Samsung ER-650 Electronic Cash Register

KDS 650 Video System Programming Manual

All specifications are subject to change without notice.

M-650KDS Version 2.0

Contents

Introduction

Using this Manual

Please note that this manual was to serve as a supplement to the ER-650 Program Manual. Programming issues related to the ER-650 are briefly discussed in this manual but are covered in detail in the *ER-650 Operation and Program Manual*.

The KDS 650 Video System is also compatible with the Samsung ER-5100 series electronic cash registers. Programming issues related to the ER-5100 are also briefly discussed here, but are covered in detail in the *ER-5100/5140 Operator's and Programming Manual*.

If you have questions or need additional information, call Cash Register Sales at (800) 333-4949.

Features

The ER-650 - MicroPlus Kitchen Display System or " KDS 650 Video System" allows up to 5 registers, 8 video monitors and 8 keypads or bump bars to be attached to a single "Video Controller" PC. Unique boards are installed in the PC to connect all devices. Some features include:

- Up to eight orders can display on each screen at one time. (Another 50 orders can be stored in the system and viewed by scrolling right and left using the arrow keys on the keypad.)
- When utilizing the "split screen" option, orders from one group of registers (such as Counter) can appear on the top half of the screens and orders from another group of registers (such as Drive Thru) can appear on the bottom half of the screens.

Additional features include:

- Prioritization option - regardless of the order items are entered into the register, all of one group can appear on top of the order, all of another next, etc. (ER-650 only.)

- Speed of Service Report – can display on any video screen for that screen or for the entire store. Report can also be printed.
- Key Item Summary feature, allowing up to 10 items or groups of items to be tracked continuously.
- Reporting capabilities - Production Statistics Report.
- Real time clock showing time elapsed since complete order appeared; time turns red at the first alarm setting and starts flashing at the second alarm setting. (Both times are programmable.)
- The last 20 orders bumped from the screen can be recalled into a box in the lower right corner of the video screen.
- No items are lost by an overflow condition.
- Choose colors of line items and messages to be displayed on on video screens. Text may appear as dark letters on a white screen or as light letters on a black screen.
- Clear orders from video using keys on the bump bar or they may be auto cleared after a programmed number of minutes.
- Enhanced diagnostics.
- Electronic Journal without overwriting.

The Video Controller PC may be located in the back office with its own monitor and keyboard (both of these are optional). In the back office, the video software may operate in the background as a Microsoft Windows 3.1 or Windows95/98 task, to allow multitasking.

Video data, as it is sent from the register, can be monitored on the PC's VGA monitor and stored in a file called kvslog.dat. In addition, an electronic journal of the video data can be stored in the Video Controller PC, with file names such as: J_08.03 for August 3rd, J_08.04 for August 4th, etc. The system then erases journal files more than two months old.

This manual directs the installer in designing the layout of the system, setting up and connecting the ER-650s (or ER-5100/5140s) to the KDS 650 Video System equipment, setting parameters in the software and tailoring the software to the user's needs.

Components

The KDS 650 Video System consists of the following components and features:

- A KDS 650 Video Controller PC, which is a 80386 level or later PC, with at least 4 Mbyte RAM, one floppy drive (or optional hard drive), a monitor (optional) and a keyboard (optional).
- 1 to 8 VGA monitors. A single video system can use a standard PC VGA board and the PC's monitor.
- A 2-Port KDS Board for keypad(s).
- A 4-Port ISA 16 bit VGA Board for connecting one to four VGA screens. Two 4-Port VGA Boards for 5 to 8 screens; etc. (A VGA Board is not needed for a single video screen system - the Video Controller PC's standard VGA monitor board and monitor is used interchangeably for both the kitchen video screen and for menu options.)
- One to eight spill-proof, small footprint, 16-key "485" keypad(s).

Component Identification

Overview

Refer to the cable and connection infomation in Appendix A on page 42 to correctly identify, configure and connect each component.

KDS 650 Video Controller PC

Allows full length boards to be installed; has at least one floppy drive or an optional hard drive; 4 Megabyte RAM memory; a DOS or Windows operating system; and a PC keyboard.

4-Port VGA Board

This board is inserted into one of the ISA 16 bit slots of the KDS 650 Video Controller PC. It is used for systems with two or more videos. It is not necessary for a single video system.

50 Foot VGA Video Cable Extensions

These cables have a RJ45 10 conductor jack on one end to snap into the 4-Port VGA Boards and have a 15 pin socket on the other end, to plug in a VGA Monitor cable.

2-Port KDS Board or 4-Port KDS Board

This communication board is inserted into the KDS 650 Video Controller PC. It is mandatory to have a KDS communication board for the video system to run. There are three jacks on this board, but only the one closest to the hold down screw is used, for the keypad(s).

Keypad Junction Board

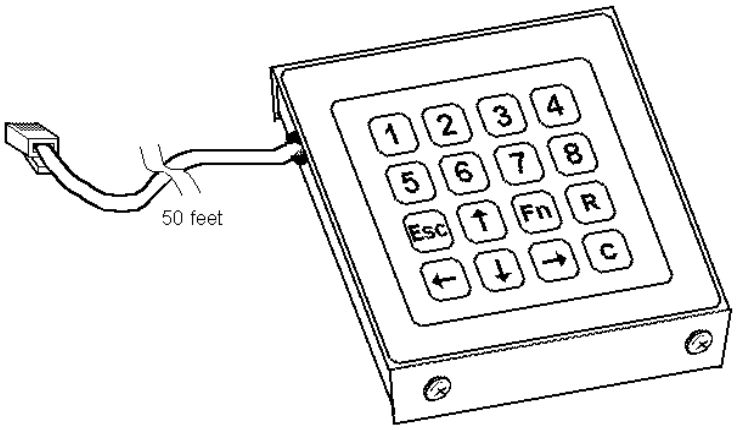
This small triangular or rectangular board has five RJ45 8-conductor jacks. A short jumper comes from the 2-Port KDS board into one of theses 5 jacks. The four remaining jacks connect to keypads. A second Junction Board can connect more keypads. If you have no open slots in the PC, there are Junction Boxes that don't use them.

