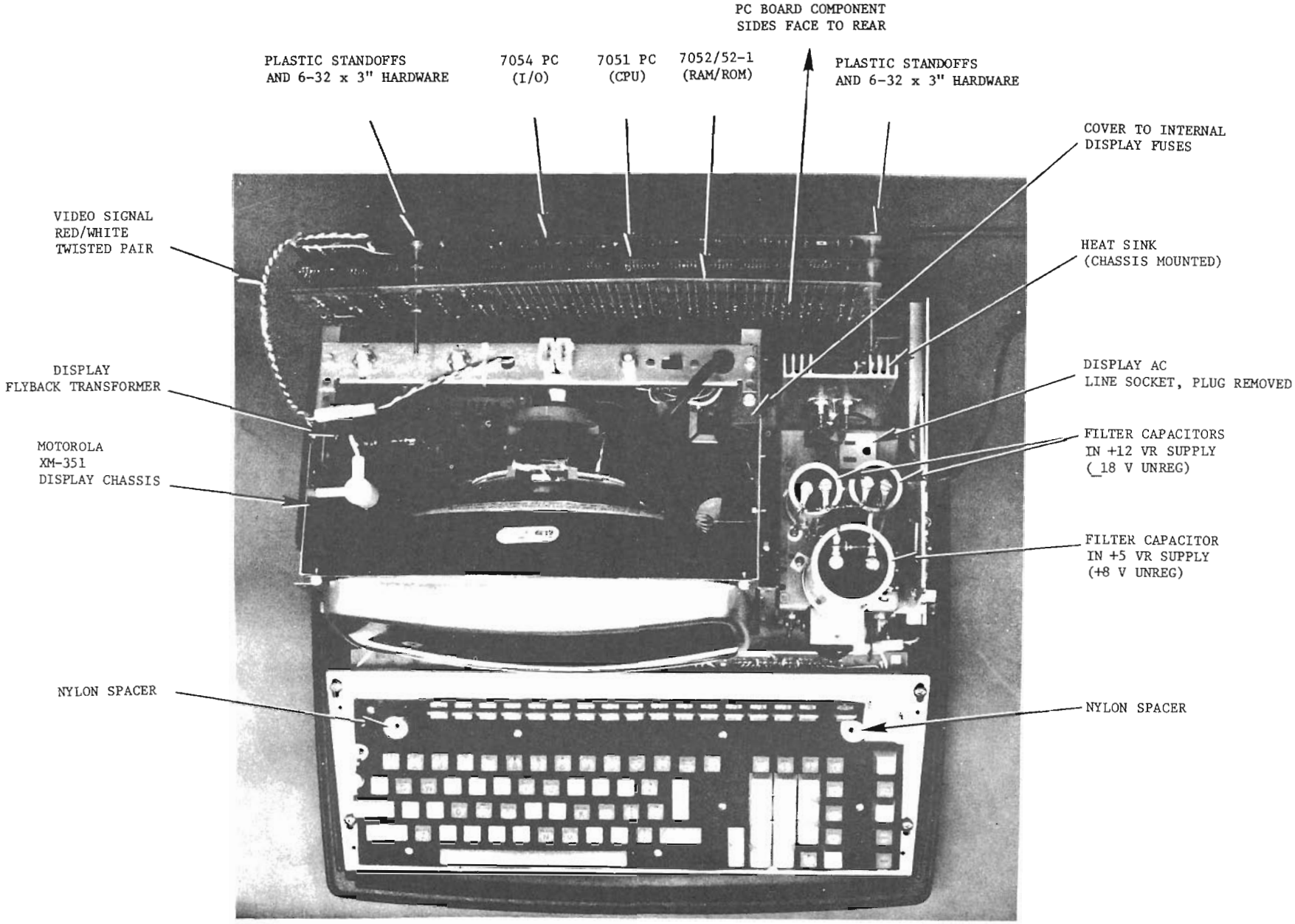


FIGURE 13 2200F; TOP VIEW/COVER REMOVED

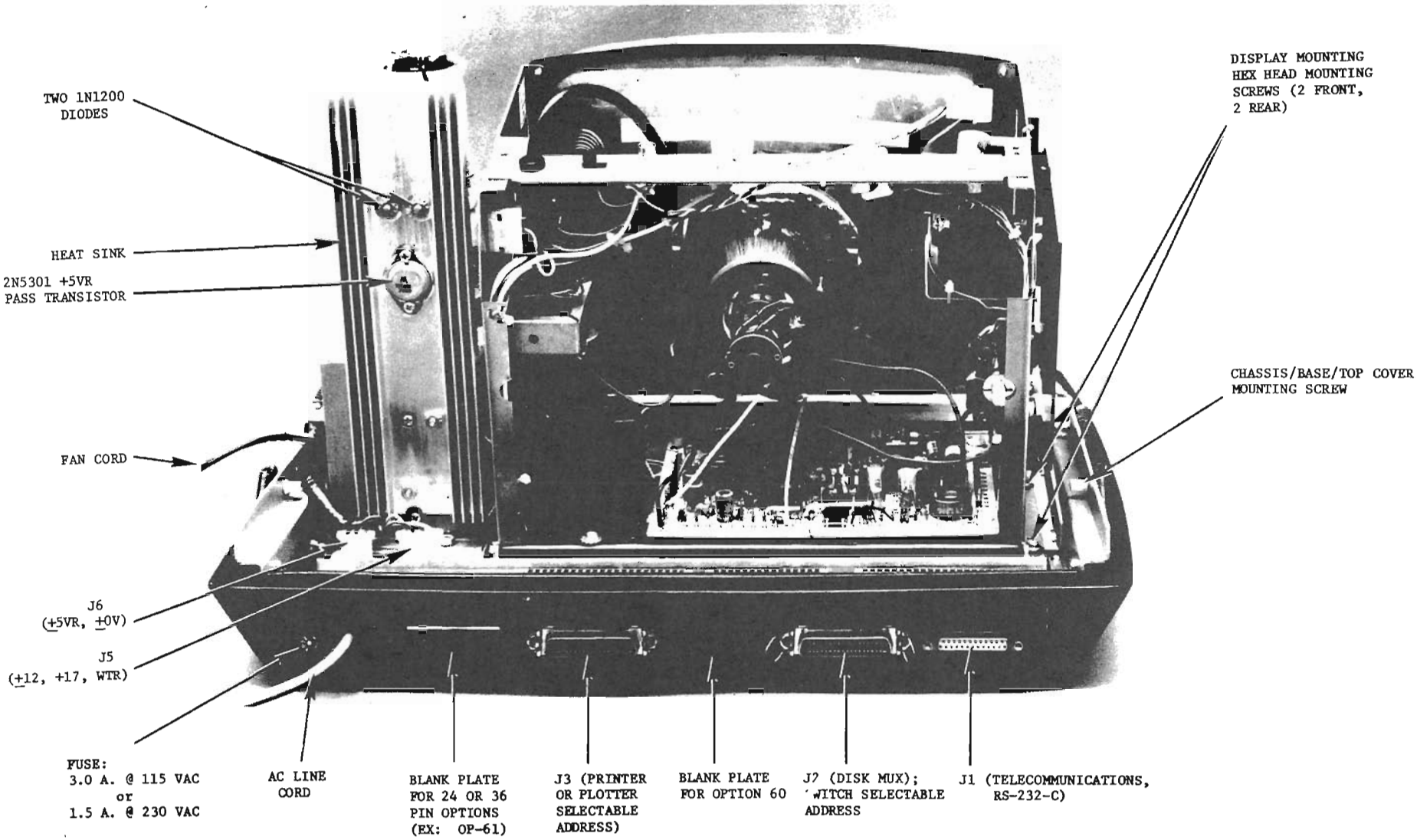


FIGURE 14 2200F; REAR VIEW/COVER REMOVED

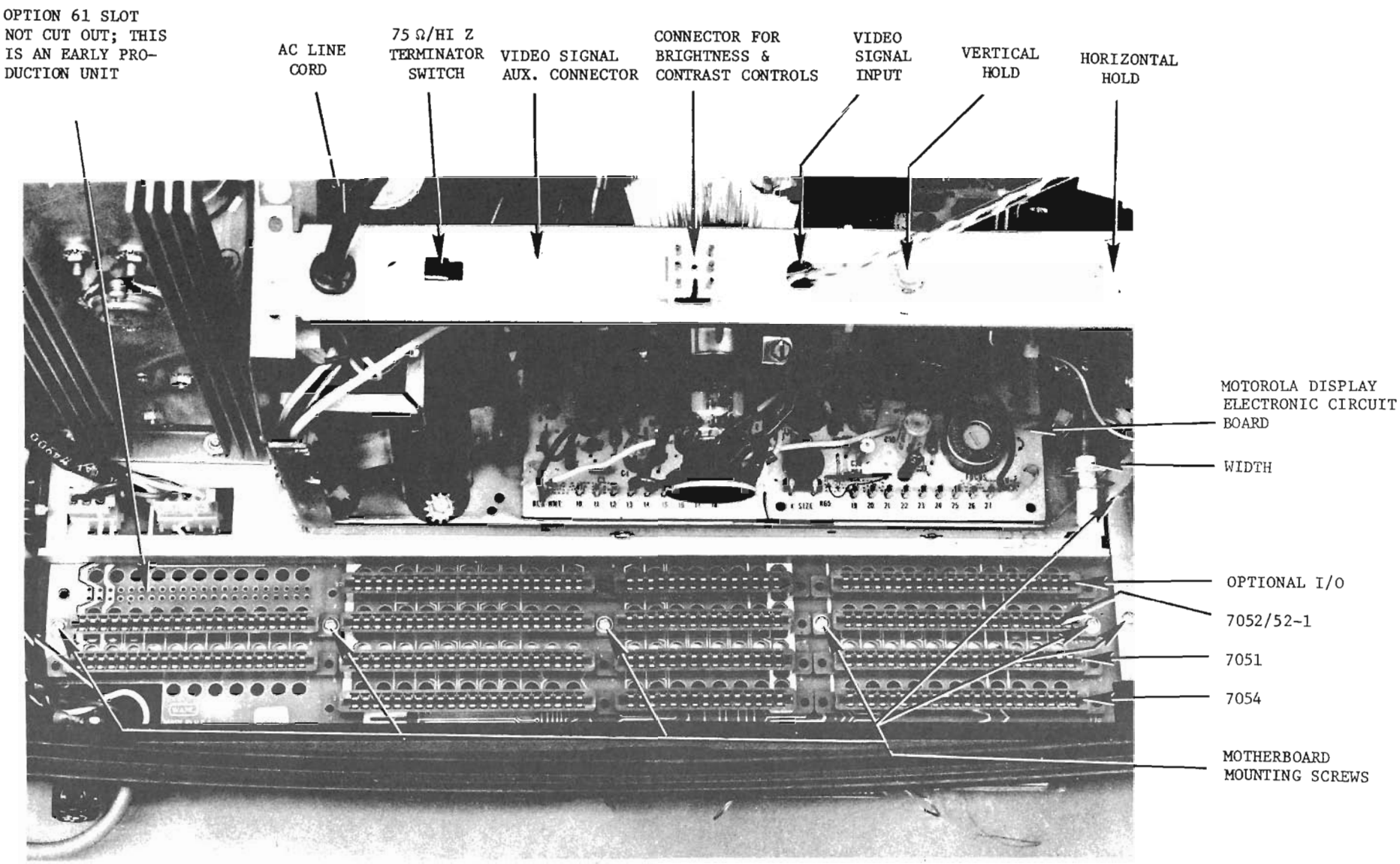


FIGURE 15 2200F; TOP/REAR VIEW/COVER REMOVED

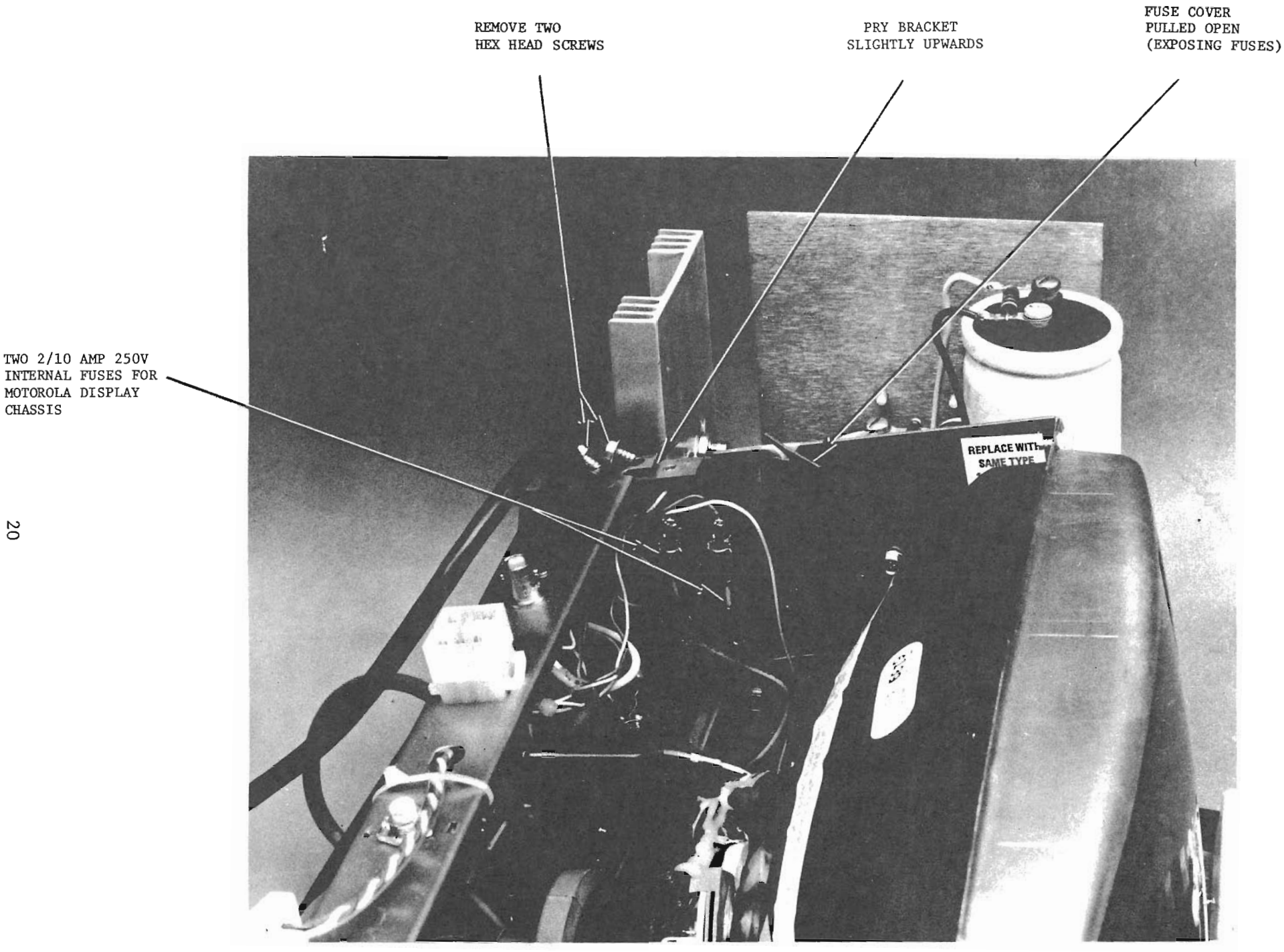


FIGURE 16 XM-351 VIDEO DISPLAY FUSING

1.3.3 *CIRCUIT BOARD SUMMARY (2200E & F)*

CIRCUIT BOARD #	UNIT	BOARD DESCRIPTION
6749	E/F	115/220 AC SWITCH
7048	E/F	KEYBOARD ENCODER
7049	E/F	KEYBOARD
7051	E/F	CPU
7052	E/F	RAM/ROM (8K or 16K RAM)
7052-1	E/F	RAM/ROM (24K or 32K RAM)
7053	E	TAPE DRIVE CONTROLLER
7054	F	VIDEO/PRINTER/DISK CONTROLLER
7055	F	MOTHERBOARD
7056	E	MOTHERBOARD
7057	E	VOLTAGE REGULATOR
7058	E	VIDEO/PRINTER/PLOTTER CONTROLLER
7059	F	OPTION 66; 80x24 VIDEO/PRINTER/DISK.
7061	E/F	OPTION 61 OUTPUT WRITER CONTROLLER
7067	F	VOLTAGE REGULATOR
7068	F	CASSETTE INTERFACE TEST CONTROLLER
7078	E	FINGERBOARD CONNECTOR TO 6175 TD INTERFACE

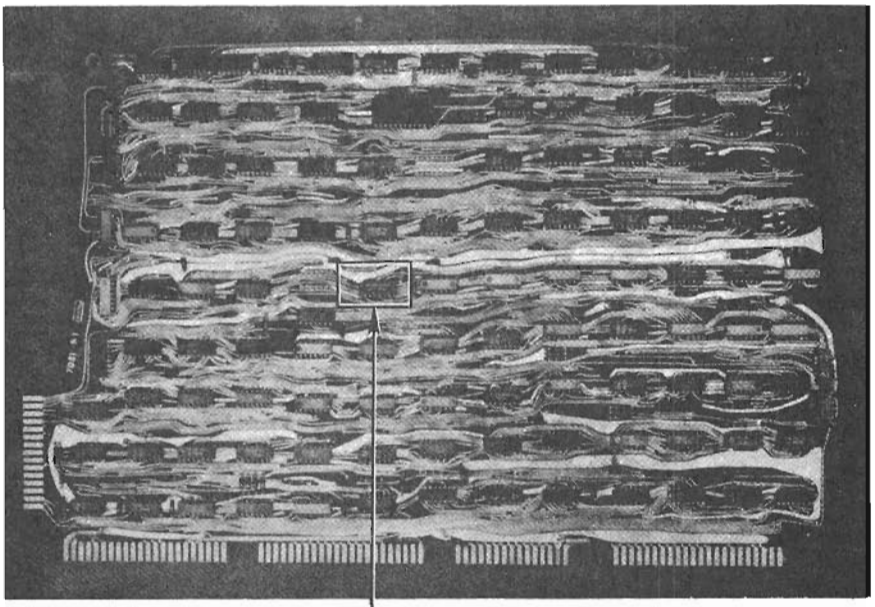


FIGURE 17 7051 PC

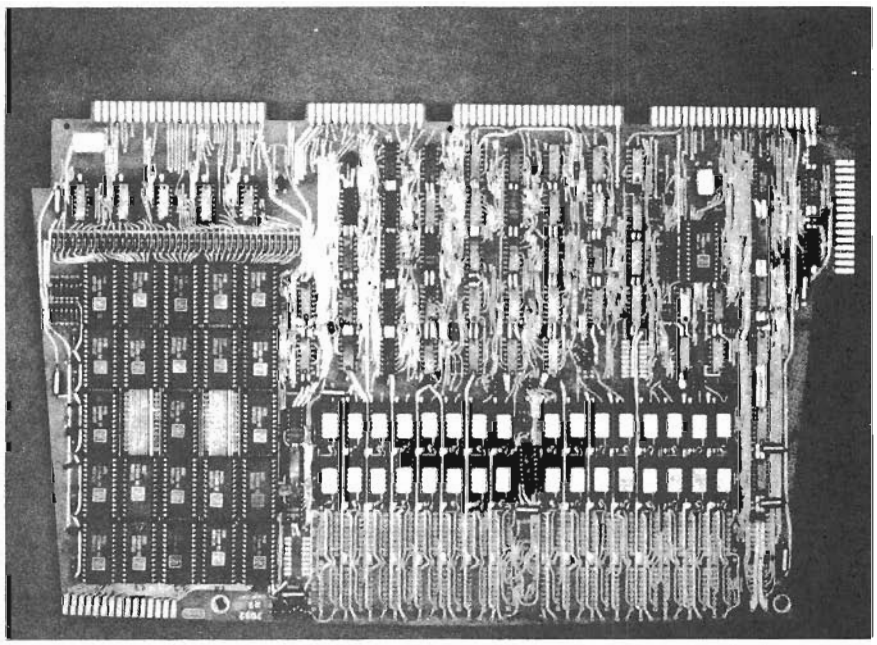


FIGURE 18 7052 PC

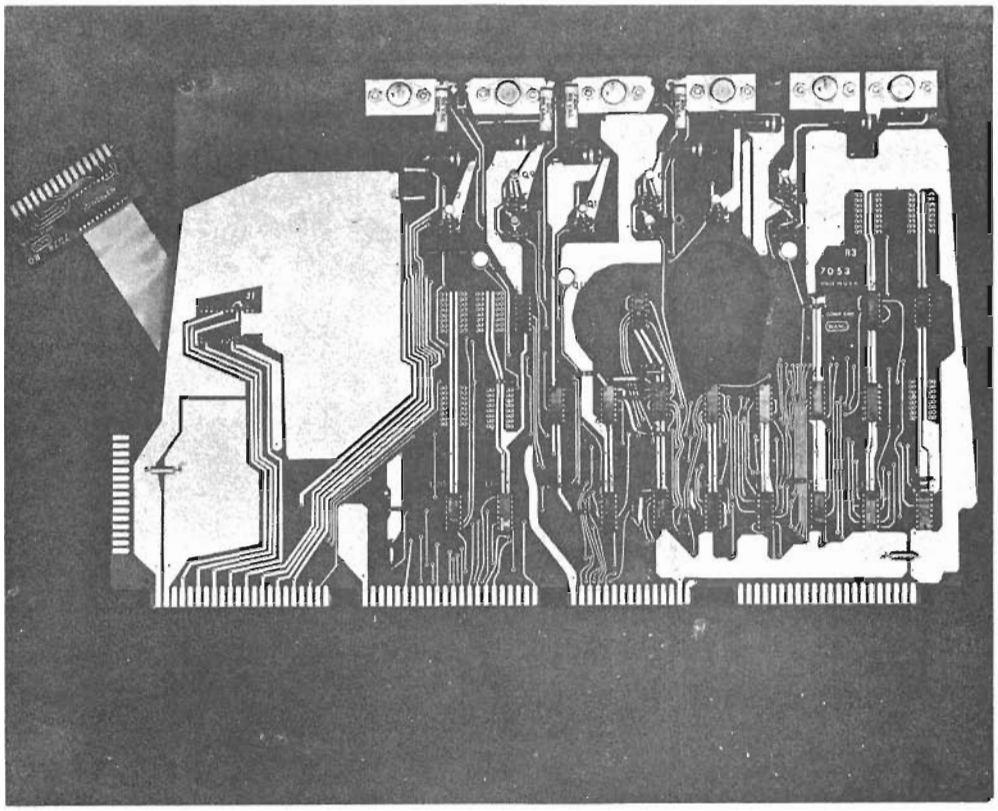


FIGURE 19 7053 PC

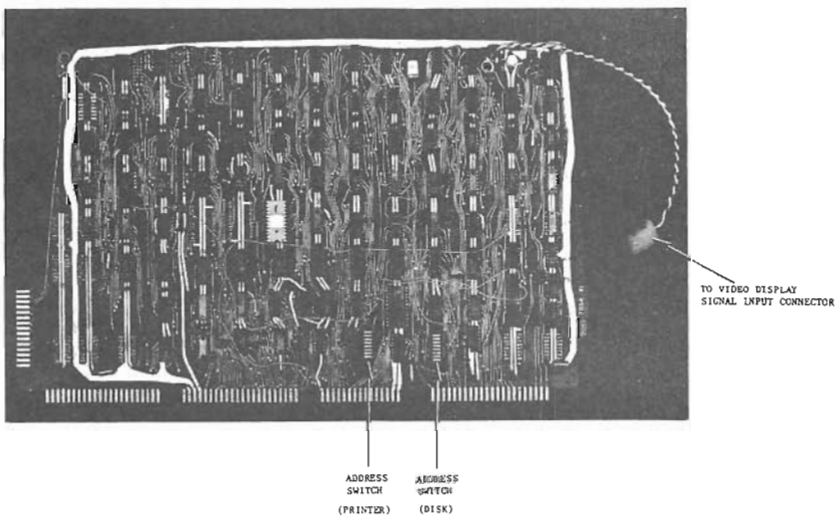


FIGURE 20 7054 PC

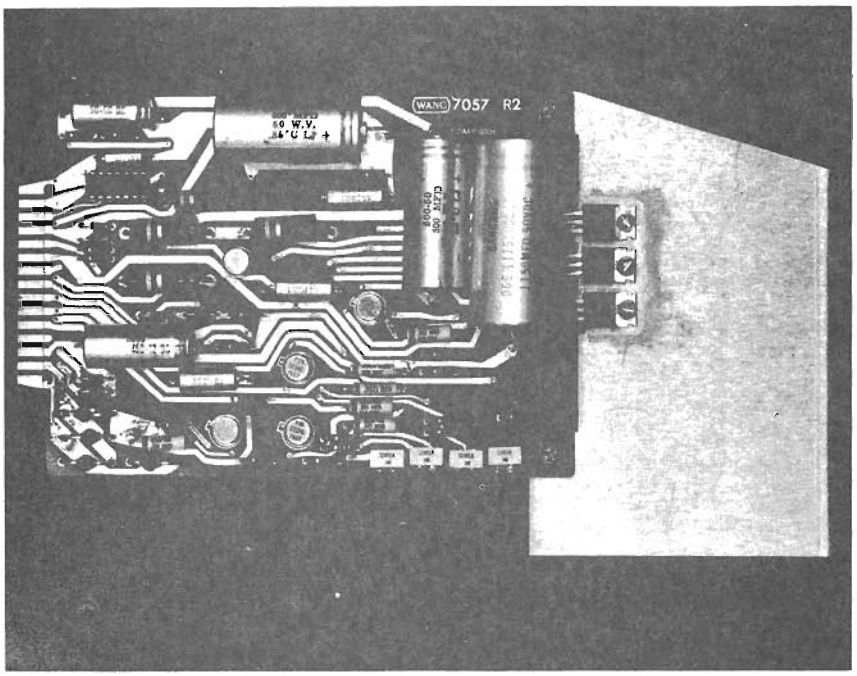


FIGURE 21 7057 PC

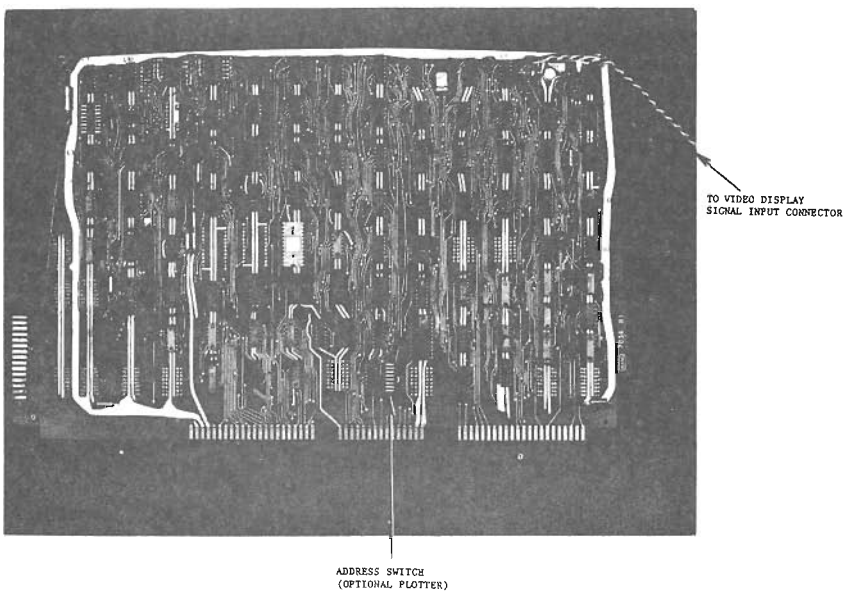


FIGURE 22 7058 PC

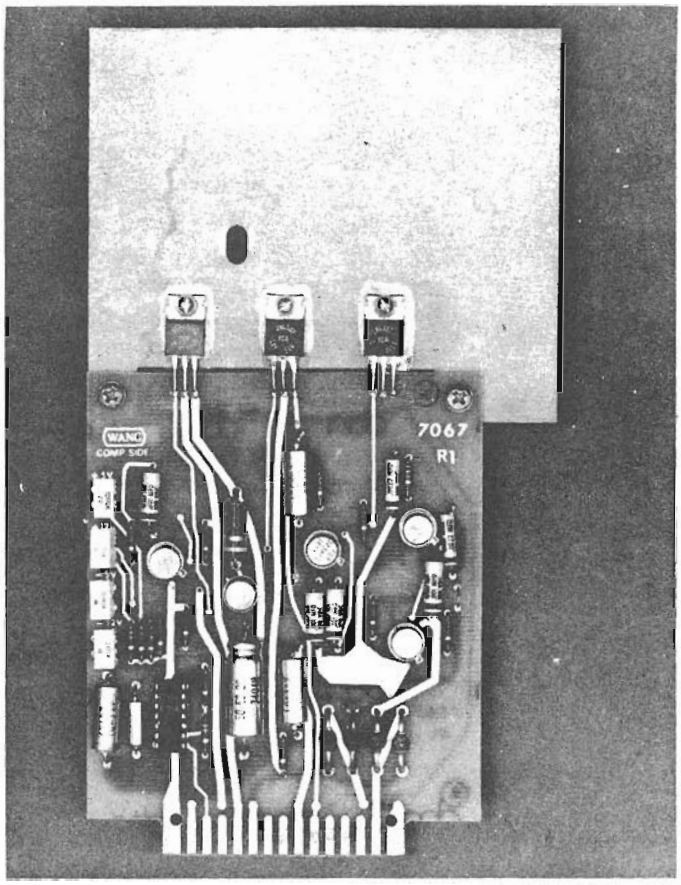


FIGURE 23 7067 PC

1.4 SPECIFICATIONS

1.4.1 *MODEL 2200E (PORTABLE COMPUTER SYSTEMS)*

Unit Size

Height . . . . . 13 1/2 in. (34.3 cm)

Depth . . . . . 20 1/2 in. (52 cm)

Width . . . . . 19 3/4 in. (50.2 cm)

Weight

57 lb (25.8 kg)

Display Size

9 in. diagonal (22.9 cm)

Display Capacity

16 lines, 64 char/line

Character Size

Height . . . . . 125 in. (.32 cm)

Width . . . . . 125 in. (.32 cm)

Cassette Drive

Stop/start time . . . . . .09/.05 sec

Capacity

Approximately 300 automatically formatted dually recorded 256 byte physical records per 150 ft cassette (i.e., approx. 76,800 bytes).

Recording/Search Speed

7.5 in./sec (19 cm/sec)

Transfer Rate

326 bytes/sec (including dual recording on interrecord gaps).

Rewind Speed

7.5 ft/sec (2.3 m/sec)

Power Requirements

115 or 230 VAC $\pm$ 10%

50 or 60 Hz $\pm$ 1/2 Hz

Wattage

260W

External Fuses (One)

3a @ 115V/60 Hz

1.5a @ 230V/50 Hz

Internal Fuses (Two)

Display Chassis; 2/10 amps @ 250V each; see Figure 10.

Operating Environment

50°F to 90°F (10°C to 32°C)

20% to 80% relative humidity, allowable

35% to 65% relative humidity, recommended

Memory

8K, 16K, 24K, 32K

Subroutine Stacking

44

1.4.2 *MODEL 2200F (DISK WORK STATIONS)*

Size

Height . . . . . 13 1/2 in. (34.3 cm)

Depth . . . . . 20 1/2 in. (52 cm)

Width . . . . . 19 3/4 in. (50.2 cm)

Weight

54 lb (24.5 kg)

CRT

Display Size . . . . . 12 in. diagonal (30.4 cm)

Capacity . . . . . 16 lines, 64 characters/line

Character Size

Height . . . . . 0.20 in. (0.51 cm)

Width . . . . . 0.12 in. (0.30 cm)

Optional CRT

Display Size . . . . . 12 in. diagonal (30.4 cm)

Capacity . . . . . 24 lines, 80 characters/line

Character Size

Height . . . . . .16 in. (0.41 cm)

Width . . . . . .09 in. (0.23 cm)

Power Requirements

115 or 230 VAC $\pm$ 10%

50 or 60 Hz $\pm$ 1/2 Hz

Wattage

200W

External Fuses (One)

2.5a @ 115V/60 Hz

1.2a @ 230V/50 Hz

Internal Fuses (Two)

Display Chassis; 1/2 amp @ 250V each; see Figure 10.

Operating Environment

50°F to 90°F (10°C to 32°C)

20% to 80% relative humidity, allowable

35% to 65% relative humidity, recommended

Cabling

Extension cables are available in lengths of 25 (WL #120-2225-25), 50 (WL #120-2225-50), 100 (WL #120-2225-1), and 200 (WL #120-2225-2) feet. The extension cable is coupled with a standard 12 foot connector cable to permit an increased distance between successive systems in the chain. Extension cables may be coupled together; thus the maximum distance between a pair of systems in the multiplexer chain is 512 feet (two 200-foot extension cables, a 100-foot extension cable plus a standard 12-foot connector cable). The maximum distance between CPU #1 and CPU #4 in a four-station configuration is 536 feet (two 200-foot extension cables and one 100-foot extension cable, plus three standard 12-foot cables). The disk I/O cable connecting the disk to CPU #1 (the CPU containing the 2230MXA master board) cannot be extended; the maximum distance between CPU #1 and the disk is 12 feet. For the second and subsequent Work Stations, T connectors must be ordered. See paragraph 2.5, item 1.

Memory

8K, 16K, 24K, 32K

Subroutine Stacking

44

SECTION 2
INSTALLATION

2.1 SYSTEM AC POWER REQUIREMENTS

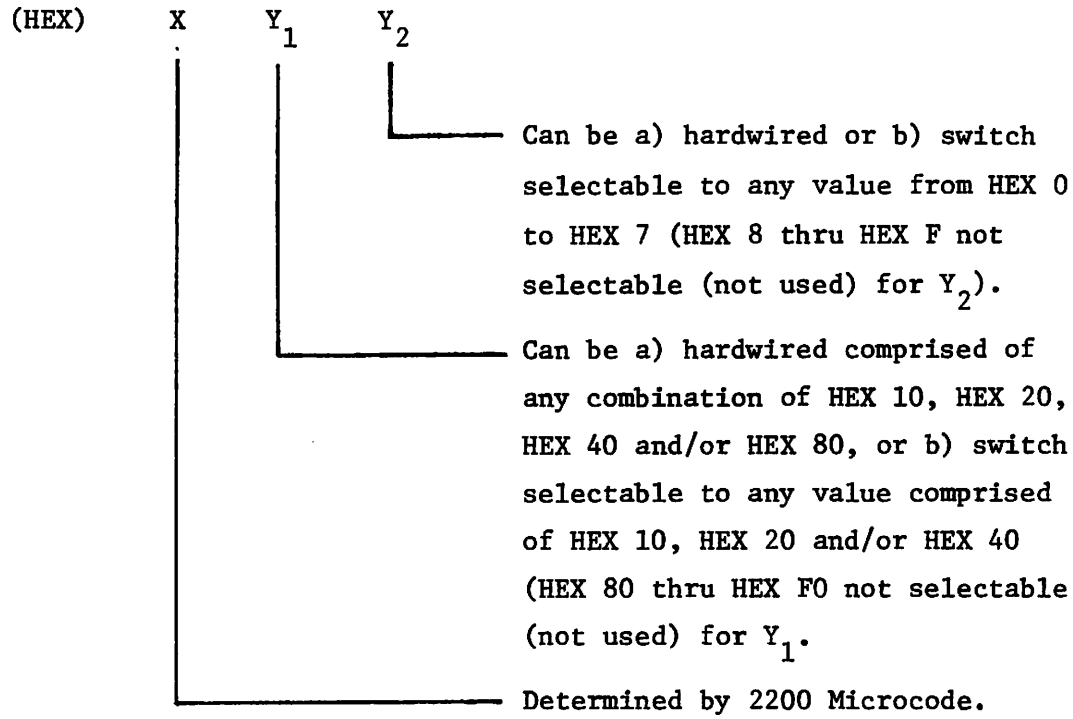
As outlined on page 2-1 of the 2200 Maintenance Manual, a suitable location with a dedicated AC power line should be selected for any 2200 System. This requirement is easily met with the 2200F, since primary use of the WS is in a WCS-30 system and will probably be installed in a permanent location. The 2200E, however, because it is 'portable', apparently dictates that any AC power outlet can be used. In most cases this is true; however, the unit should not be plugged into the same AC line as electrical machinery, air conditioners, large office machines, refrigerators, etc. Intermittent errors or program errors might result.

2.2 DEVICE ADDRESS ASSIGNMENTS

Note that only addresses HEX 001 and 005 are available for primary console devices; these two addresses are hardwired and not switch-selectable. Also note that the 7061 (Option 61, Output Writer Controller) PC uses standard address switch setting procedures per 2200SSYSTEMS MAINTENANCE MANUAL.

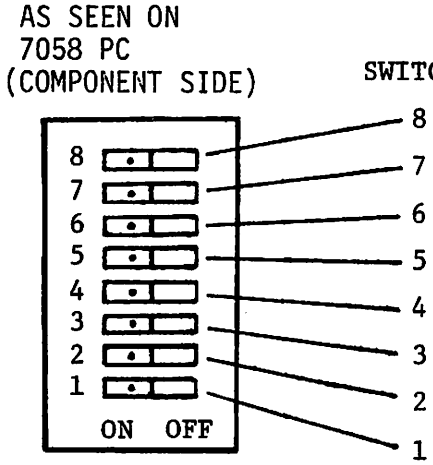
Unlike overall 2200 System address switch settings, on the 7054, 7058, and 7059 pc boards, only *one* rocker in an eight - rocker address switch bank is set ON for the desired device address. Each rocker, when set ON, represents a unique HEX address digit ("Y_1" or "Y_2" but not both; entire address = HEX XY_1Y_2). Note that if Y_1 is switch-selectable, Y_2 is hardwired; conversely, if Y_2 is switch-selectable, Y_1 is hardwired (Example: 7054 pc, Figure 20). Rocker SW_8 is not used in current 2200 E/F device address assignments. "Y_1" or "Y_2", when switch selectable, may be made up of one to three HEX digits (HEX 10, HEX 20, HEX 40).

Device Address Settings in 2200 E&FF(Excluding 7061 PC):



2.2.1 *SETTING THE I/O ADDRESSES (2200E)*

One address switch is mounted on the 7058 I/O controller. The CRT, KB and PRINTER are hardwired to HEX X05, X01 and X15 respectively ("X" is set by 2200 microcode). The switch provides a selectable address for the optional plotter. The switch only provides the low order HEX address digit Y_2 for the plotter; the high order address Y_1 is hardwired to '10' (i.e., the switch allows 'Y' to be selected in the address X1Y). To set the address, refer to the following list:



SWITCH	HEX ADDRESS
8	X (NOT USED)
7	17
6	16
5	X (NOT USED)
4	14
3	13
2	12
1	11

NOTE: In general HEX XY_1Y_2 format:
Y_1 = Hardwired
Y_2 = Switch Selectable

FIGURE 24

2.2.2 *SETTING THE I/O ADDRESS (2200F)*

There are two address switches on the 7054/7059 I/O controller. SW1 is used to set the printer address and SW2 to set the disk address. The KB and CRT are hardwired to X01 and X05 respectively. To set the printer address:

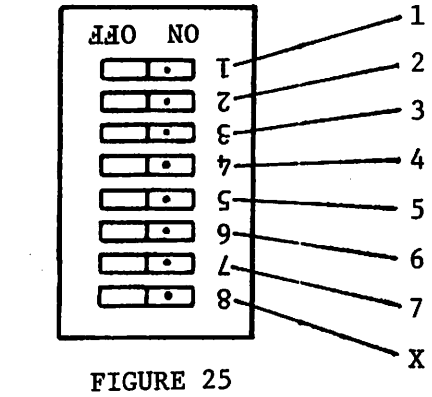


FIGURE 25

NOTE: In general HEX XY_1Y_2 format:
Y_1 = Hardwired
Y_2 = Switch Selectable

Note that the HEX high order 1 (2nd HEX address digit) is hardwired in this case, and is not selectable. To set the Disk Address for the Work Station: (Note - If two addresses are required such as 310 and 350, BOTH switches must be ON.)

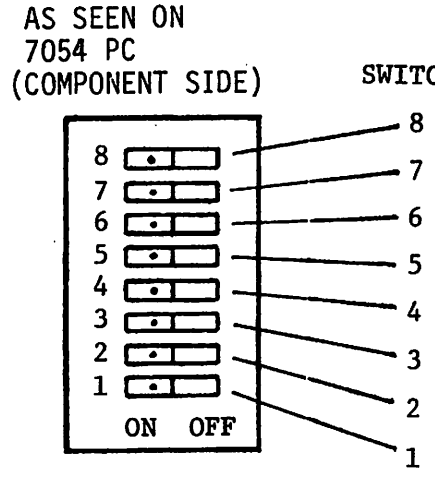


FIGURE 26

NOTE: In general HEX XY_1Y_2 format:
Y_1 = Switch Selectable
Y_2 = 0

2.3 RAM SIZE SELECTION

RAM size selection in the 2200 E/F is very similar to that used in previous 2200 CPU's, except that jumper wires are installed on the 7051 CPU board (see Figures 17 and 27) for the *four* RAM size variations available. No other variations are possible.

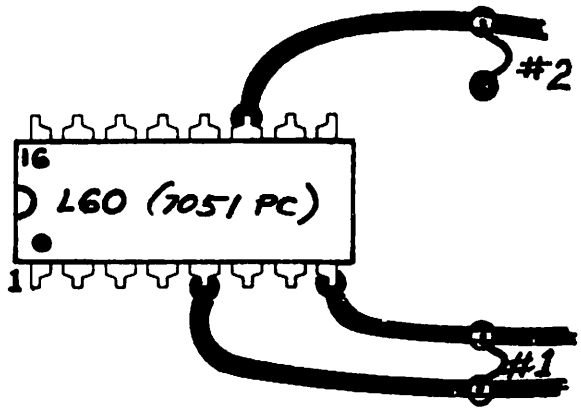


FIGURE 27 RAM SIZE JUMPER CHANGES

MEMORY SIZE	JUMPER(S) INSTALLED
8K	Neither
16K	'1' only
24K	'2' only
32K	Both

2.4 INCOMING INSPECTION

Until further notice, 2200E and 2200F units are being shipped with all logic boards removed from the chassis/motherboard.

When a 2200E (PCS)/2200F (WS) shipment arrives, partially disassemble the Display/Cassette/Keyboard user terminal as described in steps a) thru c), paragraph 7.3.

The separate logic boards, transported in the same shipping container, must be carefully inserted into the 2200 E/F motherboard.

Insert boards according to the following procedure: (Ref: Figures 6-16 in paragraph 1.3).

1) 7053 PC - 2200E ONLY

Place the 7053 near its motherboard connector with 7053 component side facing rear and with plastic standoffs (in upper corners of each pc) also facing rear. Without twisting the Cassette Ribbon Cable/7078 Connector pc, route this ribbon cable *under* the heat sink and plug the 7078 pc into the 6175 connector. Pins 1 thru 15 of the 7078 connector pc should be facing up. Place 7053 into its correct motherboard slot (shown in Figures 8 and 7). Press firmly downward on alternate ends of the board until it becomes firmly seated in its motherboard connector. Component side faces rear of unit.

2) 7052/7052-1 PC

With component side facing *rear*, and with plastic board standoffs facing *front*, insert 7052/7052-1 into the correct motherboard slot (shown in Figures 7 and 8 or 13 and 15). Press firmly downward on alternate ends of the board until it becomes firmly seated in its motherboard connector.

3) 7051 PC

Same procedure as for 7052 pc.

4) 7058 PC (2200E)/7054 (2200F)/7059 (80 X 24 DISPLAY; 2200F)

Same procedure as for 7052. The 7058/7059/7054 Video connector mates to the Motorola chassis video signal input via red/white twisted pair and a nylon polarized connector.

5) Plastic Standoffs

Insert one 6-32 x 3" screw through each of the plastic board standoffs on one side of the pc boards. Repeat same for

opposite side of pc boards. Note that on 2200F units, the standoff screw on the heat-sink side of the unit must be slightly shorter than 6-32 x 3". Secure each of the two 6-32 standoff screws with a 6-32 hex nut (one hex nut for each standoff screw). Do not overtighten 6-32 nuts in order to prevent breakage of plastic standoffs for each pc board.

6) Reassemble unit per instructions in paragraph 7.7.

2.5 INSTALLATION PROCEDURE

1. See 2200 Maintenance Manual for installation of 2200 Systems (device address switch settings do not apply).

NOTE:

Do not apply power to the 2200E or 2200F without the cover in place. The airflow provided by the fan is necessary to prevent overheating of the unit.