Software diskette: "ER-650 - KDS 650 Video System"

If this system is run on a floppy drive, it is recommended that a copy be made from the original disk and the copy be used in day to day operation. When making a copy of the diskette, be sure to make it a system disk so that it boots. Two ways to do this are: to do a complete DISKCOPY of the original disk or to type SYS A: from the run command (if the duplicate disk is in drive A:). In addition, you must copy Ramdrive.sys from the Windows sub-directory in explorer. Once a system disk has been created, you may copy the rest of the files to the disk.

KDS 650 "485" Keypads

One of these 16-key keypads is used for each video screen. (You can have more than one keypad with the same number controlling the same video.) Each has a modular RJ45 jack on the end of a 50 foot cable. This spill-proof keypad is well suited for the food service environment.



Keypad Functions

Key	Function
<1> - <8>	Remove the order from the corresponding box #. If order fills more than one box, the number outlines all boxes of the order; cleared with the <C> key.
<Fn>	Key Item Report is displayed or hidden.
<Esc>	Clears error messages from the top of the screen. Unselect outlined multi-box order. If an order is recalled, <Esc> removes it from the screen.
<R>	Recalls previously cleared orders.
<C>	Clear or "bump off screen" highlighted multibox order.
<←> <→>	Accesses uncleared, off-screen orders to the left or right.
<↑>	Park the oldest order.
<↓>	Speed of Service (Productivity) Report on screen.

Video Controller Setup

Overview

The following sections provide details on setting up the hardware for the KDS video controller. It may be necessary to make cables that are not provided with the system, such as those of lengths that cannot be predetermined or cables that must be terminated after being pulled through narrow openings. Cabling diagrams are provided in Appendix A on page 42.

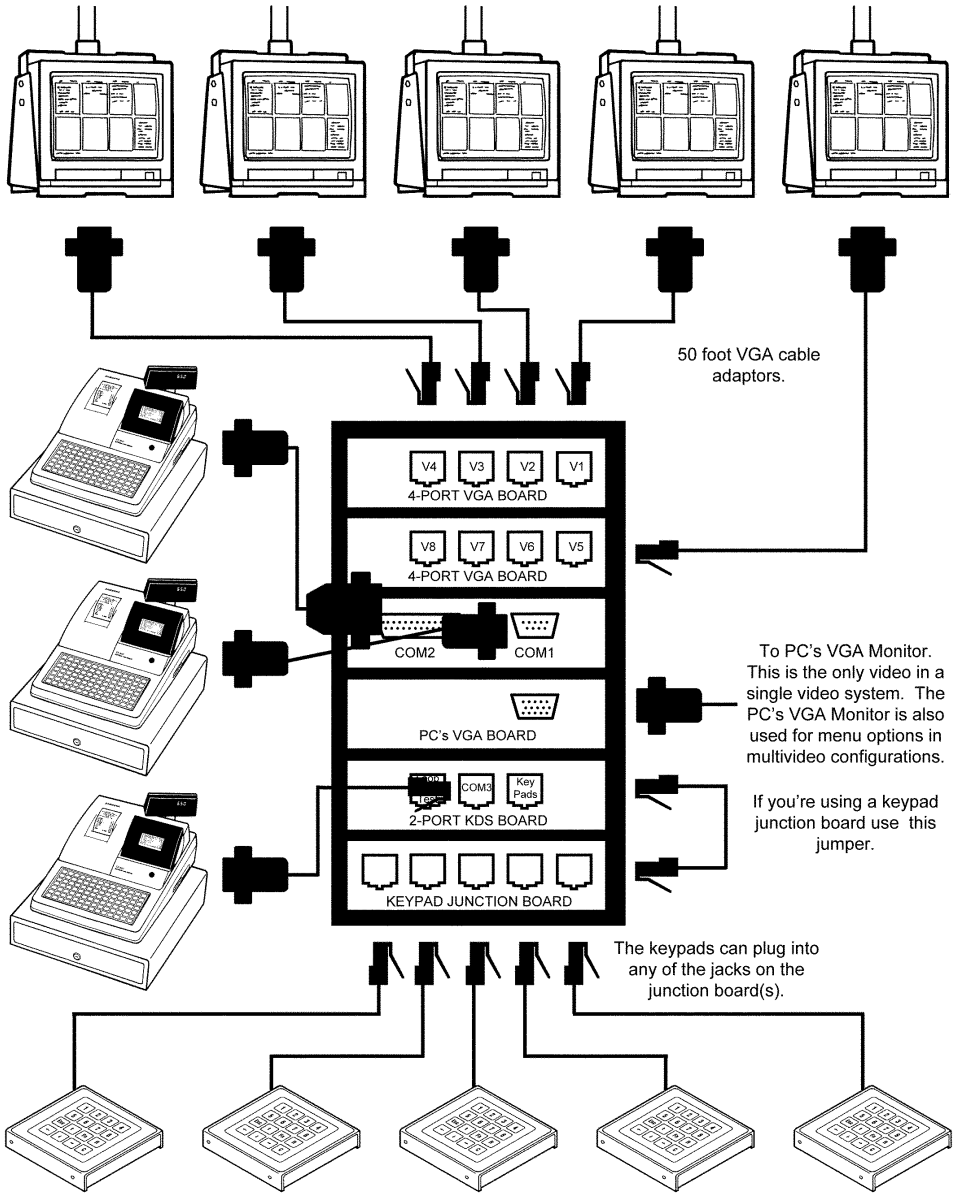
Initial PC Operating System Set-up

If you did not receive your PC from CCR, enter SETUP for your PC and:

- Set monitor to VGA.
- If the date and time are incorrect, correct them.
- Make other changes, such as hard drive setup if you are using one. A hard drive is not necessary, a floppy drive is sufficient.
- Save changes.

Diagram of Connected Components

This diagram shows the KDS 650 Video Controller PC, the VGA monitors, the 485 Keypads, the ER-650's and how to connect them all together. The diagram is designed to help you identify the components and ports.



Setting Up the KDS 650 Video Controller

To set up the KDS 650 Video System, attach the following to the KDS 650 Video Controller (PC):

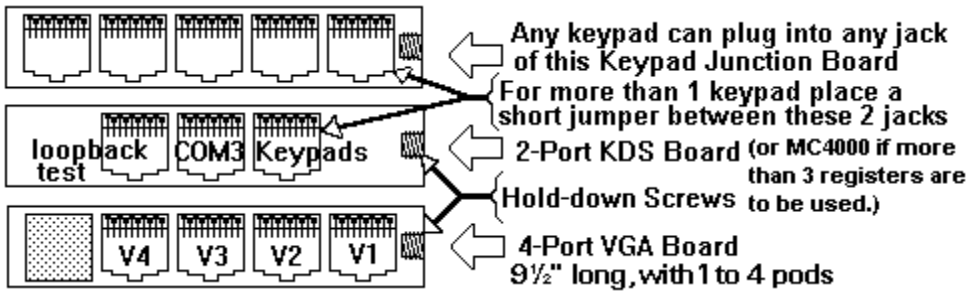
2-Port KDS Board or 4-Port VGA Board

If they were shipped separately from your PC, install the 2-port KDS board (for one video screen) or the 4-port VGA board (for systems utilizing more than one video screen) into your PC. The longer board with only four jacks and one empty hole is the 4-Port VGA Board and the shorter board with three jacks is the 2-Port KDS Board. Make sure the boards are well seated and screwed down tight.

NOTE: Be careful to attach the keypads only to the 2-Port KDS Board and 50 foot VGA Cable Adapters only to the 4-Port VGA Board because RJ45 connectors are used for both and **the cables can be plugged into the wrong boards**. This may damage the boards and cause the cables to heat up.

VGA Video Monitors

For a single video system, the PC's standard VGA monitor is used as the only screen. For two or more videos, all kitchen screens are attached via the 50 foot VGA Adapter Cables supplied. For 2, 3 or 4 videos, only one 4-Port VGA Board is used with the Video 1 jack closest to the screw that holds the board in the PC, Video 2 is the next closest, etc., as shown in the following diagram:



For 5 - 8 videos install a second 4-Port VGA Board. A wiring diagram for the 50 Foot VGA Adapter Cables is included in Appendix A, should you have to make one or pull un-terminated cables through conduit.

Keypads

If there is more than one keypad, install a Keypad Junction Board (a small triangular or rectangular board) next to the 2-Port KDS Board and connect the supplied modular jumper between the ports nearest the hold-down screws on both

boards. If your system was supplied with Keypad Junction Boxes, attach this assembly to the 2-Port KDS Board, into to the jack closest to the hold down screw. The wiring diagram for the Keypad Junction Boxes is included in Appendix A.

The Keypads should be labeled 1, 2, 3, etc., up to the number of keypads in the system. Jumpers inside the keypad are moved to change the Keypad Number between 1, 2, 3 and 4 with the standard EPROM and 5, 6, 7 and 8 with the "5 thru 8 EPROM". A diagram showing jumper settings to change the keypad number is included in Appendix A.

If you want more than one keypad to control a single video or single video image that has been split to appear on multiple screens, set all such keypads to the same number.

After the system is set up and completely programmed, each Keypad should control the Video screen you select. If they control the wrong screen, you may have to open the keypad and check the jumper settings.

Serial Cables

Attach a serial cable from either port of each ER-650 into one of the PC's serial ports, COM1, COM2, or COM3 (located on the 2 port KDS board). Wiring diagrams for serial cable connections are included in Appendix A.

PC Keyboard (Optional)

Optionally, you may attach a standard 101 key PC keyboard into the keyboard connector of the PC. A PC keyboard is helpful in setting up the system, but is not required to run the system. Without a keyboard you cannot change to Period 2 through Period 5, watch diagnostic data, manually start logging video data, manually start journalling or edit the setup files for changes in system configuration on the Video Controller PC (you can start logging and journalling automatically when the system is booted and can still edit setup files on another PC).