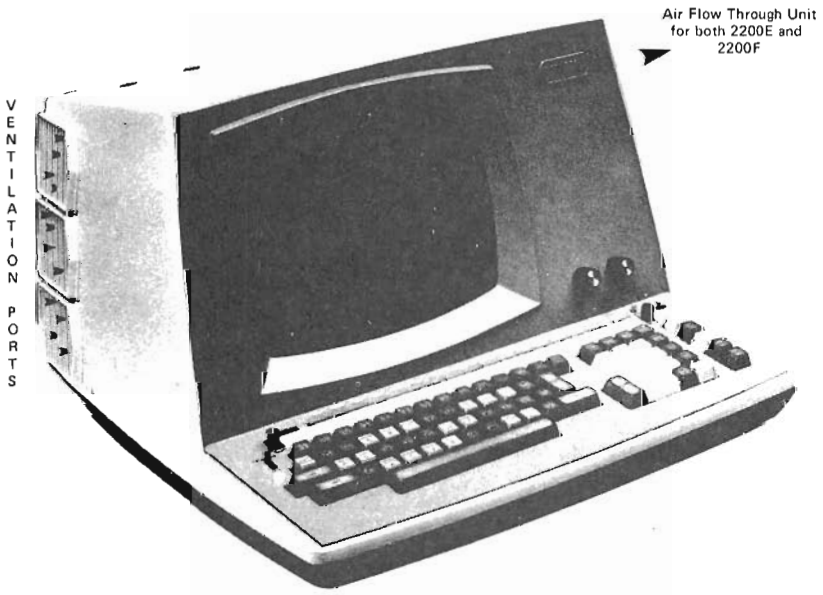
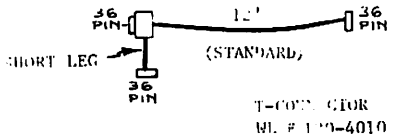


FIGURE 28

A configuration guide for 2200F follows:



T-CONNECTOR
WL # 120-4010

Do not exchange connections shown for the 12' and 2' cable legs from a "T" connector; the 12' cables must always be in the locations illustrated in these configurations.

FIGURE 29

WL# 120-2225-25 FOR 25'
WL# 120-2225-50 FOR 50'
WL# 120-2225-1 FOR 100'
WL# 120-2225-2 FOR 200'

* Extension cabling may be inserted at 'A', 'B', and/or 'C', but total *extension cabling* between units may not exceed 500 feet (does not include any standard 12 foot cable lengths from units or 'T' connectors.

FIGURE 30

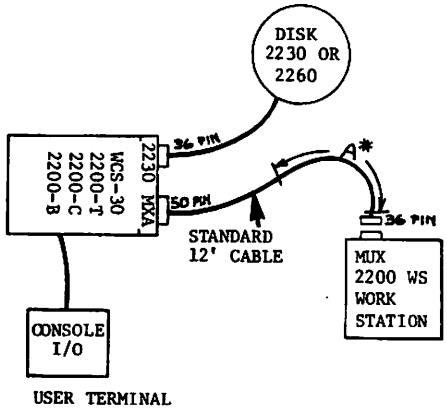


FIGURE 31

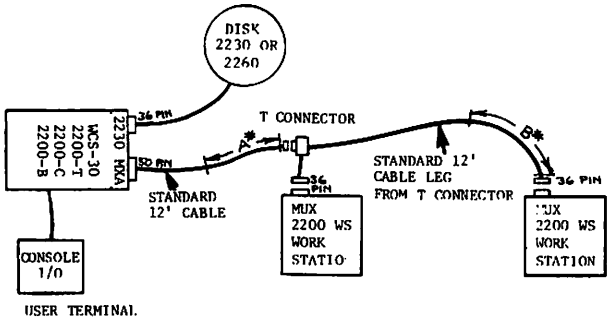


FIGURE 32

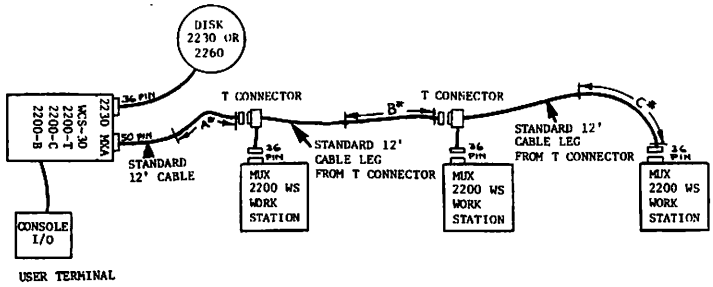


FIGURE 33

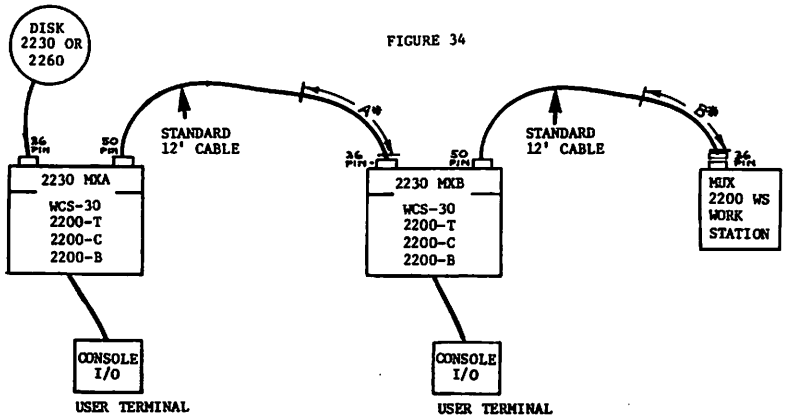


FIGURE 34

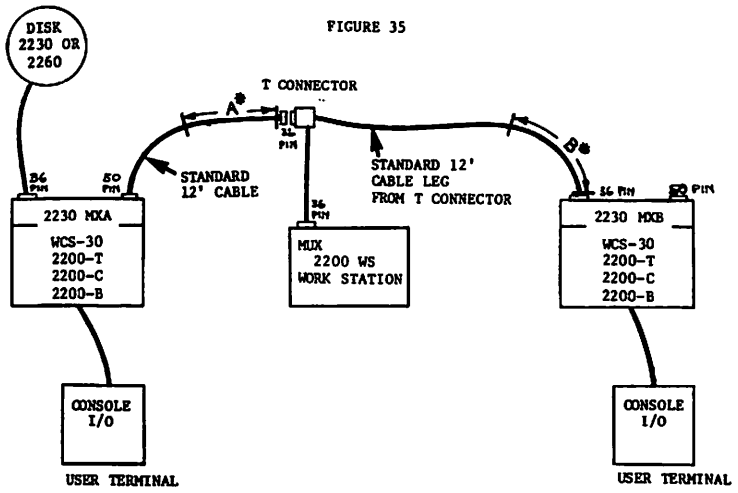


FIGURE 35

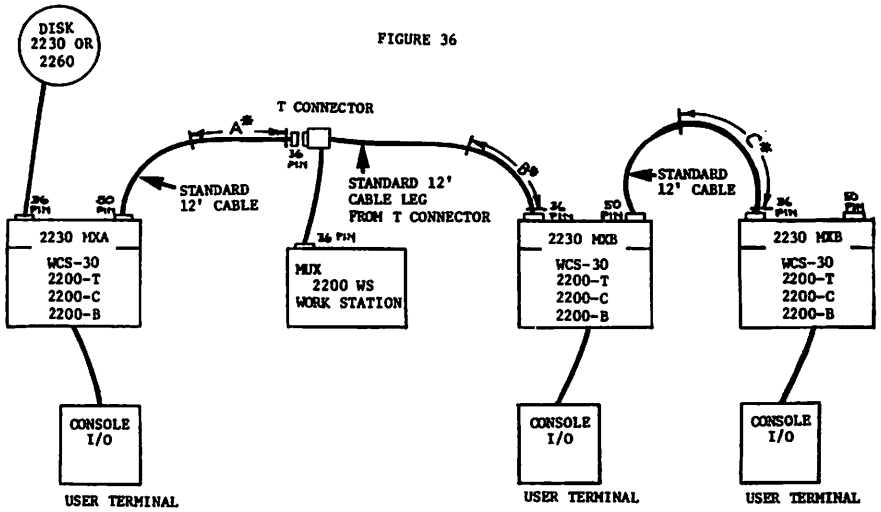
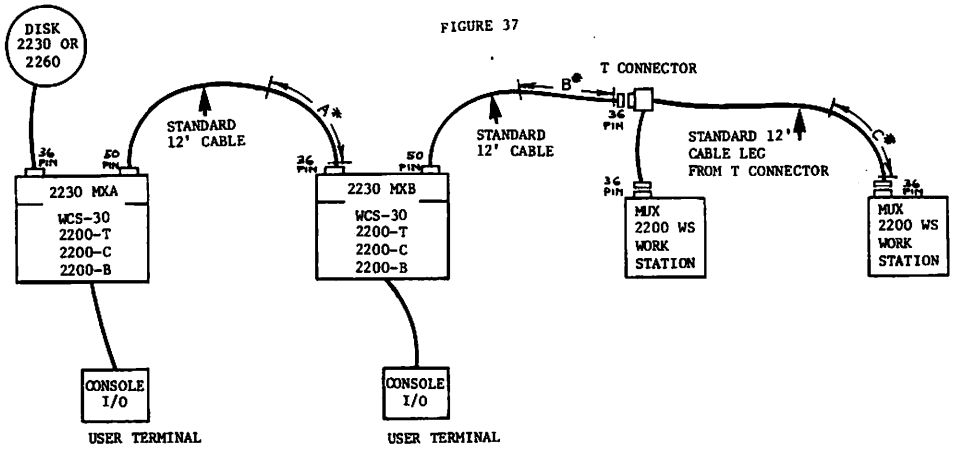


FIGURE 36

FIGURE 37



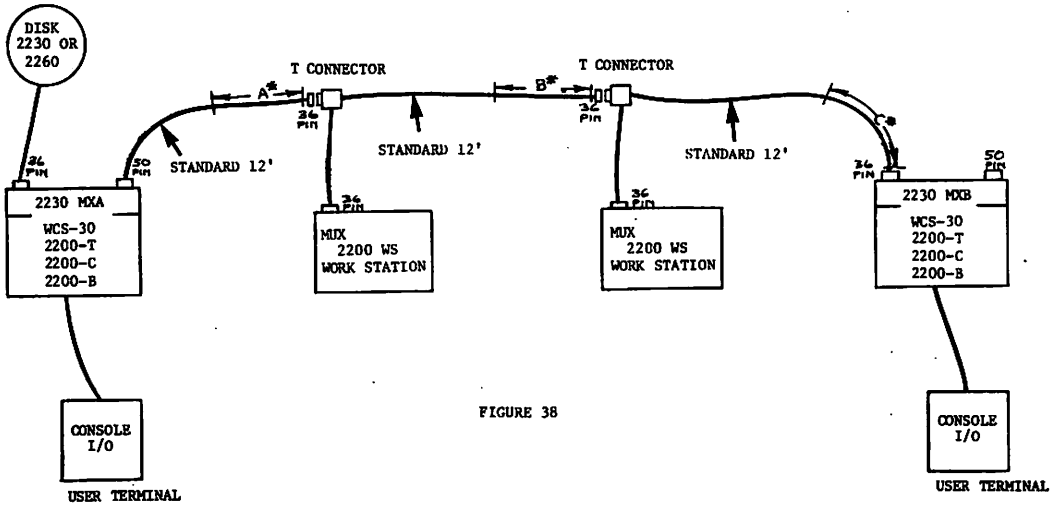


FIGURE 38

ILLEGAL CONFIGURATION

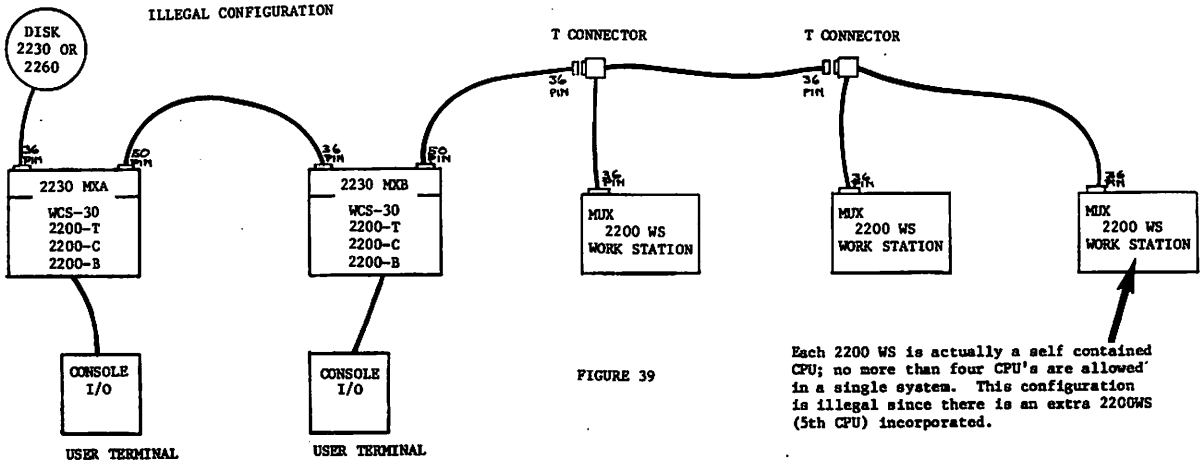


FIGURE 39

Each 2200 WS is actually a self contained CPU; no more than four CPU's are allowed in a single system. This configuration is illegal since there is an extra 2200WS (5th CPU) incorporated.

2. Connect the appropriate peripheral (where applicable) to the rear panel connector.

3. Plug the AC power cord into an AC outlet.

4. Turn power on by use of the power switch on the keyboard. After a short period of time, READY should appear on video display.

5. For initial installation checkout, use the appropriate tests described in Section 5 of this Bulletin.

6. See Section 7 for any 2200E or 2200F upgrades/options.

SECTION 3

OPERATION

Refer to 2200 Maintenance Manual, Section 3. Both the 2200E and 2200F have most BASIC statements available with 2200 Systems including MATRIX, GIO and SORT statements. 2200E Software will not support DISK units.

NOTE:

2200E CASSETTE DRIVES ONLY

Due to minor changes in 2200E Cassette Drive circuitry, when inserting a cassette into the Cassette Drive, it may be noted that for an instant, the TD-24 forward drive motor & spool turn counter-clockwise and the reverse drive motor & spool simultaneously turn clockwise. This is normal, and will not harm the Cassette or the Cassette Drive in any way.

SECTION 4

THEORY OF OPERATION

4.1 INTRODUCTION

The 2200E and 2200F use basically the same internal hardware configuration as the other 2200 CPUs except the hardware has been repackaged (formerly six or more CPU cards and four I/O controllers) and layed out on several (4 to 5) larger PC boards. The register structure, ROM, Memory Addressing and I/O are the same as described in Section 4 of the 2200 Maintenance Manual (component numbering has changed). Block diagrams of the PC boards follow; functional blocks are described as in the 2200 Maintenance Manual, Section 6.

4.2 I/O CONTROLLERS

The CRT, Printer and Disk I/O Controllers for the 2200F are contained on the 7054. The 7054 performs the same functions as the 6312A/6313, 6350A/6313 Video Display Controllers, the 6785 Multiplexer and the 7079 Printer Controller. The CRT and Printer Controllers for the 2200E are contained on the 7058 pc. The 7058 performs the same functions as the 6312A/6313, 6350A/6313 Video Display controllers and the 7079 Printer controller.

The 7048 Keyboard Decoder takes the place of the 6367 Keyboard Controller. Nearly the entire 6567 controller circuitry is functionally replaced by the EA20100 Keyboard Encoder IC contained on the 7048. Only output buffers and RESET, HALT/STEP and SHIFT detection circuits are required in addition to the EA20100. Provisions are incorporated on the 7048 pc for addition of PROMs L5, L6 and L10 for special character sets and applications.

The 7053 pc (cassette control/drive) performs the same functions as the 6316, L558 and L559 pc boards.

4.3 POWER SUPPLY

Refer to 2200E & F power supply schematics

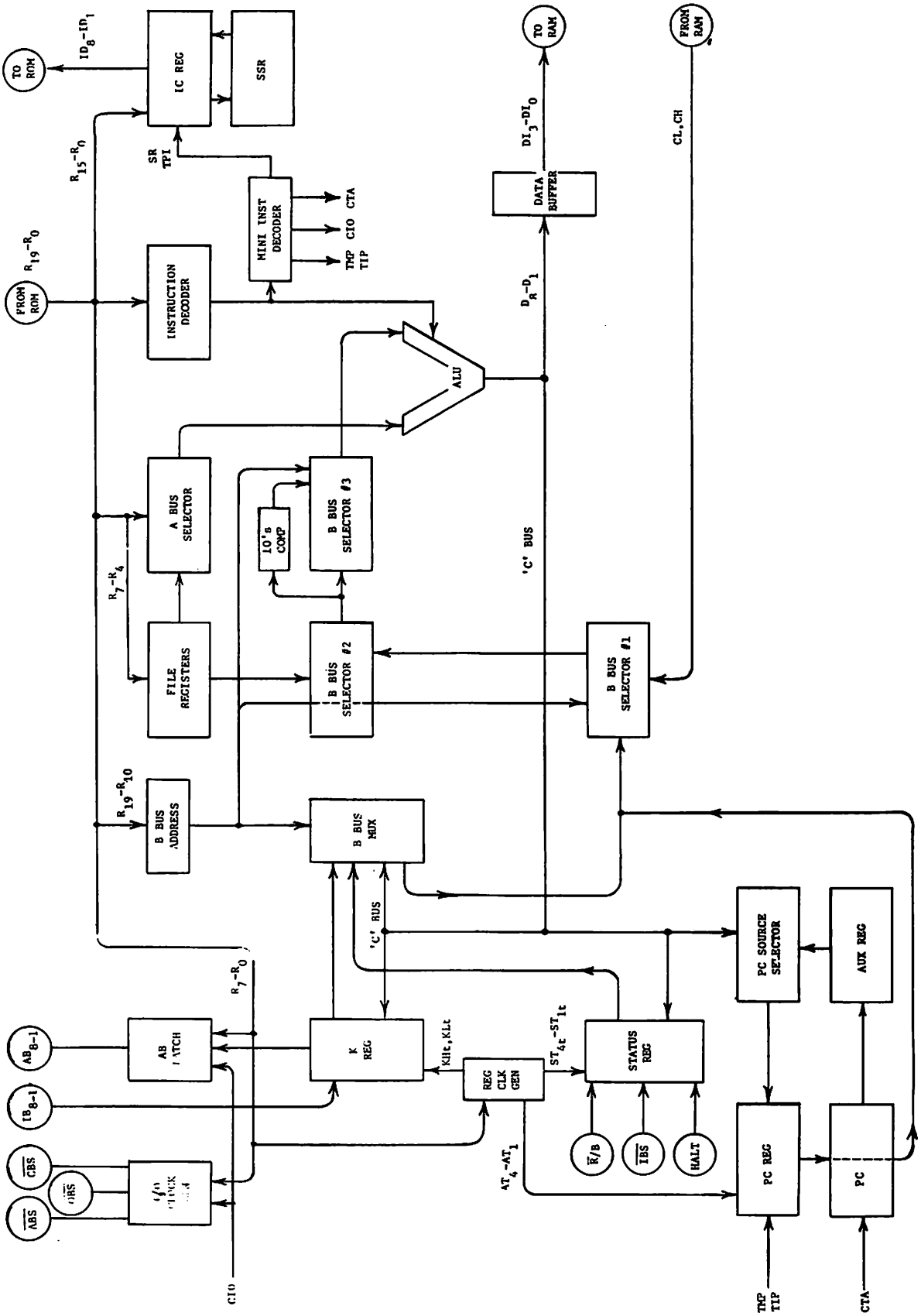


FIGURE 40 7052 BLOCK DIAGRAM

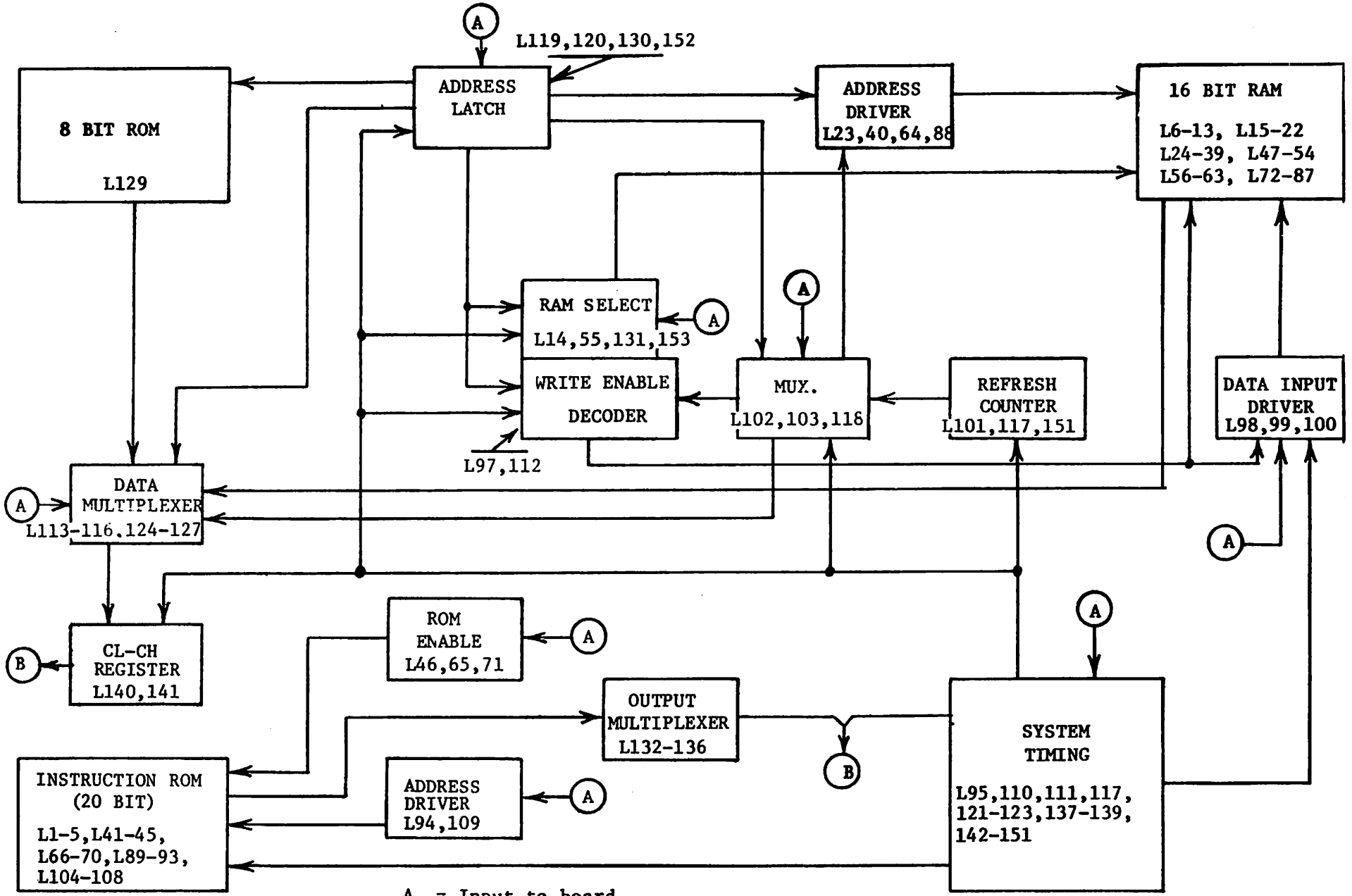


FIGURE 41
7052 BOARD BLOCK DIAGRAM

SECTION 5

DIAGNOSTICS

5.1 INTRODUCTION

Diagnostics can be loaded easily into the 2200E with its tape drive. In multi-work station 2200F systems, it is not desirable to take the entire system out of operation just to test one Work Station, therefore a 7068 cassette interface board is available to allow tape diagnostics to be loaded. To use the cassette interface, remove the cover from the 2200F, temporarily remove any board occupying the optional I/O slot, and insert the 7068 Cassette Interface into the optional I/O connector and place cable at a convenient position. Connect a 2217 Tape Drive to the interface cable and replace the 2200F cover (do not fasten cover). Remove the disk cable from the rear of the 2200F, apply power, and load the appropriate diagnostics into the 2200F. The unit now functions as an off-line computer, and does not affect operation of the other 2200F terminals (Work Stations). If it is necessary to test the operation of the 2200F with the disk, replace the disk cable and run the appropriate Disk Microcode Diagnostic.

CAUTION:

Be sure to use a "scratched" platter and that all customer data has been copied from the fixed platter before using a disk diagnostic.

If one must access an entire system (or if one does not have a 7068), one may wish to use the ISS Hardware Diagnostic with the work station. To use the diskette drive with WS (for test purposes only), simply disconnect the Wang Diablo disk from the 2230 MXA and connect the Shugart in place of the Diablo Drive as shown below.

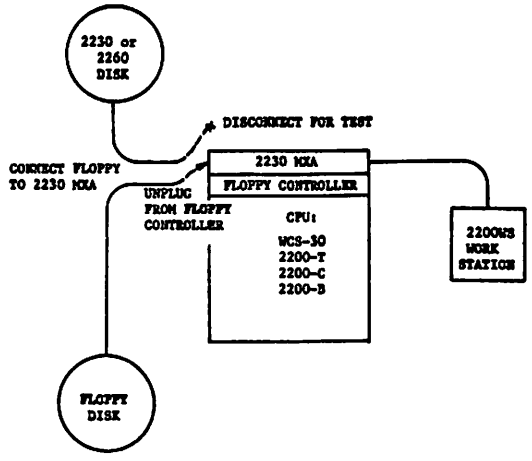


FIGURE 42

5.2 MEMORY

Use the OP-5 Memory Diagnostic (701-0363) as described in Service Newsletter No. 12 (2200 #2), paragraph E. Because the 2200E and 2200F have only one memory board, one cannot change the position of the boards in the chassis as with other 2200 CPUs. However, to simulate this, two jumpers have been added to the 7052 Memory to change the addressing of the RAM ICs. Refer to Figure 43.

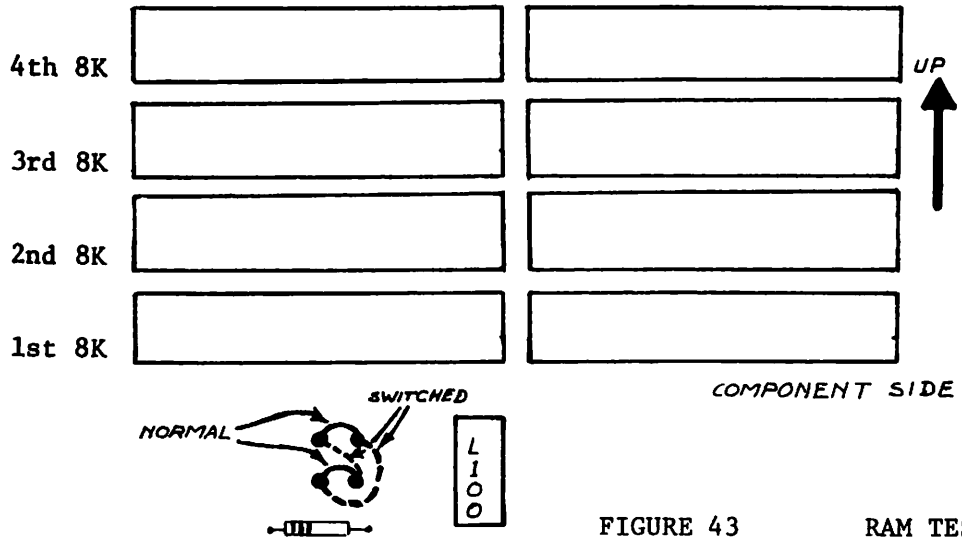


FIGURE 43 RAM TESTING

These jumpers allow one to switch the 1st and 2nd 8K of RAM. The RAM ICs that occupy the bottom row are now the second 8K and the next row up is now the first 8K. The purpose of this is to allow the memory program to be loaded into memory if one of the RAM ICs in the first 8K is bad. The program, when loaded, will reside in the second row of RAM, and the bottom row (1st row) can now be tested. However, if a problem exists in the RAM data path, it will not be possible to load the diagnostic, even with use of jumpers and one must use other trouble-shooting means to repair the board. After testing is complete, be sure to return the jumpers to their normal position.

5.3 CPU

To test the 7051 CPU, use the 2200 Hardware Diagnostic (701-0379) as described in Service Newsletter No. 34 (2200 #8).

5.4 I/O

Proper operation of the Keyboard, Display, Tape Drive and Printer are verified by inspection. If a problem is suspected with a Disk Work Station, first verify that the Master CPU and other Work Stations are operating properly with the disk. If none of the stations access the disk, the problem is most likely to be either in the disk or in the 2230MXA/MXB multiplexer. If only one Work Station is unable to access the disk, LOAD and RUN the Disk Microcode Diagnostic (Ref: 2200 Maintenance Manual, Section 7) in the failing Work Station.

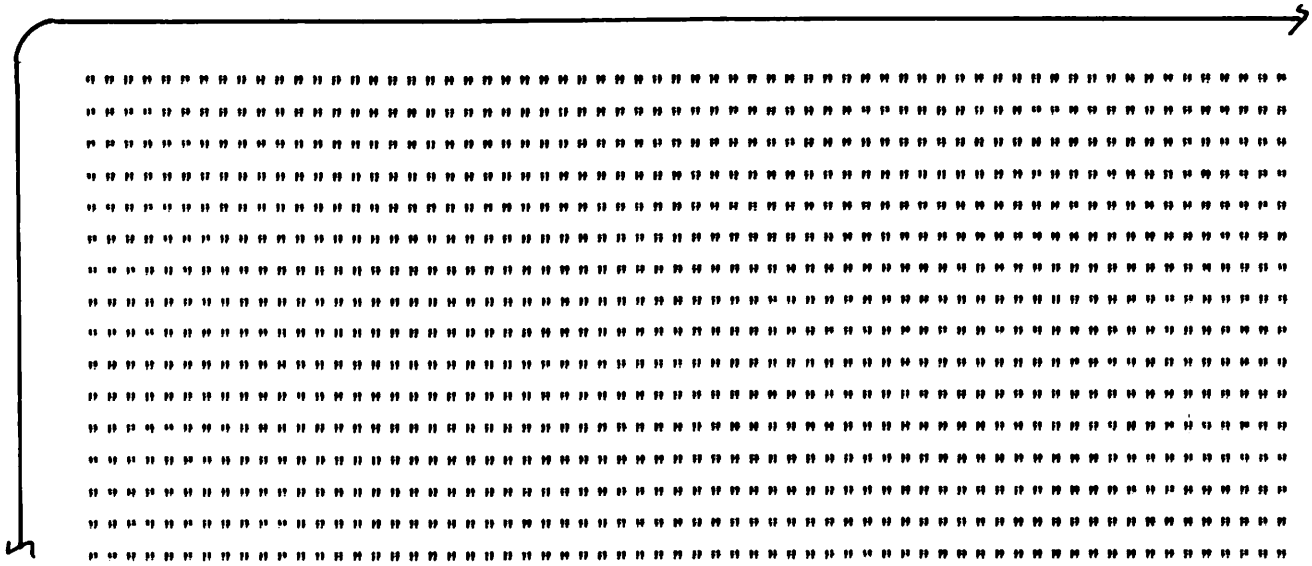
To verify proper operation of the 64 x 16 Display Controller, enter the following program via the Keyboard and RUN:

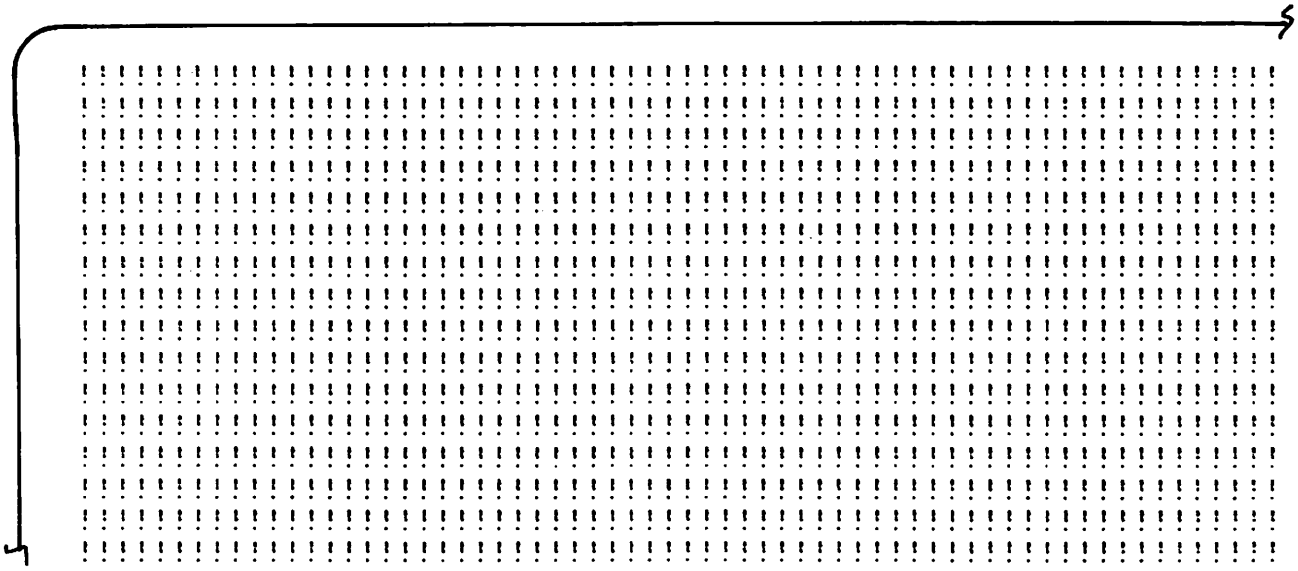
```
10 DIM A$(16,2)33, A2$10, A3$33
15 STR(A3$, 1, 33) = " "
20 STR( A$( 1, 1) ,1 ,33) , STR( A$( 1, 2) ,1 ,33) = STR( A3$,1
,33) : FOR A = 1 TO 16 : A$( A, 1), A$( A, 2) = A$( 1, 1) : STR(
A$( A, 2),32,2) = HEX(0D0A) : NEXT A
30 STR( A$(16,2), 32, 2)=HEX(0001): $GIO /005 (A200, A2$) A$() :
 ADD( A3$, 01) : IF STR( A3$,1,1) = HEX(FF) THEN 15 : GOTO 20
```

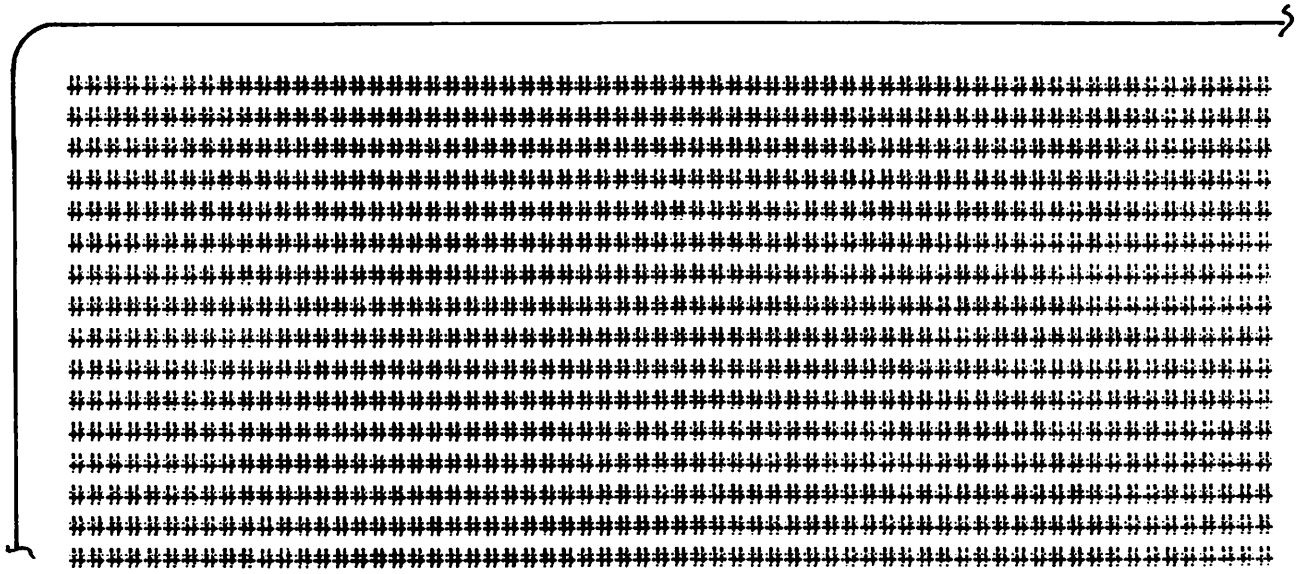
If an 80 x 24 display is used, change statement lines as follows:

```
10 DIM A$(24,2)41, A2$10, A3$41
15 STR(A3$, 1, 41) = " "
20 STR( A$( 1, 1) ,1 ,41) , STR( A$( 1, 2) ,1 ,41) = STR( A3$,1
,41) : FOR A = 1 TO 24 : A$( A, 1), A$( A, 2) = A$( 1, 1) : STR(
A$( A, 2),40,2) = HEX(0D0A) : NEXT A
30 STR( A$(16,2), 40, 2)=HEX(0001): $GIO /005 (A200, A2$) A$() :
 ADD( A3$, 01) : IF STR( A3$, 1, 1) = HEX(FF) THEN 15 : GOTO 20
```

Every character will be displayed on the CRT. Visually inspect the display for incorrect character readout:







SECTION 6
CONVERSIONS

6.1 GENERAL

OPTION #	STOCK #	DESCRIPTION	2200E	2200F
60	177-22EF-60	Auxiliary Display Connector, Audio & KB Clicker	X	X
61	177-22EF-61	2201 Output Writer	X	X
66	177-22XX-66	80 x 24 Display		X

TABLE 6-1

For options requiring the addition of a rear panel connector on the 2200 E/F, two mounting plates are available (for adaptation to either 24 pin or 36 pin connectors); this plate (451-4420 for 24 pin; 451-4421 for 36 pin connectors) replaces the blank plate in the optional I/O slot on the rear panel (see Figures 9 and 14). Refer to 2200 Maintenance Manual, Section 8 for any tools required for 2200E/F option installations.

6.2 RAM UPGRADES

When increasing memory by 8K bytes (from 8K to 16K or from 24K to 32K), add only the necessary ICs to the existing memory board and change the memory size jumpers on the 7051 (see Figure 17). When increasing memory from 8K to 24K or 32K or from 16K to 24K or 32K, it is also necessary to change the 7052 Memory to a 7052-1. Again, be sure to change the memory size jumpers on the 7051. Change the unit dash number to reflect RAM size increase (see table, next page).