System Programming

Overview

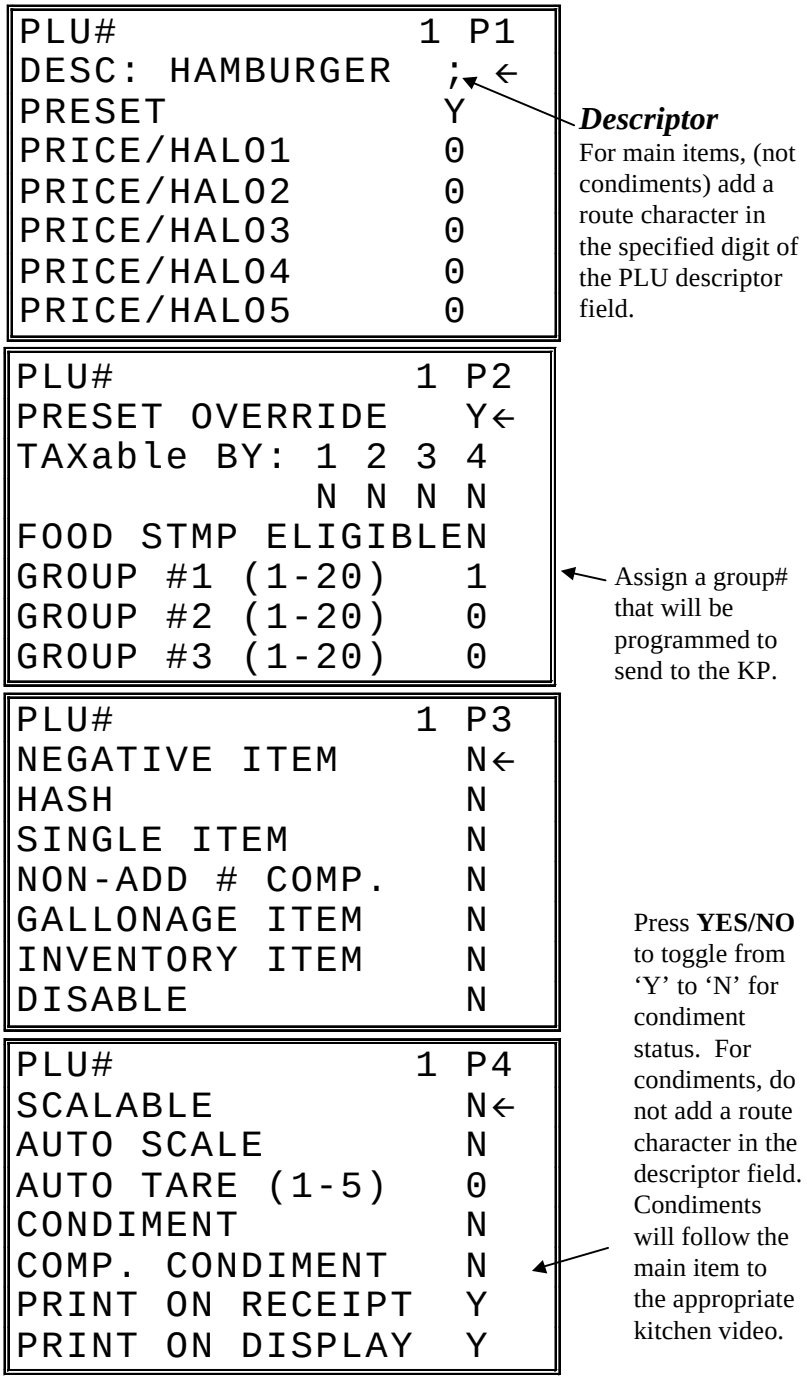
Once the operating system parameters are set and the hardware is connected, it is time to start programming the system. The following sections provide details regarding overall system design and subsequent system programming. An example application is provided, summarizing the steps required to program the system.

ER-650 Programming

The following sections provide details regarding ER-650 programming, related to the KDS Video System. The ER-650 programming instructions provided here are to be used only as a supplement to the instructions provided in the ER-650 Program Manual.

PLU Programming

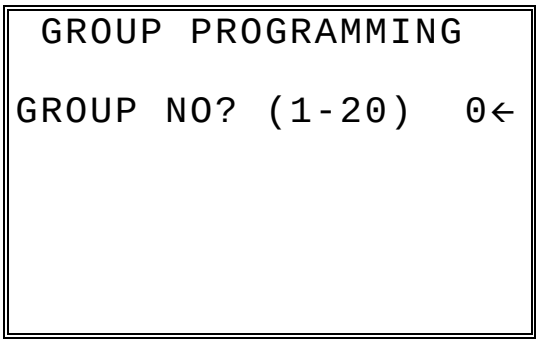
1. Access the **PLU # PROGRAMMING** screen, for the PLU you wish to program.
2. Set the DESCRIPTOR, GROUP and CONDIMENT fields per the instructions below:



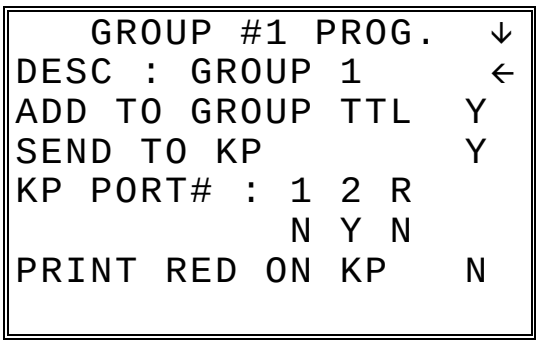
Group Programming

NOTE: Do not enter information in the SEND TO KV, KV GROUP# or KV COLOR fields on the second page of the Group Program screen. These fields are not used for programming the kitchen video system.

1. At the **PGM** control lock position menu, press **1** for **GROUP**. The **GROUP PROGRAM** screen displays: (The maximum group number is set by memory allocation.)



2. Enter the number of the group to be programmed, press **ENTER**. The **GROUP# PROG**. screen displays:



3. At the SEND TO KP field, enter "Y" to send items in this group to the kitchen printer. At the KP PORT# field, select Y for the appropriate port. Press **ENTER** after each entry.
4. Press **ENTER** to return to the **GROUP PROGRAMMING** screen. Continue to program groups as necessary. Press **ESC** to return to the **PROGRAM MODE** screen.

RS232C Port 1/RS232C Port 2 Options

1. Program the RS232C port by selecting **8** for RS232C Port 1 programming or **9** for RS232C Port 2 programming. The appropriate **PORT PROGRAM** screen displays:

```
 PORT 1 PROGRAM pg1
BAUD RATE          0←
 0: 9,600  1:1,200
 2: 2,400  3:4,800
 4:19,000
PARITY CHECK       0
0:NONE 1:ODD 2:EVEN
DATA BITS(0:8 1:7)0
```

2. Verify the default settings. Press **PAGE DOWN** to view page 2 of the RS232C port program:

```
 PORT 1 PROGRAM pg2
STOP BITS(0:1 1:2)0←
DEVICE FUNCTION    4
--------------------
0:NONE 1:PC   2:SCL
3:RJ   4:RP   5:KV
6:SCAN 7:COIN 8:LIQ
9:POLE
```

3. At the DEVICE FUNCTION field, enter **4** (for remote printer), then press **ENTER**. *Do not use the KV selection (5).* Press **PAGE DOWN** twice to view page 4 of the RS232C port program:

```
 PORT 1 PROGRAM pg4
PRINT LINE ON GUEST
 CHECK(0-50)       0←
SCALE TYPE
 0:NCI   1:CAS     0
PRINTER TYPE       8
 0:NONE
 1:SAM SRP-100
```

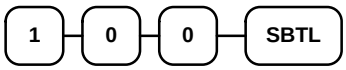
4. At the PRINTER TYPE field, enter **8** for TM-T88, then press **ENTER**. The kitchen video system accepts TM-T88 data for video processing.