TO INCREASE MEMORY SIZE

To Go From	To	Remove	Add	Jumper Per Fig. 27	Change Unit Model Number FROM 2200 E/F	TO 2200 E/F
8K	16K	----	------; L47-54, L56-63	Install 1	-2	-4
8K	24K	7052	7052-1	Install 2	-2	-6
8K	32K	7052	7052-1	Add 1 & 2	-2	-8
16K	24K	7052	7052-1	Add 2 Remove 1	-4	-6
16K	32K	7052	7052-1	Add 2	-4	-8
24K	32K	----	------; L6-13, L15-22	Add 1	-6	-8

RAM Part No. = 377-0314 Quantity = 16 for each 8K

6.3 OPTION 60 - AUX. DISPLAY CONNECTOR, AUDIO ALARM, KB CLICKER; KIT #177-22EF-60

1. Completely disassemble unit per paragraph 7.3.

2. Proceed as follows for key "clicker" relay installation (Ref: Figures 11, 44).

Parts required are as follows:

ITEM:	WL#:	QUANTITY:	DESCRIPTION:
1	320-0049	one	Keyboard Clicker (relay) Assy.
2	451-4379	one	Bracket, KB Clicker Mounting A6422-327
3	653-0003	one	No. 4 Nylon Flat Washer
4	650-2160	one	4-40 x 1/2" Pan Head PHL MS
5	653-2002	one	No. 4 Int. T Lock Washer

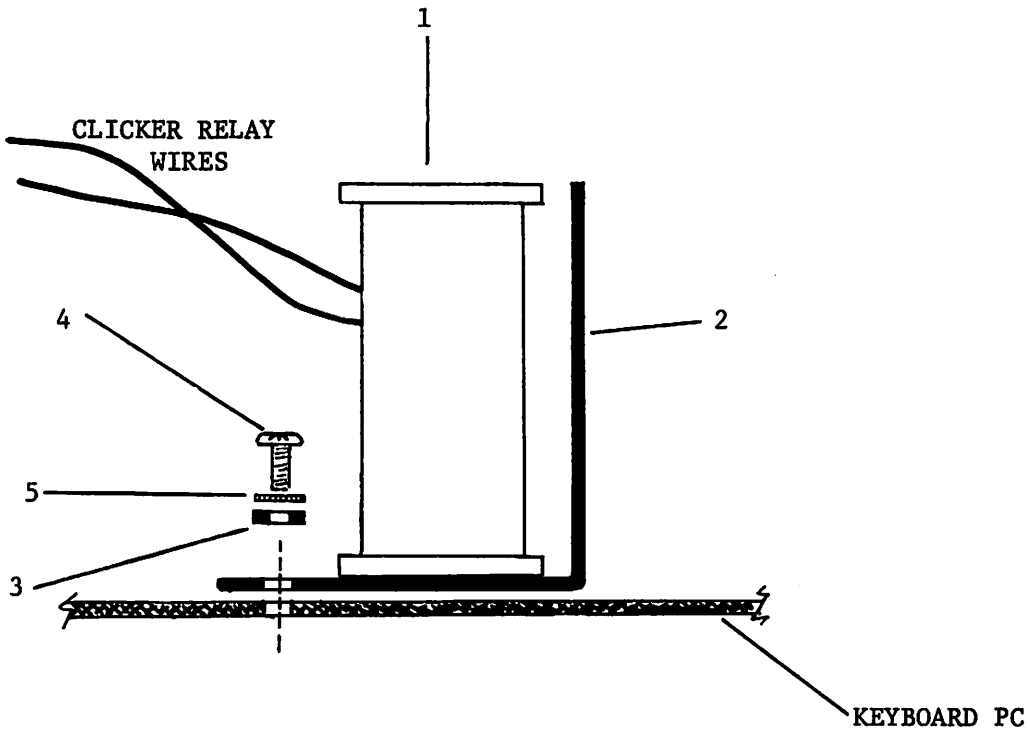


FIGURE 44 KEYBOARD CLICKER RELAY INSTALLATION

3. Proceed as follows for Audio Alarm speaker installation (Ref: Figures 6, 7, 45, and 46).

Parts required are as follows:

ITEM:	WL#:	QUANTITY:	DESCRIPTION:
1	320-0300	one	3" Speaker
2	650-3160	two	6-32 x 1/2" Pan Head PHL SEMS
3	652-0032	two	6-32 KEPS NUT
4	380-3001	one	Diode, 1N3255
5	600-2000	one	Black Wire, 24GA
6	600-2002	one	Red Wire, 24GA
7	605-0105	one	#6 Tubing (9" length)

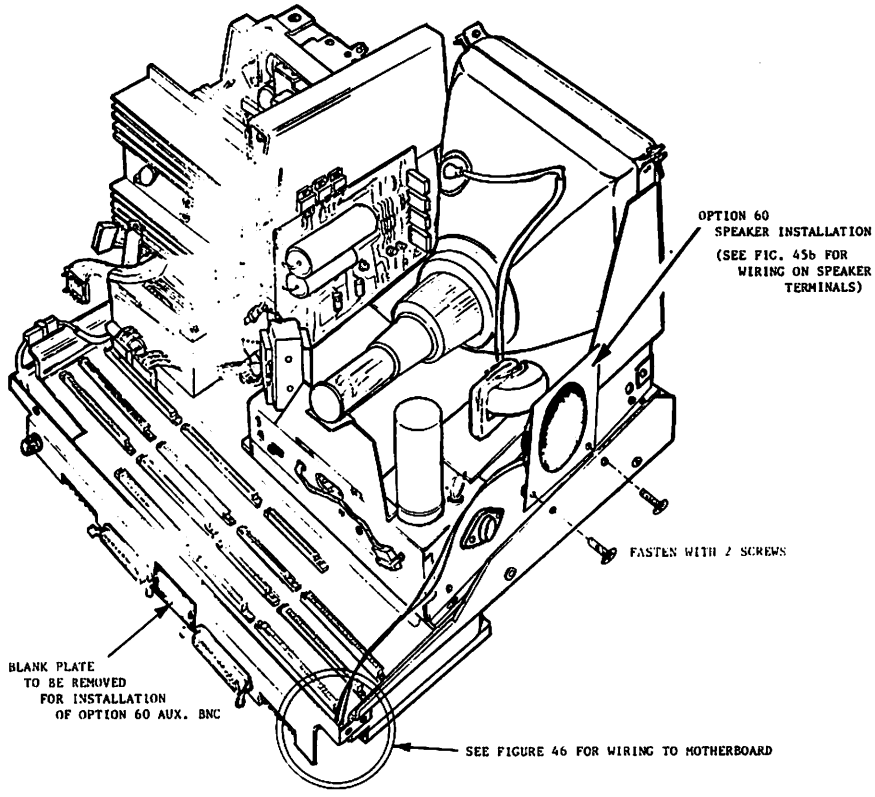
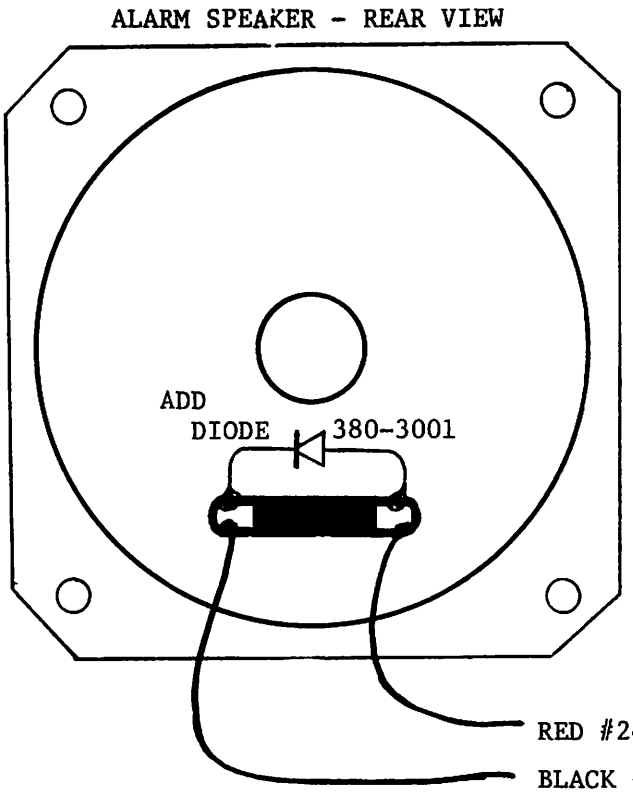


FIGURE 45A OPTION 60 SPEAKER PLACEMENT



ACTUAL CONNECTION:
7055/56 MOTHER BD.
RED TO PIN 4_3 (SIGNAL)
BLACK TO PIN 1_2 ($\pm$0 V)

FIGURE 45B

SPEAKER TERMINAL WIRING

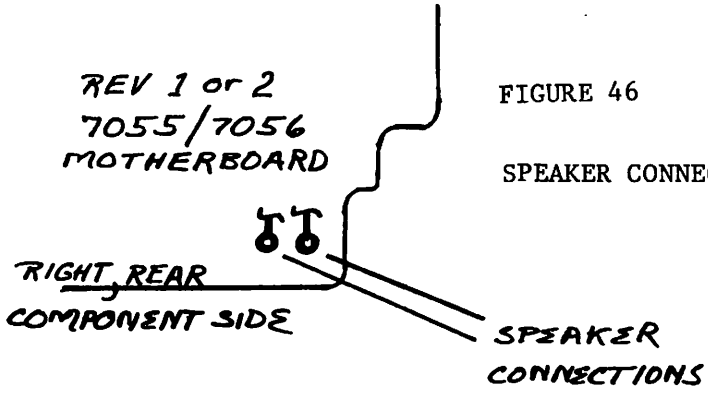


FIGURE 46

SPEAKER CONNECTION TO MOTHERBOARD

4. Proceed as follows for Auxiliary Display BNC Connector installation (Ref: Figures 9, 14, 20, 22, 47 and 48).

Parts required are as follows:

ITEM:	WL#:	QUANTITY:	DESCRIPTION:
1	615-0377	one	BNC Mounting Plate
2	350-1036	one	BNC Socket Assembly
3	654-1011	one	3/8" Ground Lug
4	220-1069	one	CRT Cable/Male Nylon Connector
5	220-1026	one	CRT Cable/Female Nylon Connector

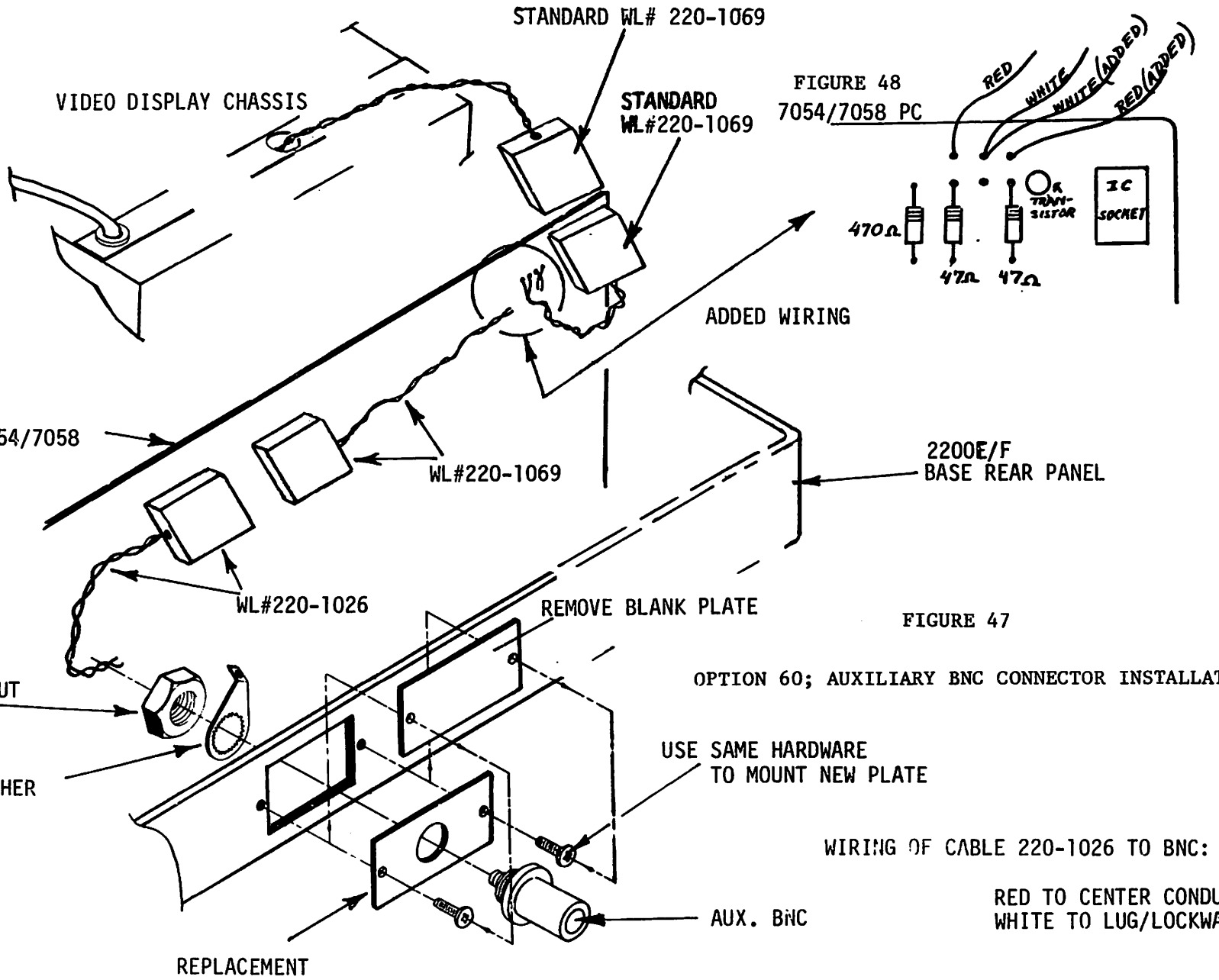


FIGURE 48
7054/7058 PC

FIGURE 47

OPTION 60; AUXILIARY BNC CONNECTOR INSTALLATION

WIRING OF CABLE 220-1026 TO BNC:

RED TO CENTER CONDUCTOR
WHITE TO LUG/LOCKWASHER

6.4 OPTION 61 - OUTPUT WRITER; KIT #177-22EF-61

1. Disassemble 2200E/F per steps a) thru j) in Section 7.

2. Remove blank plate from rear apron of unit base at location adjacent to J3 (Ref: Figures 9 and 14).

3. Remove motherboard strengthening bracket (see Figure 11) and set aside hardware for reinstallation.

4. Attach 24-pin Amphenol connector and plate assembly in place of blank plate removed in step 2.

5. Place the 44-pin PC connector into the option slot (see location of OP-61 slot in Figure 8) in the motherboard.

NOTE:

Early 2200F units did not have a slot for OP-61 provided on the 7055 motherboard (Ref: Fig. 15). Therefore, to install OP-61 on such 2200F units, one must also replace the motherboard with a new version (with OP-61 slot provision (Ref: Fig. 8)).

6. Install mounting hardware for 44-pin PC connector (2 screws, 2 lockwashers, 2 nuts). Be sure to position the connector correctly.

7. Lay the cable against the motherboard. Observe the location of the rubber grommet for the motherboard strengthening bracket in relation to the cable position.

8. Spread the cable wires accordingly to provide room for the grommet; ensure that the cable wires are not pinched.

9. Replace the motherboard strengthening bracket.

10. Install one rubber grommet in each top/outside hole of the 7061 I/O board.

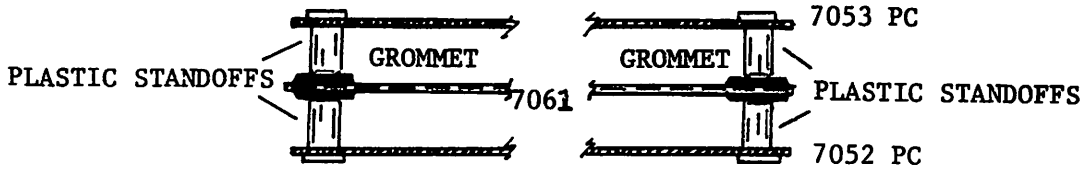


FIGURE 49

11. Install the 7061 PC and reinstall other PC's previously removed.

12. Replace standoff screws through PC boards (two; one each side).

13. Replace the chassis.

14. Reassemble all hardware, since 2200E/F units cannot be run without the unit cover on (for proper air circulation/ventilation via fan; Ref: Figure 28).

15. Connect Output Writer cable to J3.

16. Run appropriate diagnostic test for OP-61 (Output System Diagnostic, 2200 System Maintenance Manual, Section 7).

IMPORTANT:

2200E and F units with certain early serial numbers may not be upgradeable to Option 61 and other options without power supply modification. The following units were shipped with old style transformers (410-0103).

2200-E	SERIAL #
	EX 1000 to and including 1021
	EX 1032, EX 1033, EX 1034, EX 1040,
	EX 1044, EX 1047, and EX 1048
2200-F	SERIAL #
	EF 1020

If it is necessary to upgrade one of these units, consult the Home Office Field Engineering Group.

6.5 OPTION 66 - 2200F ONLY; 80 X 24 DISPLAY

a) Remove the top cover as described in paragraph 7.3, items a) through c).

b) Remove the 7054 I/O controller and replace it with the Disk/ Printer I/O controller (7059 pc). Be sure to set the disk and printer address switches correctly.

c) Remove the 7052 or 7052-1 Memory Boards. If the board has an early version software loading (see left-hand column below for "early version" identification), remove the following ROM ICs and replace them as indicated using ROM IC removal tool :

IC LOCATION	REMOVE		REPLACE WITH	
L2	377-0306	EARLY SOFTWARE VERSIONS	377-0334	ALL PRESENT VERSIONS
L4	377-0307		377-0335	
L5	377-0305		377-0333	
L90	377-0293		377-0331	
L92	377-0294		377-0332	
L93	377-0292		377-0330	
L105	377-0301		377-0328	
L107	377-0302		377-0329	
L108	377-0300		377-0327	

d) Replace the memory board and apply power.

e) First adjust the Horizontal Hold pot to the center of its range. Adjust the horizontal oscillator coil L1, on the Motorola Video Display Chassis; L1 must be adjusted very carefully for a stable display (refer to page 8-29 of the Model 2200 Systems Maintenance Manual). This adjustment has a limited range of stability with the 80 x 24 display, and must be set in the middle of this stable range. Be sure to turn the power off and on several times after adjusting the coil to be sure horizontal sync is achieved, otherwise another service call will be required to readjust L1 in the Motorola display.

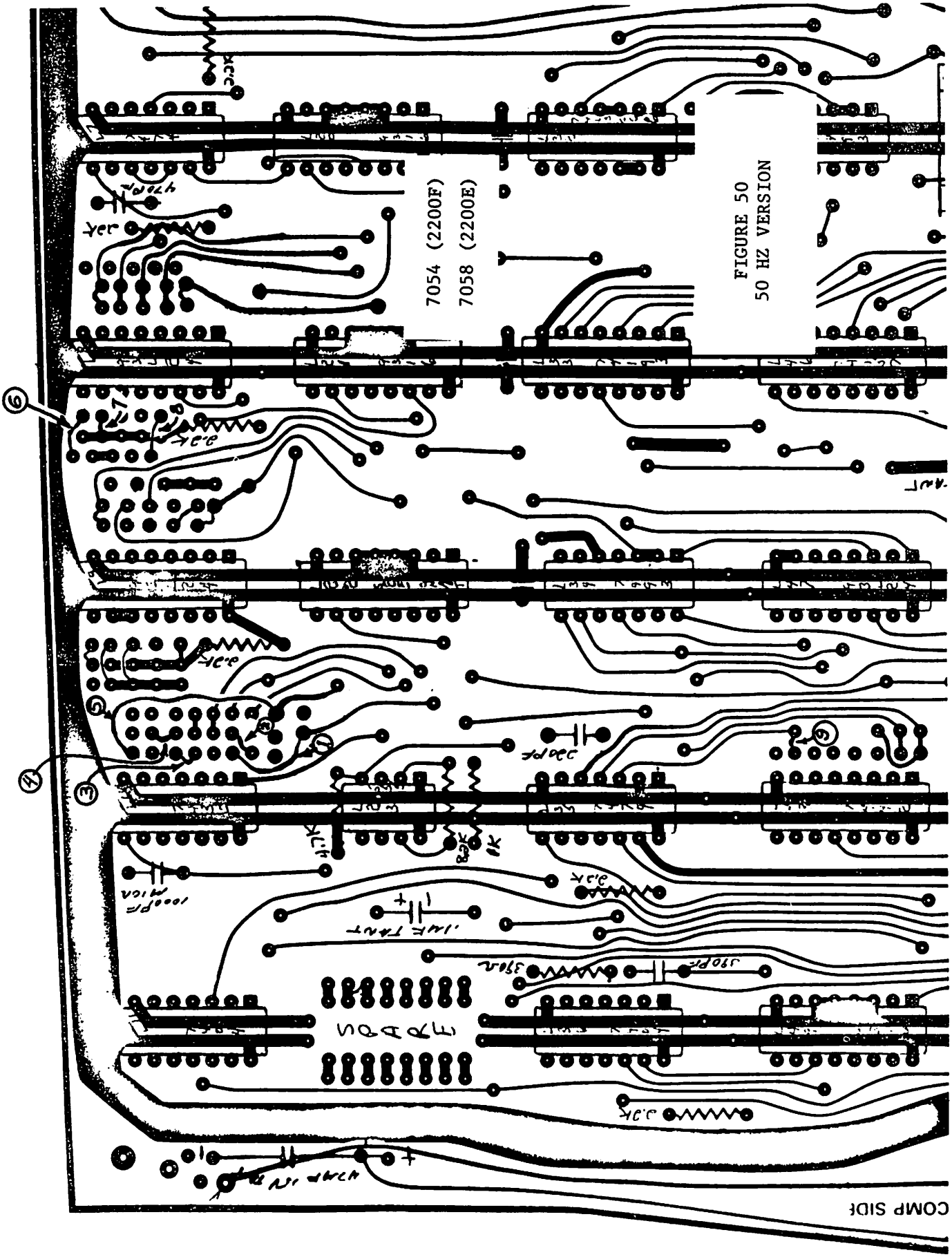
f) Replace unit cover. Enter the program described in paragraph 5.4 to verify proper operation.

6.6 50 HZ/60 HZ CRT CONVERSION

a) Remove the 7054 or 7058 I/O controller.

b) To allow versatility with the I/O controllers, jumpers are used for 50 Hz and 60 Hz operation. The charts and diagrams follow that show jumper placement for 50/60 Hz variations. Only the jumpers that require changing are listed. (Jumpers to L9 always remain in the same locations.) Refer to Figures 50 and 51.

		60 Hz	50 Hz
1.	L10 pin 2	V128	V256
2.	L10 pin 12	V64	L10 pin 2
3.	L10 pin 4	V8	L10 pin 11
4.	L10 pin 5	V4	L10 pin 4
5.	L10 pin 6	V2	V1
6.	L8 pin 9	+5	$\pm$0
7.	L8 pin 10	$\pm$0	+5
8.	L8 pin 13	+5	$\pm$0
9.	L49 pin 9	L48 pin 6	L48 pin 7


7054 (2200F)
7058 (2200E)
FIGURE 50
50 HZ VERSION
COMP SIDE

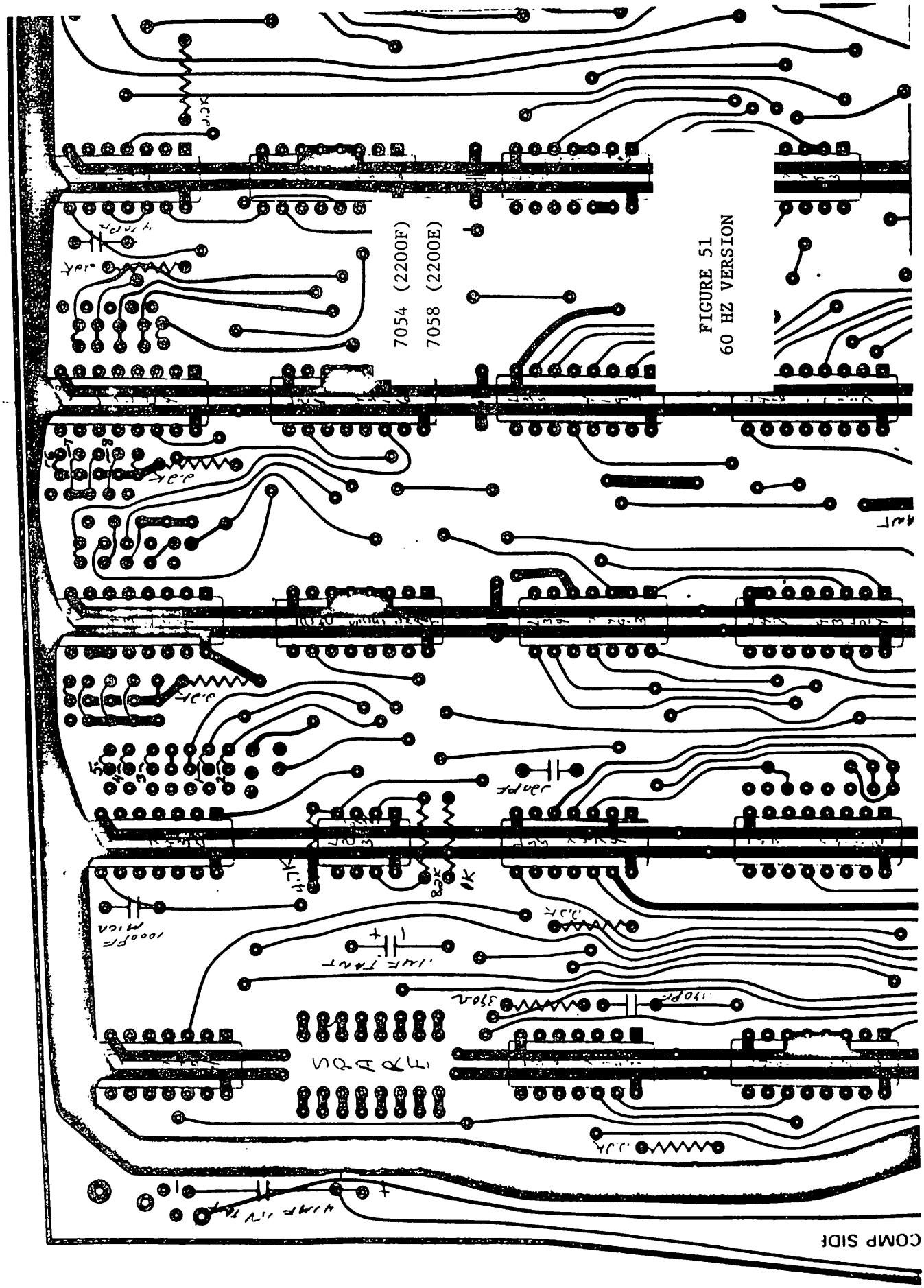


FIGURE 51
60 HZ VERSION

SECTION 7

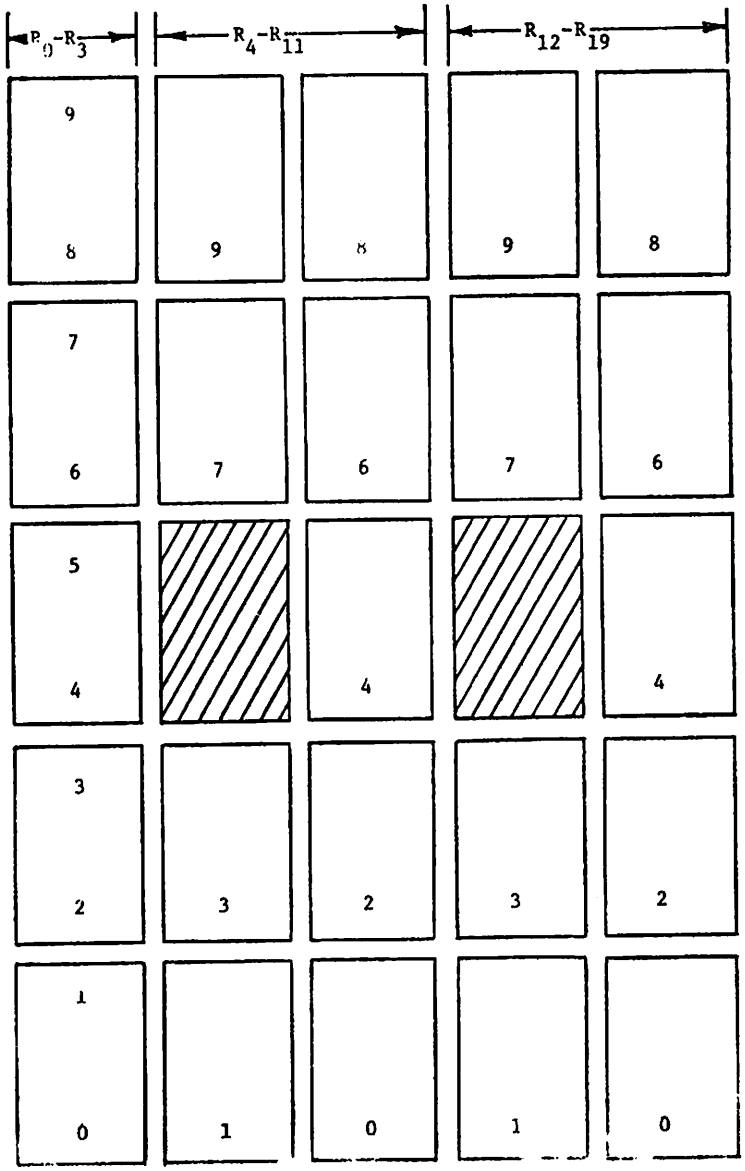
MAINTENANCE

7.1 PREVENTIVE MAINTENANCE

See 2200 Maintenance Manual, Sections 8.1, 8.1.1, 8.1.1.2 and 8.1.2.

7.2 TROUBLESHOOTING

See 2200 Maintenance Manual, Section 8.2 except for Mini ROM Tester use for 2200 E/F PCBs below:



7052 ROM CHART FOR MINI ROM TESTER

Read in Hex for above

MSB LSB

ID_3 ID_2 ID_1 IC8 (Same as 6735 & 7025)

FIGURE 52 7052 ROM LAYOUT

Use 6773 Control PC in Mini-ROM Tester;also, use a 7082 Adapter PC in the TEST slot only. A 6735 D/E or a 7025 D/E will be used in the REFERENCE slot. If the 7052 under test is a D-level board (software level) be sure to use a D-level 6735 or 7025 PC.

7.3 DISASSEMBLY

Refer to paragraph 8.3.1, 2200 Maintenance Manual for recommended tool list.

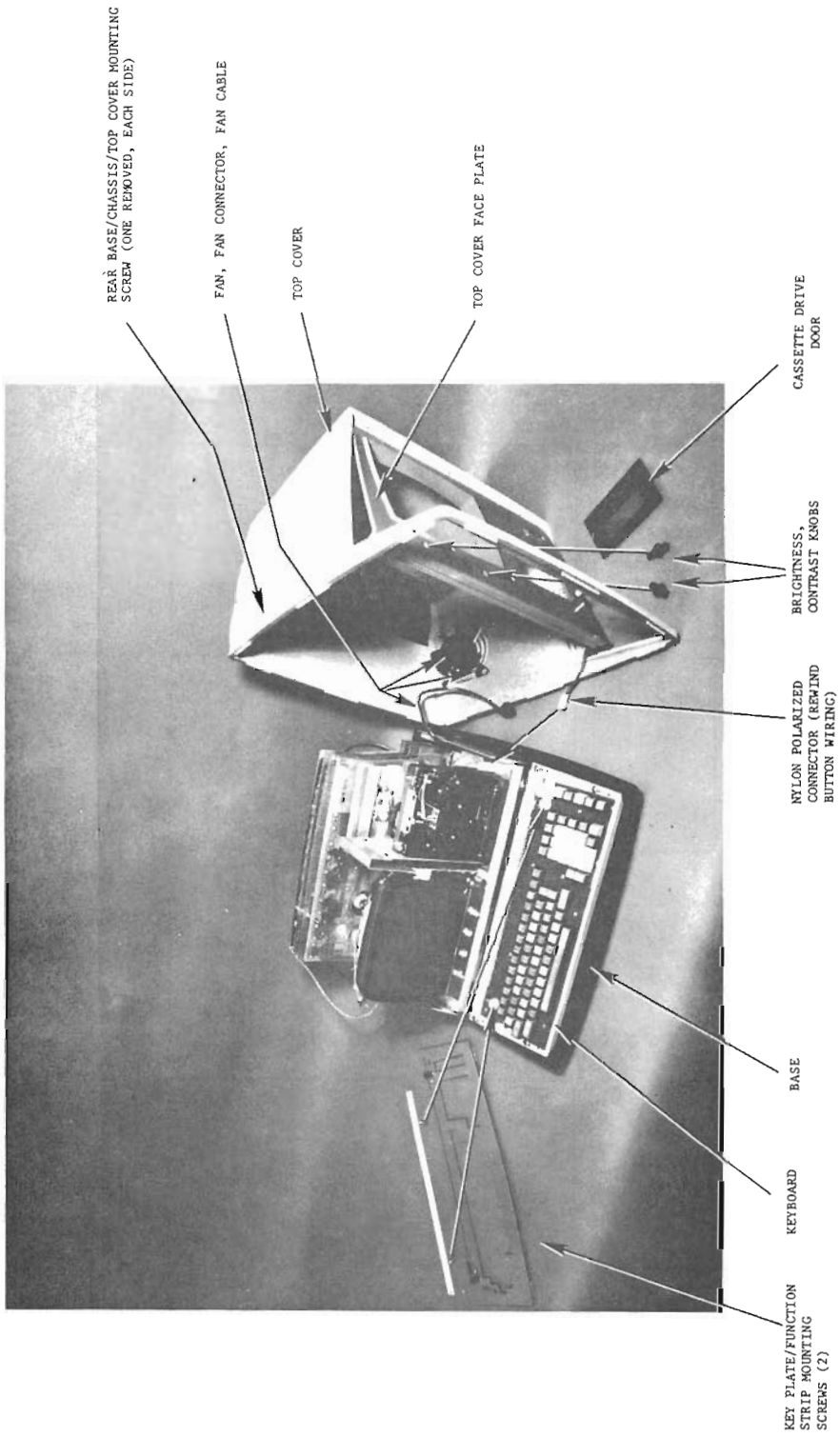


FIGURE 53 UNIT DISASSEMBLY

a) *Keyboard Cover* - Loosen the two finger nuts and remove the special function strip. Remove the two screws found under the function strip. Remove Brightness and Contrast knobs (2200E). Using the function strip finger nuts, lift the key plate up and back until free. Remove the two nylon spacers with brass eyelet grounding rivets.

CAUTION:

Ensure power is off and fan has stopped. If cover is removed while the fan is turning, the fan blades will break.

b) *Front Cover* - Remove keyboard cover. Remove door cover of tape drive unit. Lift up bottom of top cover faceplate and pull outwards. Disconnect Rewind/Lamp cable.

c) *Top Cover* - Remove front cover. Remove the two side screws. Firmly hold the top cover sides and lift upward until cover clears the top of inside components. Lay top cover on its side and disconnect fan cable.

CAUTION:

Do not remove the fish paper that covers the ventilation slots on the underside of the top cover.

d) *Keyboard* - Remove top cover. Remove the four screws at the sides of the keyboard plate. Tilt front of keyboard up while lifting keyboard out. Disconnect the 24 pin ribbon cable and the OFF/ON switch cable which goes to a nylon polarized connector (3 wire); see photographs in Section 1, front right, cover removed.

e) *Circuit Board Removals* - Turn all power off and remove the top cover. Remove the two long standoff screws extending through the plastic standoffs at the top outside corners of each board (Ref: Figures 7 and 13).

f) *Chassis* - Remove keyboard. Remove the two side screws and lift unit up and forward *being careful not to damage AC power cord and fuse holder.*

g) 7054/7058 (I/O) - Disconnect video cable and lift board upward while moving it slightly from side to side.

h) 7051 (CPU) - Lift board upward while moving it slightly from side to side.

i) 7052 (MEMORY - RAM/ROM) - Same as 7051.

j) 7053 (TAPE DRIVE) - Disconnect the 7078 ribbon cable fingerboard from the TD-24 first. Lift 7053 board upward while moving it slightly from side to side; slide ribbon cable under the heat sink assembly. *Be careful not to damage CRT while removing this board.*

k) 7056/7055 (MOTHERBOARD) - Remove chassis assembly from baseplate. Remove the 7051, 7052, 7053 and 7054/7058 circuit boards. Remove screws located at circuit board amphenol connectors and at each side of the motherboard. Remove 7055/7056 motherboard from bottom of chassis assembly.

l) 7057 (POWER SUPPLY REGULATOR; 2200E) - Remove the two mounting screws (see Figure 6) and, while applying slight pressure on the 7057 regulator heat sink plate (towards the cassette drive), slowly pull board upward; careless removal may damage regulator potentiometers. (The potentiometers are in close proximity to the display chassis.)

m) 7067 (POWER SUPPLY REGULATOR; 2200F) - Remove one screw which fastens 7067 heat sink plate to a chassis mounted vertical support bracket (see Figure 12). Pull board upwards while moving it slightly from side to side.

n) 7048 (KEYBOARD ENCODER) - Remove keyboard. Disconnect ribbon cable. Remove 3 Phillips screws from 7048 pc. Unplug 7048 from the keyboard (see Figure 11).

7.4 ADJUSTMENTS

See 2200 Maintenance Manual, Section 8.3 Also see 80 x 24 adjustments, page 56 of this publication.

7.4.1 *2200E/F CPU VOLTAGE ADJUSTMENTS*

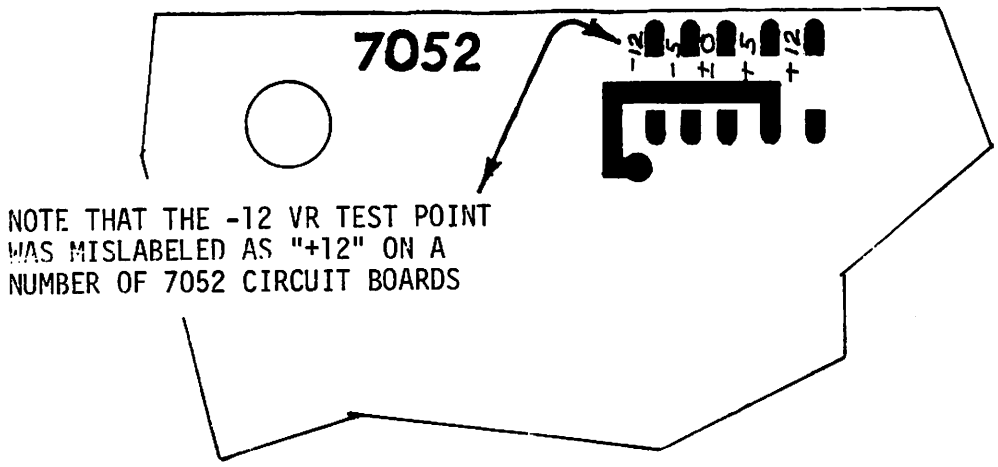
2200 "F" POWER SUPPLY ADJUSTMENTS (7067 REGULATOR)

LOCATION	VOLTAGE	LIMITS	ADJ	RIPPLE	
7052 TP+5	+ 5VR	+4.95 vdc to +5.10 vdc	R4	20 mvp-p	7067 pin S/15
7052 TP-5	- 5VR	-4.90 vdc to -5.1 vdc	R19	15 mvp-p	7067 pin 12
7052 TP+12	+12VR	+11.80 vdc to +12.20 vdc	R10	50 mvp-p	7067 pin F/6
7052 TP-12	-12VR	-11.80 vdc to -12.20 vdc	R16	50 mvp-p	7067 pin H/7

2200 "E" POWER SUPPLY ADJUSTMENTS (7057 REGULATOR)

7052 TP+5	+ 5VR	+4.95 vdc to +5.10 vdc	R4	20 mvp-p	7057 pin S/15
7052 TP-5	- 5VR	-4.90 vdc to -5.1 vdc	R14	15 mvp-p	7057 pin 12
7052 TP+12	+12VR	+11.80 vdc to +12.20 vdc	R10	50 mvp-p	7057 pin F/6
7052 TP-12	-12VR	-11.80 vdc to -12.20 vdc	R17	50 mvp-p	7057 pin H/7

FIGURE 54 7052 WIRE SIDE ±VR TEST POINTS



7.4.2 *TEST EQUIPMENT REQUIREMENTS*

See 2200 Maintenance Manual, Section 8.3.1.

7.4.3 *TAPE DRIVE UNIT*

See 2200 Maintenance Manual, Section 8.3.4.

7.5 DISPLAY CHASSIS REPLACEMENTS AND REPAIR

See pages 8-49 through 8-53 and 8-61 through 8-63 in the 2200 Maintenance Manual.

DISPLAY CHASSIS REPLACEMENTS/INTERCHANGE NOTES:

CAUTION:

Carefully remove 7057 pc in 2200E (See 7057 removal procedure, paragraph 7.3) before removing or installing a display chassis. This allows proper access to display mounting hardware.

A. Using a 2200E Display Chassis in a 2220:

1) Remove CRT neck-save bracket from 2200E display chassis.
2) Add the plug protector to the AC connector.
3) Tape AC connector to 2200E display chassis transformer.
4) Remove 2220 display chassis.
5) Install modified 2200E display chassis in 2220 chassis.
6) Save the CRT neck saver for future use.

B. Using a 2220 Display Chassis in a 2200E:

1) Remove defective display chassis.
2) Remove CRT neck-save bracket from defective 2200E display chassis.
3) Desolder AC connector assembly from defective display chassis.
4) Solder AC connector removed in step 3 to the replacement display chassis AC wires.
5) Install neck-save bracket on replacement chassis.
6) Replace display chassis.
7) Perform adjustments.

C. Using a 2226 Display Chassis in a 2200F. (Long shaft hex-head nut driver required for display removal in 2200F.)

1) Remove the brackets from the rear control panel. Save the brackets for future use.
2) Move the control panel to the top of the chassis.
3) If there is no Molex^{R} video connector for the video input, solder one in place.
4) Install the chassis in the 2200F.

D. Using a 2200F Chassis in a 2226. (Long shaft hex-head nut driver required for display removal in 2200F.)

1) Remove the rear control panel from the top of the chassis.
2) Install the rear control panel on the rear of the chassis with the brackets.
3) Install the chassis in the 2226.

7.6 CHASSIS LAYOUTS

See Section 1.3 in this publication.

7.7 REASSEMBLY

Reassemble in reverse order of disassembly, but note the following items:

a) 2200E:

Do not replace keyboard cover plate until Video Display knobs are replaced. The top cover faceplate may have to be pried upward slightly to replace Display knobs.

b) 2200E:

When reinserting the 7057 Regulator pc, apply slight finger-tip pressure to the heat sink plate for the 7057; press

plate toward Cassette Drive slightly. This prevents possible damaging to voltage adjust potentiometers (7057) by contact with the edge of the display chassis support bracket.

c) 2200E/F:

When restoring the red/white twisted pair display connection to the 7054/7058 pc, do not route this twisted pair in close proximity to the display flyback transformer (Ref: Figure 7). Coupling from the flyback transformer can result in unit malfunction.

d) 2200E/F:

Note that only two side baseplate screws (the front pair) are initially fastened with cover off. The rear pair is not installed until the cover is on. The rear pair fasten the top cover and the rear of the chassis to the baseplate.

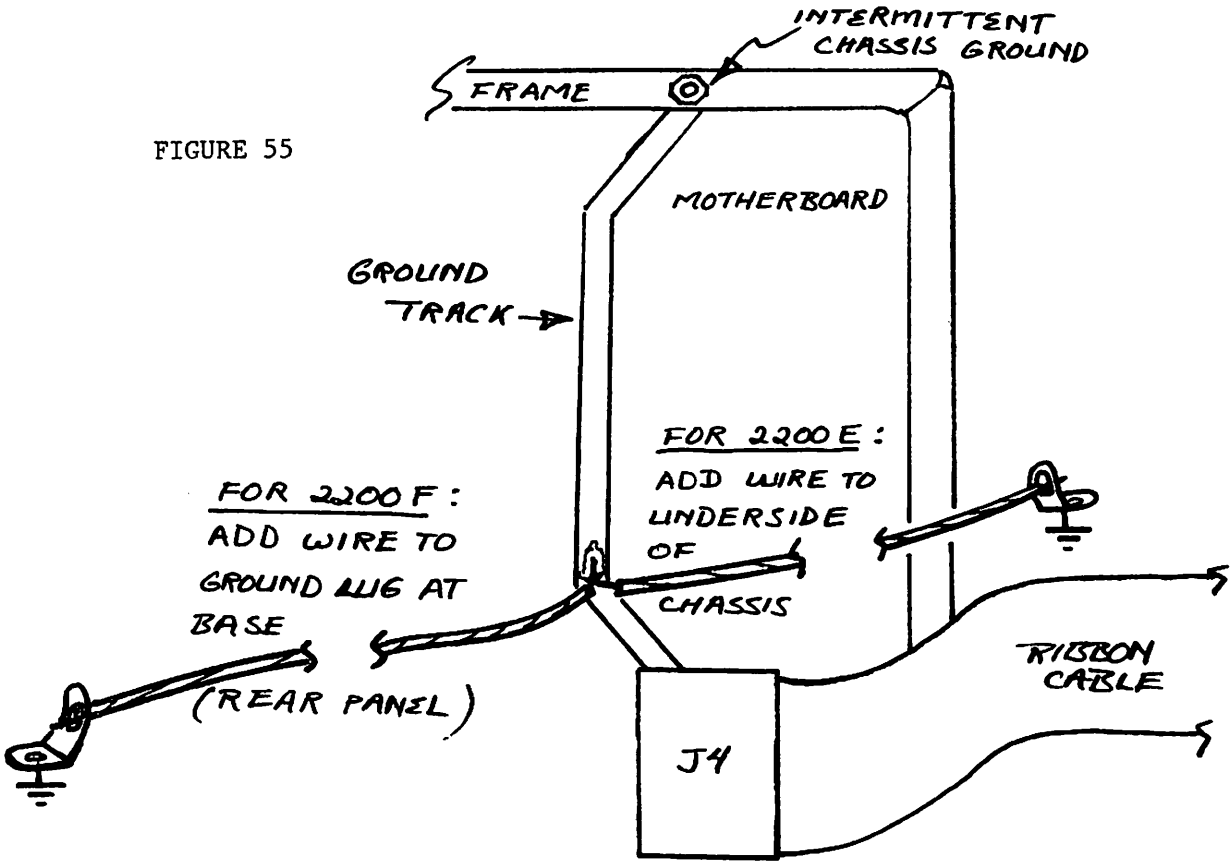
e) 2200E/F:

Note that cable clamps secure wires to underside of 2200E/F top covers. In the 2200E (PCS), only the fan cable is secured by clamp. In the 2200F (WS), the fan cable and the Brightness and Contrast wiring are secured by clamp.

f) 2200E/F:

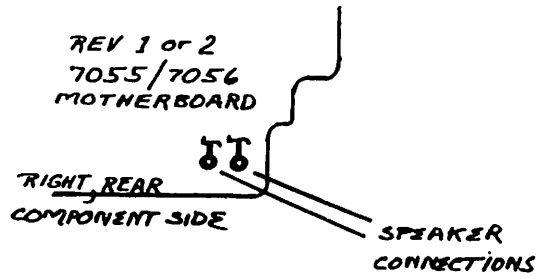
2200E Units with serial numbers under 1053 and 2200F units with serial numbers under 1030 have a potential problem with chassis ground. The motherboard frame does not come in constant contact with the motherboard ground track. The only symptom reported thus far which appears to be caused by this grounding problem is that the EXECUTE Key intermittently will not function. The manufacturing solution adds a #18 Ga. green/yellow ground wire from the motherboard ground track (see Figure 55) to a chassis ground stud.

FIGURE 55



In reference to installations of Option 60 (Key "clicker", Audio Alarm and Auxiliary BNC) on the same serial number units mentioned in item f) above, the motherboard frame was occasionally found to be attached to the motherboard incorrectly. The result was that two eyelets (see Figure 56 below, Rev. 1 or Rev. 2 7055/7056 motherboard only; not Rev. 0) used for the OP-60 speaker connections were covered over by the wide flange of the motherboard frame. The solution is to remove the motherboard frame and four pem nuts, reinstall the frame onto the motherboard with the narrow flange of the frame mounted on the connector side of the motherboard. Using the same screws just removed, resecure the frame with 4-40 hex nuts.

FIGURE 56



APPENDIX A

MISCELLANEOUS ITEMS

1. *7052 ROMS*

The Preliminary SB for the 2200E/F described the ROM ICs required for an 80 x 24 CRT display. The ICs listed in the SB are now being loaded onto every 7052 PCB; however, unless a 7059 80 x 24 controller is also installed in the 2200F, the system will still initialize to 64 characters. When a 7059 80 x 24 controller is installed, the system will initialize to an 80 character line width and 24 character lines. Note that the LISTS function displays only 15 lines of text, with or without the 80 x 24 controller.

2. *INTERMITTENT ERROR 18 - 7051 PC CHANGE*

2200E Units with serial numbers below EX1085 and 2200F units with serial numbers below EF1044 could possibly generate intermittent ERR 18. To correct this problem on those units, ECN #5658 must be incorporated. Proceed as follows:

a) Cut *etch* at L48 pin 3.
b) Cut *etch* at L41 pin 11.
c) Connect jumpers between L48 pin 3, L61 pin 13, and L51 pin 1.
d) Connect a jumper from L61 pin 12 to L51 pin 2.
e) Connect a jumper from L51 pin 3 to L41 pin 11.
f) Connect a 150Ω, 1/4 W, 5% (330-2016) between L61 pin 12 and +5V.
g) Connect a 470 pf mica capacitor (300-5005) between L51 pin 2 and ± 0V.
h) Change the E REV from 1 to 2.

3. *2200E REGULATOR*

Exercise care when removing or installing the 7057 Regulator in the 2200E. The +12V Regulator potentiometer can be damaged by jamming the board against the Display Chassis frame.

4. *7051 CPU BOARD*

Many 7051 boards have a resistor installed incorrectly. The resistor is located near the upper left corner of the 7051 PCB at L12. On boards where the resistor is installed incorrectly, one lead is connected to pin 14 of L12. That resistor lead must be connected to L12 pin 13, not pin 14.

REVISED AS OF / /

WANG LABORATORIES, INC.
BILL OF MATERIALS

PAGE 1
06/23/76

ASSEMBLY PART NUMBER 177 2200 F
ASSEMBLY DESCRIPTION 2200F COMMON MECHANICAL ASSY

LEGEND
*=KIT TAG #=STATUS ITEM ###=FRACTIONAL QTY

PART NUMBER			DESCRIPTION		QUANTITY
000 0003			LABOR CALCULATING SYSTEMS		8.00
000 0011			LABOR QUALITY CONTROL		1.60
210 7048 A	*	#	7048-A MODULE(PRELIMINARY)		1.00
209 7048			# 7048 W/UNLOADED SOCKETS(A/I)		1.00
210 7051 A		#	7051-A MODULE	EC5625	1.00
209 7051			# 7051 W/UNLOADED SOCKETS		1.00
210 7067	*	#	7067 MODULE(AUTO-INSERTED)		1.00
220 1026			CRT CABLE ASSY(2220)B6482-37	EC5542	1.00
270 0325	*		2200F CHASSIS ASSY E6829-11		1.00
210 7055		* #	7055 MODULE		1.00
220 3014			24 COND 14"FLAT CABLE C-6482-79		1.00
220 1074			CABLE PS/MB(F CHASSIS)B6482-91		1.00
220 1075			AC SWITCH CABLE(F CHAS)B6482-94	EC5620	1.00
220 1076			POWER CORD ASSY(F CHAS)B6482-95	EC5620	1.00
220 1077			P043 WIRE & LUG ASSY(F CHAS)B648296	EC5620	1.00
271 1121	*		2200E/F KEYBOARD ASSY		1.00
210 7049		* #	7049 MODULE		1.00
220 1071			AC SWITCH CABLE(E/F KEYBD)B6482-88	EC5619	1.00
279 1012	*		BASE ASSY(2200E/F)D6829-12		1.00
360 1015	*		1 1/2 AMP FUSE 250V		1.00
360 1030	*		3 AMP FUSE 250 V		1.00
400 1010			FAN,SKELETON(75CFM)ROTRON WR2H2		1.00
449 0101 9			FAN GUARD 4"(WHITE)D5300-1085		1.00
449 0111		#	BEZEL 12" CRT D6646-104		1.00
449 0143	*	#	COVER,2200E/F (MOLDED)E6829-125		1.00
452 2335		#	FINISH PLATE(2200E&F)D6829-120		1.00
452 2517			700 PROGRAM CLAMPS B5900-39	(2	2.00
452 3518			2200 CRT CHASSIS SHIELD B6422-143		1.00
462 0191			CAPTIVE SHIM SPACER B6491-3		2.00
462 0265	*		SPACER,PC BOARD(E/F)C6815-13		8.00
478 0061			700 PROGRAM CLAMP NUTS B5900-27	(2	2.00
478 0252			EDIT KEY HOLE PLUG B6422-288		1.00
615 0359			2200 EDIT OPTION FCTN STRIP B6611-1		1.00
615 1073	*		UNIVERSAL ID LABEL(LARGE)C5300-1066		1.00
615 1304	*		LABEL,CONN ID(F)(20/ROLL)C6829-136		.05
650 2087			4-40X1/4 PAN HD PHL MS SS MAG. SEMS		3.00
650 3680			6-32 X 2 1/8 PAN HD PHL MS SS	EC5681	2.00
650 4133			8-32 X 3/8 FLANGE WHIZ-LOCK MS ZINC	EC5506	4.00
650 4243 W			8-32 X 3/4 PAN HD PHL(OYSTER WHITE)		4.00
650 6121			10-32X3/8 TRUSS HD PHL MS SS		4.00
650 6241			10-32 X 3/4 FL HD PHL MS SS		2.00
650 6243			10-32 X 3/4 TR. HD. PH. MS. SS.		2.00

ASSEMBLY PART NUMBER 177 2200 F
ASSEMBLY DESCRIPTION 2200F COMMON MECHANICAL ASSY

LEGEND
*=KIT TAG #=STATUS ITEM ###=FRACTIONAL QTY

PART NUMBER		DESCRIPTION		QUANTITY
650 6322 W		10-32 X 1 TRUSS HD PHL SCREW(WHITE)		2.00
651 0021 W		SCR.#8X1/2 SELF TAP TRUSS HD(WHITE)		6.00
652 0029		8-32 LOCK-NUT KEPS 511-081800-50		4.00
652 3006		6-32 WING NUT CAD PLATE	EC5681	2.00
653 3000		NO. 6 FLAT WASHER		2.00
653 3001		NO. 6 INT T LK WASHER		2.00
653 6002		#10 FLAT WSHR (7/32X1/2X1/16ZINC PL		4.00
654 1274		CABLE CLAMP ADH.BACK DKLSP 021-0375	EC5681	2.00
655 0009		PLUG BUTTON BLACK SS51338 P50011		2.00
655 0012		VENT.AIR D6815-17		3.00
655 0157		612/712 KNOB ALCO KN700BA		2.00
660 0058	*	NEOPRENE SPONGE TP GREENE 2218 3/8"		.34
660 0076	*	HOOK TAPE (ADH.BACK)		.34
660 0077	*	LOOP TAPE (ADH.BACK)		.34
725 0033	* #	2200 CRT DISPLAY		1.00

ASSEMBLY PART NUMBER 177 2200 E
ASSEMBLY DESCRIPTION 2200E COMMON MECHANICAL ASSY

LEGEND
*=KIT TAG #=STATUS ITEM ###=FRACTIONAL QTY

PART NUMBER		DESCRIPTION		QUANTITY
000 0003		LABOR CALCULATING SYSTEMS		8.00
000 0011		LABOR QUALITY CONTROL		1.60
210 7048 A	* #	7048-A MODULE(PRELIMINARY)		1.00
209 7048		# 7048 W/UNLOADED SOCKETS(A/I)		1.00
210 7051 A	#	7051-A MODULE	EC5625	1.00
209 7051		# 7051 W/UNLOADED SOCKETS		1.00
210 7053	* #	7053 MODULE		1.00
220 3016		24 PIN FLAT CABLE(7053)C6482-79		1.00
210 7057	* #	7057 MODULE		1.00
210 7058 A	* #	7058-A MODULE(60 HZ)		1.00
209 7058		# 7058 W/UNLOADED SOCKETS(60 HZ)(A/I)		1.00
220 1068		CABLE,CRT BD (7058)(E)B6482-86		1.00
220 1026	*	CRT CABLE ASSY(2220)B6482-37	EC5542	1.00
220 1072		9"CRT CABLE B6482-89	EC5542	1.00
270 0320	*	2200E CHASSIS ASSY E6829-10		1.00
210 7056	* #	7056 MODULE(M.B.)		1.00
220 3014		24 COND 14"FLAT CABLE C-6482-79		1.00
220 1029		TD CASS TO P.S.CABLE(2220)B6482-39	EC5647	1.00
220 1070		CRT AC CABLE(E CHASSIS)B6482-87		1.00
220 1073		AC SWITCH CABLE(E/F CHAS)B6482-90		1.00
271 1121	*	2200E/F KEYBOARD ASSY		1.00
210 7049	* #	7049 MODULE		1.00
220 1071		AC SWITCH CABLE(E/F KEYBD)B6482-88	EC5619	1.00
272 0002	*	2220 BEZEL ASSY D6621-52	EC5542	1.00
220 1025		SWITCH & LAMP CABLE(2220)B6482-35		1.00
279 0078		TD DOOR RELEASE ASSY C5300-1062		1.00
279 0300		MICRO SWITCH ASSY,C6060-203		1.00
278 5240	*	MODEL 24 TAPE DRIVE		1.00
210 6175	* #	6175 MODULE(AUTO-INSERTED)		1.00
210 6179	* #	6179 MODULE		1.00
210 6558	* #	6558 MODULE		1.00
278 5330		TD 24 BASE PLATE ASSY		1.00
278 5331		TD 24 REEL BRG HOUSING ASSY		2.00
278 5332		TD 24 LATCH BRKT & SPRING ASSY		1.00
278 5333		TD 24 CAPSTAN BRG HOUSING ASSY		2.00
278 5334		TD 24 MOTOR BRKT ASSY		1.00
278 5335		TD 24 CASSETTE GUIDE STAKED		1.00
278 5336		TD 24 LT.ROLLER SHAFT & ARM B5996-4		1.00
278 5337		TD 24 RT.ROLLER SHAFT & ARM B5996-3		1.00
278 5338		PLATE & PIN STAKING(TD24)B5996-124		1.00
278 5339		TAPE GUIDE & HEAD ASY(TD24)C5996-16	EC4934	1.00
210 5960		# 5960 MODULE		1.00

ASSEMBLY PART NUMBER 177 2200 E
ASSEMBLY DESCRIPTION 2200E COMMON MECHANICAL ASSY

LEGEND
*=KIT TAG #=STATUS ITEM ###=FRACTIONAL QTY

PART NUMBER			DESCRIPTION		QUANTITY
279 0037			MDL 24 INTERLOCK ARM ASSY B5996-1		1.00
279 1012		*	BASE ASSY(2200E/F)D6829-12		1.00
360 1015		*	1 1/2 AMP FUSE 250V		1.00
360 1030		*	3 AMP FUSE 250 V		1.00
400 1010			FAN,SKELETON(75CFM)ROTRON WR2H2		1.00
449 0037			700 WINDOW B5900-646		1.00
449 0101	9		FAN GUARD 4"(WHITE)D5300-1085		1.00
449 0143		* #	COVER,2200E/F (MOLDED)E6829-125		1.00
451 4179	M		BRKT (2220) UPPER (MOD) D6621-21		1.00
451 4419			BRKT,NECK SAVER(E)C6829-133		1.00
451 4430			BRKT WELDMT,TD MOUNT(20/E)D6621-25		1.00
452 2335		#	FINISH PLATE(2200E&F)D6829-120		1.00
452 2517			700 PROGRAM CLAMPS B5900-39 (2		2.00
452 3537			SHIELD,TAPE DRIVE(2200E)B6829-139		1.00
458 0146			DOOR,TAPE DRIVE(BLACK)B6001		1.00
462 0191			CAPTIVE SHIM SPACER B6491-3		2.00
462 0265		*	SPACER,PC BOARD(E/F)C6815-13		8.00
478 0061			700 PROGRAM CLAMP NUTS B5900-27 (2		2.00
478 0177			1220 MOUNTING PEG B6106-125		2.00
478 0252			EDIT KEY HOLE PLUG B6422-288		1.00
615 0359			2200 EDIT OPTION FCTN STRIP B6611-1		1.00
615 1073		*	UNIVERSAL ID LABEL(LARGE)C5300-1066		1.00
615 1303		*	LABEL,CONN ID(E)(20/ROLL)C6829-135		.05
650 2087			4-40X1/4 PAN HD PHL MS SS MAG. SEMS		3.00
650 3840			6-32 X 2-1/2 PN HD PH MS CAD P1	EC5681	2.00
650 4133			8-32 X 3/8 FLANGE WHIZ-LOCK MS ZINC	EC5506	8.00
650 4160			8-32 X 1/2 PAN HD PHL MS SS SEMS	EC5506	2.00
650 4243	W		8-32 X 3/4 PAN HD PHL(OYSTER WHITE)		4.00
650 6121			10-32X3/8 TRUSS HD PHL MS SS		4.00
650 6165			10-32 X 1/2 CUP PT. ALLEN SET SCREW		2.00
650 6241			10-32 X 3/4 FL HD PHL MS SS		2.00
650 6243			10-32 X 3/4 TR. HD. PH. MS. SS.		2.00
650 6322	W		10-32 X 1 TRUSS HD PHL SCREW(WHITE)		2.00
651 0021			SCR,#8X1/2 SELF TAP TRUSS HD T-B		2.00
651 0021	W		SCR,#8X1/2 SELF TAP TRUSS HD(WHITE)		6.00
652 0007			PEM NUT CL 832-2		2.00
652 0008			6-32 PEM NUT #CL 632-2		6.00
652 0029			8-32 LOCK-NUT KEPS 511-081800-50		4.00
652 3006			6-32 WING NUT CAD PLATE	EC5681	2.00
653 3000			NO. 6 FLAT WASHER		2.00
653 3001			NO. 6 INT T LK WASHER		2.00
653 4000			NO. 8 FLAT WASHER	EC5506	8.00

REVISED AS OF	WANG LABORATORIES, INC.	PAGE 3
/ /	BILL OF MATERIALS	06/23/76

ASSEMBLY PART NUMBER 177 2200 E
ASSEMBLY DESCRIPTION 2200E COMMON MECHANICAL ASSY

LEGEND
*=KIT TAG #=STATUS ITEM ###=FRACTIONAL QTY

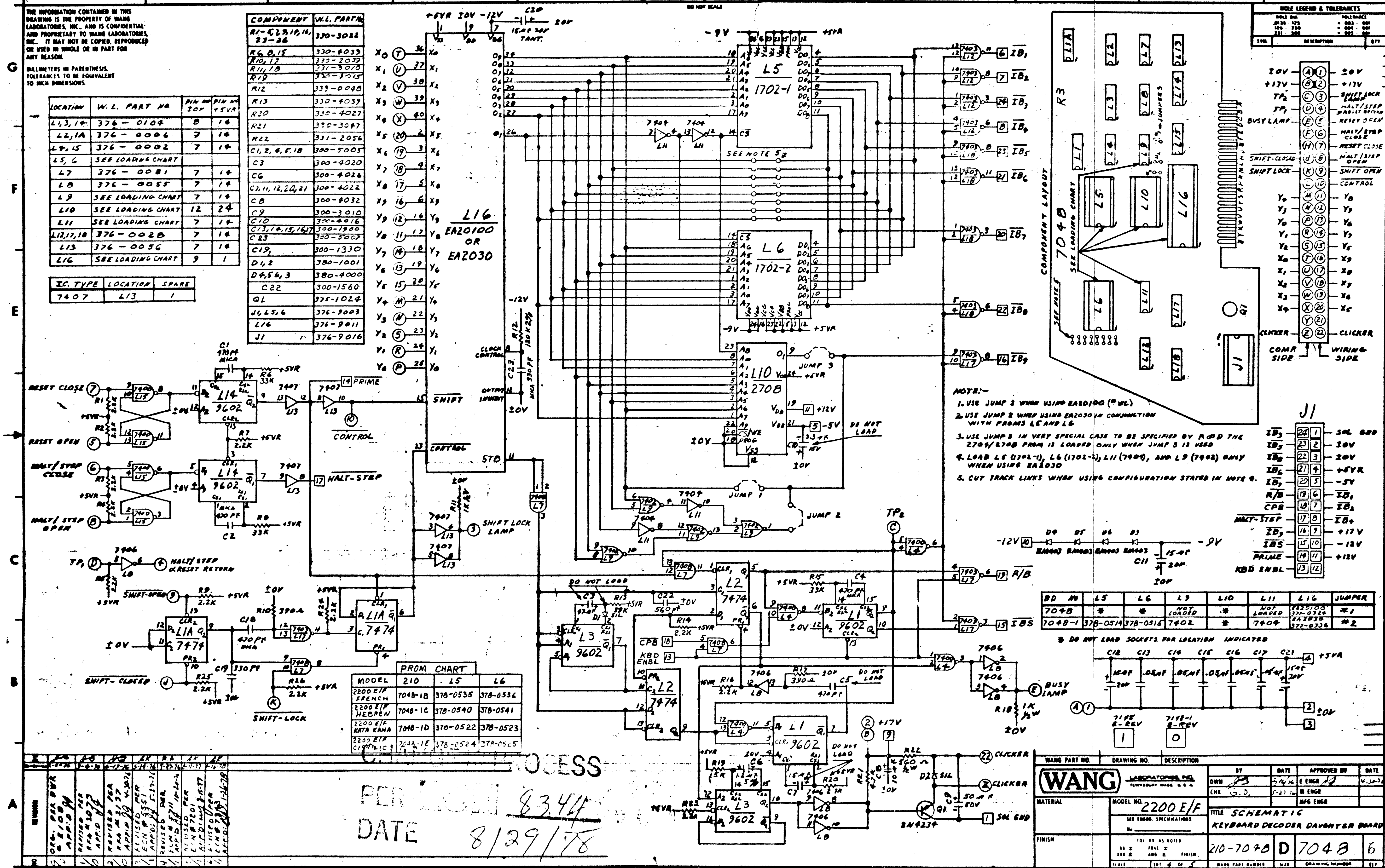
PART NUMBER		DESCRIPTION	QUANTITY
653 6002		#10 FLAT WSHR .17/.32X1/2X1/16ZINC PL	4.00
654 1204		GROMMET 3/16 ID FOR 5/16 HOLE	2.00
654 1233		GROM.5/16 ID 7/16 HOLE A.I.#2538	2.00
654 1274		CABLE CLAMP ADH.BACK DKLSP 021-0375 EC5681	1.00
655 0009		PLUG BUTTON BLACK SS51338 P50011	2.00
655 0012		VENT.AIR D6815-17	3.00
655 0166		KNOB ASSY.CONTROL B6621-54	2.00
725 0045	* #	9" CRT MONITOR	1.00

APPENDIX C

SCHEMATIC DIAGRAMS

BOARD NO.	DRAWING NO.	SHEETS		TITLE
7048	D7048	1	Page 75	2200E/F KBD DECODER
7049	D7049	1	76	2200E/F KEYBOARD
7051	E7051	3	77	2200E/F CPU
7052	E7052	3	80	2200E/F MEMORY
7053	E7053	1	83	2200E CASSETTE CONTROL & INTERFACE
7054	E7054	2	84	2200F CRT/DISK/PRINTER CONTROL
7055	E7055	1	86	2200F MOTHERBOARD
7056	E7056	1	87	2200E MOTHERBOARD
7057	D7057	1	88	2200E PWR SUPPLY REGULATOR
7058	E7058	2	89	2200E CRT/PRINTER/PLOTTER
7059	-			NOT AVAILABLE AT TIME OF PRINTING
7061	E7061	1	91	2200E/F TYP/PLOTTER OUTPUT
7067	D7067	1	92	2200F PWR SUPPLY REGULATOR
7068	D7068	1	93	2200F CASSETTE INTERFACE (TESTER)
			94	2200E POWER SUPPLY

MILLIMETERS IN PARENTHESIS. TOLERANCES TO BE EQUIVALENT TO INCH DIMENSIONS.



LOCATION	W. L. PART NO.	PIN NO ±0V	PIN NO +5VR
L1, 3, 14	376 – 0104	8	16
L2, 1A	376 – 0006	7	14
L4, 15	376 – 0002	7	14
L5, 6	SEE LOADING CHART		
L7	376 – 0081	7	14
L8	376 – 0055	7	14
L9	SEE LOADING CHART	7	14
L10	SEE LOADING CHART	12	24
L11	SEE LOADING CHART	7	14
L12, 17, 18	376 – 0028	7	14
L13	376 – 0056	7	14
L16	SEE LOADING CHART	9	1

I.C. TYPE	LOCATION	SPARE
7407	L13	1

COMPONENT	W.L. PART NO.
R1–5, 7, 9, 14, 16, 23–26	330-3022
R6, 8, 15	330-4033
R10, 17	330-2039
R11, 18	331-3010
R19	330-3015
R12	339-0048
R13	330-4039
R20	330-4027
R21	330-3047
R22	331-2056
C1, 2, 4, 5, 18	300-5005
C3	300-4020
C6	300-4026
C7, 11, 12, 20, 21	300-4022
C8	300-4032
C9	300-3010
C10	300-4016
C13, 14, 15, 16, 17	300-1900
C23	300-5007
C19	300-1330
D1, 2	380-1001
D4, 5, 6, 3	380-4000
C22	300-1560
Q1	375-1024
J1, L5, 6	376-9003
L16	376-9011
J1	376-9016

NOTE:–

1. USE JUMP 1 WHEN USING EA20100 (* VL)
2. USE JUMP 2 WHEN USING EA2030 IN CONJUNCTION WITH PROMS L5 AND L6
3. USE JUMP 3 IN VERY SPECIAL CASE TO BE SPECIFIED BY R & D THE 2704/2708 PROM IS LOADED ONLY WHEN JUMP 3 IS USED
4. LOAD L5 (1702-1), L6 (1702-2), L11 (7404), AND L9 (7402) ONLY WHEN USING EA2030
5. CUT TRACK LINKS WHEN USING CONFIGURATION STATED IN NOTE 4.

BD NO	L5	L6	L9	L10	L11	L16	JUMPER
7048	*	*	NOT LOADED	*	NOT LOADED	EA20100 377-0324	#1
7048-1	378-0514	378-0515	7402	*	7404	EA2030 377-0336	#2

* DO NOT LOAD SOCKETS FOR LOCATION INDICATED

PROM CHART

MODEL	210	L5	L6
2200 E/F FRENCH	7048-1B	378-0535	378-0536
2200 E/F HEBREW	7048-1C	378-0540	378-0541
2200 E/F KATA KANA	7048-1D	378-0522	378-0523
2200 E/F CYRILLIC	7048-1E	378-0524	378-0525

7148 E-REV: 1

7148-1 E-REV: 0

CHANGE IN PROCESS PER 8347 DATE 8/29/78

WANG PART NO.	DRAWING NO.	DESCRIPTION

WANG LABORATORIES, INC. TEWKSBURY MASS. U.S.A.

	BY	DATE	APPROVED BY	DATE
DWN		3/14/76	E ENGR	4-30-76
CHK	G.D.	5-27-76	M ENGR	
			MFG ENGR	

MATERIAL

MODEL NO. 2200 E/F

SEE ENGRG. SPECIFICATIONS No. ____

TITLE: SCHEMATIC KEYBOARD DECODER DAUGHTER BOARD

FINISH

TOL EX AS NOTED

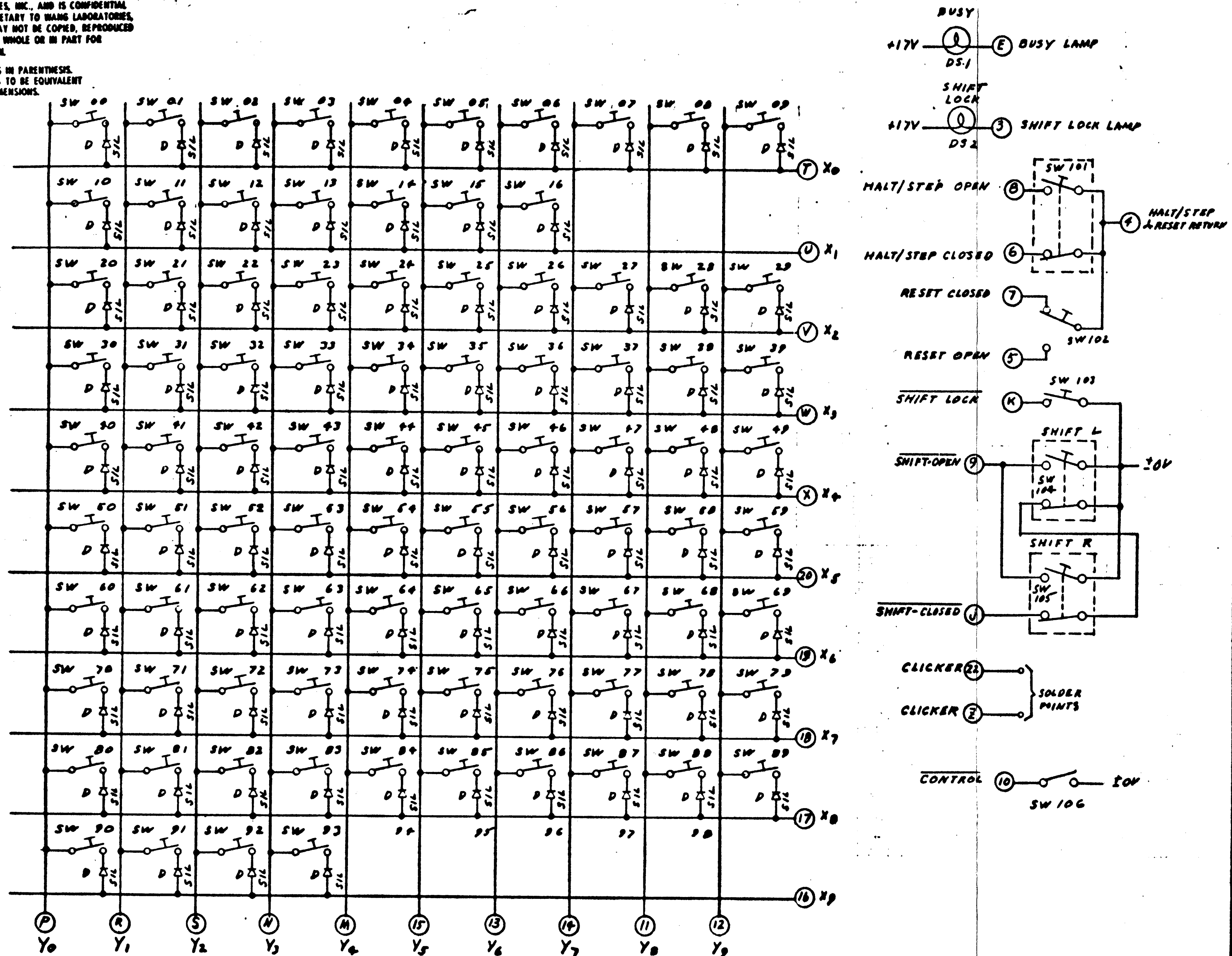
SCALE — SHT 4 OF 5

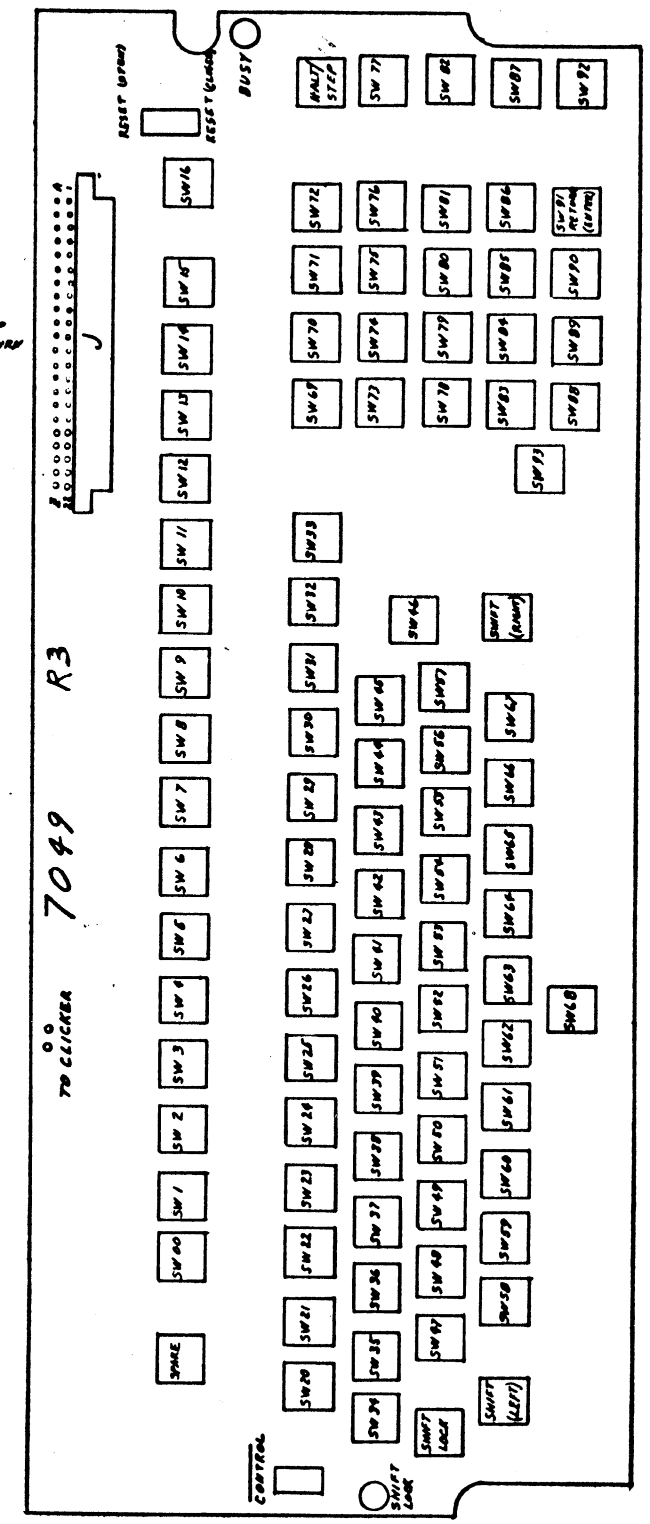
WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
210-7048	D	7048	6

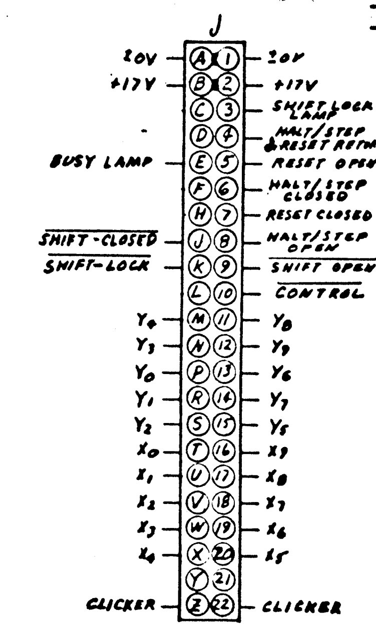
D 7048

MILLIMETERS IN PARENTHESIS. TOLERANCES TO BE EQUIVALENT TO INCH DIMENSIONS.

DO NOT SCALE







COMPONENT	W.L. PART NO.
SW 00 – 16	325-2413
SW 20 – 93, 103	325-2405
SW 101, 104, 105	325-2407
SW 102	325-0026
SW 106	325-0020
D (S/L)	380-1001
DS 1, 2	370-0004
J (44 PIN)	350-0022

E-REV 0

NO.	REVISION	DATE	BY
0/0	ORG PER DWR # E107 APP'D	3-8-76	
1/0	REVISED PER RPA # 2018 APP'D		
2/0	REVISED PER RPA # 2131 APP'D	4-13-76	

HOLE LEGEND & TOLERANCES

HOLE DIA	TOLERANCE
.0135 - .125	+ .003 - .001
.126 - .250	+ .004 - .001
.251 - .500	+ .005 - .001

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

	BY	DATE	APPROVED BY	DATE
DWN		3-8-76	E ENGR	4-16-76
CHK	G. D.	4-16-76	M ENGR	
			MFG ENGR	

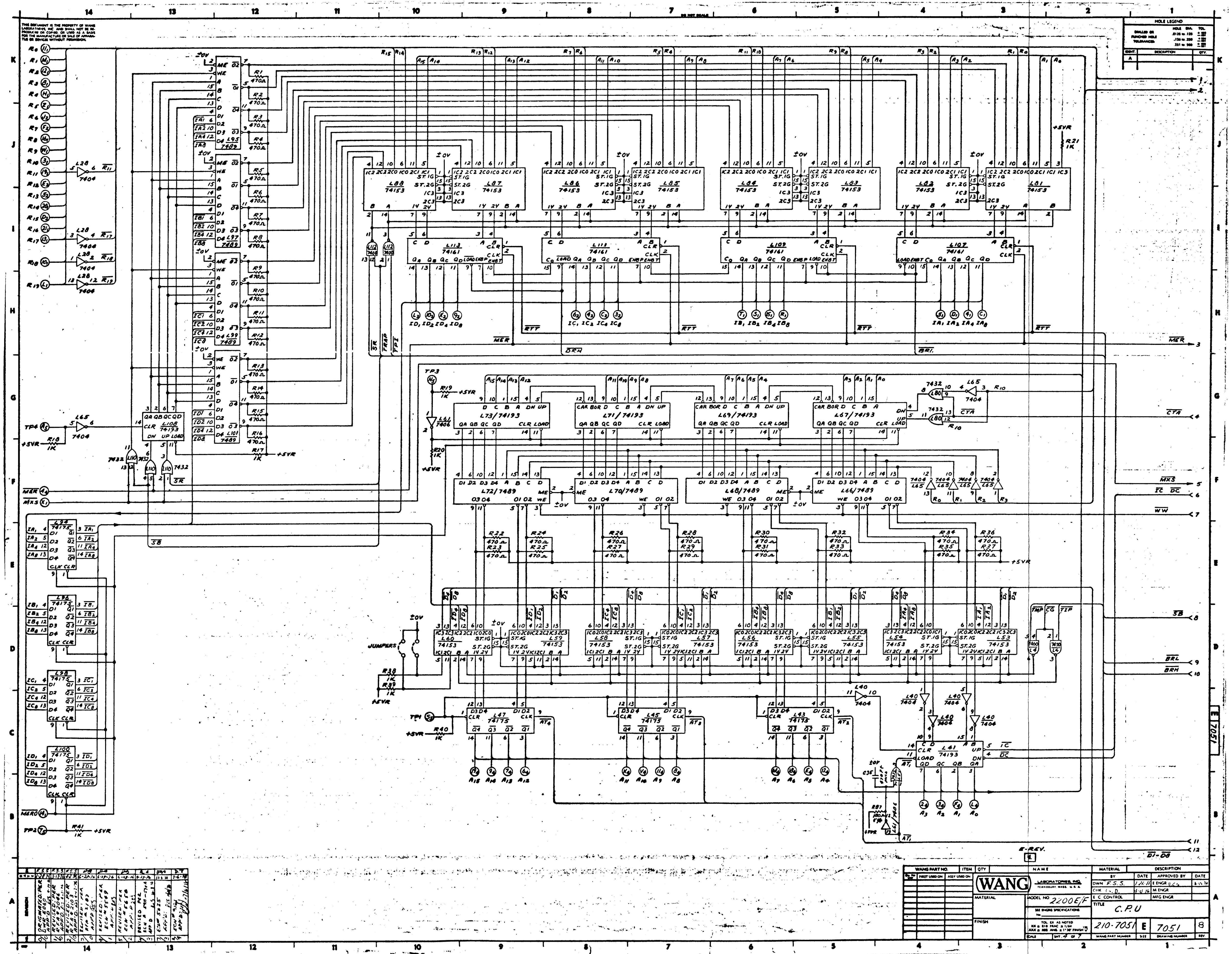
MODEL NO. 2200 E/F

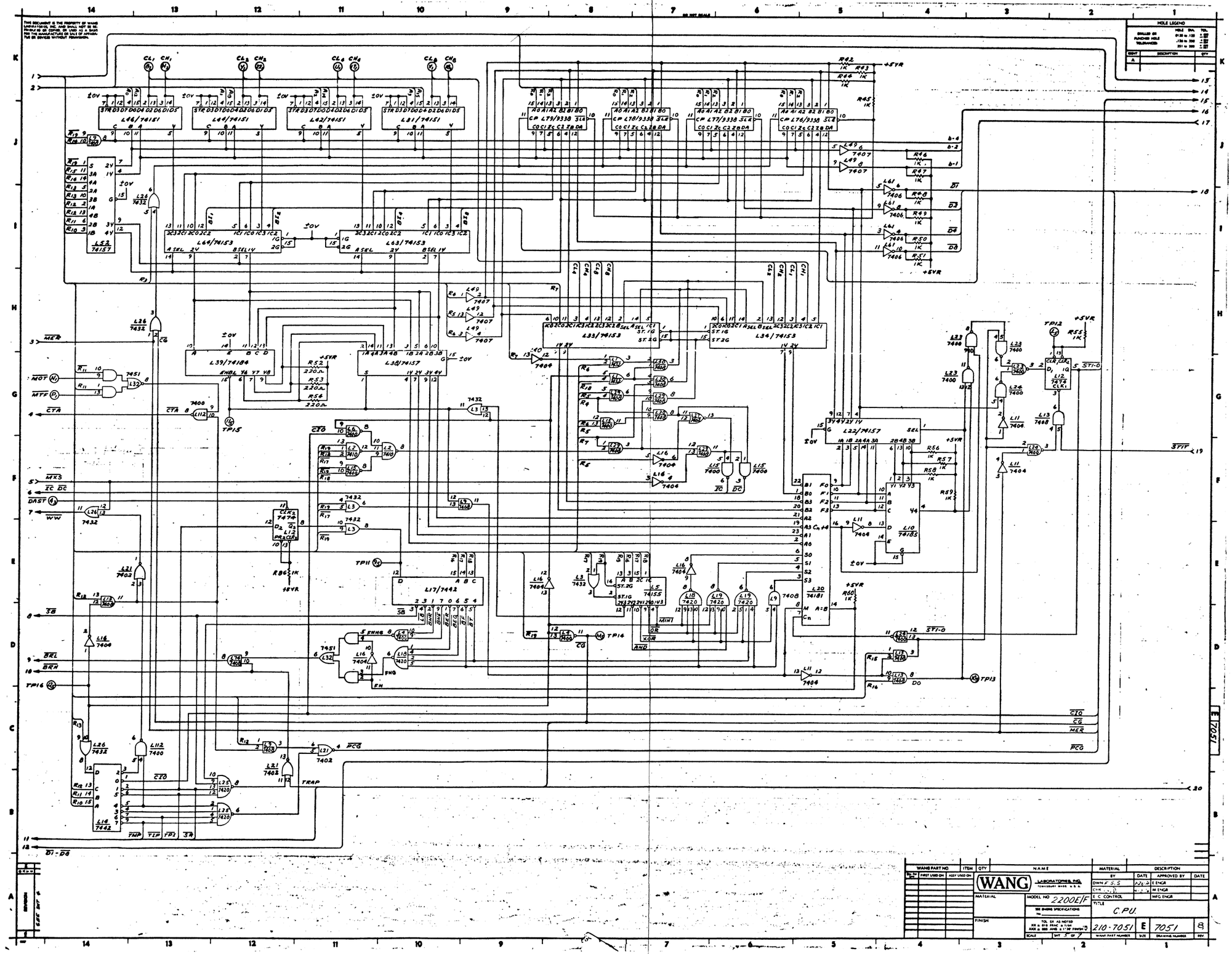
TITLE SCHEMATIC, KEYBOARD

WANG PART NUMBER 220-7049 · SIZE D · DRAWING NUMBER 7049 · REV 2

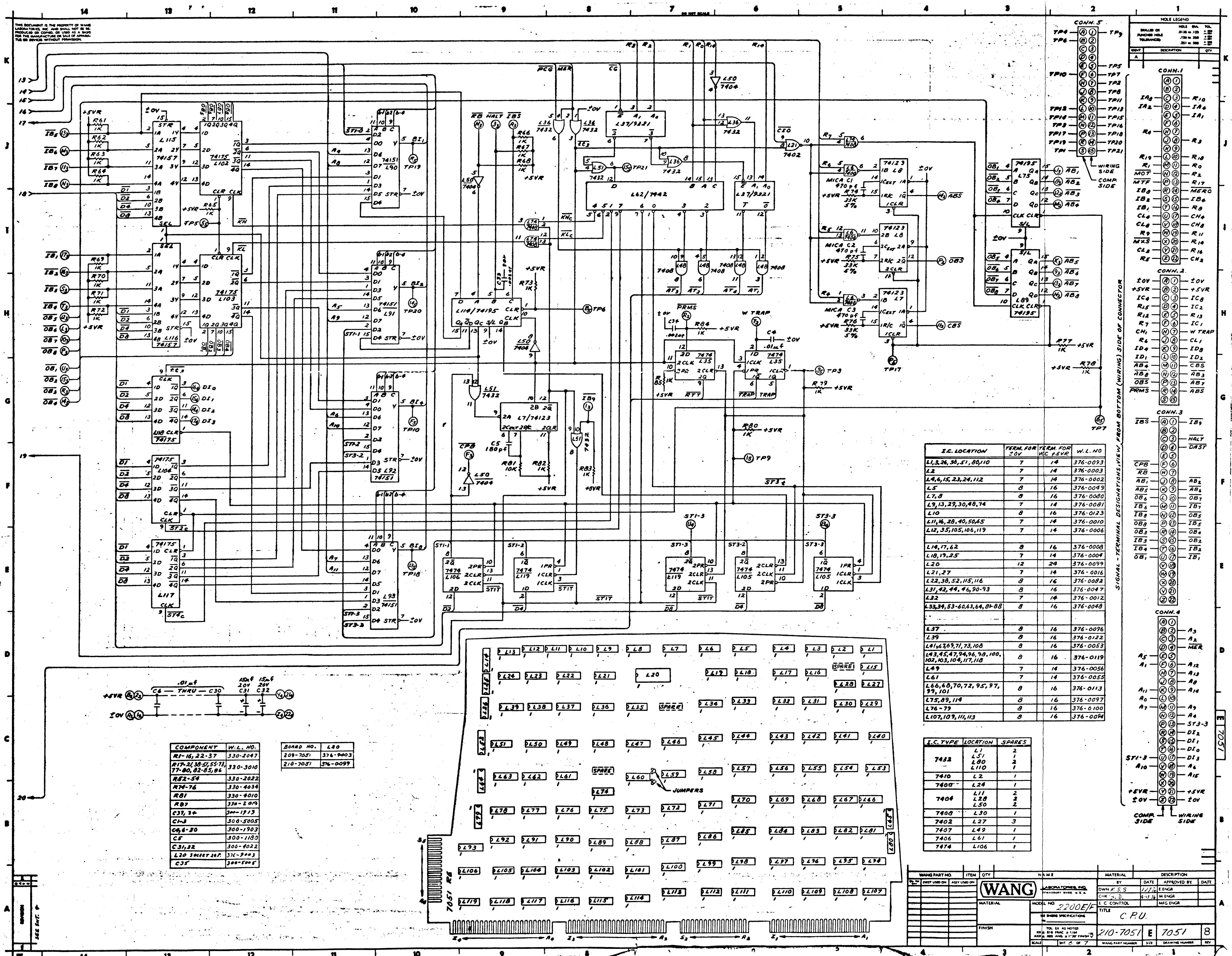
SHT 4 OF 5

D 7049


WANG
LABORATORIES, INC.
MODEL NO 2200E/F
TITLE C.P.U
210-7051
E
7051
B



WANG PART NO	ITEM	QTY	NAME	MATERIAL	DESCRIPTION
			WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.	BY	DATE / APPROVED BY / DATE
			MODEL NO 2200E/F	DWN F.S.S	ENGR
			SEE ENGRG SPECIFICATIONS	CHK	ENGR
				E.C. CONTROL	MFG ENGR
			FINISH: TOL. EX AS NOTED .XX ± .010 .XXX ± .005 ANG. ± 1/2° FINISH	TITLE: C.P.U.	
			SCALE SHT 5 OF 7	210-7051	E 7051 8
				WANG PART NUMBER	DRAWING NUMBER REV



I.C. LOCATION	TERM. FOR ±0V	TERM. FOR VCC +5VR	W.L. NO
L1,3,26,36,51,80,110	7	14	376-0093
L2	7	14	376-0003
L4,6,15,23,24,112	7	14	376-0002
L5	8	16	376-0049
L7,8	8	16	376-0080
L9,13,29,30,48,74	7	14	376-0081
L10	8	16	376-0123
L11,16,28,40,50,65	7	14	376-0010
L12,35,105,106,119	7	14	376-0006
L14,17,62	8	16	376-0008
L18,19,25	7	14	376-0004
L20	12	24	376-0099
L21,27	7	14	376-0016
L22,38,52,115,116	8	16	376-0082
L31,42,44,46,90-93	8	16	376-0047
L32	7	14	376-0012
L33,34,53-60,63,64,81-88	8	16	376-0048
L37	8	16	376-0096
L39	8	16	376-0122
L41,67,69,71,73,108	8	16	376-0053
L43,45,47,94,96,98,100,102,103,104,117,118	8	16	376-0119
L49	7	14	376-0056
L61	7	14	376-0055
L66,68,70,72,95,97,99,101	8	16	376-0113
L75,89,114	8	16	376-0097
L76-79	8	16	376-0100
L107,109,111,113	8	16	376-0094

I.C. TYPE	LOCATION	SPARES
7432	L1 L51 L80 L110	2 1 2 1
7410	L2	1
7400	L24	1
7404	L11 L28 L50	2 2 2
7408	L30	1
7402	L27	3
7407	L49	1
7406	L61	1
7474	L106	1

COMPONENT	W.L. NO.
R1-16, 22-37	330-2047
R17-21, 38-51, 55-73, 77-80, 82-85, 86	330-3010
R52-54	330-2022
R74-76	330-4034
R81	330-4010
R87	330-2019
C33, 34	300-1913
C1-3	300-5005
C4, 6-30	300-1903
C5	300-1180
C31,32	300-4022
L20 SOCKET 24P.	376-9003
C35	300-5005

BOARD NO.	L20
209-7051	376-9003
210-7051	376-0099

WANG LABORATORIES, INC. TEWKSBURY MASS. U.S.A.