5. Press the **CLEAR** key to finalize and return to the **SERVICE MODE** screen.

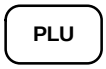
ER-5100/5140 Programming

Program 100 - PLU Status Programming

1. Turn the control lock to the **P** position.
2. To begin the program, enter **1 0 0**, press the **SBTL** key.



3. Select the PLU or PLUs you wish to program in one of the following ways:
   - Press a PLU key on the keyboard, or



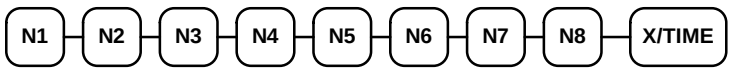
   - Press multiple PLU keys that are to receive the same status, or

   - Press a level key, then an PLU key, or

   - Enter the number of the PLU (1-1000) and press the **PLU** key, or

   - Enter the number (1-1000) of the first PLU in a range of PLUs that are to receive the same setting; press the **PLU** key. Enter the last number (1-1000) in the range; press the **PLU** key.

4. Refer to the "PLU Status Chart" to determine the values for **N1** through **N8**. (If an address offers more than one option, add the values for each option and enter the sum. For example, if you wish the PLU to be taxable by rates 1 and 3, add the values for your choices, 1 + 4, and enter the sum "5" for address N5.) Enter the values you have selected, press the **X/TIME** key. (**You do not need to enter preceding zeros**. For example, if you are only selecting a value for **N8**, i.e. taxable by tax 1, just enter **1**.)



5. To program additional PLUs, repeat from step 3, or press the **CASH** key to finalize the program.

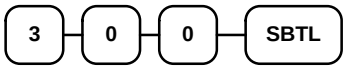
PLU Status Chart

Address	Program Option	Value	=	Sum
N1	PLU is gallonage?	Yes = 1 No = 0		
	PLU is single item?	Yes = 2 No = 0		
	PLU is food stamp eligible?	Yes = 4 No = 0		
N2	PLU is negative?	Yes = 1 No = 0		
	PLU is a condiment?	Yes = 2 No = 0		
	PLU is hash?	Yes = 4 No = 0		
N3	Compulsory scale entry? (When Yes, PLU will only work with scale.)	Yes = 1 No = 0		
	Compulsory non-add number?	Yes = 2 No = 0		
	Compulsory validation?	Yes = 4 No = 0		
N4	Compulsory condiment entry?	Yes = 1 No = 0		
	PLU prints RED on kitchen printer?	Yes = 2 No = 0		
	PLU price does not print on receipt, detail or guest check?	Yes = 4 No = 0		
N5	PLU does not print on receipt?	Yes = 1 No = 0		
	PLU does not print on detail?	Yes = 2 No = 0		
	PLU does not print on guest check?	Yes = 4 No = 0		
N6	PLU is: open = preset = inactive =	0 1 2		
N7	PLU sales counter decrements for stock keeping?	Yes = 1 No = 0		
	PLU is taxable by rate 4?	Yes = 2 No = 0		
	PLU counter is reset when a PLU Z report is done?	Yes = 0 No = 4		
N8	PLU is taxable by rate 1?	Yes = 1 No = 0		
	PLU is taxable by rate 2?	Yes = 2 No = 0		
	PLU is taxable by rate 3?	Yes = 4 No = 0		

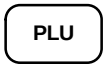
Program 300 - PLU Descriptor Programming

Program descriptors for the *ER-5100* by typing descriptors on the alpha keyboard overlay. Program descriptors for the *ER-5140* by entering three digit alpha character codes. The keyboard overlay option is not available on the *ER-5140*.

1. Turn the control lock to the **P** position.
2. To begin the program, enter **3 0 0**, press the **SBTL** key.



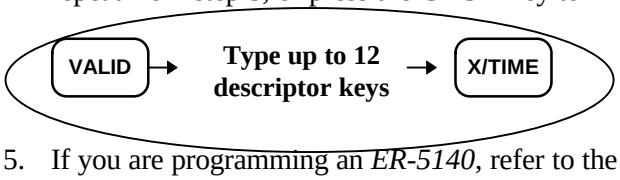
3. Select the PLU you wish to program in one of the following ways:
   - Press a PLU key on the keyboard, or



   - Press a level key, then an PLU key, or

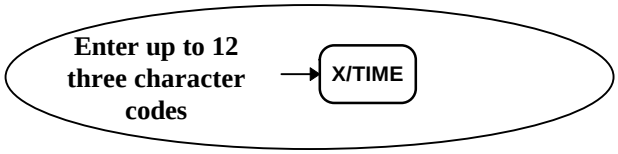
   - Enter the number of the PLU (1-1000) and press the **PLU** key, or

4. If you are programming an *ER-5100,* insert the *Alpha Keyboard Overlay*. To use the overlay, press **VALID**, type up to 12 descriptors by pressing the appropriate descriptor keys on the alpha keyboard, then press **X/TIME**. To program additional PLUs using this method, repeat from step 3, or press the **CASH** key to finalize the program.



Include a route character in the descriptor. The route character does not need to be included if the item is a condiment. Condiments follow main items.

5. If you are programming an *ER-5140*, refer to the *Descriptor Code Chart* and determine the codes for the descriptor you wish to program. Enter up to 12 three character codes; press the **X/TIME** key.



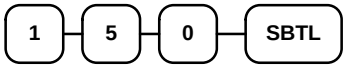
6. To program additional PLUs, repeat from step 3, or press the **CASH** key to finalize the program.

Program 150 - PLU Group Assignment

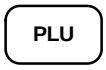
Each PLU may report to any two of 21 groups. Group totals appear on reports, so that you can track sales of different types of items. A group can also be used to designate items that are to print on an optional kitchen printer.

Note: The PLU will report to group "0", if not programmed to report to groups 1-20.