DWN F.S.S	12/7/76	E ENGR	
CHK D. D.	4-13-76	M ENGR	
E C CONTROL		MFG ENGR	

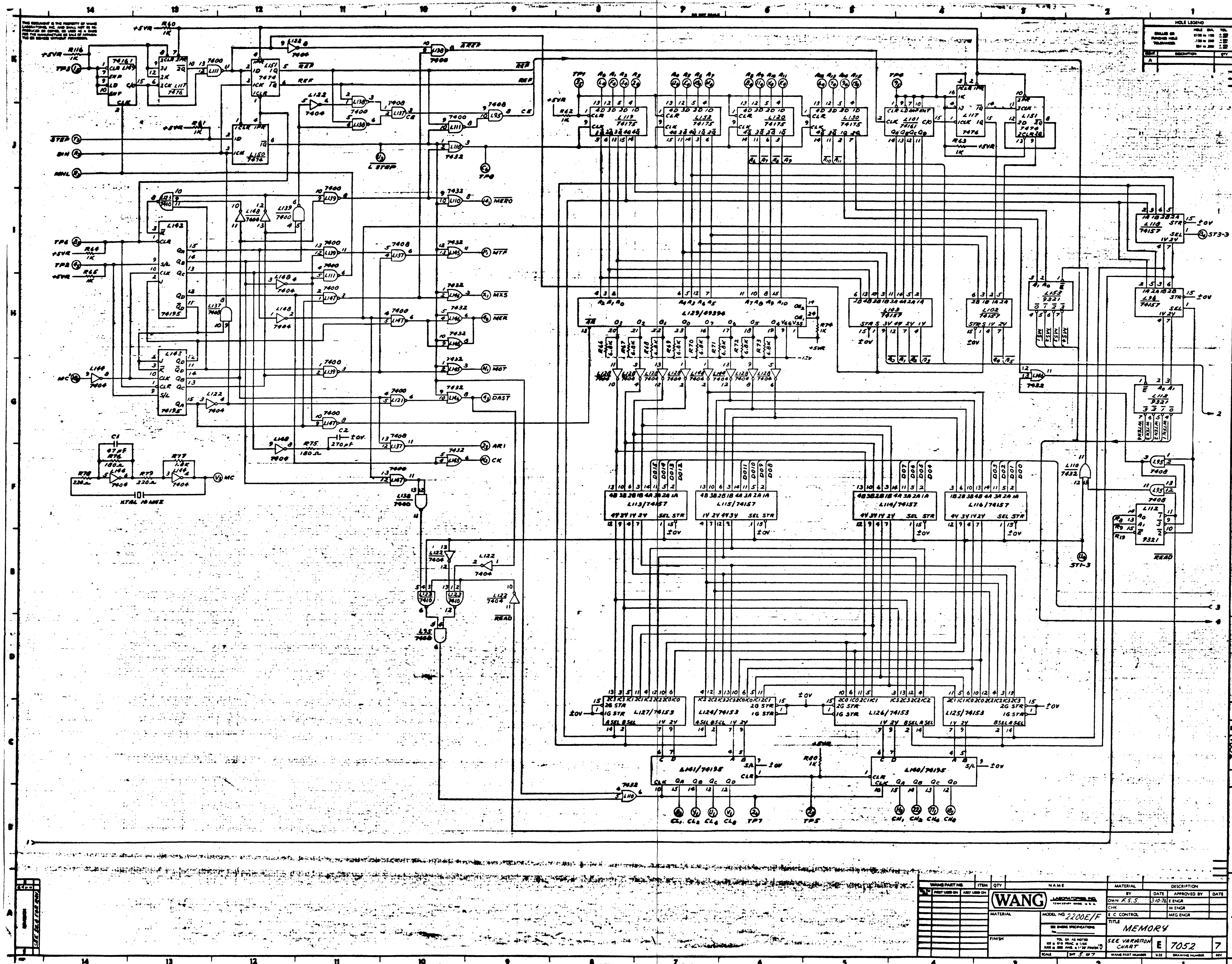
MODEL NO. 2200E/F

TITLE C.P.U.

TOL. EX. AS NOTED XX ± .010 FRAC ± 1/64 XXX ± .005 ANG. ± 1°30' FINISH

SCALE — SHT 6 OF 7

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
210-7051	E	7051	8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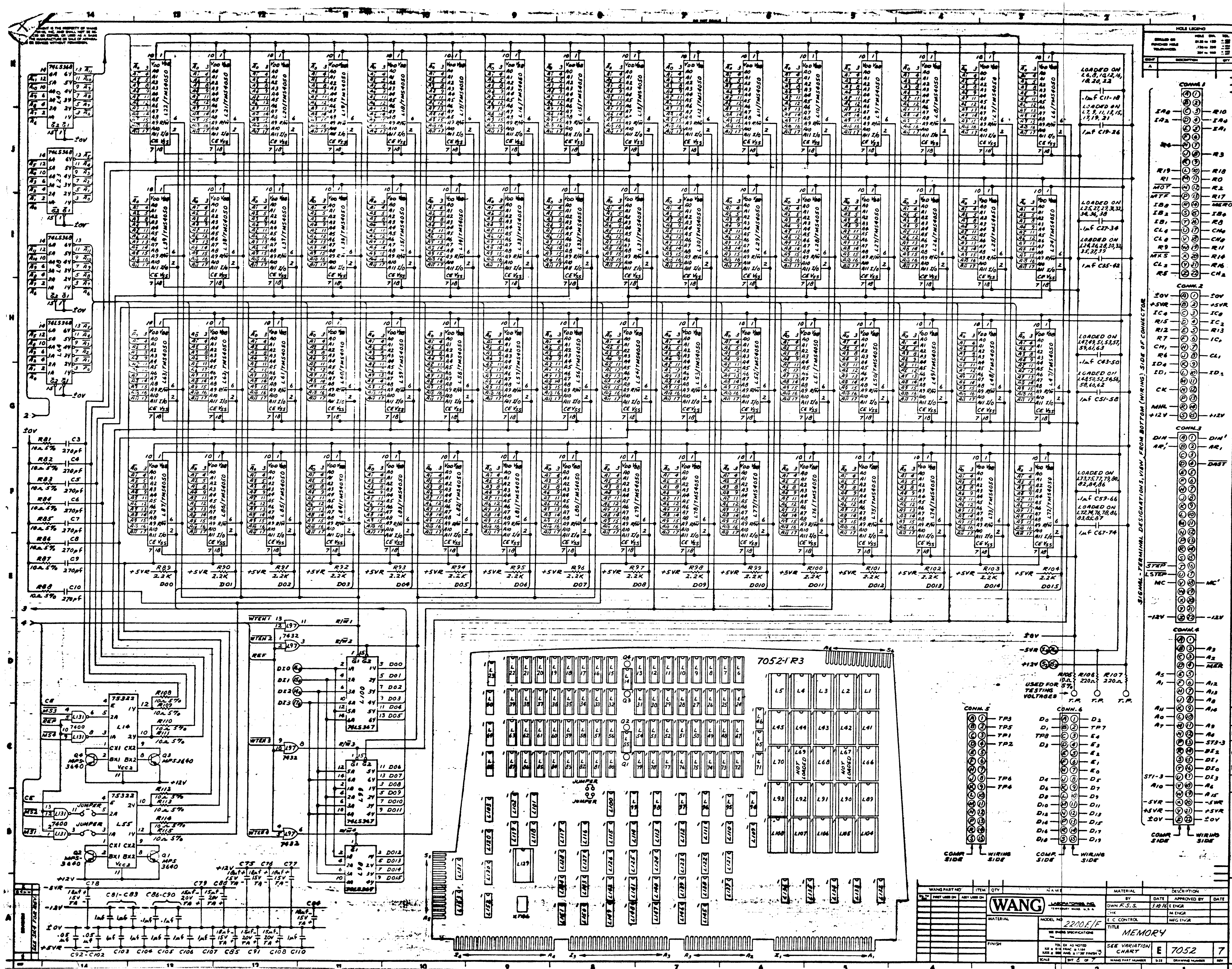
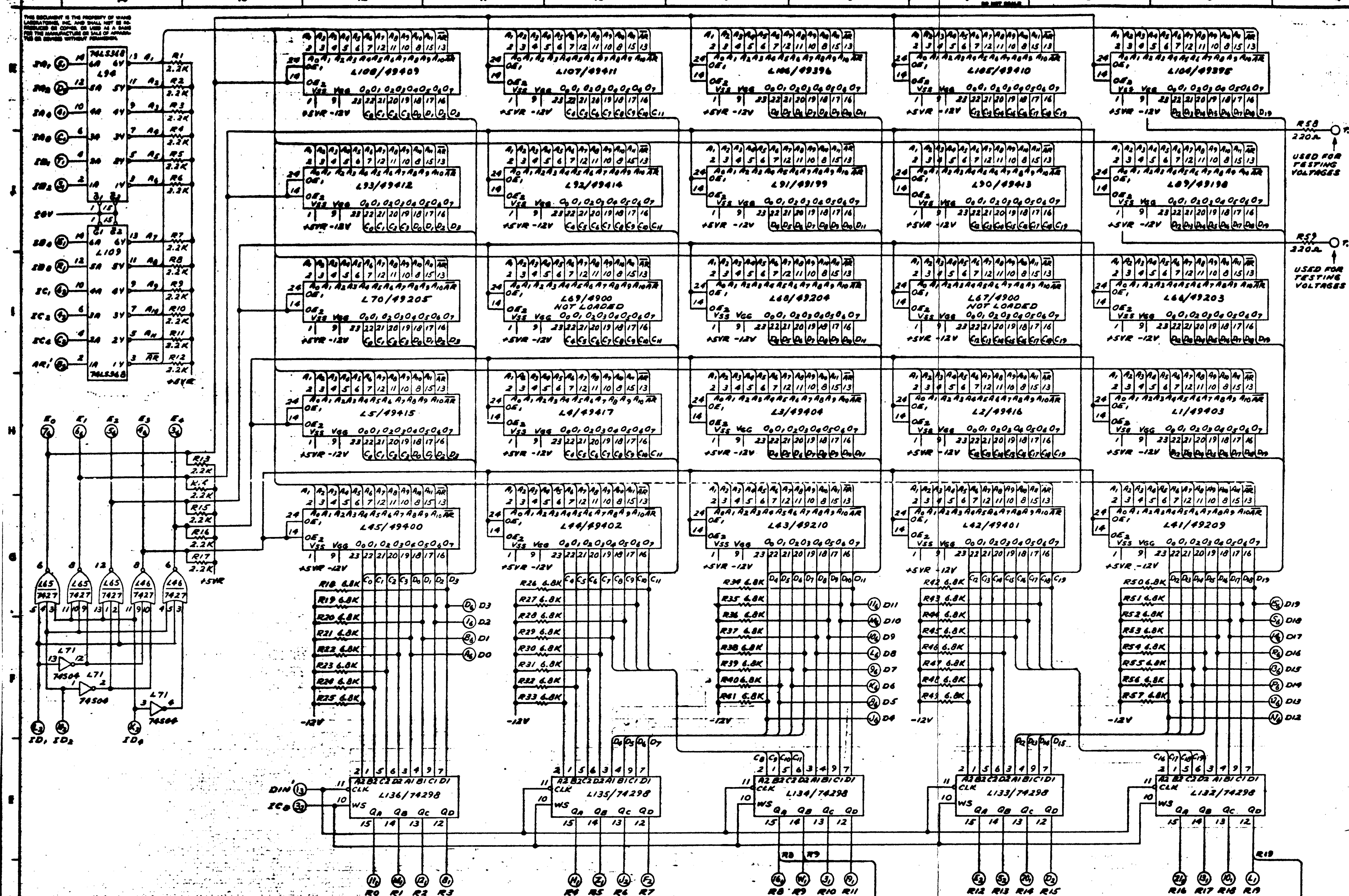
HOLE LEGEND
+5VR R60 1K
R116 1K
TP3
L149 74161
L117 7476
L111 7400
L151 7474
REF
L122 7404
L138 7400
AREF
L137 7408 CE
L95 7408
STEP
BIN
MNL
L150 7474
L110 7432
L STEP
TP8
MERO
L123 7410
L142 74195
L148 7404
L139 7400
TP6
R64 1K
TP2
R65 1K
L143 74195
MC
L144 7404
MTF
L146
MXS
L147
MER
MOT
L121
DAST
C2 270pf
R75 180Ω
AR1
L145
CK
C1 47pf
R76 180Ω
R78 220Ω
R79 220Ω
R77 1.8K
XTAL 10MHZ
READ
TP1
A0 A1 A2 A3
L119 74175
A4 A5 A6 A7
L152 74175
A8 A9 A10 A11
L120 74175
A12 A13 A14 A15
L130 74175
R62 1K
L101 74161
TP9
R63 1K
L129/49394
R74 1K
R66 R67 R68 R69 R70 R71 R72 R73 6.8K
L128 7404
-12V
L103 74157
L102 74157
L153 9321
MS1 MS2 MS3 MS4
L118 74157
ST3-3
L96 74157
L112 9321
WTEN1 WTEN2 WTEN3 WTEN4
L113/74157
L115/74157
L114/74157
L116/74157
DO15 DO14 DO13 DO12 DO11 DO10 DO9 DO8 DO7 DO6 DO5 DO4 DO3 DO2 DO1 DO0
L110 7432
ST1-3
R8 R9 R19
L127/74153
L124/74153
L126/74153
L125/74153
±0V
L141/74195
L140/74195
R80 1K
L140 7432
CL1 CL2 CL4 CL8 TP7
TP5
CH1 CH2 CH4 CH8
WANG LABORATORIES, INC.
WANG PART NO. ITEM QTY NAME MATERIAL DESCRIPTION
MODEL NO. 2200E/F
DWN F.S.S. DATE 3-10-76
TITLE MEMORY
SEE VARIATION CHART
E 7052 7
SHT 3 OF 7



7052-1 R3
SIGNAL - TERMINAL DESIGNATIONS, VIEW FROM BOTTOM (WIRING) SIDE OF CONNECTOR
WANG LABORATORIES, INC.
2200E/F
MEMORY
SEE VARIATION CHART
E 7052 7



VARIATION CHART

I.C. LOCATION	210-7052-2A	210-7052-4A	210-7052-6A	210-7052-8A	+5VR	+12V	-5VR	+12V	±0V
	209-7052	209-7052	209-7052-1	209-7052-1					
L72-87	377-0314	377-0314	377-0314	377-0314			1	10	18
L47-54,56-63		377-0314	377-0314	377-0314			1	10	18
L24-39			377-0314	377-0314			1	10	18
L6-13,15-22				377-0314			1	10	18
L1	377-0303	377-0303	377-0303	377-0303	1	9			
L2	377-0334	377-0334	377-0334	377-0334	1	9			
L3	377-0304	377-0304	377-0304	377-0304	1	9			
L4	377-0335	377-0335	377-0335	377-0335	1	9			
L5	377-0333	377-0333	377-0333	377-0333	1	9			
L41	377-0284	377-0284	377-0284	377-0284	1	9			
L42	377-0296	377-0296	377-0296	377-0296	1	9			
L43	377-0285	377-0285	377-0285	377-0285	1	9			
L44	377-0297	377-0297	377-0297	377-0297	1	9			
L45	377-0295	377-0295	377-0295	377-0295	1	9			
L66	377-0241	377-0241	377-0241	377-0241	1	9			
L67	NOT LOADED	NOT LOADED	NOT LOADED	NOT LOADED					
L68	377-0242	377-0242	377-0242	377-0242	1	9			
L69	NOT LOADED	NOT LOADED	NOT LOADED	NOT LOADED					
L70	377-0243	377-0243	377-0243	377-0243	1	9			
L89	377-0236	377-0236	377-0236	377-0236	1	9			
L90	377-0331	377-0331	377-0331	377-0331	1	9			
L91	377-0237	377-0237	377-0237	377-0237	1	9			
L92	377-0332	377-0332	377-0332	377-0332	1	9			
L93	377-0330	377-0330	377-0330	377-0330	1	9			
L104	377-0298	377-0298	377-0298	377-0298	1	9			
L105	377-0328	377-0328	377-0328	377-0328	1	9			
L106	377-0299	377-0299	377-0299	377-0299	1	9			
L107	377-0329	377-0329	377-0329	377-0329	1	9			
L108	377-0327	377-0327	377-0327	377-0327	1	9			
L129	377-0291	377-0291	377-0291	377-0291	✓	9			

209-7052 7052 LOADING

COMPONENT	W.L. NO.
R1-17, 89-104	330-3022
R18-57, 66-73	330-3068
R58,59,78,79,106,107	330-2022
R60-65,74,80	330-3010
R75-76	330-2018
R77	330-3018
R85-88,105,112-115	330-1011
C1	300-1047
C2,7-10	300-1270
C43-50,59-66,86-90,109	300-1930
C51-58,67-74,81-83,103-107,110	300-1931
C77,78,84,91	300-4018
C79,80,85,108	300-4022
C92-102	300-1900
L55 SOCKET	376-9001
L132-136 SOCKET	376-9002
Q1,2	375-1050
XTAL	321-0008
I.C. SOCKET (18 PIN)	376-9014
I.C. SOCKET (24 PIN)	376-9003

209-7052-1 7052-1 LOADING

COMPONENT	W.L. NO.
R1-17, 89-104	330-3022
R18-57,66-73	330-3068
R58,59,78,79,106,107	330-2022
R60-65,74,80,116	330-3010
R75,76	330-2018
R77	330-3018
R81-88,105,108-115	330-1011
C1	300-1047
C2-10	300-1270
C11-18,27-34,43-50,59-66,86-90,109	300-1930
C19-26,35-42,51-58,67-74,81-83,103-107,110	300-1931
C75-78,84,91	300-4018
C79,80,108,85	300-4022
C92-102	300-1900
L14,55 SOCKET	376-9001
L132-136 SOCKET	376-9002
Q1-4	375-1050
XTAL	321-0008
I.C. SOCKET (18 PIN)	376-9014
I.C. SOCKET (24 PIN)	376-9003

7052-1 LOADING I.C. LOCATION	7052 LOADING I.C. LOCATION	W.L. NO.	TERM FOR ±0V	TERM FOR VCC +5VR
L14,55	L55	376-0178	7	14
L23,40,64,88,94,109	L64,88,94,109	376-0193	8	16
L46,65	SAME	376-0125	7	14
L71	SAME	376-0197	7	14
L95,137	SAME	376-0081	7	14
L96,102,103,113,114,115,116,118	SAME	376-0082	8	16
L97,110,145,146	SAME	376-0093	7	14
L98,99,100	SAME	376-0192	8	16
L101,149	SAME	376-0094	8	16
L111,121,131,138,139,147	SAME	376-0002	7	14
L112,153	SAME	376-0096	8	16
L117	SAME	376-0007	13	5
L119,120,130,152	SAME	376-0119	8	16
L122,128,144,148	SAME	376-0010	7	14
L123	SAME	376-0003	7	14
L124-127	SAME	376-0048	8	16
L132-136	SAME	376-0138	8	16
L140-143	SAME	376-0097	8	16
L150,151	SAME	376-0006	7	14

I.C. TYPE	LOCATION	SPARES
7427	L46	1
74S04	L71	3
74LS367	L98	2
7400	L111	1
7400	L121	3
9321	L153	1
7404	L144	1
7404	L148	1
7474	L150	1

7052 E-REV 0

7052-1 E-REV 0

WANG LABORATORIES, INC. TEWKSBURY MASS. U.S.A.

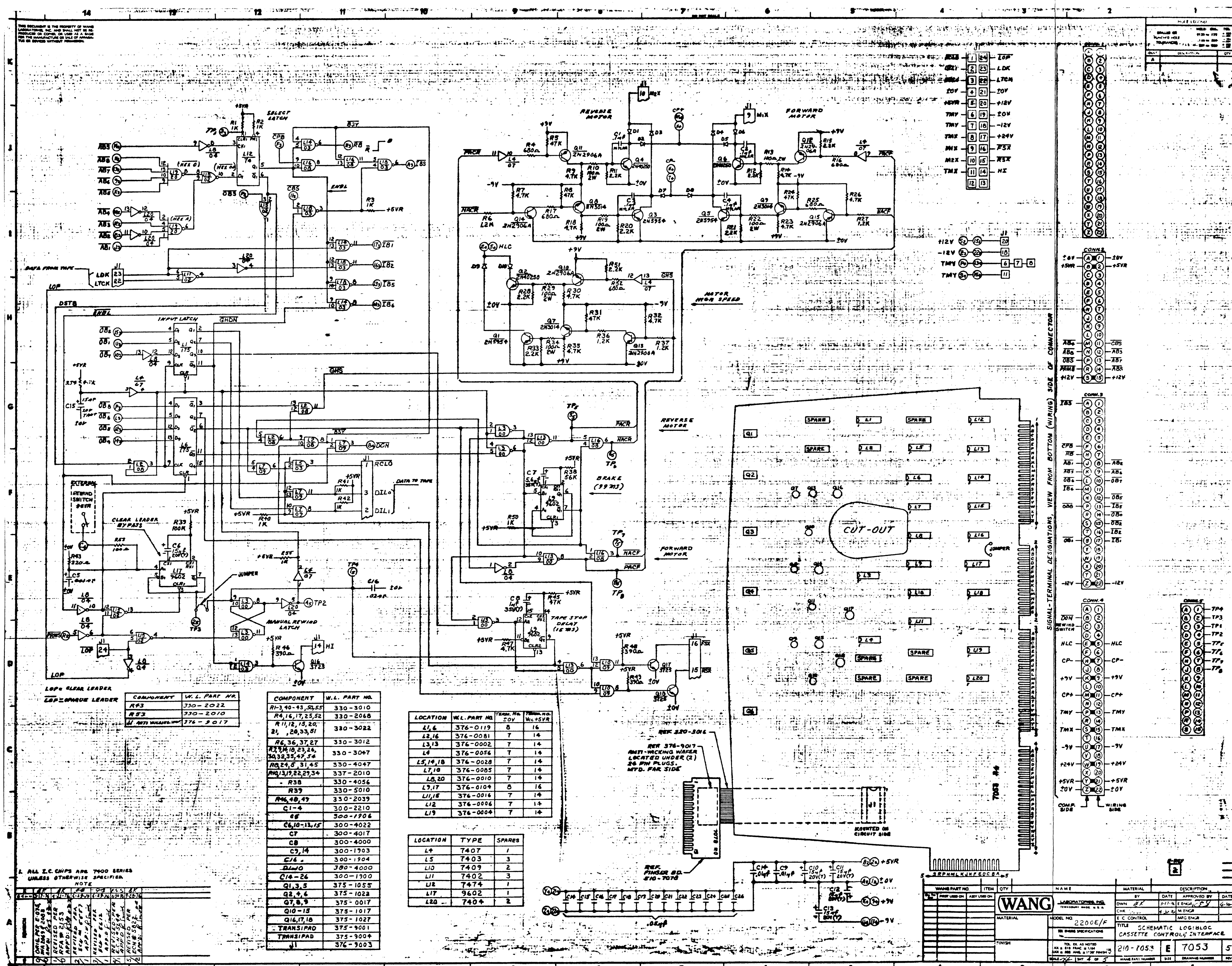
MODEL NO 2200E/F

TITLE MEMORY

DWN F.S.S. 3-10-76

SEE VARIATION CHART | SIZE E | DRAWING NUMBER 7052 | REV. 7

SHT 4 OF 7



LOP = CLEAR LEADER

$\overline{LOP}$ = OPAQUE LEADER

COMPONENT	W. L. PART NO.
R43	330-2022
R53	330-2010
J1 ANTI WICKING WAF.	376-9017

COMPONENT	W.L. PART NO.
R1-3, 40-43, 50, 55	330-3010
R4, 16, 17, 25, 52	330-2068
R11, 12, 15, 20, 21, , 28, 33, 51	330-3022
R6, 36, 37, 27	330-3012
R7, 9, 14, 18, 23, 26, 30, 32, 35, 47, 54	330-3047
R8, 24, 5, 31, 45	330-4047
R10, 13, 19, 22, 29, 34	337-2010
R38	330-4056
R39	330-5010
R46, 48, 49	330-2039
C1-4	300-2210
C5	300-1906
C6, 10-13, 15	300-4022
C7	300-4017
C8	300-4000
C9, 14	300-1903
C16	300-1904
D1-10	380-4000
C14-26	300-1900
Q1, 3, 5	375-1055
Q2, 4, 6	375-1022
Q7, 8, 9	375-0017
Q10-15	375-1017
Q16, 17, 18	375-1027
TRANSIPAD	375-9001
TRANSIPAD	375-9004
J1	376-9003

LOCATION	W.L. PART NO.	TERM. NO. ±0V	TERM. NO. Vcc +5VR
L1, 6	376-0119	8	16
L2, 16	376-0081	7	14
L3, 13	376-0002	7	14
L4	376-0056	7	14
L5, 14, 18	376-0028	7	14
L7, 10	376-0085	7	14
L8, 20	376-0010	7	14
L9, 17	376-0104	8	16
L11, 15	376-0016	7	14
L12	376-0006	7	14
L19	376-0004	7	14

LOCATION	TYPE	SPARES
L4	7407	1
L5	7403	3
L10	7409	2
L11	7402	3
L12	7474	1
L17	9602	1
L20	7404	2

NOTE

1. ALL I.C. CHIPS ARE 7400 SERIES UNLESS OTHERWISE SPECIFIED.

WANG LABORATORIES, INC. TEWKSBURY MASS. U.S.A.

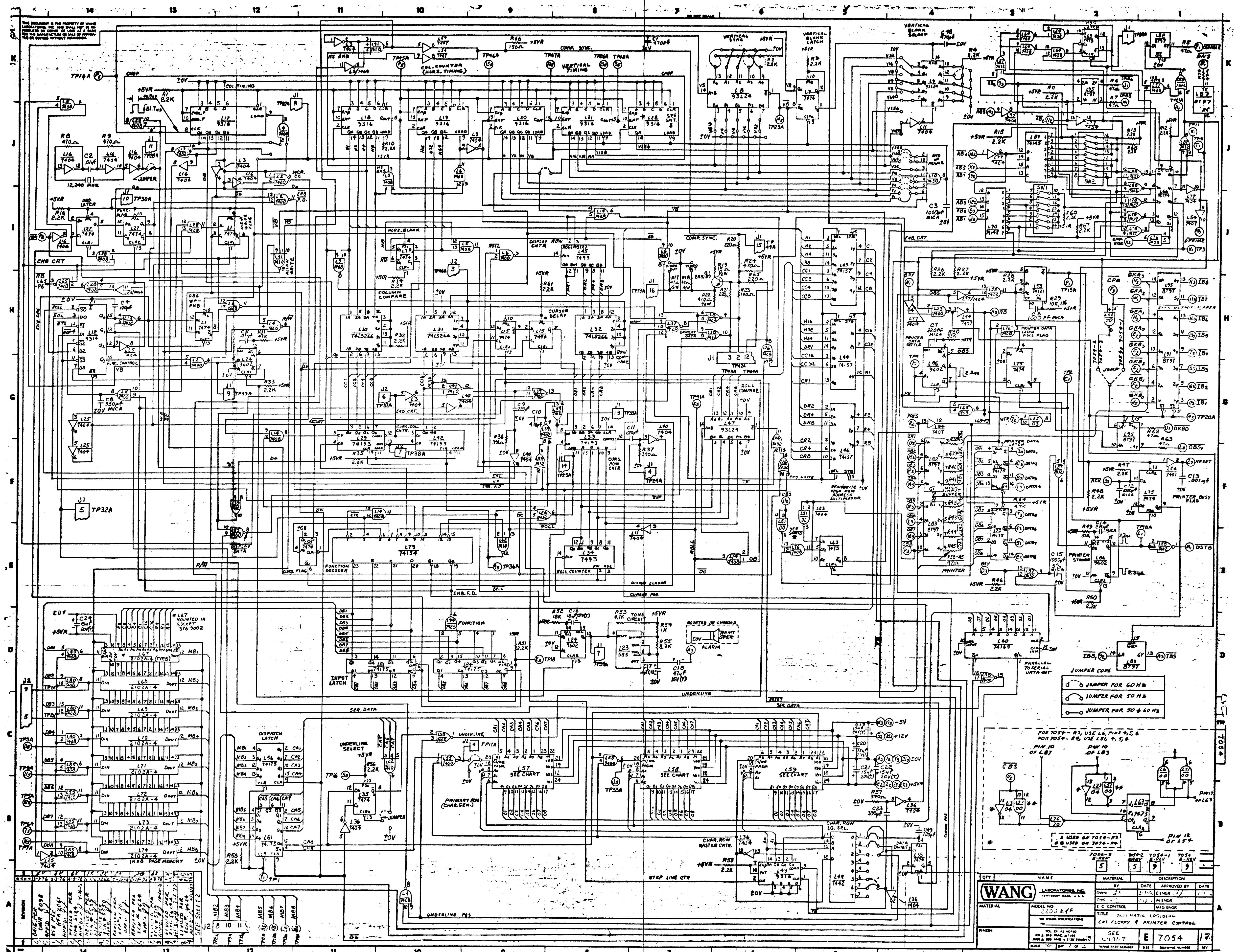
MODEL NO. 2200E/F

TITLE SCHEMATIC LOGIBLOC CASSETTE CONTROLS INTERFACE

DWN AK 3-17-76 | E ENGR 4-10-76

WANG PART NUMBER 210-7053 | SIZE E | DRAWING NUMBER 7053 | REV 5

SCALE | SHT 4 OF 5


THIS DOCUMENT IS THE PROPERTY OF WANG LABORATORIES, INC. AND SHALL NOT BE REPRODUCED OR COPIED OR USED AS A BASIS FOR THE MANUFACTURE OR SALE OF APPARATUS OR DEVICES WITHOUT PERMISSION.
COL. COUNTER (HORZ. TIMING)
VERTICAL TIMING
COMP. SYNC.
VERTICAL SYNC
VERTICAL BLANK LATCH
VERTICAL BLANK SELECT
END OF FRAME
COL TIMING
DBS LATCH
FUNC. FLAG
MEM WRITE FLAG
ALLOW WRITE
ENB CRT
FUNC. CONTROL
HORZ. BLANK
COLUMN COMPARE
DISPLAY ROW CNTR
CURSOR DELAY
ROW COMPARE
DISPLAY DATA
ROLL COMPARE
CURS. COL. CNTR.
CURS. ROW CNTR
ROLL COUNTER
FUNCTION DECODER
READ/WRITE PAGE MEM ADDRESS MULTIPLEXOR
PRINTER DATA SETTLE
PRINTER DATA LATCH FULL FLAG
PRINTER DATA LATCH
DISK INPUT BUFFER
DISK OUTPUT BUFFER
PRINTER STROBE
PRINTER BUSY FLAG
*L67 MOUNTED IN SOCKET 376-9002
1KX8 PAGE MEMORY
FUNCTION
INPUT LATCH
TONE CIRCUIT
MOUNTED ON CHASSIS
ALARM
PARALLEL TO SERIAL DATA OUT
JUMPER CODE
JUMPER FOR 60 Hz
JUMPER FOR 50 Hz
JUMPER FOR 50 & 60 Hz
FOR 7054 - R3, USE L6, PINS 4, 5, 6
FOR 7054 - R4, USE L51, 4, 5, 6
PIN 10 OF L87
PIN 10 OF L83
PIN 13 OF L63
PIN 12 OF L54
* USED ON 7054-R3
** USED ON 7054-R4
DISPATCH LATCH
UNDERLINE SELECT
PRIMARY ROM (CHAR. GEN.)
SEE CHART
CHAR. ROW RASTER CNTR.
CHAR. ROW LG. SEL.
DATA INHIBIT
STEP LINE CTR
UNDERLINE POS
SER. DATA
UNDERLINE
7054-3 E-REV 5
7054-2 E-REV 5
7054-1 E-REV 9
7054 E-REV 9
WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.
MODEL NO 2200 E&F
TITLE SCHEMATIC LOGIBLOC CRT FLOPPY & PRINTER CONTROL
SEE CHART
E
7054
SHT 1 OF 2
SEE SHEET 2

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SPARES

I.C. TYPE	LOCATION	SPARES
7404	L3	1
7404	L25	1
7400	L6	1
7404	L11	4
7432	L13	2
7404	L36	2
7420	L37	1
7400	L52	2
7400	L51	1
7403	L65	1
7408	L85	1
7432	L87	1
7404	L40	3
7474	L50	1
7410	L62	1
7420	L94	1

JUMPER VARIATION CHART

	7054 60HZ	7054-1 50HZ	7054-2 60HZ	7054-3 50HZ
L10-2	V128	V256	V128	V256
L10-12	V64	L10-2	V64	L10-2
L10-4	V8	L10-11	V8	L10-11
L10-5	V4	L10-4	V4	L10-4
L10-6	V2	V1	V2	V1
L9-3	V32	V32	V32	V32
L9-4	V16	V16	V16	V16
L9-9	HIGH	HIGH	HIGH	HIGH
L9-12	±0V	HIGH	±0V	HIGH
L8-9	HIGH	±0V	HIGH	±0V
L8-10	±0V	HIGH	±0V	HIGH
L8-13	HIGH	±0V	HIGH	±0V
L49-9	L48-6	L48-7	L48-6	L48-7
R5, 6 R36-45 R62, 63	LOAD 47Ω RESISTORS	LOAD 47Ω RESISTORS	LOAD JUMPERS	LOAD JUMPERS

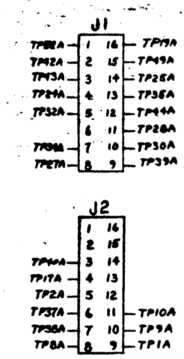
LOADING CHART

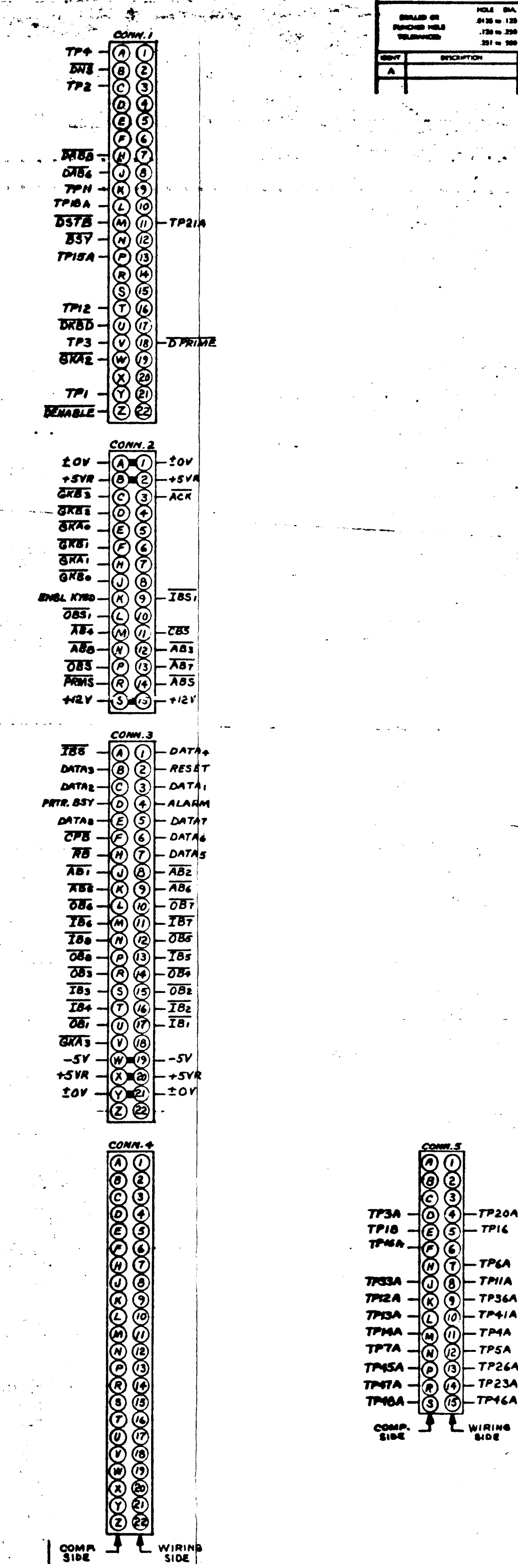
MODEL	P.C. BOARD	L57	L58	L59
210-7054-1B KATA KANA 210-7054-3B	209-7054-1 209-7054-3	378-2044	NOT LOADED	NOT LOADED
210-7054-1C CYRRILIC 210-7054-3C	209-7054-1 209-7054-3	378-2024	NOT LOADED	NOT LOADED
210-7054-1A 210-7054-3A	209-7054-1 209-7054-3	377-0323	NOT LOADED	NOT LOADED
210-7054A 210-7054-2A	209-7054 209-7054-2	377-0323	NOT LOADED	NOT LOADED
2200F	209-7054-2B	378-2044		

COMPONENT	W.L. PART NO.
R54	330-3010
R8,9,24	330-2047
R1-4,10-16,26-28, 32,33,35,46,47,48, 50,51,58,59,60,61, 68,67,56	330-3022
R5-7,34,38-45,62,63	330-1047
R29	333-0017
R17,18	331-1047
R22,	331-2047
R20,21,65	330-2022
R23	330-2010
R36,37,57	330-2039
R53,64,	330-3047
R19	331-1015
R52	330-4018
R30,49	330-4033
R55	330-3082
R31	330-4047
R66	330-2015
C1,10,48	300-1470
C2,5,25-47	300-1903
C4	300-1100
C9,11,49	300-1220
C3,6,12,15	300-5006
C13	300-1906
C7,14	300-5004
C16	300-4018
C17	300-4002
C18	300-4020
C19-22,24	300-4022
C8	300-5007
C23	300-1390
SW. 1, 2	325-1503
SW. CAP 1, 2	325-9047
XTAL	321-0019
J1, 2	376-9002T
Q1	375-1021
L57-59	376-9003
B.N.C. CONN.	350-2064 REF.

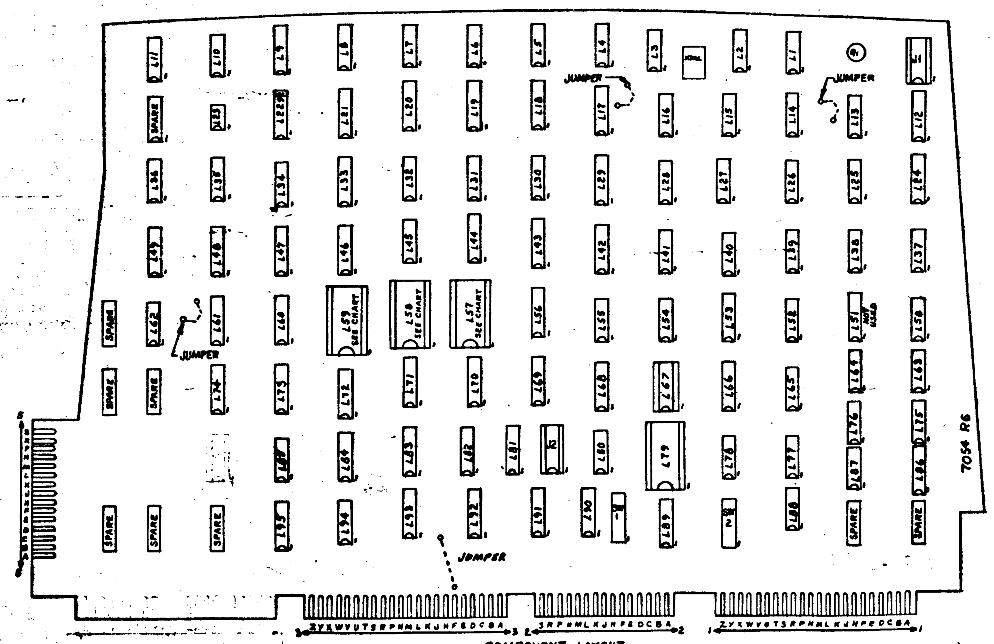
LOCATION	W.L. PART NO.	TERM. NO ±0V	TERM. NO Vcc+5VR
L1,7,15,27,35,54,75	376-0006	7	14
L2,4,6,51,52,55	376-0002	7	14
L3,11,16,25,36,40,77	376-0010	7	14
L5,14,28,64,76,80,85	376-0081	7	14
L8,9,47	376-0120	8	16
L10	376-0031	7	14
L12	376-0108	8	16
L13,26,87	376-0093	7	14
L17-21,49	376-0094	8	16
L23	376-0126	1	8
L24,86	376-0104	8	16
L29,33,42	376-0053	8	16
L30,31,32	376-0148	7	14
L34,45	376-0011	10	5
L38,39,88	376-0016	7	14
L37,94	376-0004	7	14
L43,44,46	376-0082	8	16
L48	376-0008	8	16
L67	376-9002		
L53	376-0051	7	14
L54	376-0056	7	14
L56,61,81,84,92,93	376-0119	8	16
L57,58,59	SEE CHART (SH.4)	12	24
L60	376-0105	8	16
L41,62	376-0003	7	14
L63	376-0005	11	4
L65	376-0028	7	14
L66	376-0098	8	16
L67-74	377-0069	9	10
L79	376-0090	12	24
L82,83,91,95	376-0189	8	16
L78	376-0125	7	14
L89,90	376-0069	8	16
L22 (SEE NOTE 1)	376-0094	8	16

NOTE 1: L22 LOADED ON 7054-1 ONLY

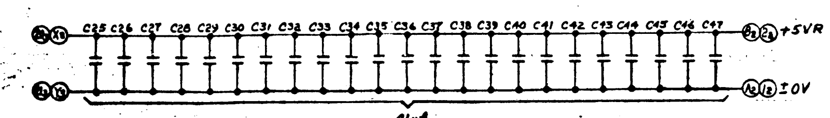




SIGNAL-TERMINAL DESIGNATIONS, VIEW FROM BOTTOM (WIRING) SIDE OF CONNECTOR



COMPONENT LAYOUT



WANG PART NO.	ITEM	QTY	NAME	MATERIAL	DESCRIPTION

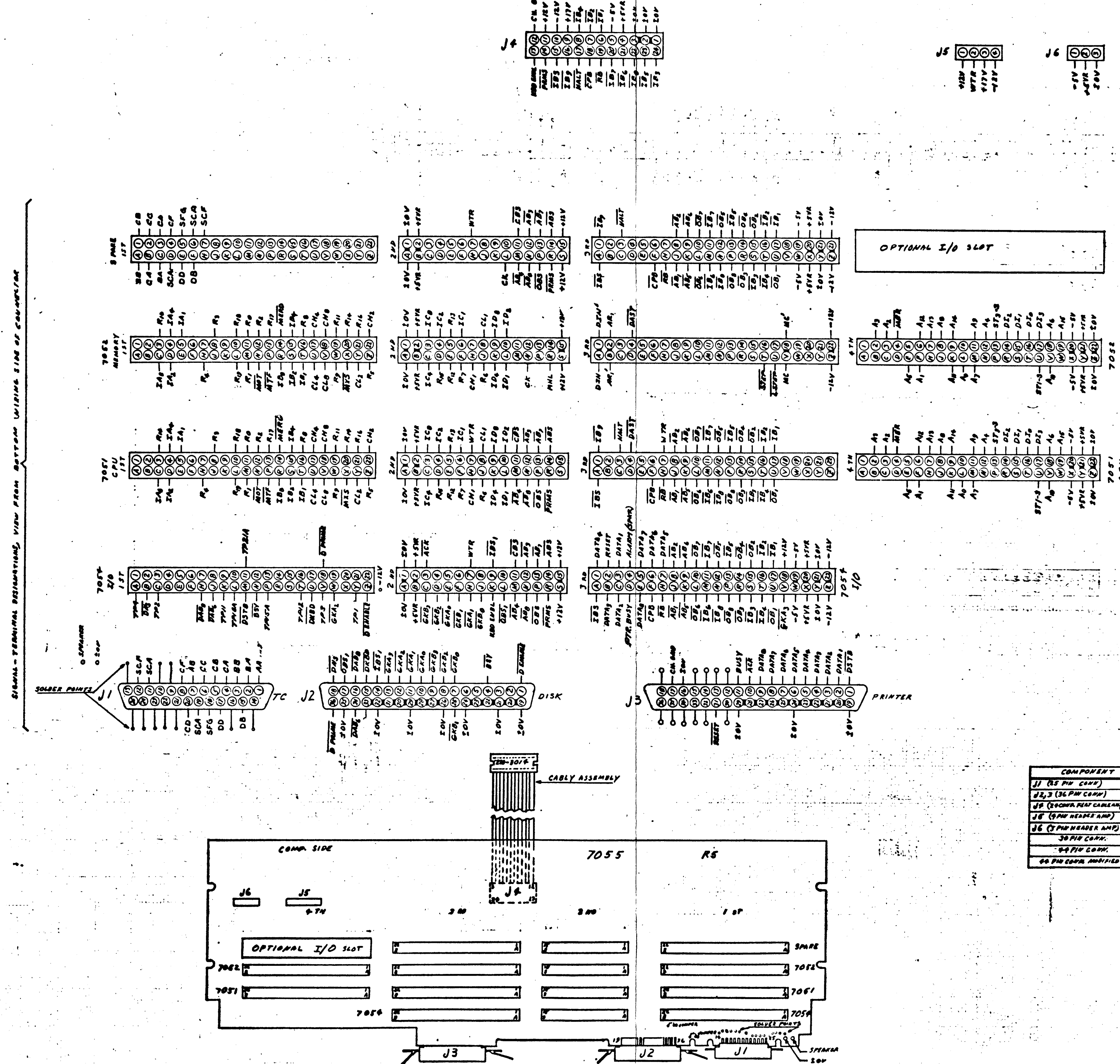
WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

BY	DATE	APPROVED BY	DATE
DWN		E ENGR	
CHK		M ENGR	
E C CONTROL		MFG ENGR	

MODEL NO: 2200 E&F

TITLE: CRT FLOPPY & PRINTER CONTROL

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
SEE CHART	E	7054	17



COMPONENT	W.L. PART No.
J1 (25 PIN CONN)	350-1031
J2,3 (36 PIN CONN)	350-1038
J4 (20 COND. FLAT CABLE ASSY)	220-3014
J5 (4 PIN HEADER AMP)	354-1194
J6 (3 PIN HEADER AMP)	354-1193
30 PIN CONN.	350-0011
44 PIN CONN.	350-0021
44 PIN CONN. MODIFIED	350-0021M1

E-REV 0

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MODEL NO. 2200 F

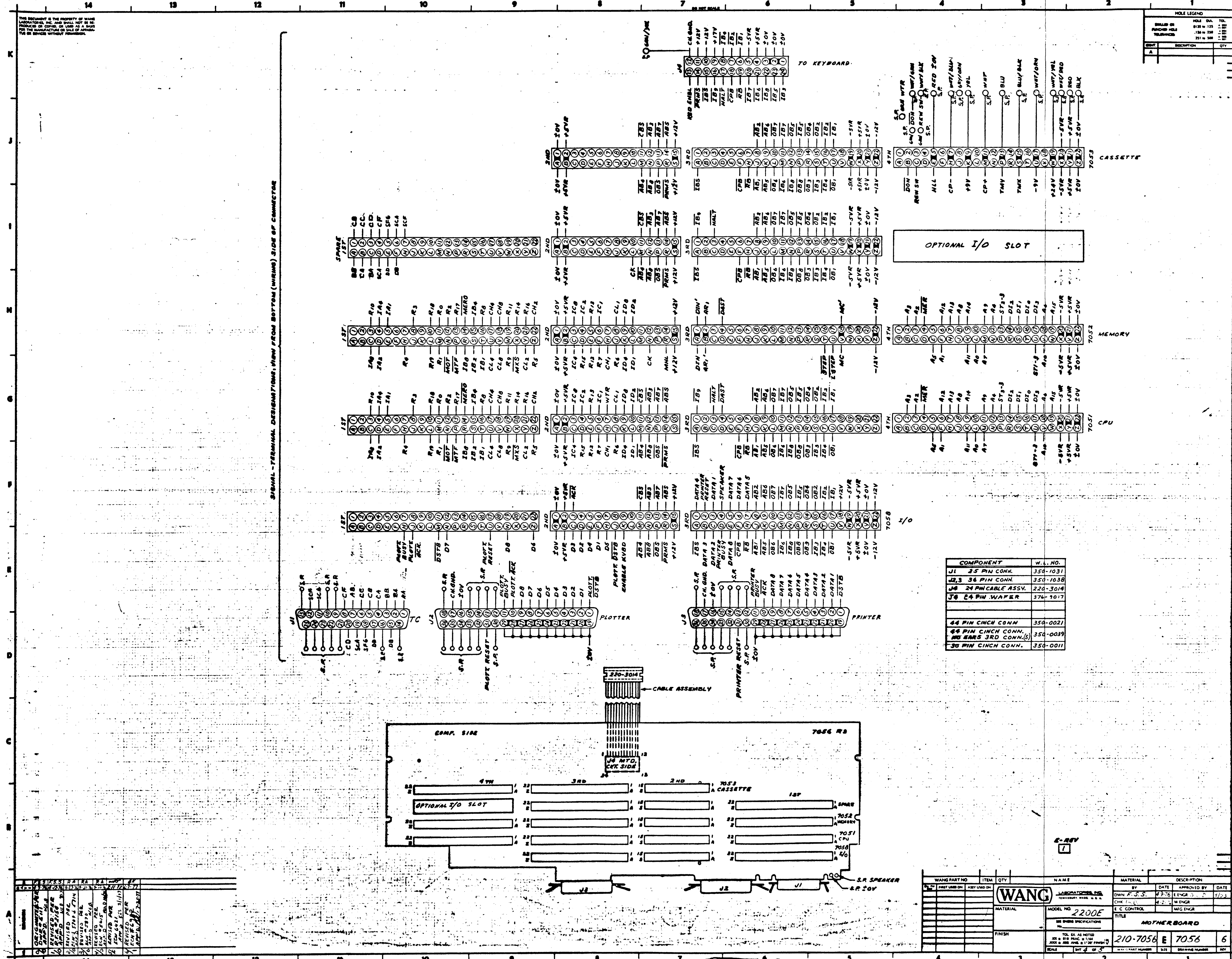
TITLE SCHEMATIC MOTHER BOARD

DWN 7/14/76 — CHK 9/30/76 — E ENGR 9 30 76

TOL. EX. AS NOTED .XX ± .010 FRAC. ± 1/64 .XXX ± .005 ANG. ± 1°30'

SHT 4 OF 5

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
210-7055	E	7055	4



COMPONENT	W.L. NO.
J1 25 PIN CONN.	350-1031
J2,3 36 PIN CONN.	350-1038
J4 24 PIN CABLE ASSY.	220-3014
J4 24 PIN WAFER	376-9017
44 PIN CINCH CONN	350-0021
44 PIN CINCH CONN. NO EARS 3RD CONN.(5)	350-0039
30 PIN CINCH CONN.	350-0011

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MODEL NO. 2200E

TITLE: MOTHERBOARD

DWN F.S.S.

WANG PART NUMBER 210-7056 | SIZE E | DRAWING NUMBER 7056 | REV 6

SHT 4 OF 5

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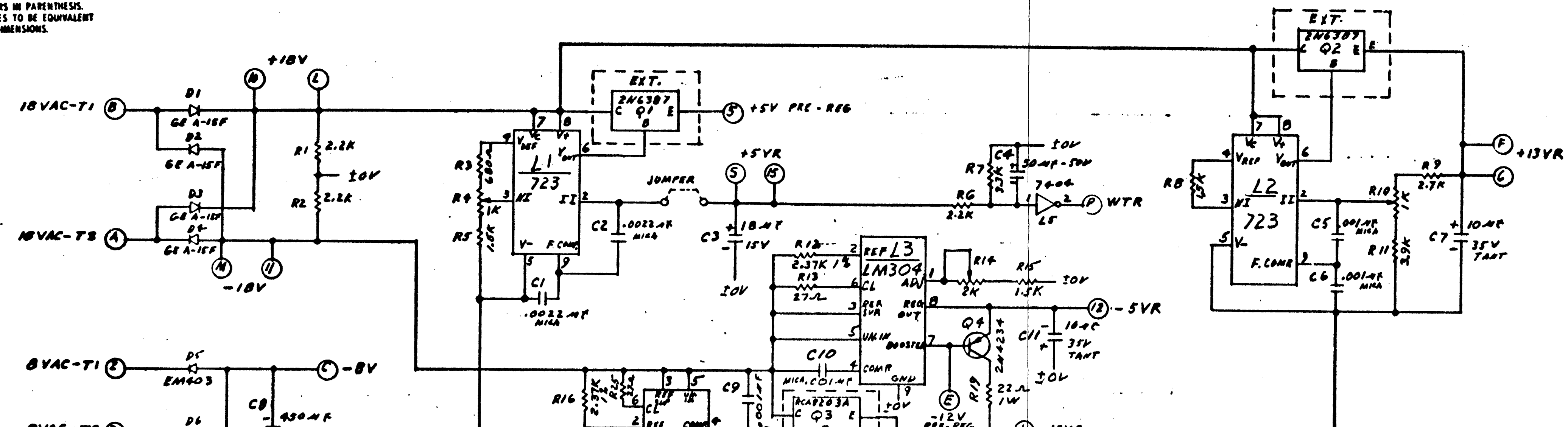
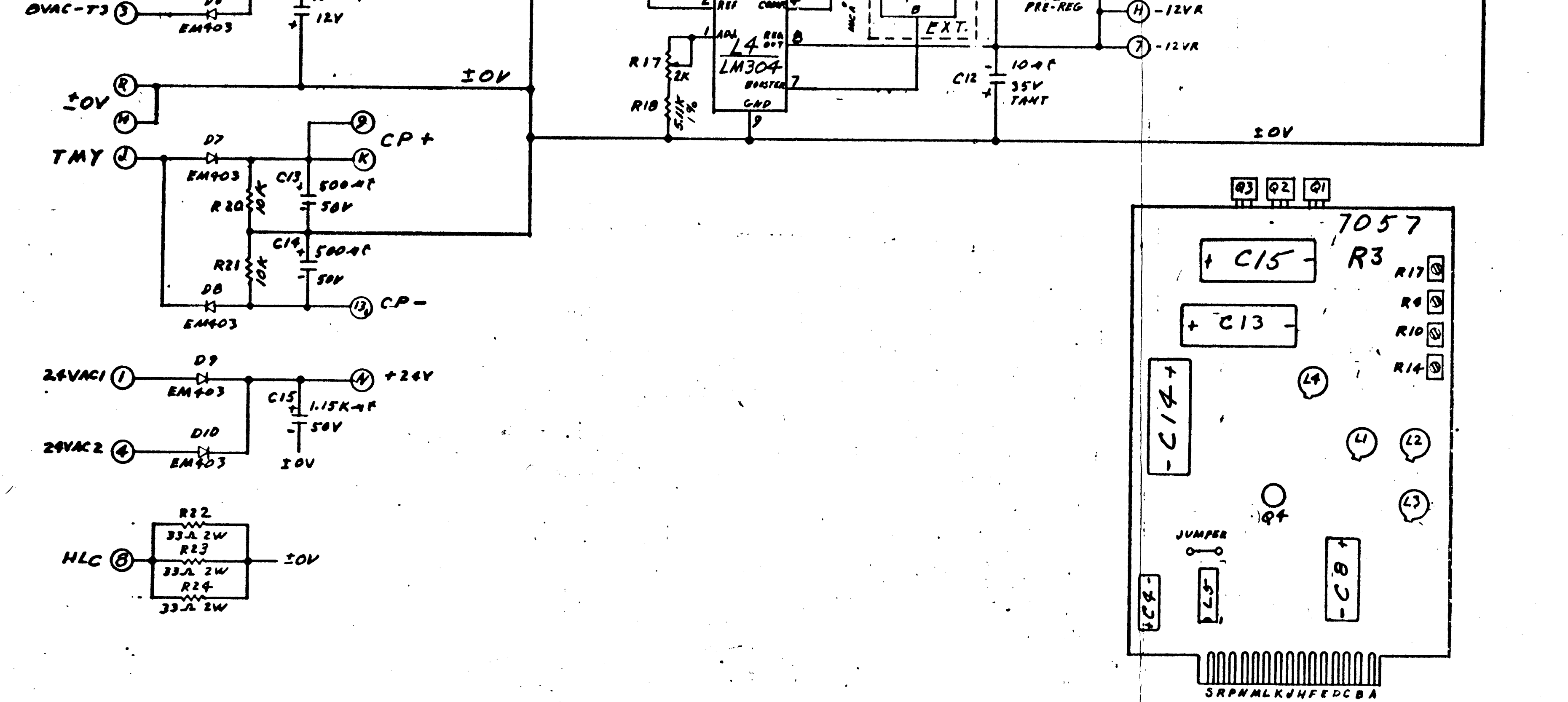
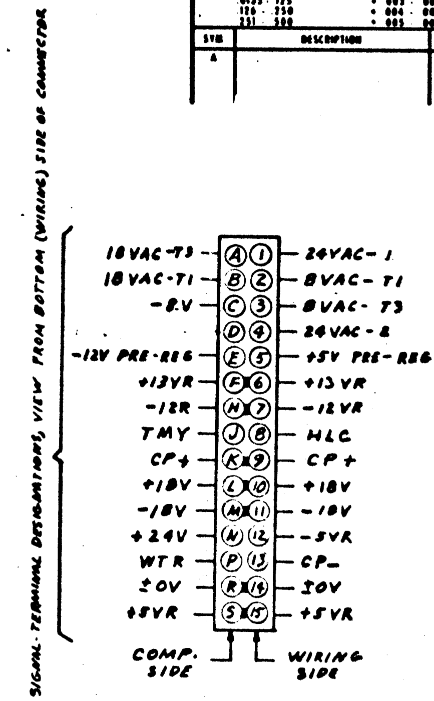
DO NOT SCALE

HOLE LEGEND & TOLERANCES







LOCATION	W.L. PART No.	PIN NO ±OV	PIN NO +5VR
L1, 2.	376-0066	5	
L 3, 4	376-0134	9	
L 5	376-0010	7	14

I.C. TYPE	LOCATION	SPARE
7404	L5	5

COMPONENT	W.L. PART No.
R1, 2, 6,	330-3022
R3	330-2068
R4, 10,	336-1014
R5, 8, R15	330-3015
R7	330-3033
R17, R14	336-1022
R9	330-3027
R11	330-3039
R13, 25	330-1027
R18	333-0088
R19,	332-1022
R20, 21	330-4010
R22, 23, 24	337-1033
R12, 16	333-0073
C1, 2	330-5012
C3	300-4018
C4	300-3010
C5, 6, 9, 10	300-5006
C7, 11, 12	300-4032
C8	300-3043
C13, 14	300-3053
C15	300-3055
D1, 2, 3, 4	380-3004
D5, -10	380-4000
Q4	375-1024
Q4 PAD	375-9001

E-REV 3

REVISION		
0	2-18-76	ORG PER DWR REQ #1149, 1148 APP'D N.C.D.
1	3-19-76	REVISED PER RFA #2070 APP'D N.C.D.
2	3-29-76	REVISED PER RFA #2087 APP'D N.C.D.
3	5-13-76	REVISED PER ECN #5536 APP'D N.C.D.
4	5-18-76	REVISED PER PFA #2215 APP'D N.C.D.
5	9-28-76	REVISED PER ECN #5875 APP'D N.C.D.
6	2-17-77	REVISED PER ECN #6367 APP'D
7	10-11-77	REVISED PER ECN #7523 APP'D

QTY.	ITEM	WANG PART NO.	DRAWING NO.	DESCRIPTION
NEXT ASSY.				

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

BY	DATE	APPROVED BY	DATE
DWN GO	2-18-76	E ENGR N.C.D.	
CHK G.D.	4-13-76	M ENGR	
		MFG ENGR	

MATERIAL

MODEL NO. 2200E

SEE ENGRG SPECIFICATIONS No.

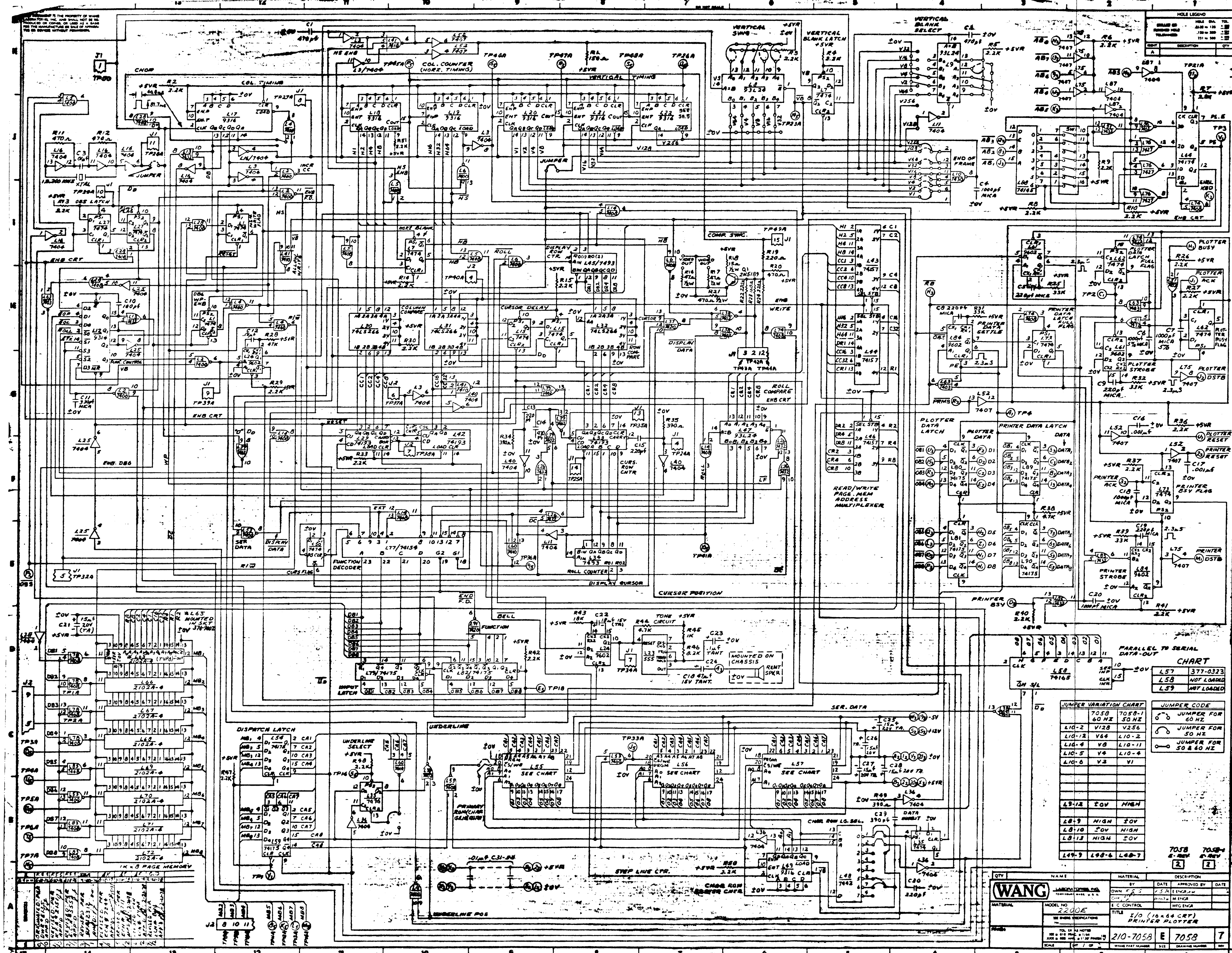
FINISH

TOL EX AS NOTED .XX ± .XXX ± FRAC ± ANG ± FINISH ✓

SCALE SHT 4 OF 5

TITLE SCHEMATIC POWER SUPPLY REGULATOR

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
210-7057	D	7057	7

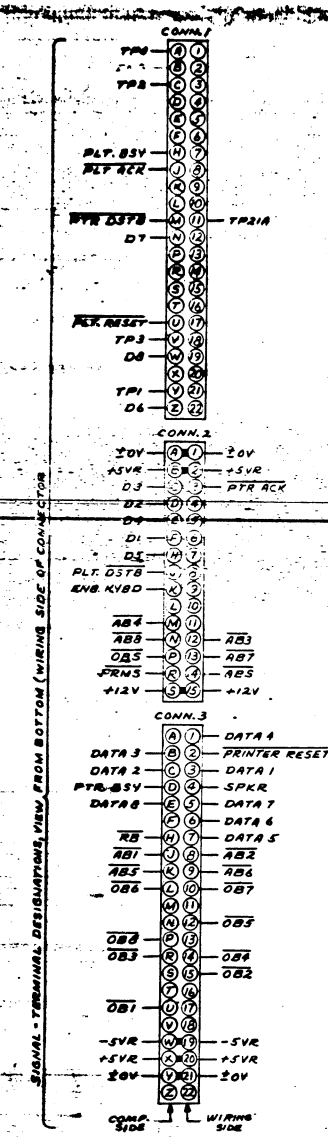

VERTICAL SYNC
VERTICAL BLANK LATCH
VERTICAL BLANK SELECT
COL. COUNTER (HORZ. TIMING)
COL. TIMING
VERTICAL TIMING
CHOP
JUMPER
END OF FRAME
COMP. SYNC.
DISPLAY DATA
ROLL COMPARE
COLUMN COMPARE
CURSOR DELAY
CURS. ROW CNTR
ROLL COUNTER
DISPLAY CURSOR
CURSOR POSITION
FUNCTION DECODER
SER. DATA
INPUT LATCH
TONE CIRCUIT
MOUNTED ON CHASSIS
READ/WRITE PAGE MEM ADDRESS MULTIPLEXER
PLOTTER DATA LATCH
PRINTER DATA LATCH
PLOTTER BUSY
PLOTTER ACK
PLOTTER DSTB
PLOTTER RESET
PRINTER RESET
PRINTER BSY FLAG
PRINTER STROBE
PRINTER DSTB
PARALLEL TO SERIAL DATA-OUT
DISPATCH LATCH
UNDERLINE SELECT
UNDERLINE
UNDERLINE POS
PRIMARY ROM (CHAR GENERATOR)
CHAR ROW LG. SEL.
STEP LINE CTR.
CHAR ROW COUNTER
DATA INHIBIT
1K x 8 PAGE MEMORY
2102A-4
CHART
L57 377-0323
L58 NOT LOADED
L59 NOT LOADED
JUMPER VARIATION CHART
7058 60 HZ
7058-1 50 HZ
L10-2 V128 V256
L10-12 V64 L10-2
L10-4 V8 L10-11
L10-5 V4 L10-4
L10-6 V2 V1
L9-12 ±0V HIGH
L8-9 HIGH ±0V
L8-10 ±0V HIGH
L8-13 HIGH ±0V
L49-9 L48-6 L48-7
JUMPER CODE
JUMPER FOR 60 HZ
JUMPER FOR 50 HZ
JUMPER FOR 50 & 60 HZ
7058 E-REV 2
7058-1 E-REV 2
WANG LABORATORIES, INC.
MODEL NO 2200E
TITLE I/O (16x64 CRT) PRINTER PLOTTER
210-7058
E
7058
7
WANG PART NUMBER
SIZE
DRAWING NUMBER
REV

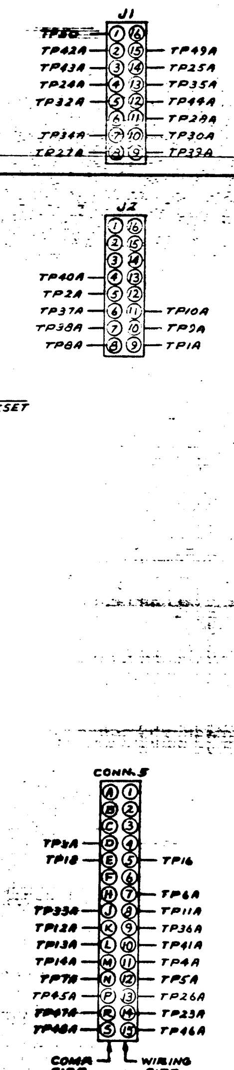
COMPONENT	W.L. NO.
R1	330-2015
R2-10,13-15,26,27, 29,30,32,36,37,40, 41,42,47,48,50,51	330-3022
R11,12,20	330-2047
R16,17	331-1047
R18	331-1015
R19,22,24	330-2022
R21	331-2047
R23	330-2010
R25,31,32,39	330-4033
R28	330-4047
R34,35,49	330-2039
R38,44	330-3047
R43	330-4018
R45	330-3010
R46	330-3082
C1,2,14	300-1470
C3,12,31-53	300-1503
C4,6,7,18,20	300-5006
C5,8,9,19	300-5004
[illegible]	[illegible]
C11	300-5007
C13,15,30	300-1220
C16,17	300-1906
C21,25-28	300-4022
C22	300-4018
C23	300-4002
C24	300-4020
C29	300-1390
SW1	325-1503
SW1 CAP	325-9047
XTAL	321-0019
Q1	375-1021
L55-57, 77 SKT	376-9003
L65 SKT	376-9002
J1,2	376-9004
B.K.C. CONN	350-2064 REF

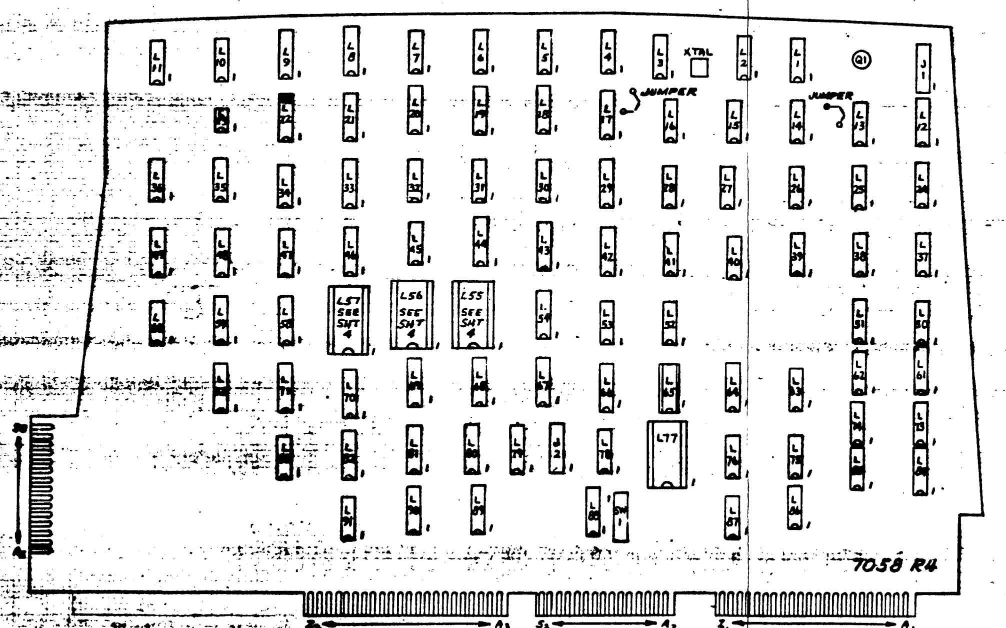
I.C. TYPE	LOCATION	SPARES
7474	L50	1
7400	L6	1
7400	L8 L11 L25 L36 L40 L87	1 4 1 2 2 3
7408	L83	1
7432	L13 L51 L85	2 1 2
7420	L37 L91	1 1
7402	L86	3
7410	L60	1
7403	L63	1
7407	L52	1

I.C. LOCATION	W.L. NO.	TERM. FOR ±0V	TERM. FOR VCC +5VR
L1,7,15,27,35,50,62,73	376-0006	7	14
L2,4,6,53	376-0002	7	14
L3,11,16,25,36,40,87	376-0010	7	14
L5,14,28,74,78,83	376-0081	7	14
L8,9,47	376-0120	8	16
L10	376-0031	7	14
L12	376-0108	8	16
L13,26,51,85	376-0093	7	14
L17-21,49	376-0094	8	16
*L22	376-0094	8	16
L23	376-0126	1	8
L24,61,84	376-0104	8	16
L29,33,42	376-0053	8	16
L30-32	376-0148	7	14
L34,45	376-0011	10	5
L37,91	376-0004	7	14
L39,37,86	376-0016	7	14
L41,66	[illegible]	7	14
L43,44,46	376-0082	8	16
L48	376-0008	8	16
L52,75	376-0056	7	14
L54,59,79,80-82, 89,90	376-0119	8	16
L55-57	SEE CHART	12	24
L58	376-0105	8	16
L63	376-0028	7	14
L64	376-0098	8	16
L65-72	377-0069	9	10
L76	376-0125	7	14
L77	376-0090	12	24
L88	376-0069	8	16

*NOTE: L22 LOADED ON 7058-1 ONLY.







VARIATION CHART

MODEL	P.C. BOARD	L55	L
210-7058-1B KATA KANA	209-7058-1	377-0317	
210-7058-1C CYRILLIC	209-7058-1	378-2024	

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

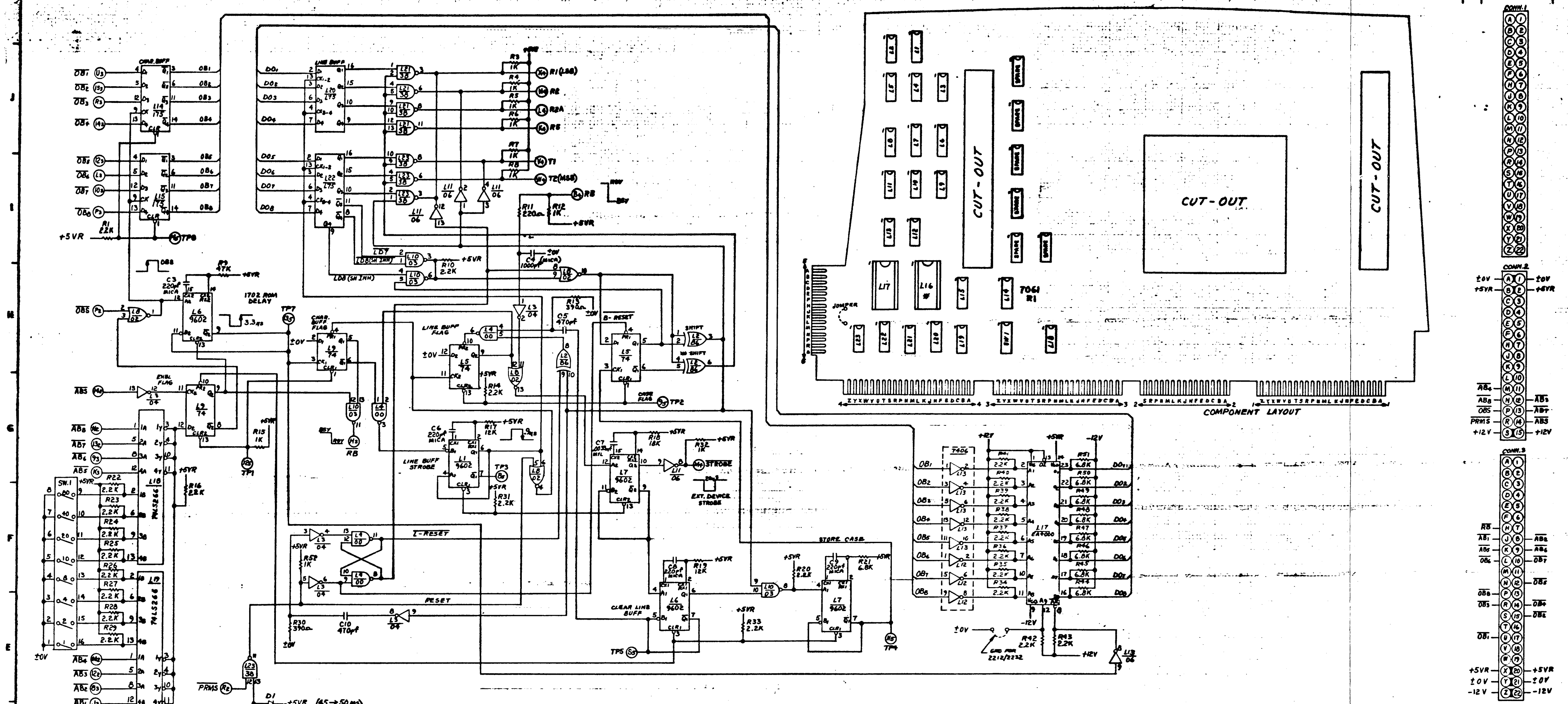
DWN F.S.S.	6-12-76	E ENGR	
CHK	11-11-76	M ENGR	
E C CONTROL		MFG ENGR	

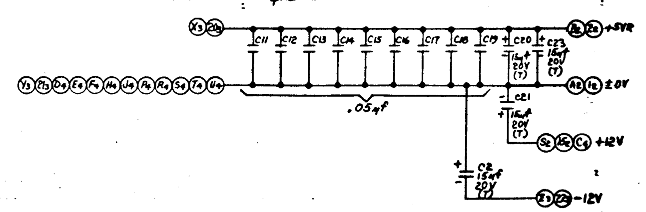
MODEL NO. 2200E

TITLE I/O (16 x 64 CRT) PRINTER PLOTTER

SHT 2 OF 2

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
210-7058	E	7058	7

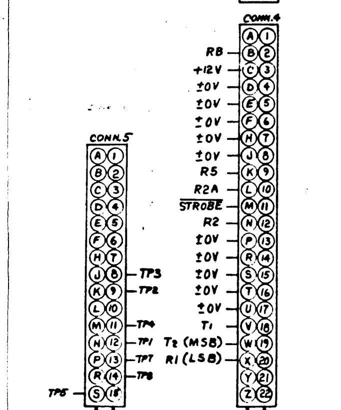




LOCATION	W.L. PART NO.	TERM. NO. ±0V	TERM. NO. Vcc +5VR
L1,6,7	376-0104	8	16
L2	376-0036	7	14
L3	376-0010	7	14
L4	376-0002	7	14
L5,9	376-0006	7	14
L8	376-0016	7	14
L10	376-0028	7	14
L11,12,13	376-0055	7	14
L14,15	376-0119	8	16
L17 SKT	376-9003		
L17	377-0156		24
L18,19	376-0148	7	14
L20,22	376-0151	12	5
L21,23	376-0128	7	14
* L16	DO NOT LOAD		

COMPONENT	W.L. PART NO.
R1,14,31,33-43, 10,16,20,22-29	330-3022
R3-8,12,15,32,52	330-3010
R9	330-4047
R11	330-2022
R13,30	330-2039
R17,19	330-4012
R18,53	330-4018
R21,44-51	330-3068
C3,6,8,9	300-5004
C4	300-5006
C5,10	300-1470
C11-19	300-1900
C2,20,21,23	300-4022
SW.1	325-1503
SW.1 CAP	325-9047
C7	300-2033
D1	380-1001
C22	300-3009

LOCATION	TYPE	SPARES
L1	9602	1
L2	7486	1
L11	7406	2
L12	7406	3
L3	7404	1



SIGNAL-TERMINAL DESIGNATIONS, VIEW FROM BOTTOM (WIRING) SIDE OF C

1. ALL I.C. CHIPS ARE 7400 SERIES UNLESS OTHERWISE NOTED.

NOTES

E-REV 1

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

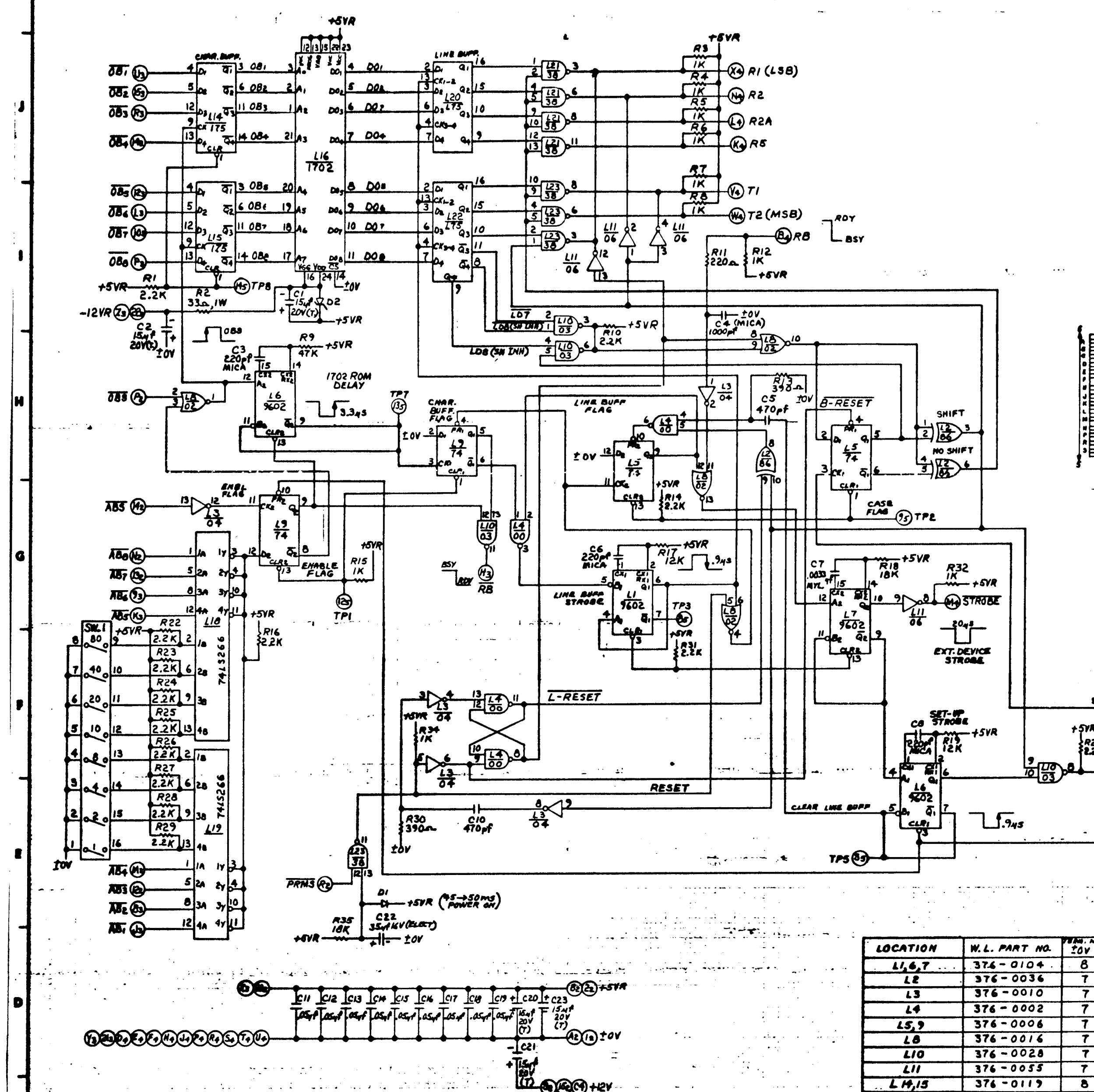
MODEL NO 2200E/F

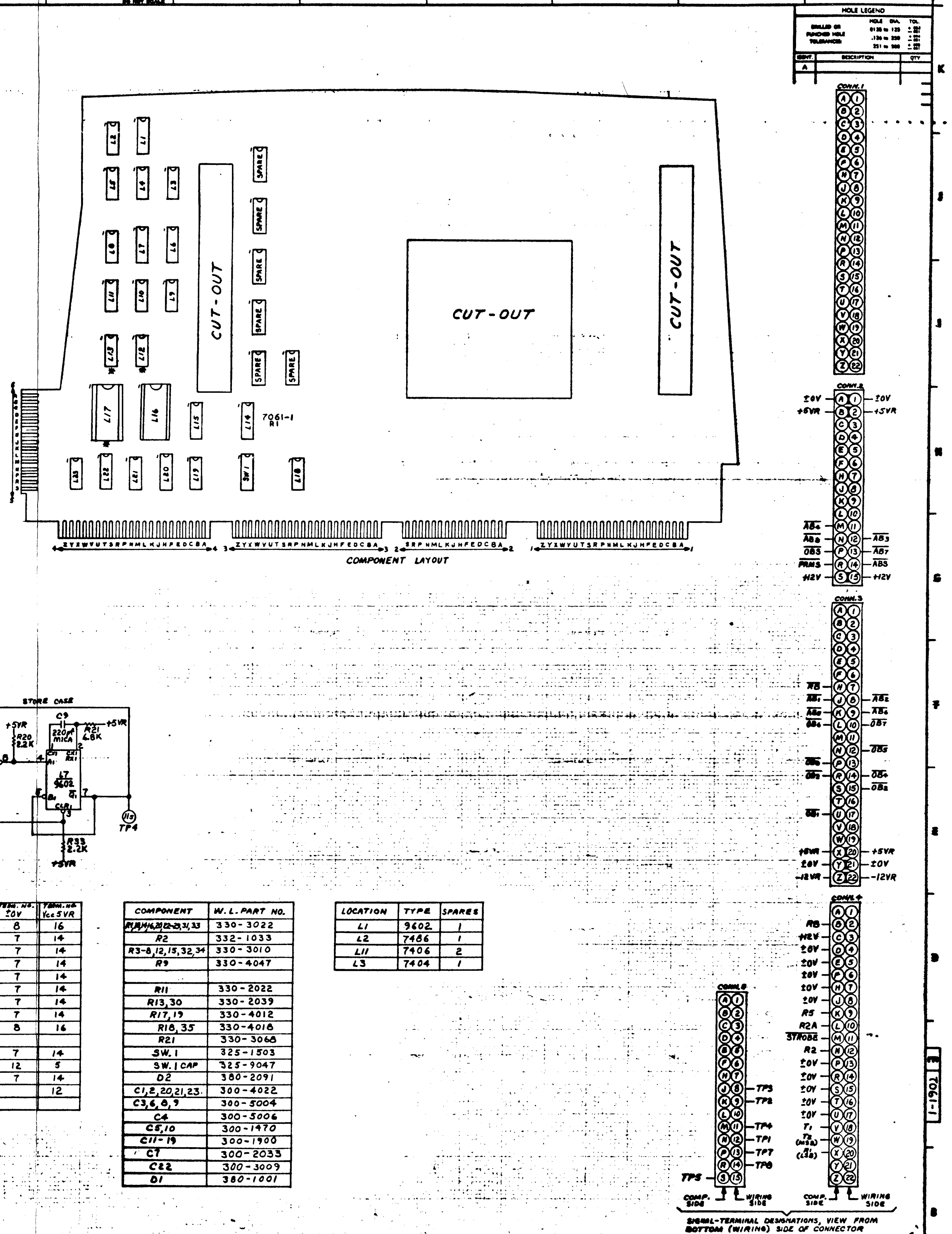
DWN ZK 5-11-76 — CHK F.S.S. 5-12-76

TITLE SCHEMATIC LOGIBLOC DOUBLE BUFFERED TYPEWRITER/PLOTTER OUTPUT

WANG PART NUMBER 210-7061 — SIZE E — DRAWING NUMBER 7061 — REV. 1

SCALE ✓ — SHT 4 OF 5





LOCATION	W.L. PART NO.	TERM. NO. ±0V	TERM. NO. Vcc 5VR
L1,6,7	376-0104	8	16
L2	376-0036	7	14
L3	376-0010	7	14
L4	376-0002	7	14
L5,9	376-0006	7	14
L8	376-0016	7	14
L10	376-0028	7	14
L11	376-0055	7	14
L14,15	376-0119	8	16
L16 SKT	376-9003		
L18,19	376-0148	7	14
L20,22	376-0151	12	5
L21,23	376-0128	7	14
L16	377-0009		12
* L12,13,17	NOT LOADED		

COMPONENT	W.L. PART NO.
R1,R14,16,20,22-29,31,33	330-3022
R2	332-1033
R3-8,12,15,32,34	330-3010
R9	330-4047
R11	330-2022
R13,30	330-2039
R17,19	330-4012
R18,35	330-4018
R21	330-3068
SW.1	325-1503
SW.1 CAP	325-9047
D2	380-2091
C1,2,20,21,23	300-4022
C3,6,8,9	300-5004
C4	300-5006
C5,10	300-1470
C11-19	300-1900
C7	300-2033
C22	300-3009
D1	380-1001

LOCATION	TYPE	SPARES
L1	9602	1
L2	7486	1
L11	7406	2
L3	7404	1

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MODEL NO. 2200 E/F

TITLE: SCHEMATIC LOGIBLOC DOUBLE BUFFERED TYPEWRITER/PLOTTER OUTPUT

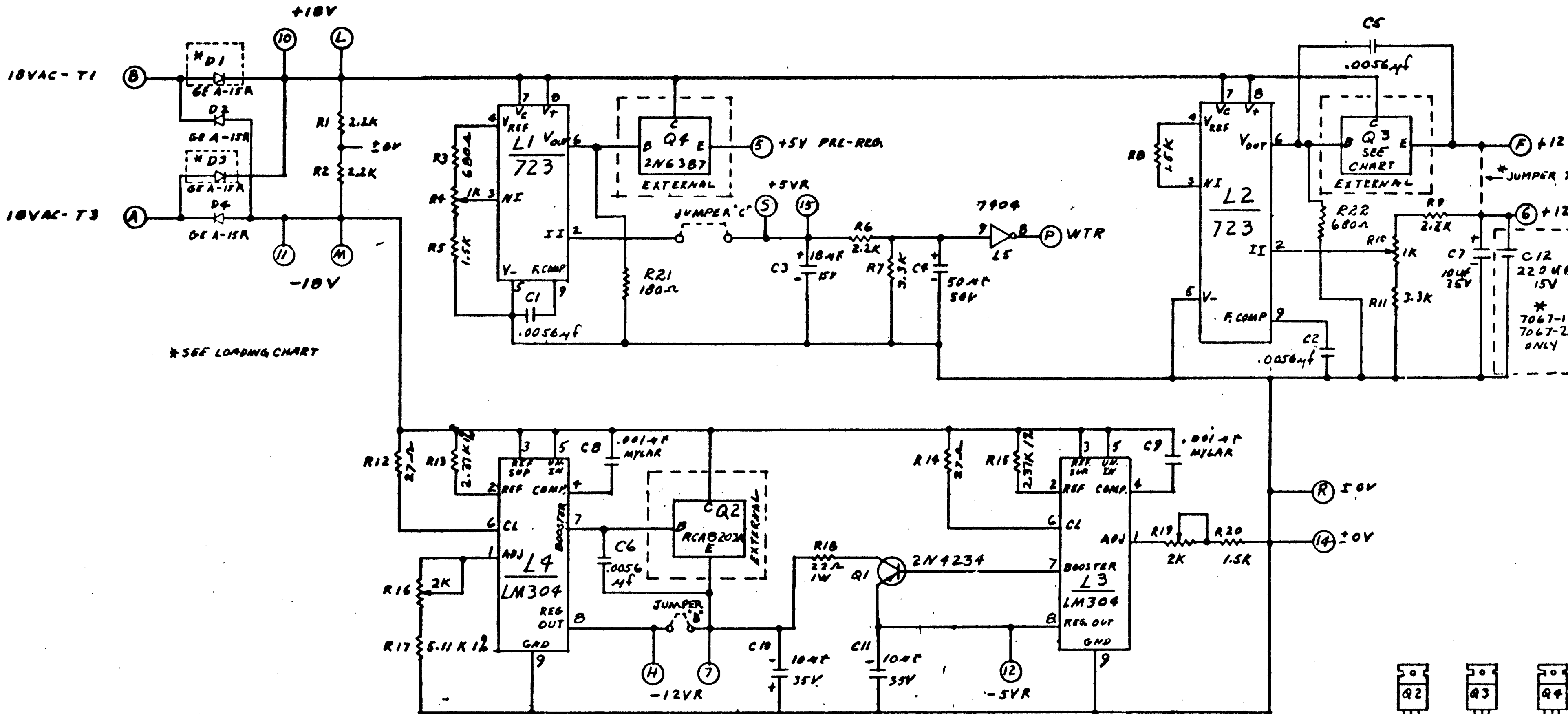
BY	DATE	APPROVED BY	DATE
DWN	5-11-76	E ENGR	11-12-76
CHK F S S	5-13-76	M ENGR	
E C CONTROL		MFG ENGR	

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.
210-7061	E	7061-1	1

SHT 4 OF 5

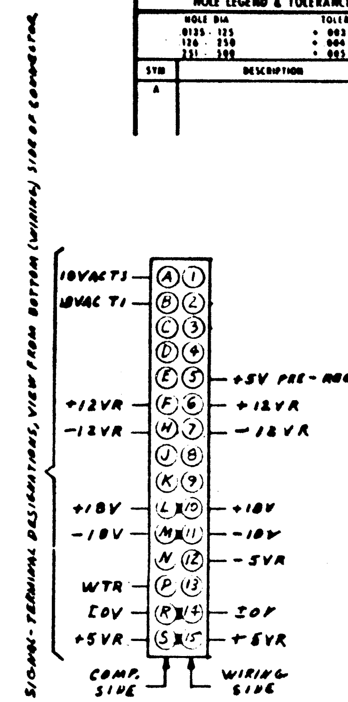
MILLIMETERS IN PARENTHESIS. TOLERANCES TO BE EQUIVALENT TO INCH DIMENSIONS.