1. Turn the control lock to the **P** position.
2. To begin the program, enter **1 5 0**, press the **SBTL** key.



3. Select the PLU or PLUs you wish to program in one of the following ways:
   - Press a PLU key on the keyboard, or



   - Press multiple PLU keys that are to receive the same status, or

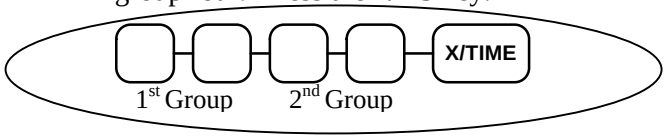
   - Press a level key, then an PLU key, or

   - Enter the number of the PLU (1-1000) and press the **PLU** key, or

   - Enter the number (1-1000) of the first PLU in a range of PLUs that are to receive the same setting; press the **PLU** key. Enter the last number (1-1000) in the range; press the **PLU** key.

4. Enter up to two 2-digit numbers representing the groups where you wish to add the PLUs sales, i.e. enter **1 0** for group 10 or enter **0 4** for group four. Press the **#/NS** key.

Assign PLUs to a group that reports to a kitchen printer.



5. To program additional PLUs, repeat from step 3, or press the **CASH** key to finalize the program.

Group Status and Descriptor Programming

21 Group totals are available to accumulate totals of individual PLUs that are assigned to each group. Each PLU can be assigned to one or two different groups. (See "Program 300 - PLU Descriptor Programming

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Program descriptors for the *ER-5100* by typing descriptors on the alpha keyboard overlay. Program descriptors for the *ER-5140* by entering three digit alpha character codes. The keyboard overlay option is not available on the *ER-5140.*

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3. Turn the control lock to the **P** position.
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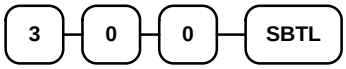
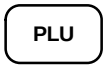


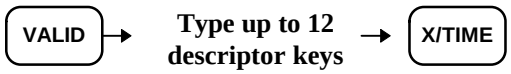
5. Select the PLU you wish to program in one of the following ways:
   - Press a PLU key on the keyboard, or



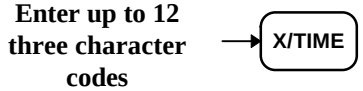
   - Press a level key, then an PLU key, or

   - Enter the number of the PLU (1-1000) and press the **PLU** key, or

6. If you are programming an *ER-5100,* insert the *Alpha Keyboard Overlay.* To use the overlay, press **VALID,** type up to 12 descriptors by pressing the appropriate descriptor keys on the alpha keyboard, then press **X/TIME.** To program additional PLUs using this method, repeat from step 3, or press the **CASH** key to finalize the program.



6. If you are programming an *ER-5140,* refer to *the Descriptor Code* Chart and determine the codes for the descriptor you wish to program. Enter up to 12 three character codes; press **the** X/TIME key.



7. To program additional PLUs, repeat from step 3, or press the **CASH** key to finalize the program.

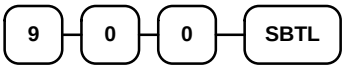
Program 150 - PLU Group Assignment" to program PLU groups for each PLU.)

- Use program 900 to assign a group status, i.e. a group can be set to *not add* to the total of all groups, or a group can be used to designate like items for kitchen printer assignment.
- Use program 910 to assign a unique descriptor for each group, so that the group may be easily understood on the group report.

Program descriptors for the *ER-5100* by typing descriptors on the alpha keyboard overlay. Program descriptors for the *ER-5140* by entering three digit alpha character codes. The keyboard overlay option is not available on the *ER-5140*.

Programming Group Status - Program 900

1. Turn the control lock to the **P** position.
2. To begin the program, enter **9 0 0**, press the **SBTL** key.

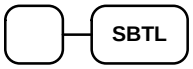


3. Enter the number (**1**-**20**) of the group you wish to program; press the **X/TIME** key.

4. Enter an option digit from the table below, press the **SBTL** key.

ps of
be
d as
printer

OPTION	VALUE	=	SUM
This group does not add to the group total?	Yes = 1 No = 0		
This group is a kitchen printer group?	Yes = 2 No = 0	2	2



5. To program additional groups, repeat from step 3, or press the **CASH** key to finalize the program.

System Option Programming

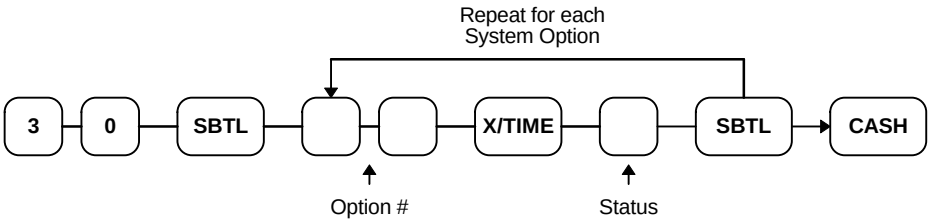
Set Options #42 and #43 to implement the KVS 650 Video System.

NOTE: Because after clearing memory all options settings are automatically set to 0, and because your most likely option selections require a status setting of 0, you do not need to program this section unless you wish to change the default status.

Programming a System Option:

1. Turn the control lock to the **P** position.
2. Enter **3 0**, press the **SBTL** key.
3. Enter a system option address, press the **X/TIME** key.
4. Enter the number representing the status you have selected, or if there is more than one decision to be made in an address, add the values representing your choices for each decision and enter the sum. Press the **SBTL** key.
5. Repeat from step 3 for each system option you wish to change.
6. Press the **CASH** key to end system option programming.

System Option Flowchart



printer as
. KVS
he printer

42	Slip (hard check) operation on optional printer Kitchen printer operation on optional printer	0 1	1	1
43	Printer type: no printer = EPSON TM-295 = EPSON TM-300(D) = EPSON TM-T85 = CITIZEN IDP 3540/3541 = STAR SP200 = SAMSUNG SRP100 =	 0 1 2 3 4 5 6	3	3

SAM_650.DAT Programming

The following section describes the programming procedures for the SAM_650.DAT file. When performing programming changes, be sure to complete them in a text editor which has a “text only” mode, otherwise additional characters, such as formatting instructions, may be inadvertently inserted (DOS editor or Windows Notepad, for example).

Sample SAM_650.dat Configuration File

```
;*************************************************************************
;                  SAMSUNG 650  CONFIGURATION FILE          SAM_650.DAT
;*************************************************************************
;
;   VIDEO COLOR ASSIGNMENTS   : 0=BLACK     1=BLUE      2=GREEN   4=RED
;                                9=LT/BLUE  11=LT/CYAN  12=PINK   14=YELLOW
;                               15=High-Intensity WHITE
;
;               Note ....... Add 128 to color number for blinking
;
;************************************************************************
;
;*************************************************************************
;
; Video Routes for Character Routing (only)
;
;************************************************************************
;
[ALPHA01] =  /;                 /        ; Video #1
[ALPHA02] =  /.                 /        ; Video #2
[ALPHA03] =  /                  /        ; Video #1 & #2
[ALPHA04] =  /                  /        ; Video #3
[ALPHA05] =  /                  /        ; Video #1 & #3
[ALPHA06] =  /                  /        ; Video #2 & #3
[ALPHA07] =  /,                 /        ; Video #1 & #2 & #3
[ALPHA08] =  /                  /        ; Video #4
[ALPHA09] =  /                  /        ; Video #1 & #4
[ALPHA10] =  /                  /        ; Video #2 & #4
[ALPHA11] =  /                  /        ; Video #1 & #2 & #4
[ALPHA12] =  /                  /        ; Video #3 & #4
[ALPHA13] =  /                  /        ; Video #1 & #3 & #4
[ALPHA14] =  /                  /        ; Video #2 & #3 & #4
[ALPHA15] =  /                  /        ; Video #1 & #2 & #3 & #4
[ALPHA16] =  /                  /        ; Not Used
[ALPHA17] =  /1                 /        ; HEADER LINE COLOR
[ALPHA18] =  /0                 /        ; ITEM LINE COLOR
[ALPHA19] =  /4                 /        ; CONDIMENT LINE COLOR  (indented)
[ALPHA20] =  /14                /        ; MESSAGE LINE COLOR  contains "##"
[ALPHA21] =  /132               /        ; VOID LINE COLOR
[ALPHA22] =  /1                 /        ; END OF TRANS. color
[ALPHA23] =  /!                 /        ; Blinking character (items/cond)
[ALPHA24] =  /MULTI-VIDEO       /        ; STANDALONE OR MULTI-VIDEO
[ALPHA25] =  /C                 /        ; RAM DRIVE
[ALPHA26] =  /_______           /        ; (7) Char. Ignore
[ALPHA27] =  /-------           /        ; (7) Char. Ignore
[ALPHA28] =  /Toppin            /        ; (6) Char. Ignore
[ALPHA29] =  /??????            /        ; (6) Char. Ignore
[ALPHA30] =  /                  /        ; (12) char. Ignore ( All Spaces)
[ALPHA31] =  /                  / ; Ports to be excluded from video #1 ie 1,2
[ALPHA32] =  /                  / ; Ports to be excluded from video #2
[ALPHA33] =  /                  / ; Ports to be excluded from video #3
[ALPHA34] =  /                  / ; Ports to be excluded from video #4
[ALPHA35] =  /DISABLED          /        ; BEEPERS .... ( ENABLED /DISABLED )
[ALPHA36] =  /Y                 /        ; Character Routing? (Y/N)
[ALPHA37] =  /12                /        ; Route Char. Position in Alpha
[ALPHA38] =  /                  /        ; NOT USED
[ALPHA39] =  /                  /        ; NOT USED
[ALPHA40] =  /                  /        ; NOT USED
[ALPHA41] =  /                  /        ; NOT USED
[ALPHA42] =  /                  /        ; NOT USED
[ALPHA43] =  /                  /        ; NOT USED
[ALPHA44] =  /                  /        ; NOT USED
[ALPHA45] =  /                  /        ; NOT USED
[ALPHA46] =  /                  /        ; NOT USED
[ALPHA47] =  /                  /        ; NOT USED
[ALPHA48] =  /                  /        ; NOT USED
[ALPHA49] =  /                  /        ; NOT USED
[ALPHA50] =  /                  /        ;
```

Configuration File Definitions

The following is a description of the options listed in the General Alpha Definitions menu and the choices pertaining to each.

[ALPHA01] through [ALPHA15]

Enter the route character to assign a PLU to the desired video(s). See "Route Character Example" on page 27.

[ALPHA16]

Not used.

[ALPHA 17-22]

Enter the color# (from the video color assignment codes shown on top of the SAM_650.dat configuration file) that will display for each type of item.

[ALPHA23]

Enter a character to make the item blink.

[ALPHA24]

Enter standalone (for single video) or multi-video for multiple video screens. Entry must match the videos entry and the MX4000 address programmed in MXKERNEL.INI.

[ALPHA25]

Enter the RAM drive letter for the video controller PC. (This letter is always "C" if the controller PC is purchased from CCR.) The entry must match RAM drive programmed in MXKERNEL.INI.

[ALPHA26-30]

Enter characters that the KVS will ignore. (Leave as default, Microplus has programmed all characters that should be ignored.)

[ALPHA31-34]

Enter the PC communcation ports that should be excluded from each video screen. For example: If 1, 3 is entered in Alpha 31 (for video 1), no entries from the registers connected to PC communication ports 1 or 3 will display on video 1.

[ALPHA35]

Enter **enabled** to activate the beeper when a new order appears on the video screen, or **disabled** to silence the beeper.

[ALPHA36]

Enter **Y** to allow character routing. This setting must be **Y** for this video system.

[ALPHA37]

Enter the position in the PLU descriptor that contains the route character. Note: Prices will overwrite the end of a descriptor. If prices are to appear on the video, assign position 1 and place the route character in the first position of the PLU descriptor.