DO NOT SCALE



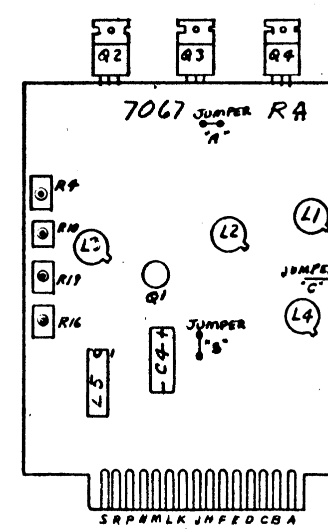
LOCATION	W.L. PART NO.	PIN NO. ΣOV	PIN NO. +5VR
L1, 2	376-0066	5	
L3, 4	376-0134	9	
L5	376-0010	7	14

I.C. TYPE	LOCATION	SPARE
7404	L5	5



COMPONENT	W.L. PART NO.
R1, 2, 6, 9	330-3022
R3, 22	330-2068
R4, 10,	336-1014
R5, 8, 20	330-3015
R7, 11	330-3039
R16, 19	336-1022
R13, R15	333-0093
R12, 14	330-1027
R17	333-0088
R18	332-1022
R21	330-2318
C1, 2, 5, 6	300-1915
* C3	300-3[illegible]18
C4	300-[illegible]10
C8, 9	300-2310
* C7, 10, 11	300-4032
* C12	300-4045
* D1, 2, 3, 4	380-3008
Q1	375-1024
Q2	375-1053
* Q3, 4	375-1052
Q1 PAD	375-9001

LOADING CHART	
210-7067	DO NOT LOAD C12. LOAD 375-1052 ON Q3
210-7067-1	DO NOT LOAD D1, D3 & JUMPER "A"; CNG. C3 TO A 300-4020-47µF, CNG. C7 TO A 300-4045-220µf; LOAD 375-1035 ON Q3
210-7067-2	LOADING SAME AS 7067, BUT REMOVE JUMPER "B". LOAD 375-1035 ON Q3



7067	7067-1	7067-2
E-REV 6	E-REV 6	E-REV 5

REVISION											
	PB	DB	RR	WES	EBA	WAS	EBA	EBA	EBA	EBA	WES	BG
	1-30-76	4-12-76	5-13-76	5-28-76	2-11-77	5-1-77	5-18-77	7-29-77		8-5-77	10-4-77	4-24-78
	ORG. PER DWR #E151 APP'D W.C.D.	REVISED PER RIA 2152 APP'D W.C.D.	REVISED PER ECN # 5537 APP'D W.C.D.	REV PER ECN 5876 APP'D W.C.D. 9/23	REVISED PER ECN 6781 APP'D W.C.D.	REVISED PER ECN 6756	REVISED PER ECN 6979	REVISED PER ECN 7112 APP'D	REVISED PER ECN 7277	REVISED PER ECN 7291 APP'D	REVISED PER ECN 7524 APP'D	ECN # 8199 APP'D
	0	1	2	3	4	5	6	7	8	9	10	11

QTY. | ITEM | WANG PART NO. | DRAWING NO. | DESCRIPTION

NEXT ASSY.

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

FINISH

MODEL NO. 2200F

SEE ENGRG SPECIFICATIONS

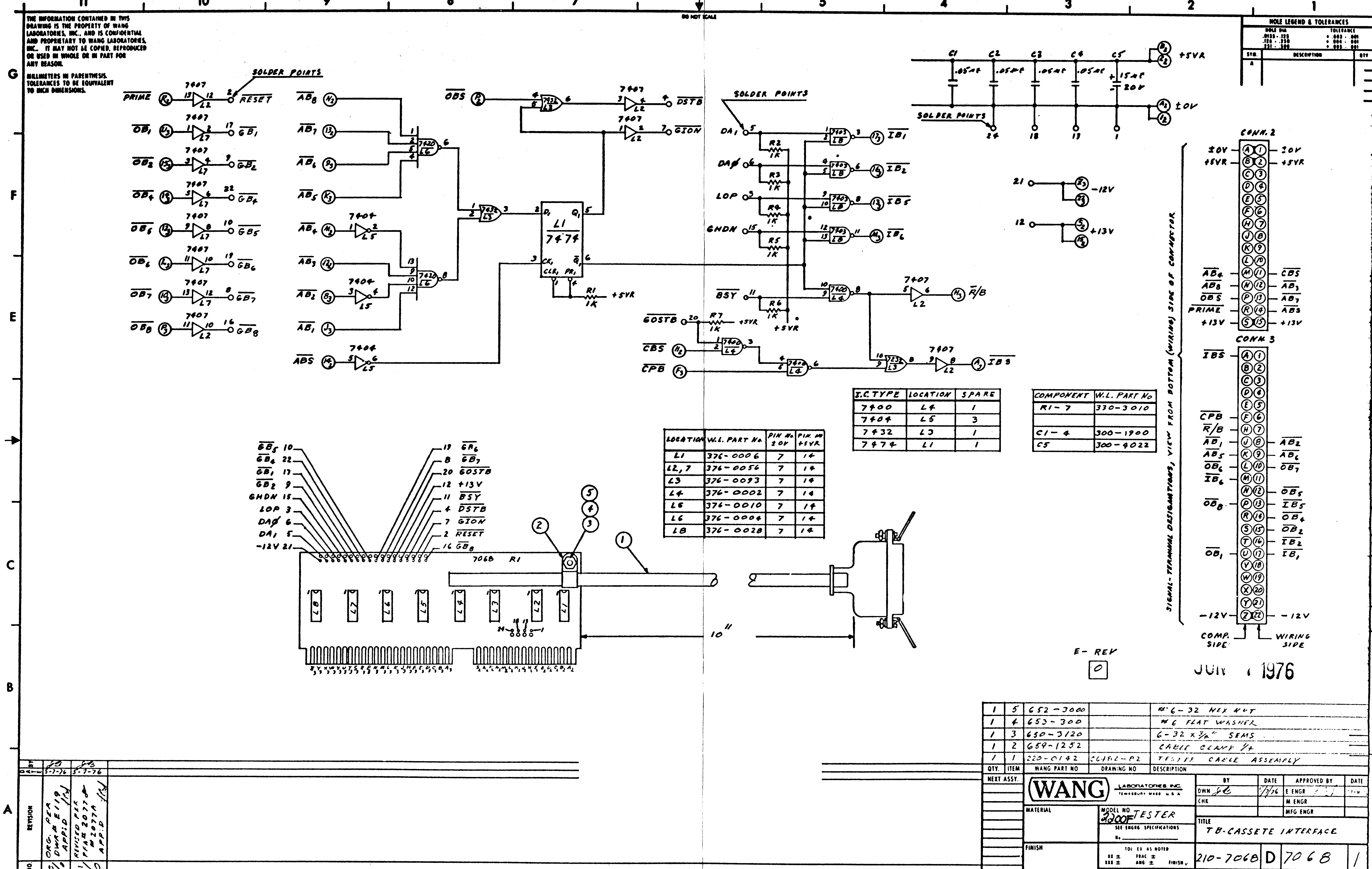
TOL EX AS NOTED

	BY	DATE	APPROVED BY	DATE
DWN			E ENGR	
CHK	G.D.		M ENGR	
			MFG ENGR	

TITLE SCHEMATIC POWER SUPPLY REGULATOR

SEE CHART | D | 7067 | 11

WANG PART NUMBER | SIZE | DRAWING NUMBER | REV



I.C. TYPE	LOCATION	SPARE
7400	L4	1
7404	L5	3
7432	L3	1
7474	L1	1

COMPONENT	W.L. PART No
R1 - 7	330-3010
C1 - 4	300-1900
C5	300-4022

LOCATION	W.L. PART No.	PIN No. ±0V	PIN No. +5VR
L1	376-0006	7	14
L2, 7	376-0056	7	14
L3	376-0093	7	14
L4	376-0002	7	14
L5	376-0010	7	14
L6	376-0004	7	14
L8	376-0028	7	14

QTY.	ITEM	WANG PART NO	DRAWING NO	DESCRIPTION
1	5	652-3000		#6-32 HEX NUT
1	4	653-300		#6 FLAT WASHER
1	3	650-3120		6-32 x 3/8" SEMS
1	2	659-1252		CABLE CLAMP 1/4
1	1	220-0142	CC4162-P2	TESTER CABLE ASSEMBLY

WANG LABORATORIES, INC. TEWKSBURY MASS. U.S.A.

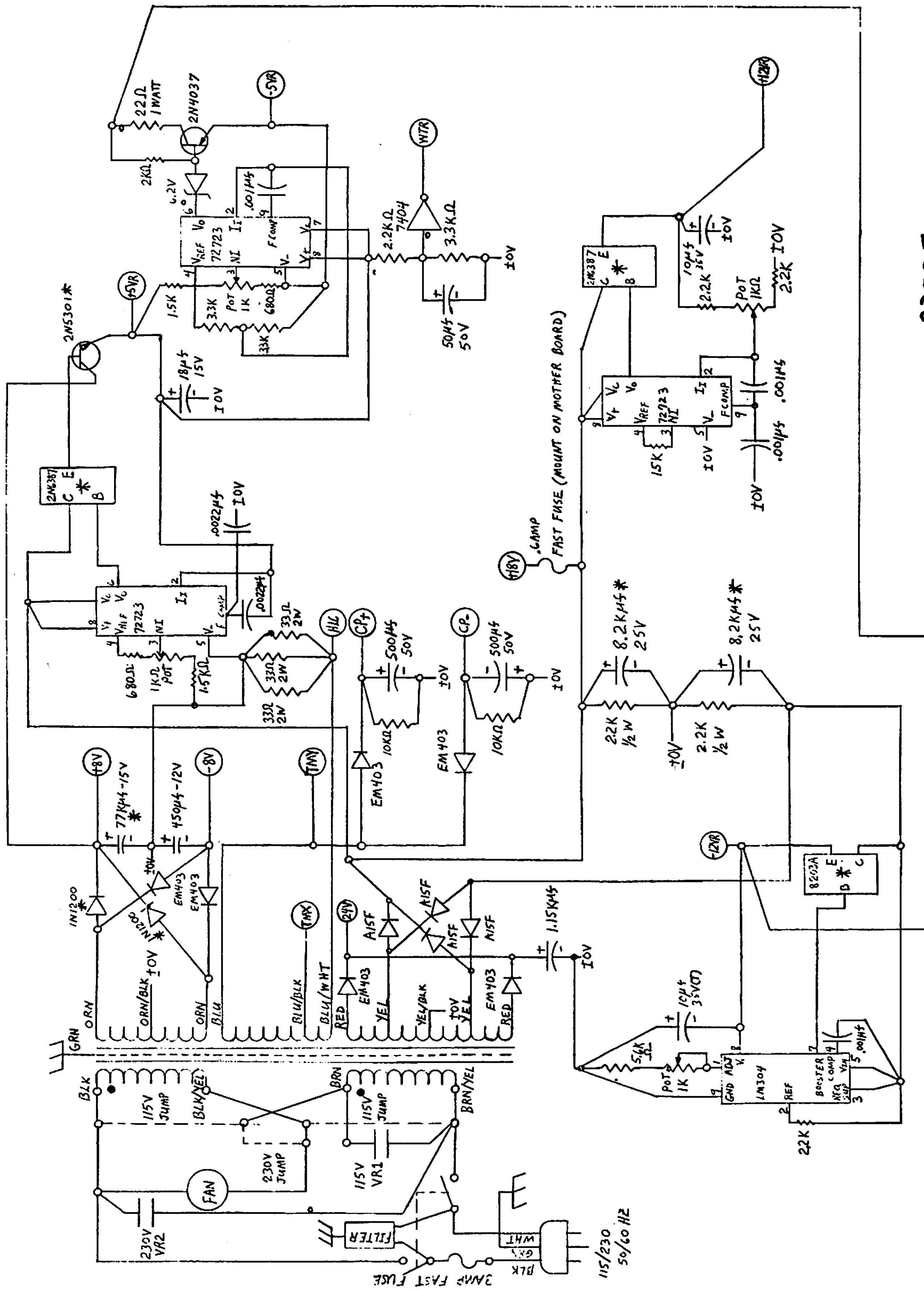
MODEL NO. 2200F TESTER

TITLE: TB-CASSETE INTERFACE

DWN: JL 5/7/76

WANG PART NUMBER: 210-7068 | SIZE: D | DRAWING NUMBER: 7068 | REV: 1

SHT 4 OF 5



2200E POWER SUPPLY

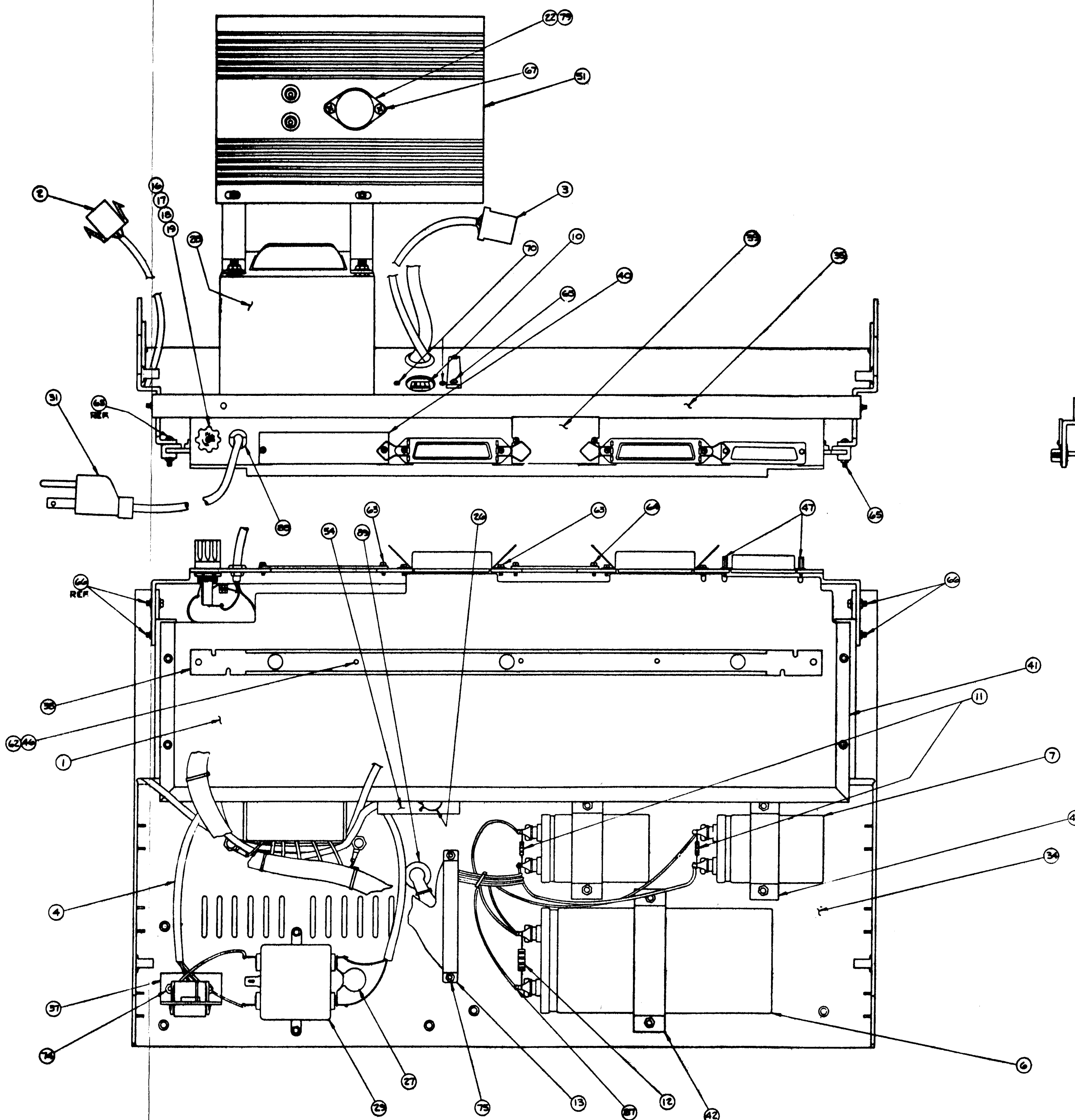
ALL COMPONENTS MARKED "*" MOUNT ON THE BRIDGE

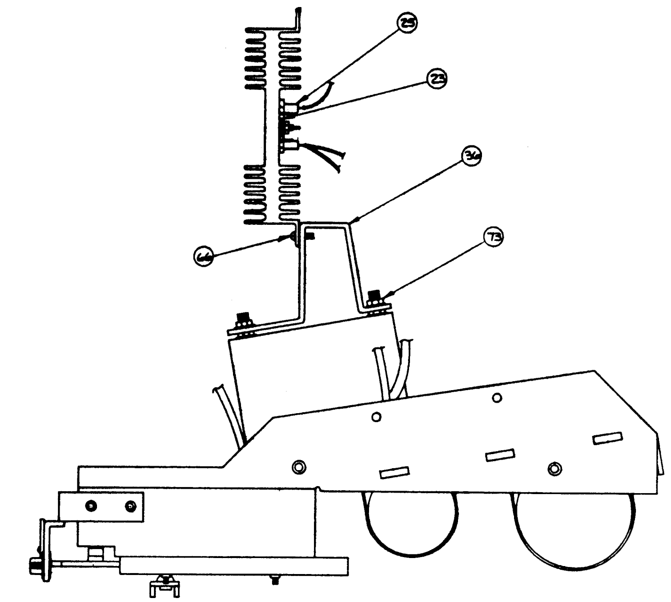
APPENDIX D

ASSEMBLY DRAWINGS

MILLIMETERS IN PARENTHESIS. TOLERANCES TO BE EQUIVALENT TO INCH DIMENSIONS.

DO NOT SCALE





ITEM	WANG PART #	DESCRIPTION
1	210-7056	MOTHERBOARD
2	220-1029	CABLE T.D. CASSETTE P.S.
3	220-1070	CRT AC CABLE (E)
4	220-1073	AC SWITCH CABLE
6	300-3050	CAP, 124K MF ELECTROLYTIC
7	300-3068	CAP, 8.2K ELECTROLYTIC
10	325-2112	SLIDE SWITCH, 115/230V
11	331-3011	RESISTOR, 1K OHM 1/2W 5%
12	332-2010	RESISTOR, 100 OHM 1W 10%
13	350-0008	CONNECTOR, 30 PIN
16	360-0000	FUSE HOLDER, 90°
17	360-9000	RUBBER WASHER
18	360-9002	HEX NUT
19	360-9003	LOCK WASHER
22	375-1048	TRANSISTOR, 2N5301
23	375-9014	WECKESSER INSULATOR
25	380-3000	DIODE, 1200A
26	380-5000	VARISTOR, 130V V130LA10
27	380-5001	VARISTOR, 250V V250LA20
28	410-0106	TRANSFORMER
29	410-2005	LINE FILTER
31	420-1000	LINE CORD
34	451-1098	CHASSIS WELDMENT
35	451-3626	REAR PANEL
36	451-4333	HEAT SINK BRKT.
37	451-4445	BRKT., A.C. CONNECTOR
38	451-4446	BRKT., M.B. SUPPORT
39	452-2151	BNC COVER PLATE
40	452-2152	SPARE OPT COVER PLATE
41	452-2562	MB FRAME
42	452-2564	CAP CLAMP (2.50" DIA)
43	452-2565	CAP CLAMP (1.38" DIA)
46	462-0141	SPCR., PHENOLIC CURRENT 4-250
47	462-0211	SPACER MALE & FEMALE 4-40 x 1/4 x 3/16 DIA.
51	478-0317	HEAT SINK
54	510-6749	P.C. BOARD
58	615-1303	CONNECTOR I.D. LABEL
62	650-2240	SCREW, #4-40 x 3/4 PAN HD. PHL.
63	650-1080	SEMS, SCR 3-48 x 1/4 PAN HD.
64	650-2087	SEMS, SCR 4-40 x 1/4 PAN HD.
65	650-2200	SEMS, SCR 4-40 x 5/8 PAN HD.
66	650-3120	SEMS, SCR 6-32 x 3/8 PAN HD.
67	650-3160	SEMS, SCR 6-32 x 1/2 PAN HD.
68	651-0455	RIVNUT, #10-32 (A10-130)
69	651-1019	PEM STUD FHS-632-8
70	651-0401	RIVET 1/8 x 3/16
71	651-1006	PEM STUD FHS-632-6
72	652-0008	PEN NUT CL632-2
73	652-0029	KEPS NUT 8-32
74	652-0032	KEPS NUT 6-32
75	652-2001	HEX NUT 4-40
76	652-3004	HEX NUT 6-32 PATTERN
77	652-0010	PEM NUT CLS440-2
78	652-0007	PEM NUT CL832-2
79	653-0006	MICA WASHER
80	653-3000	FLAT WASHER #6
81	653-3001	WASHER, INT T LOCK #6
82	653-3003	WASHER, SPLIT LOCK #6
83	653-6000	FLAT WASHER #10
84	653-2000	FLAT WASHER #4
86	654-1006	GROUND LUG #6
87	654-1010	GROUND LUG #10
88	654-1238	STRAIN RELIEF HEYCO SR5P4
89	654-1203	GROMMET FOR 5/8 HOLE

QTY.	ITEM	WANG PART NO.	DRAWING NO.	DESCRIPTION
NEXT ASSY.				

WANG LABORATORIES, INC. TEWKSBURY MASS U.S.A.

BY		DATE	APPROVED BY	DATE
DWN	DRC	6/2/76	E ENGR	
CHK			M ENGR	
QTY/1			MFG ENGR	

MATERIAL: ~
FINISH: ~
MODEL NO. 2200E
SEE ENGRG. SPECIFICATIONS No. ES-1001
TOL EX AS NOTED
SCALE FULL SHT 1 OF 1

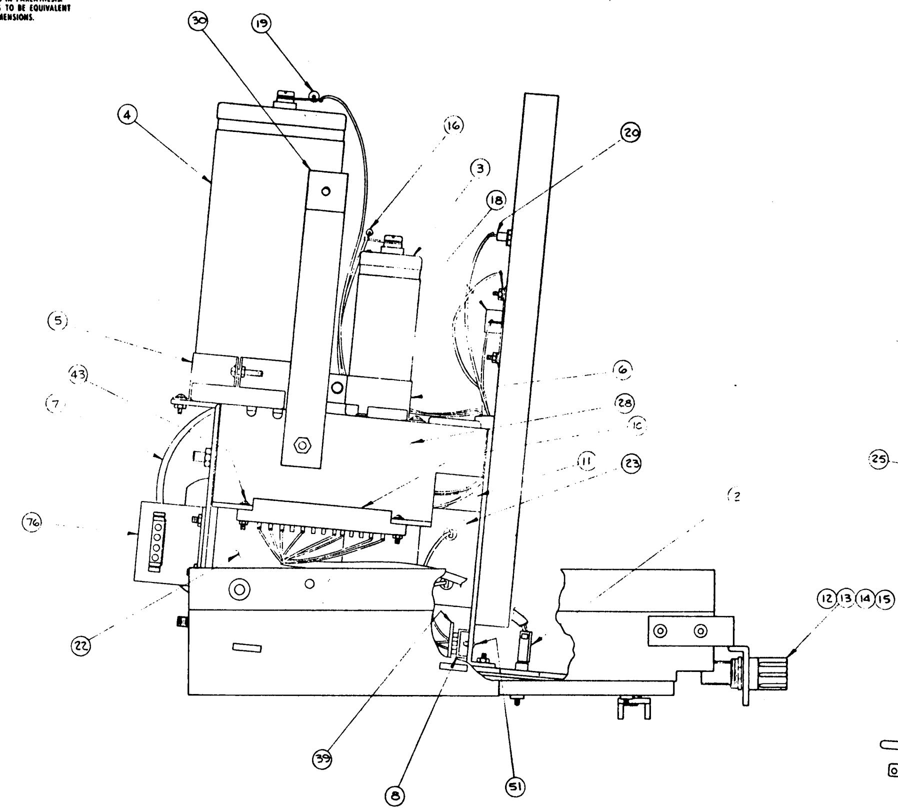
TITLE: CHASSIS ASS'Y

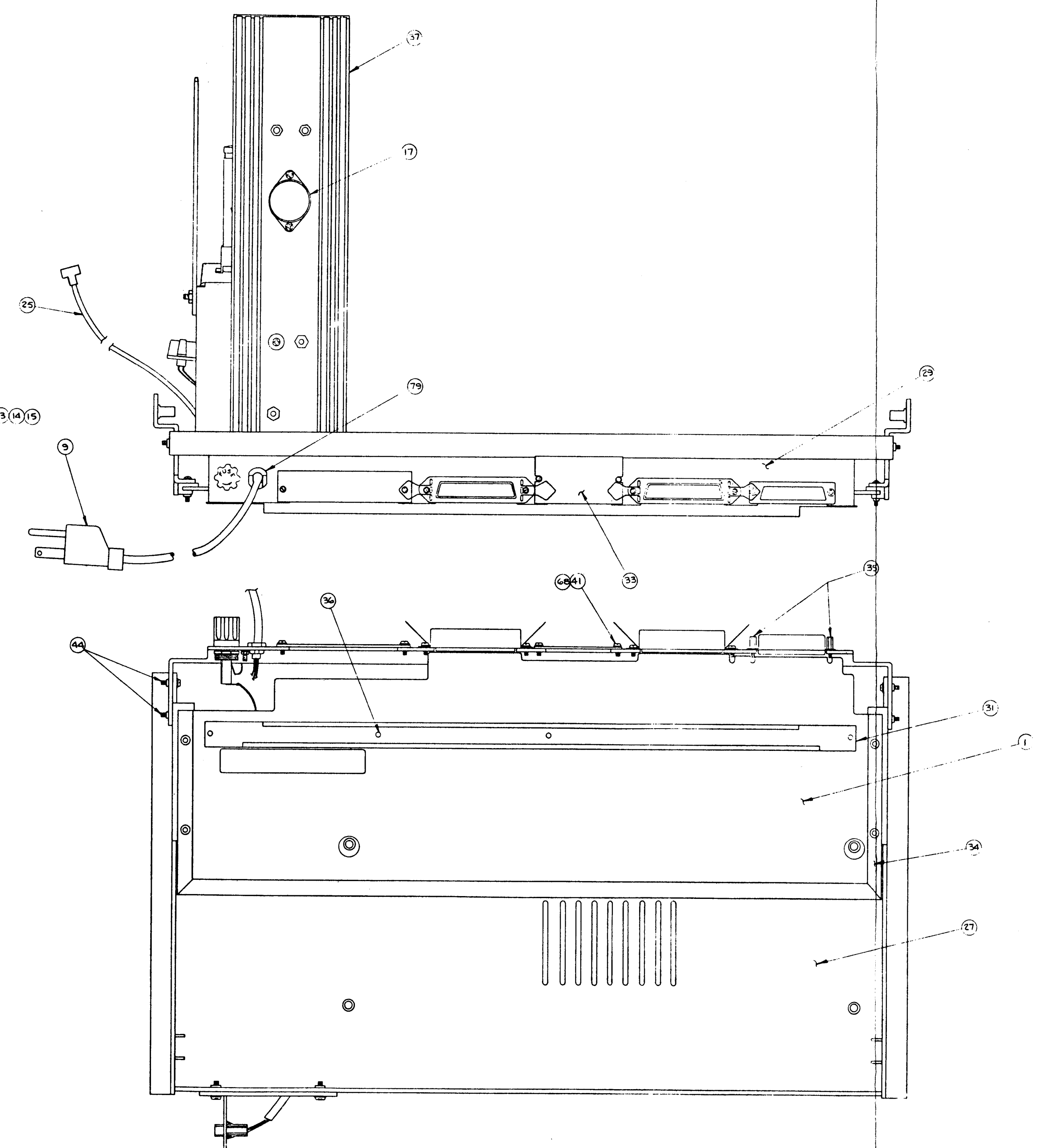
WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
270-0320	E	[illegible]	-

REVISION: SEN PER DWR M116

MILLIMETERS IN PARENTHESIS. TOLERANCES TO BE EQUIVALENT TO INCH DIMENSIONS.

DO NOT SCALE





ITEM	WANG PART #	DESCRIPTION
1	210-7055	MOTHERBOARD
2	220-1074	CABLE, P.S. M.B. (F)
3	300-3050	CAP, 124K MF 15V
4	300-3068	CAP, 8.2K MF 25V
5	300-9006	CAP CLAMP, 2 1/2" 3 LUG
6	300-9009	CAP CLAMP, 1 1/4" 2 LUG
7	220-1075	A.C. SWITCH CABLE
8	325-2112	SLIDE SWITCH, 115/230V
9	220-1076	POWER CORD ASSY
10	350-0008	CONNECTOR SOLDER TYP
11	220-1077	WIRE & LUG ASSY (TYPE P043)
12	360-0000	FUSE HOLDER 90°
13	360-9000	RUBBER WASHER
14	360-9002	HEX NUT
15	360-9003	LOCK WASHER
16	331-3011	RESISTOR, 1K OHM 1/2W 5%
17	375-1048	TRANSISTOR 2N5301
18	375-9014	WECKESSER INSULATOR (TM-1)
19	332-2010	RESISTOR, 100 OHM 1W 10%
20	380-3000	DIODE 1200A
22	410-0106	TRANSFORMER
23	410-2005	LINE FILTER
25	420-1000	LINE CORD
27	451-1100	CRT CHASSIS WELDMENT
28	451-1101	CHASSIS, PWR SUPPLY
29	451-3626	REAR PANEL
30	451-4436	P.C. BOARD RETAINER BRKT.
31	451-4446	BRKT., M.B. SUPPORT
33	452-2151	BNC COVER PLATE
34	452-2562	MB FRAME
35	462-0211	M & F SPACER
36	462-0141	SPCR., PHENOLIC CURRENT 4-250
37	478-0315	HEAT SINK
39	510-6749	P.C. BOARD
41	650-1080	SCR, 3-48 x 1/4 PAN HD PHL
42	650-2087	SEMS, 4-40 x 1/4 PAN HD PHL
43	650-2200	SEMS, 4-40 x 5/8 PAN HD PHL
44	650-3120	SEMS, 6-32 x 3/8 PAN HD PHL
45	650-3160	SEMS, 6-32 x 1/2 PAN HD PHL
46	650-3240	SCR, 6-32 x 3/4 PAN HD PHL
47	650-4120	SEMS, 8-32 x 3/8 PAN HD PHL
48	650-6240	SCR, 10-32 x 3/4 PAN HD PHL
49	650-2240	SCR, #4-40 x 3/4 PAN HD PHL
51	651-0401	POP RIVET 1/8 x 3/16
52	651-0455	RIVNUT, A10-130 (10-32)
53	651-1006	PEM STUD (FHS-632-6)
54	651-1008	PEM STUD (FHS-832-6)
57	652-0007	PEM NUT (CL832-2)
58	652-0008	PEM NUT (CL632-2)
59	652-0010	PEM NUT (CLS440-2)

ITEM	WANG PART #	DESCRIPTION
60	652-0029	NUT, 8-32 KEPS
61	652-0032	NUT, 6-32 KEPS
62	652-2000	NUT, 4-40 HEX
63	652-3004	NUT, 6-32 SM PATTERN
64	652-6002	NUT, 10-32 KEPS
67	653-0006	MICA WASHER
68	653-1000	WASHER, #3 INT T LK
69	653-2000	WASHER, #4 FLAT
70	653-2002	WASHER, #4 INT T LK
71	653-3000	WASHER, #6 FLAT
72	653-3001	WASHER, #6 INT T LK
73	653-3003	WASHER, #6 SPLIT LK
74	653-6000	WASHER, #8 FLAT
76	654-0074	AC RECEPTACLE
77	654-1006	GROUND LUG #6
78	654-1010	GROUND LUG #10
79	654-1238	HEYCO STRAIN RELIEF (SR5P-4)

REVISION: C ECN PER DWR 1118

QTY.	ITEM	WANG PART NO.	DRAWING NO.	DESCRIPTION
NEXT ASSY.				

WANG LABORATORIES, INC. TEWKSBURY MASS. U.S.A.

MATERIAL: —

MODEL NO. 2200F

SEE ENGRG SPECIFICATIONS No. ES-1001

FINISH

TOL EX AS NOTED · .XX ± .01 · FRAC ± 1/64 · .XXX ± · ANG ± · FINISH

BY	DATE	APPROVED BY	DATE
DWN DRC		E ENGR	
CHK		M ENGR	
		MFG ENGR	

TITLE: CHASSIS ASS'Y

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
	E	6829-11	C

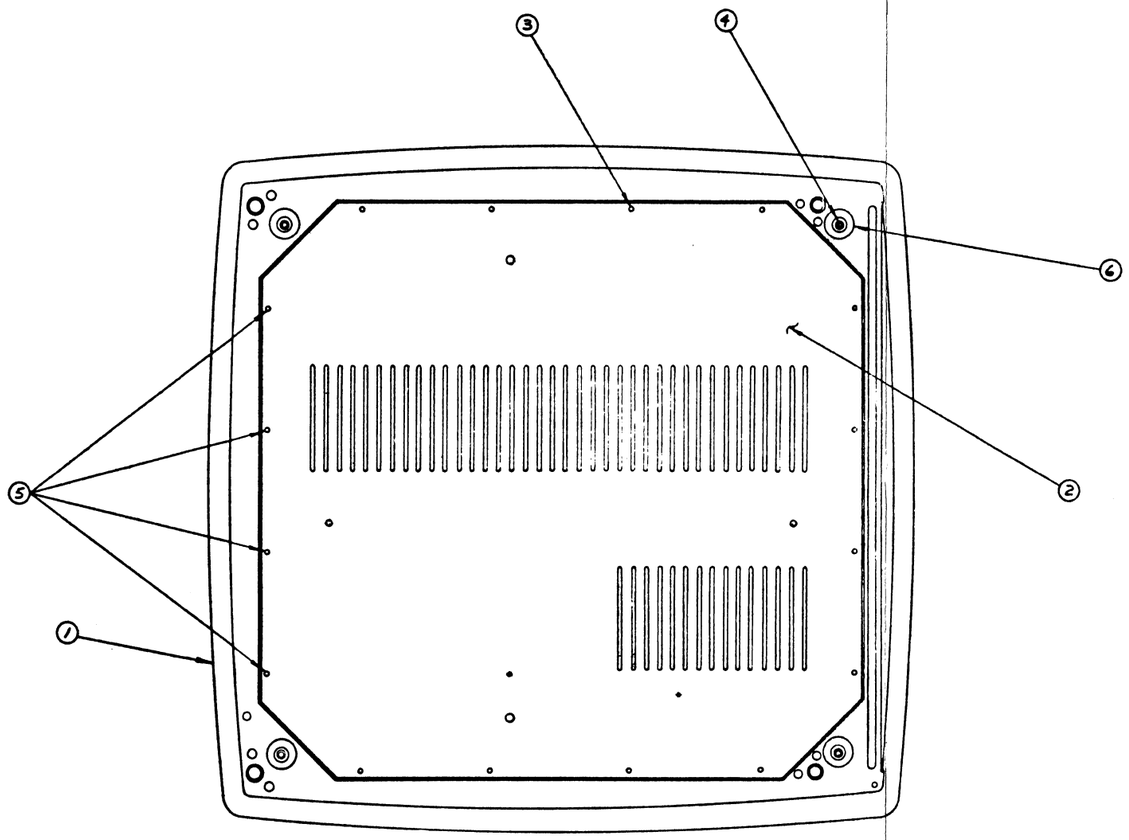
SCALE · SHT 1 OF 1

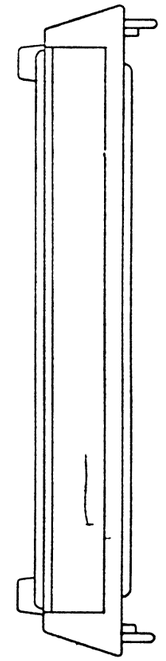
DO NOT SCALE

HOLE LEGEND

DRILLED OR PUNCHED HOLE TOLERANCES	HOLE DIA	TOL
	.0135 to .125	± .002
	.126 to .250	± .003
	.251 to .500	± .004

IDENT.	DESCRIPTION	QTY
A		





ITEM	WANG PART #	DESCRIPTION
1	449-0095	2220 BASE
2	451-2111	BOTTOM COVER 2220
3	651-0400	RIVET, AVDEL 11250412 1/8 x 3/8 LG.
4	651-0402	RIVET, AVDEL 11210615 3/16 x 7/16 LG.
5	651-0436	RIVET, AVDEL 1/8 x 3/8 100° O-SINK
6	655-0205	BUMPER, WHITE #2096 SW

See PL 6621-56

REVISION	DATE	BY

WANG PART NO	ITEM	QTY	NAME	MATERIAL	DESCRIPTION
Qty. Per Unit / FIRST USED ON / ASSY USED ON			WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.		

BY	DATE	APPROVED BY	DATE
[illegible]	6/11/75	E ENGR	
[illegible]	6-12-75	M ENGR	
E C CONTROL		MFG ENGR	

MATERIAL —

MODEL NO. 6621

SEE ENGRG SPECIFICATIONS No. ES-1001

FINISH —

TOL EX AS NOTED
XX ± .010 FRAC ± 1/64
XXX ± .005 ANG ± 1°30' FINISH ▽

TITLE 2220 BASE SUB-ASSY

SCALE 1:2 SHT 1 OF 1

279-1010 | D | 6621-56 | 0

WANG PART NUMBER | SIZE | DRAWING NUMBER | REV

95-12999 d

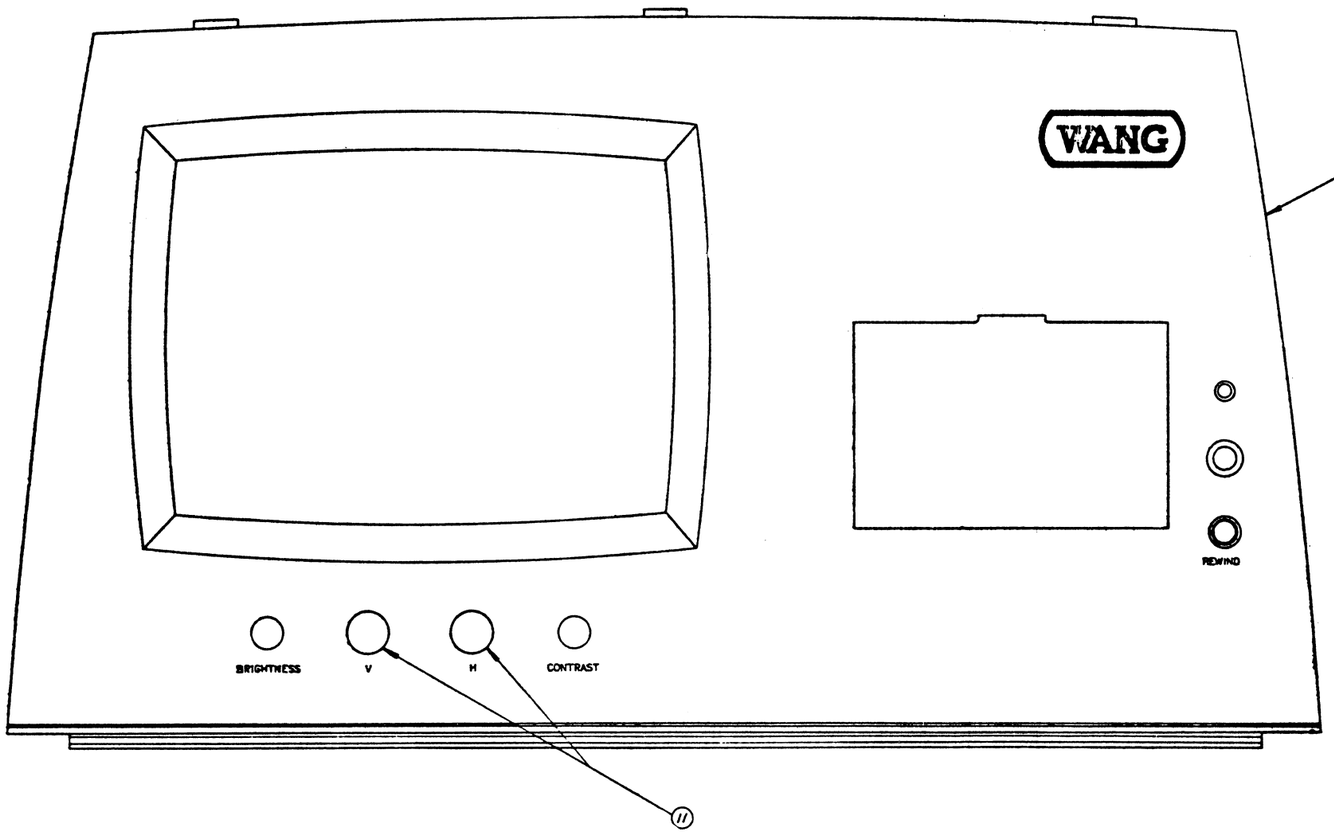
DO NOT SCALE

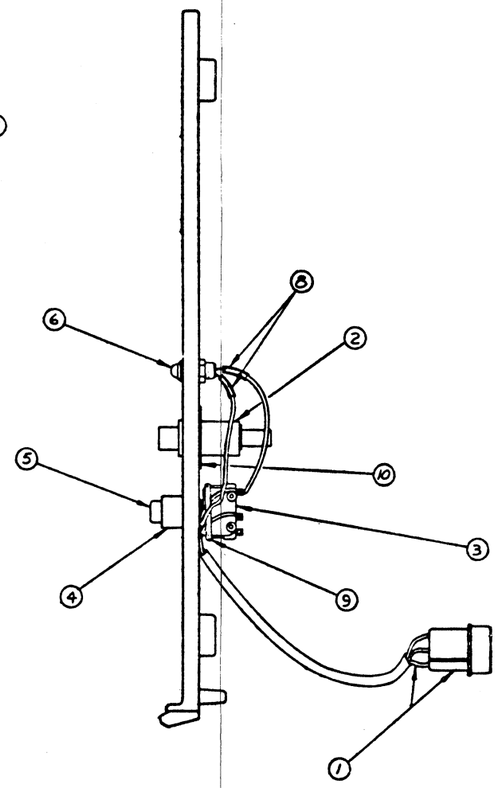
ITEM	WANG PART #	DESCRIPTION
1	220-1025	CABLE, SW. & LAMP (2200)
2	279-0078	TD DOOR RELEASE ASSY.
3	279-0300	MICRO SWITCH, ASSY.
4	325-9032	BUTTON, GUARD NAT, ALUM
5	325-9035	BUTTON, PUSH BLACK ALCO C-12
6	370-0039	LAMP, REPLACEABLE ASSY. WHITE BFK-5
7	449-0093	BEZEL, 2220 9" CRT
8	605-0002	TUBING, #15 CLEAR
9	605-1004	CABLE TYE, PAN-TY PLT1M-M
10	651-0503	CLIP, TINNERMAN C501-017-27
11	655-0009	PLUG, BUTTON BLACK SS 51388 P5001

HOLE LEGEND

DRILLED OR PUNCHED HOLE TOLERANCES	HOLE DIA	TOL
	0.125 to .125	± .002
	.126 to .250	± .003
	.251 to .500	± .004

CHNT	DESCRIPTION	QTY
A		





SEE PL6621-52

REVISION	NO

WANG PART NO	ITEM	QTY	NAME	MATERIAL	DESCRIPTION
			WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.		

BY	DATE	APPROVED BY	DATE
DWN DRC	6/9/75	E ENGR	
CHK	6/17/75	M ENGR	
E C CONTROL		MFG ENGR	6/25/75

MATERIAL

FINISH

MODEL NO 6621

SEE ENGR SPECIFICATIONS No. E-1001

TOL EX AS NOTED .XX ± .010 FRAC ± 1/64 .XXX ± .005 ANG ± 1°30' FINISH √

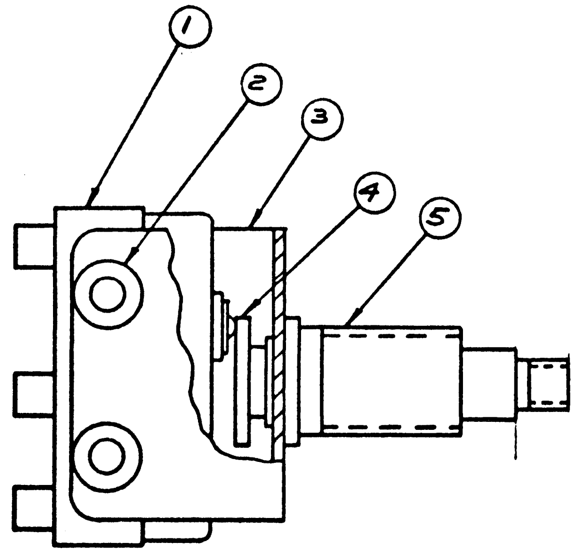
TITLE 2220 BEZEL ASSEMBLY

SCALE 1:1 SHT 1 OF 1

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
272-0002	D	6621-52	0

HOLE LEGEND		
DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	+ .003 − .001
	.126 to .250	+ .004 − .001
	.251 to .500	+ .005 − .001

IDENT.	DESCRIPTION	QTY
A		



WANG PART NO	ITEM	QTY	NAME	MATERIAL	DESCRIPTION
478-0068	5	1	GUIDE, PLUNGER		SEE DWG B5933-117
461-3056	4	1	PLUNGER, SWITCH		SEE DWG B5933-114
451-4066	3	1	MICRO-SWITCH BRKT		SEE DWG C5933-116
651-0416	2	2	RIVET SPECIAL		SEE DWG B5933-130
325-2305	1	1	MICRO-SWITCH		SEE DWG B5300-M1037

NO	REVISION	DATE	BY
1	REV. PER RFA #0235 6-27-73		
2	REV. PER R.F.A. 1121 8-26-74 DRC		LEC

QTY PER UNIT	FIRST USED ON	ASSY USED ON
7	D6060-202	
2	C5933-120	
1	D6122 87	

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

FINISH

MODEL NO 3320 2216/2217

SEE ENGRG SPECIFICATIONS No. ES-1001

TOL. EX. AS NOTED XX ± .010 FRAC ± 1/64 XXX ± .005 ANG ± 1°30' FINISH 128

SCALE 4/1 | SHT 1 OF 1

	BY	DATE	APPROVED BY	DATE
DWN	DB		E ENGR	
CHK	HLK		M ENGR	
E C CONTROL			MFG ENGR	

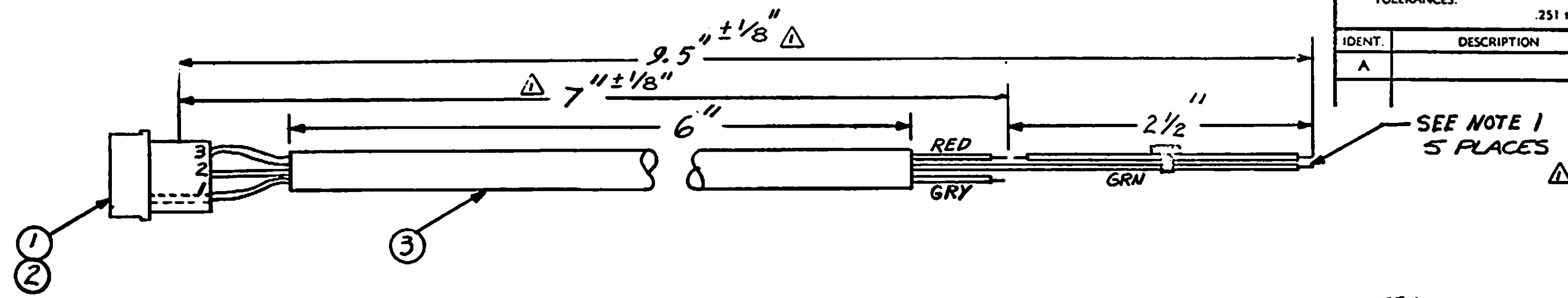
TITLE SWITCH ASSY (BASIC)

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
279-0300	C	6060-203	2

E02-0707 D

B 6482-35

DO NOT SCALE



HOLE LEGEND

DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	+.003 −.001
	.126 to .250	+.004 −.001
	.251 to .500	+.005 −.001

IDENT.	DESCRIPTION	QTY.
A		

NOTE :
1 - STRIP INSULATION BACK AND TIN 1/4"

WIRE COLOR	PIN NO	LENGTH
RED	3	7"
GREEN	2	9.5"
GRAY	1	7"

WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-2008	.	A/R	WIRE		#24 GRAY
600-2005		A/R	WIRE		#24 GREEN
600-2002		A/R	WIRE		#24 RED
605-1004	4	1	PAN-TY		PLTIM-M
605-0010	3	A/R	TUBING CLEAR		#8 6" LONG
654-1166R	2	3	MATE AND LOCK PIN		AMP 350079-4
654-1149	1	1	PIN HOUSING		AMP 1-480305-0

THIS DRAWING AND SPECIFICATIONS, ... PROPERTY OF WANG ... SHALL NOT BE ... [illegible]

NO.	REVISION	DATE	BY
1	REV. PER ECN 5402 DRC 4/7/76	4/12/76	[illegible]

Qty Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

FINISH

MODEL NO. 2220

SEE ENGRG SPECIFICATIONS No.

TOL. EX. AS NOTED .XX ± .010 FRAC. ± 1/64 .XXX ± .005 ANG. ± 1°30' FINISH 125√

SCALE | SHT | OF

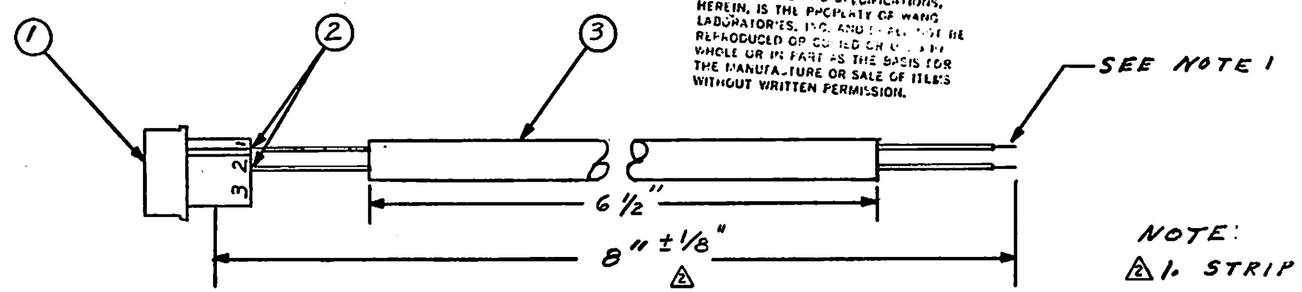
	BY	DATE	APPROVED BY	DATE
DWN	[illegible]	12/31/74	E ENGR	
CHK			M ENGR	
E. C. CONTROL			MFG ENGR [illegible]	1/6/75

TITLE CABLE, SWITCH & LAMP

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.
220-1025	B	6482-35	1

B 6482-37

DO NOT SCALE



NOTE:
2 1. STRIP & TIN 1/4".

WIRE COLOR	PIN NO	LENGTH
WHITE	1	8"
RED	2	8"
—	3	—

} APPROX 4 TURNS PER INCH

HOLE LEGEND

DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	+.003 −.001
	.126 to .250	+.004 −.001
	.251 to .500	+.005 −.001

IDENT.	DESCRIPTION	QTY.
A		

	WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
	600-2002		A/R	WIRE		#24 GA RED
	600-2009		A/R	WIRE		#24 GA WHITE
2	605-0109	3	A/R	TUBING		#6 6 1/2" LONG
2	654-1166R	2	2	MATE LOCK PIN		AMP 350079-4
2	654-1149	1	1	PIN HOUSING		AMP 1-480305-0

NO.	REVISION	DATE	BY
1	REVISED PER RFA # 1447 APPR. D. [illegible] 1-21-75	1-21-75	[illegible]
2	REV. PER ECN 5402 DEC 4/7/76	4/7/76	D.L.

Qty. Per Unit	FIRST USED ON	ASSY USED ON
1	6646	

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

MODEL NO. 2220

SEE ENGRG SPECIFICATIONS No.

FINISH

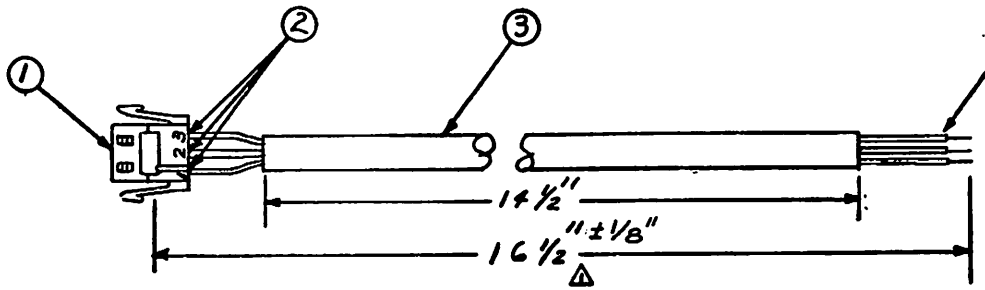
TOL. EX. AS NOTED .XX ± .010 FRAC. ± 1/64 .XXX ± .005 ANG. ± 1°30' FINISH 125 √

SCALE | SHT OF

BY		DATE	APPROVED BY		DATE
DWN	JB	1/2/75	E ENGR		
CHK			M ENGR		
E. C. CONTROL			MFG ENGR	D.L.	1/6/75

TITLE: CABLE, CRT

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.
220-1026	B	6482-37	2



HOLE LEGEND		
DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	+.003 −.001
	.126 to .250	+.004 −.001
	.251 to .500	+.003 −.001

IDENT.	DESCRIPTION	QTY.
A		

NOTE:
△ 1. STRIP INSULATION AND TIN 1/4"

WIRE COLOR	P/N NO	LENGTH	
GRAY	1	16½"	△
GREEN	2	16½"	△
RED	3	16½"	△

B 6482-39

THIS DRAWING AND SPECIFICATIONS, HEREIN, IS THE PROPERTY OF WANG [illegible] AND SHALL NOT BE [illegible] USED IN [illegible] THE BASIS FOR [illegible] OR SALE OF ITEMS [illegible] PERMISSION.

WANG PART NO	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-2008		A/R	WIRE		#24 GA GRAY
600-2005		A/R	WIRE		#24 GA GREEN
600-2002		A/R	WIRE		#24 GA RED
△ 605-0109	3	A/R	TUBING		#6 14½ LONG
△ 654-1165R	2	3	MATE LOCK SOCKET		AMP 350078-4
△ 654-1175	1	1	SOCKET HOUSING		AMP 1-480304-0

Qty Per Unit	FIRST USED ON	ASSY USED ON

NO.	REVISION	BY	DATE
1	REV. PER ECN S402 4/7/76 DRC	DRC	4/7/76

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

FINISH

MODEL NO. 2220

SEE ENGRG SPECIFICATIONS No.

TOL. EX. AS NOTED .XX ± .010 FRAC. ± 1/64 .XXX ± .005 ANG. ± 1°30' FINISH 125 √

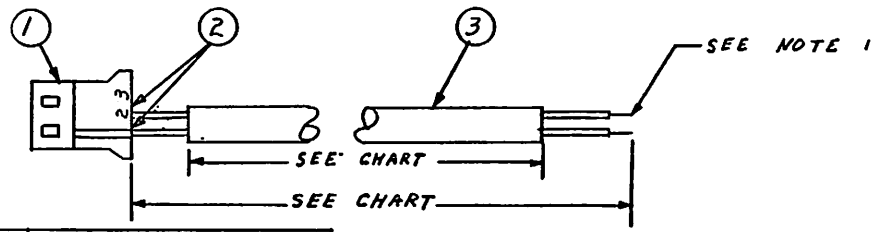
SCALE SHT 1 OF 1

	BY	DATE	APPROVED BY	DATE
DWN	BB	1/2/75	E ENGR	
CHK			M ENGR	
E. C. CONTROL			MFG ENGR	1/6/75

TITLE CABLE, TAPE DRIVE CASSETTE POWER SUPPLY

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
220-1029	B	6482-39	1

DO NOT SCALE



HOLE LEGEND		
DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	±.003 −.001
	.126 to .250	±.004 −.001
	.251 to .500	±.005 −.001

IDENT.	DESCRIPTION	QTY.
A		

WIRE COLOR	SOCKET NO.	LENGTH 7058 220-1068	LENGTH 7054 220-1069
WHITE	1	17"	10"
RED	2	17"	10
—	3	—	—
TUBING		16"	9"

} TWIST APPROX. 4 TURNS PER INCH

NOTE:
1. STRIP AND TIN 1/4"
2. TOLERANCE ± 1/4"

B 6482-86

WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-2009		A/R	WIRE		#24 GA WHITE
600-2002		A/R	WIRE		#24 GA RED
605-0109	3	A/R	TUBING		#6
654-1165R	2	2	MATE LOCK SOCKET		AMP. 20-14 GA
654-1150	1	1	SOCKET HOUSING		AMP.

Qty. Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

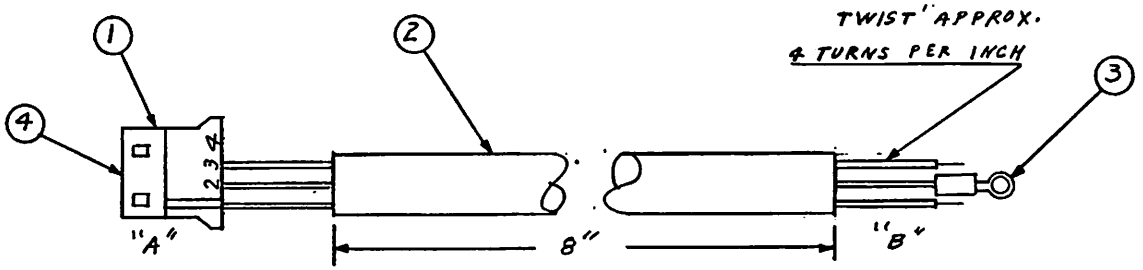
MATERIAL	MODEL NO.
	SEE ENGRG SPECIFICATIONS No.
FINISH	TOL. EX. AS NOTED .XX ± .010 FRAC. ± 1/64 .XXX ± .005 ANG ± 1°30' FINISH 125
	SCALE / SHT OF

BY	DATE	APPROVED BY	DATE
DWN [illegible]	5-17-76	E ENGR	
CHK		M ENGR	
E. C. CONTROL		MFG ENGR [illegible]	5/21/76

TITLE: CABLE CRT BOARD

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.
SEE CHART	B	6482-86	0

NO.	REVISION	BY	DATE



WIRE COLOR	SOCKET No	END 'A'	END B	LENGTH
BLACK	1	654-1163R	STRIP & TIN	10 1/2
GRN/YEL	2	654-1163R	654-0056R	10 1/2
WHITE	3	654-1163R	STRIP & TIN	10 1/2

HOLE LEGEND		
DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	+.003 −.001
	.126 to .250	+.004 −.001
	.251 to .500	+.005 −.001

IDENT.	DESCRIPTION	QTY.
A		

NOTE:
1. STRIP AND TIN 1/4"
2. TOLERANCE ± 1/4"

WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-0054		.88	WIRE		#18 GRN/YEL
600-0009		.88	WIRE		#18 WHITE
600-0000		.88	WIRE		#18 BLACK
654-1163R	4	3	MATE & LOCK SOCKET		AMP 20-14 GA.
650-0050R	3	1	RING LUG RED		#6
605-0015	2	.66	TUBING		#3 TUBING 8" LONG
654-1195	1	1	SOCKET HOUSING 4 POS		AMP.

Qty. Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

FINISH

MODEL NO. 2200 E

SEE ENGRG SPECIFICATIONS No.

TOL. EX. AS NOTED
.XX ± .010 FRAC. ± 1/64
.XXX ± .005 ANG. ± 1°30' FINISH 125 √

SCALE SHT OF

BY	DATE	APPROVED BY	DATE
DWN JS	5/11/76	E ENGR	
CHK		M ENGR	
E. C. CONTROL		MFG ENGR S. L.	5/21/76

TITLE CRT A.C. CABLE ASS'Y (CHASSIS)

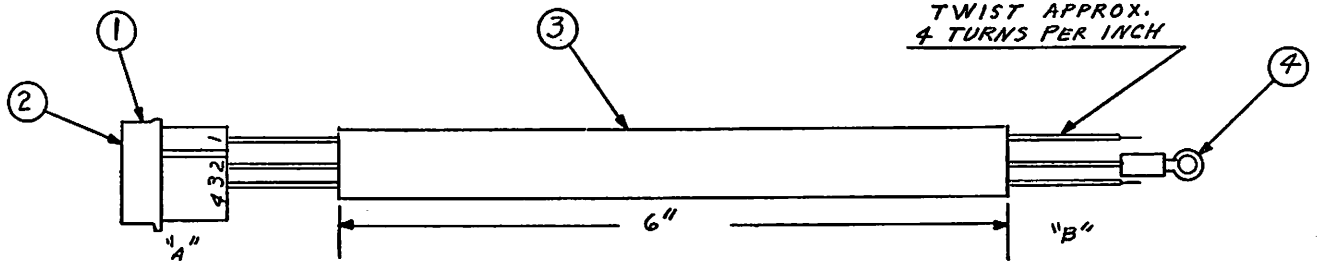
220-1070	B	6482-87	0
WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.

NO.	REVISION	DATE	BY

DO NOT SCALE

106

6482-87



HOLE LEGEND		
DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	±.003 −.001
	.126 to .250	±.004 −.001
	.251 to .500	±.005 −.001

IDENT.	DESCRIPTION	QTY.
A		

NOTE:
1. STRIP AND TIN 1/4"
2. TOLERANCE ± 1/4"

WIRE COLOR	PIN NO.	END "A"	END "B"	LENGTH
BLACK	1	654-1164R	STRIP & TIN	7"
GRN/YEL	2	654-1164R	654-0050R	7 1/2"
WHITE	3	654-1164R	STRIP & TIN	8"

WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-0054		.57	WIRE		#18 GRN/YEL
600-0009		.57	WIRE		#18 WHITE
600-0000		.57	WIRE		#18 BLACK
654-0050R	4	1	RING LUG RED		#6
605-0015	3	.50	TUBING		#3 TUBING 6" LONG
654-1164R	2	3	MATE & LOCK PIN		AMP 20-14 GA
659-1174	1	1	PIN HOUSING 4 POS		AMP.

Qty. Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U. S. A.

MATERIAL

MODEL NO. 2200 E & F

SEE ENGRG SPECIFICATIONS No.

FINISH

TOL. EX. AS NOTED .XX ± .010 FRAC. ± 1/64 .XXX ± .005 ANG. ± 1°30' FINISH 125

SCALE 4/1 SHT OF

BY	DATE	APPROVED BY	DATE
DWN JB	5/18/76	E ENGR	
CHK		M ENGR	
E. C. CONTROL		MFG ENGR B. L.	5/21/76

TITLE: AC SWITCH CABLE ASS'Y (KBD)

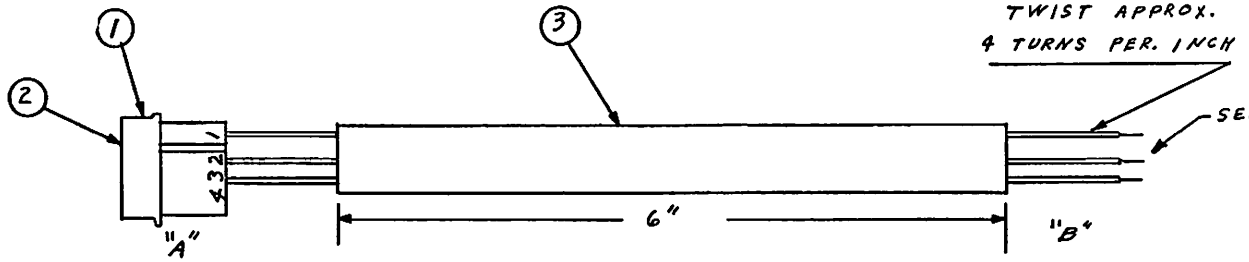
WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.
220-1071	B	6482-88	C

6482-88 B

107

VISION

DO NOT SCALE



HOLE LEGEND		
DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	+.003 −.001
	.126 to .250	+.004 −.001
	.251 to .500	+.005 −.001

IDENT.	DESCRIPTION	QTY.
A		

NOTE:
1. STRIP AND TIN 1/4"
2. TOLARANCE ± 1/4"

WIRE COLOR	PIN NO	END "A"	END "B"	LENGTH
BLACK	1	654-1164R	STRIP+TIN	8"
GRN/YEL	2	654-1164R	STRIP+TIN	8"
WHITE	3	654-1164R	STRIP+TIN	8"

WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-0054		.66	WIRE		#18 GRN/YEL
600-0009		.66	WIRE		#18 WHITE
600-0000		.66	WIRE		#18 BLACK
605-0015	3	.50	TUBING		#3 TUBING 6" LONG
654-1164R	2	3	MATE & LOCK PIN		AMP. 20-14GB
654-1174	1	1	PIN HOUSING 4 POS.		AMP.

Qty. Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

FINISH

MODEL NO. 2200 E

SEE ENGRG SPECIFICATIONS No.

TOL. EX. AS NOTED
.XX ± .010 FRAC. ± 1/64
.XXX ± .005 ANG. ± 1°30' FINISH 125

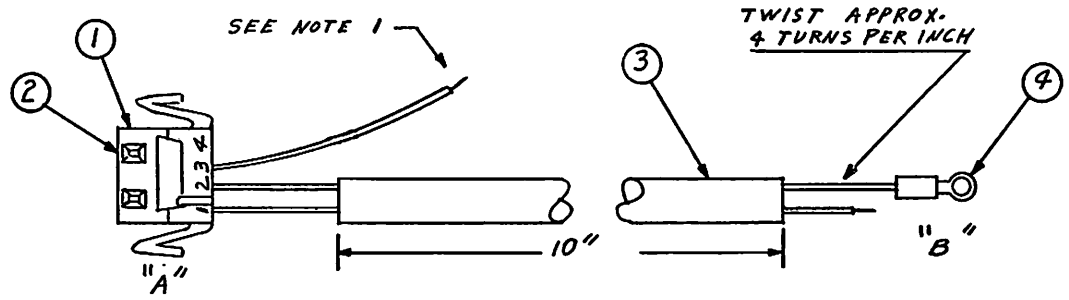
SCALE 4/1 SHT OF

BY	DATE	APPROVED BY	DATE
DWN J.S.	5/17/76	E ENGR	
CHK		M ENGR	
E. C. CONTROL		MFG ENGR J.L.	5/21/76

TITLE 9" CRT A.C. CABLE ASSEMBLY

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.
220-1072	B	6482-89	0

NO.	REVISION	BY	DATE



HOLE LEGEND		
DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	+.003 −.001
	.126 to .250	+.004 −.001
	.251 to .500	+.005 −.001

IDENT.	DESCRIPTION	QTY.
A		

NOTE:
1. STRIP AND TIN 1/4"
2. TOLERANCE ± 1/4"

WIRE COLOR	PIN NO	END "A"	END "B"	LENGTH
BLACK	1	654-1163R	STRIP & TIN	14"
GRN/YEL	2	654-1163R	654-0050R	15"
WHITE	3	654-1163R	STRIP & TIN	3 1/4"

WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-0054			WIRE		#18 GRN/YEL
600-0009			WIRE		#18 WHITE
600-0000			WIRE		#18 BLACK
654-0050R	4	1	RING LUG		#6 RED
605-0012	3	1	TUBING		#4 TUBING
654-1163R	2	3	MATE & LOCK SOCKET		AMP. 20-14 GA
654-1173	1	1	SOCKET HOUSING 4 POS.		AMP.

Qty. Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

MODEL NO. 2200 E

SEE ENGRG SPECIFICATIONS No.

FINISH

TOL. EX. AS NOTED
.XX ± .010 FRAC. ± 1/64
.XXX ± .005 ANG. ± 1°30' FINISH 125

SCALE CH SHT OF

	BY	DATE	APPROVED BY	DATE
DWN	JB	5/20/76	E ENGR	
CHK			M ENGR	
E. C. CONTROL			MFG ENGR	5/21/76

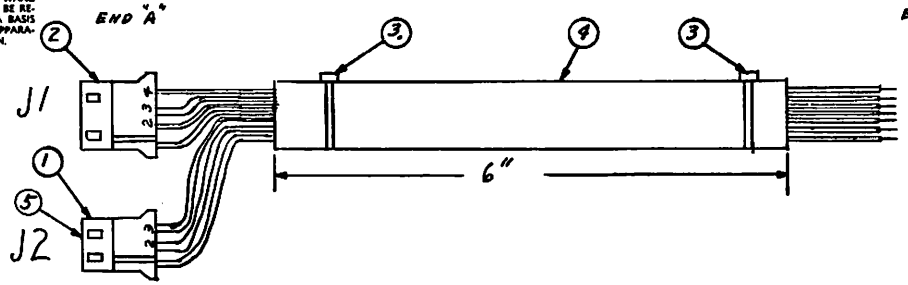
TITLE
A.C. SWITCH CABLE ASSEMBLY
(CHASSIS)

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.
220-1073	B	6482-90	0

NO.	REVISION	BY	DATE

109

DO NOT SCALE



HOLE LEGEND		
DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	± .003
	.126 to .250	± .004
	.251 to .500	± .005

IDENT.	DESCRIPTION	QTY.
A		

NOTE:
1. STRIP AND TIN 1/8"
2. TOLERANCE ± 1/4"

WIRE COLOR	END "A"	END "B"	SOCKET No.	GAUGE	W. L. PART No.	LENGTH
WHITE	654-1163R	STRIP+TIN	J1 - 1	#18	600-0009	9 1/2"
GRAY	654-1163R	STRIP+TIN	J1 - 2	#18	600-0008	9 1/2"
BLUE	654-1163R	STRIP+TIN	J1 - 3	#18	600-0006	9 1/2"
YELLOW	654-1163R	STRIP+TIN	J1 - 4	#18	600-0004	9
ORANGE	654-1163R	STRIP+TIN	J2 - 1	#18	600-0003	9 1/2"
RED	654-1163R	STRIP+TIN	J2 - 2	#18	600-0002	9"
BLACK	654-1163R	STRIP+TIN	J2 - 3	#18	600-0000	9"

WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-0009		.75	WIRE		#18 WHITE
600-0008		.75	WIRE		#18 GRAY
600-0006		.75	WIRE		#18 BLUE
600-0004		.75	WIRE		#18 YELLOW
600-0003		.75	WIRE		#18 ORANGE
600-0002		.75	WIRE		#18 RED
600-0000		.75	WIRE		#18 BLACK
654-1163R	5	7	MATE + LOCK SOCKET		AMP. 20-14 GA.
605-0102	4	.56	TUBING		5/16" BLACK 6" LONG
605-1004	3	2	TY-RAP		
654-1195	2	1	SOCKET HOUSING 4 POS		AMP.
654-1150	1	1	SOCKET HOUSING 3 POS		AMP.

Qty. Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

BY	DATE	APPROVED BY	DATE
DWN	5/17/x	E ENGR	
CHK		M ENGR	

MATERIAL

FINISH

MODEL NO. 2200

SEE ENGRG SPECIFICATIONS No.

TOL EX AS NOTED .XX ± .010 FRAC. ± 1/64 .XXX ± .005 ANG ± 1°30' FINISH 125

SCALE | SHT | OF

TITLE P.S/MB CABLE ASSEMBLY

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
220-1079	C	6402-91	0

REVISION	BY	DATE	NO.

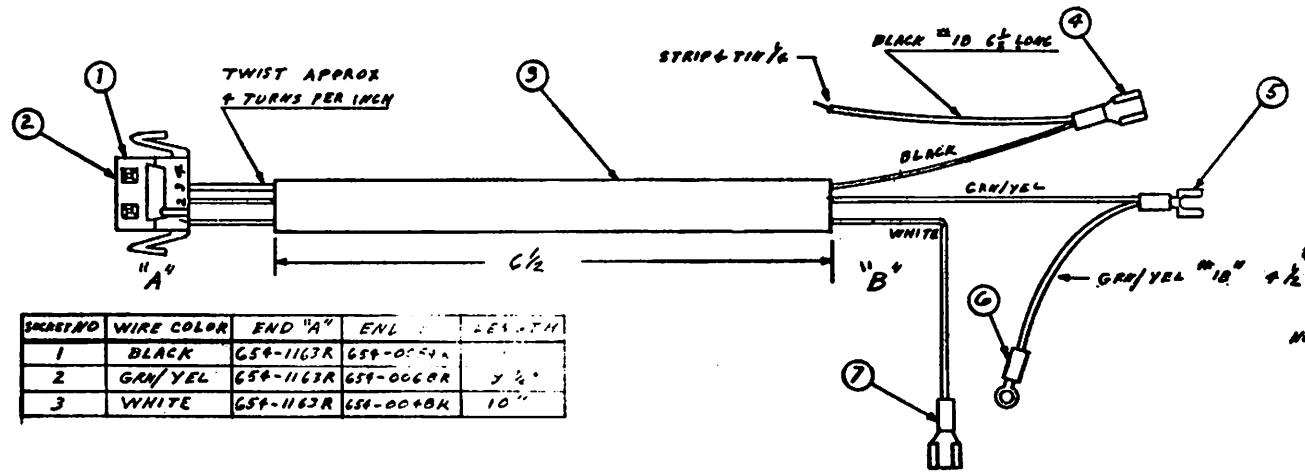
110

DO NOT SCALE

HOLE LEGEND

DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	± .003
	.126 to .250	± .005
	.251 to .500	± .007

IDENT.	DESCRIPTION	QTY.
A		



SOCKET NO	WIRE COLOR	END "A"	END "B"	LENGTH
1	BLACK	654-1163R	654-0054R	
2	GRN/YEL	654-1163R	654-0060R	5 1/2"
3	WHITE	654-1163R	654-0048R	10"

NOTES:
1. TOLERANCE ± 1/4"

WANG PART NO	ITEM	QTY	NAME	MATERIAL	DESCRIPTION
600-0054		1.16	WIRE		#18 GRN/YEL
600-0009		.83	WIRE		#18 WHITE
600-0000		1.96	WIRE		#18 BLACK
659-0048R	7	1	FASTON TERM RED		
659-0050R	6	1	RING LUG RED		
659-0060R	5	1	FORK LUG BLUE		
659-0084R	4	1	FASTON TERM BLUE		
605-0101	3	.54	TUBING		1/4" TUBING BLACK
654-1163R	2	3	MATE-LOCK SOCKET		AMP 20-18 C4
654-1173	1	1	SOCKET HOUSING 4 POS		AMP.

Qty. Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

FINISH

MODEL NO 2200 F

SEE ENGRG SPECIFICATIONS No.

TOL. ON AS NOTED XX ± .010 FRAC. ± 1/64 XXX ± .005 ANG. ± 1°30' FINISH √

SCALE 1/1 SHT OF

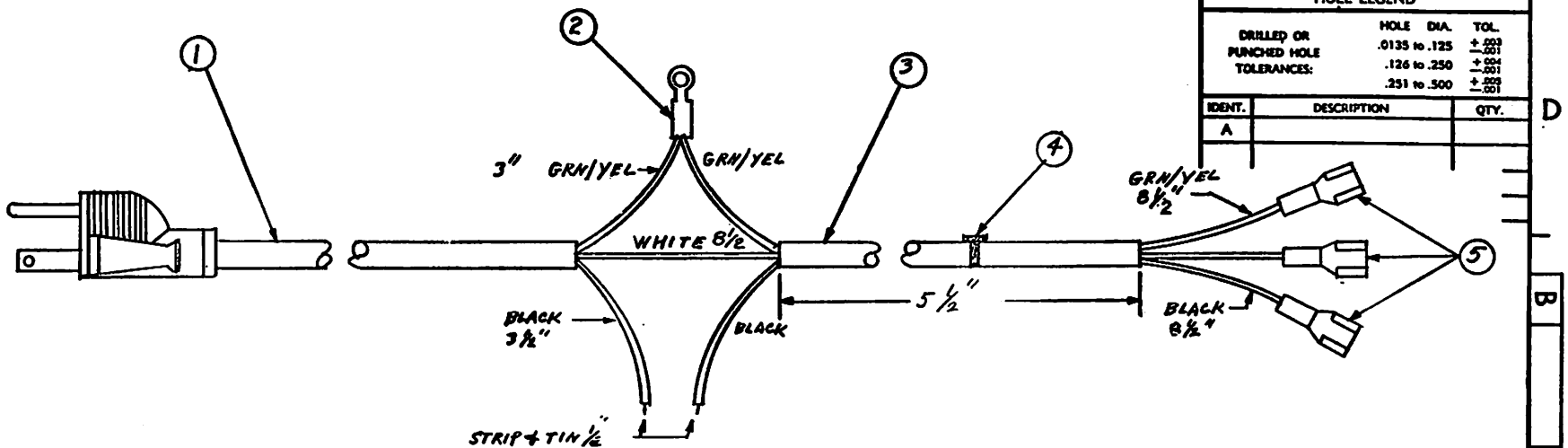
	BY	DATE	APPROVED BY	DATE
DWN	[illegible]	5/14/76	E ENGR	
CHK			M ENGR	
E C CONTROL			MFG ENGR	5/21/76

TITLE A.C. SWITCH CABLE ASSEMBLY (CHASSIS)

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV
220-1075	C	6482-94	C

REVISION

111



HOLE LEGEND

	HOLE DIA.	TOL.
DRILLED OR PUNCHED HOLE TOLERANCES:	.0135 to .125	+.003 −.001
	.126 to .250	+.004 −.001
	.251 to .500	+.005 −.001

IDENT.	DESCRIPTION	QTY.
A		

DO NOT SCALE

WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-0054		.62	WIRE		#18 GRN/YEL
600-0000		.62	WIRE		#18 BLACK
654-0048R	5	3	FASTON TERM. RED		
605-1004	4	1	CABLE TYE		PLT IM-M
605-0101	3	.46	TUBING		¼" TUBING BLACK
654-0052R	2	1	RING LUG BLUE		
420-1000	1	1	POWER CORD BELDEN		

Qty. Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U.S.A.

MATERIAL

FINISH

MC 2200 F

SEE ENGRG SPECIFICATIONS No.

TOL. EX. AS NOTED .XX ± .010 FRAC. ± 1/64 .XXX ± .005 ANG. ± 1°30' FINISH 125

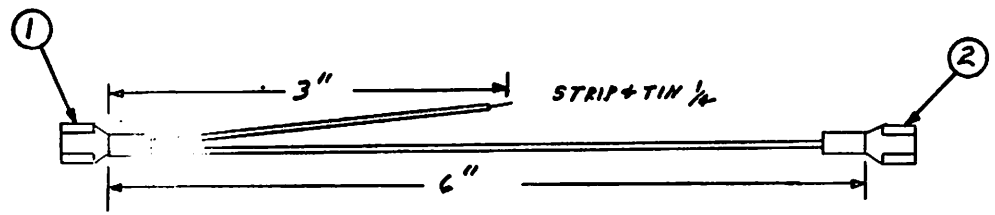
SCALE 4/1 SHT OF

BY	DATE	APPROVED BY	DATE
DWN JS	5/	I. ENGR	
CHK		M ENGR	
E. C. CONTROL		MFG ENGR. J. L.	5/21/70

TITLE: POWER CORD ASSEMBLY

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.
220-1076	B	6482-95	0

NO.	REVISION	BY	DATE



DO NOT SCALE

HOLE LEGEND		
DRILLED OR PUNCHED HOLE TOLERANCES:	HOLE DIA.	TOL.
	.0135 to .125	+.003 −.001
	.126 to .250	+.004 −.001
	.251 to .500	+.005 −.001

IDENT.	DESCRIPTION	QTY.
A		

WANG PART NO.	ITEM	QTY.	NAME	MATERIAL	DESCRIPTION
600-0009	A/R	.75	WIRE		#18 WHITE
654-0048	2	1	FASTON TERM. RED		
654-0084	1	1	FASTON TERM. BLUE		

Qty. Per Unit	FIRST USED ON	ASSY USED ON

WANG LABORATORIES, INC. TEWKSBURY, MASS. U. S. A.

MATERIAL

FINISH

MODEL NO. 2200 F

SEE ENGRG SPECIFICATIONS No.

TOL. EX. AS NOTED .XX ± .010 FRAC. ± 1/64 .XXX ± .005 ANG. ± 1°30' FINISH 125

SCALE | SHT | OF

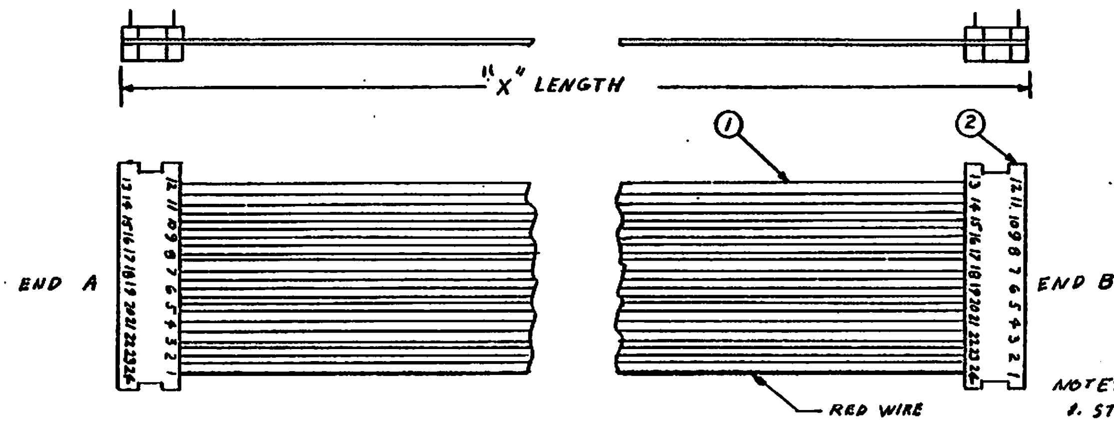
	BY	DATE	APPROVED BY	DATE
DWN	JB	5/20/76	E ENGR	
CHK			M ENGR	
E. C. CONTROL			MFG ENGR	D.L. 5/21/76

TITLE WIRE AND LUG ASSEMBLY (TYPE PO 43)

WANG PART NUMBER	SIZE	DRAWING NUMBER	REV.
220-1077	B	6482-96	O

NO.	REVISION	DATE	BY

DO NOT SCALE



NOTE:
1. STRIP WIRES BACK 1/4 INCH TIN 1/4 INCH
2. FOLD AND STRAIN RELIEVE END "A"
3. FOLD AND STRAIN RELIEVE END "B"
4. LENGTH AFTER FOLD APPROX 3/4" LESS THAN "X" LENGTH

W.L. PART NO.	END A	END B	"X" LENGTH	MODEL(S) USED ON
220-3014	350-0403	350-0403	14"	2200E 2200F
220-3016	350-0403	350-0403	8"	2200F

SEE NOTE 3 & 4

WANG PART NO	IDENT	QTY	NAME	MATERIAL	DESCRIPTION
350-0403	2	A/R	24 PIN FLAT CABLE CONN.		3M
420-0050	1	A/R	24 WIRE FLAT CABLE		3M #3365/24

TOL. EX. AS NOTED .XX ±.010 .XXX ±.005 FRAC. ±1/64 ANG. ±0°30'

WANG LABORATORIES, INC.
TEWKSBURY, MASS. U. S. A.

DR [signature] DATE 3-9-76
CHK DATE
APPD [signature] DATE 3-19-76
MODEL No. W.O. No. SCALE [illegible] SHEET 1 OF 1

TITLE 24 PIN FLAT CABLE ASSEMBLY

PART NUMBER	REV	SIZE	DRAWING NUMBER
SEE CHART.	1	C	6482-79

NO.	REVISION	DATE	BY
1	REV. PER DWR # E173 APP: R [illegible]	5/20/76	[initials]