[ALPHA38 - 50]

Not used.

Route Character Example

If Alpha 37 = 12 and,

For video 1, Alpha 1= . (period)

To get an item to go to video 1 (only), place a period in the twelfth space of the descriptor field. For example:

H A M B U R G E R _ _ .

The PLU must also be assigned to a group that is programmed to go to a kitchen printer.

PLUs that are condiments do not need to have route characters. They will automatically follow the main items.

MXKERNEL.INI Programming

The following section describes the programming procedures for the MXKERNEL.INI file. When performing programming changes, be sure to complete them in a text editor which has a “text only” mode, otherwise additional characters, such as formatting instructions, may be inserted.

General Information Menu

```
[GENERAL]
VIDEOS                = 03
MC2000 IRQ            = 05
MC2000 CONFIGURATION  = 12
1st MX4000 BOARD      = 02
2nd MX4000 BOARD      = 04
MX4000 ADDRESS        = D800
PRIORITY TIME LIMIT   = 60
RUSH TIME LIMIT       = 180
LOAD AS TSR           = YES
RAM DRIVE             = C
ERROR LOGGING         = ENABLED
BUMP BAR TYPE         = MICROPLUS
PARK DIRECTION        = DOWN
PRODUCTION STATS      = DISABLED
;DOUBLE KEY CLEAR      = NO
;ALTERNATE PALETTE     = DISABLED
;CONTINUE LINE         = ENABLED
```

When you enter the MXKERNEL.INI file, the menu shown above will be displayed. The following is a description of the menu selections and choices pertaining to each selection.

Videos

Enter the number of video screens to be utilized. The number must match the number of videos programmed in the Video Specific menus below.

MC4000 IRQ

This refers to the IRQ setting on the 2-port KDS board. The default setting is 5, no variation should be necessary. If a coflict should exist, refer to Appendix D for alternate settings.

MC2000 CONFIGURATION

This refers to the configuration of the 4-port KDS board. Boards are shipped with a default configuration of 12 and IRQ5. See Appendix D for alternate configurations and jumper switch settings should a conflict exist.

1st MV4000 BOARD and 2nd MV4000 BOARD

Set the configuration of the MV4000 board(s) here. The standard configuration is 2 but alternate configurations are included in Appendix A. It is only necessary to program the 2nd MV 4000 BOARD if more than 4 video screens are to be utilized.

MV4000 ADDRESS

Enter B000 for a single video system, D800 for a multi-video system. Option must also be specified in SAM_650.dat [ALPHA17], both files must be set the same.

PRIORITY TIME LIMIT and RUSH TIME LIMIT

Set the number of seconds before the on-screen alarms are set off. The box header, including the elapsed time, turns red when the priority time limit is reached and starts blinking (when the rush time limit is reached).

LOAD AS TSR

Enter yes if the program is to run as a TSR [Terminate Stay Resident] program in the background.

RAM DRIVE

Enter D if the program is to run off of the optional hard drive, or C if it is to run off of the floppy drive. Option must also be set in SAM_650.dat [ALPHA25].

ERROR LOGGING

Unless otherwise instructed, this should always be set to DISABLED. Error logging is a feature used by the software providers to debug kitchen video systems. When enabled, all lines that contain messages with errors are logged. If the feature is run continuously, the file will become too big, causing errors.

BUMP BAR TYPE

Enter the type of bump bar to be used (always MICROPLUS).

PARK DIRECTION

Enter the direction (up or down) that parked orders are to move on the video display when the split screen option is enabled.

PRODUCTION STATS

Enter disabled or enable to allow service log times to be viewed.

DOUBLE KEY CLEAR

Enter yes if orders are to be cleared by selecting the box number (numeric entry) and pressing the C key. An entry of “No” allows orders to be cleared by simply pressing the box number.

ALTERNATE PALETTE

Enable to display a dark background (with light lettering) on the video screens. Display background is white with dark lettering when disabled. The following table shows the Alternate Colors associated with each background color:

Keypad Number pressed after order has been selected	Header Color	
	Regular Palette White Background	Alternate Palette* Black Background
1	Black	Blue
2	Blue	Lite Green
3	Lite Green	Lite Cyan (very lite blue)
4	Lite Cyan (very lite blue)	Red
5	Red	Magenta (violet)
6	Magenta (violet)	Brown & Yellow
7	Brown or Yellow	White (lite grey)
8	White (lite grey)	Black

*In MXKERNEL.INI set ALTERNATE PALETTE = ENABLED and reboot video PC.

Video Specific Menu

```
;*************************************
; V I D E O   S P E C I F I C
;   MODE = REGULAR/ELONGATED/SPLIT
;   TYPE = FOODPREP/EXPEDITER/DISABLED
;   KEYITEM = UP TO 10 PER SCREEN
;*************************************

[VIDEO 1]
MODE                  = REGULAR
;TYPE                  = EXPEDITER
TYPE                  = FOODPREP
REROUTE VIDEO         = 01
SUMMARY               = OFF
KEYITEM               = HAMB
KEYITEM               = COKE
KEYITEM               = FRIES
KEYITEM               = SF TACO
KEYITEM               = 7-LAYER BUR
KEYITEM               = NACHO B/G
KEYITEM               = PEPPRNI PPP
KEYITEM               = SUPREME PPP
ORDER BEEPER          = DISABLED
;AUTO BUMP             = 2
```

Video specific options must be set for each video screen installed. One video specific menu is shown above, but one will be shown for each video selected in the General Information menu (five in our example). The following is a description of the menu selections and choices pertaining to each selection.

MODE

Select display mode to be used on the video screen. In regular mode, 8 boxes are displayed on the screen (2 rows of 4) and orders are placed in the boxes in numeric order. In elongated mode, 4 elongated boxes are displayed on the screen. In split mode, 8 boxes are displayed on the screen with the top and bottom rows acting as different entities. For example, all drive thru orders can be programmed to go to the top row and all counter orders can be programmed to go to the bottom row.

TYPE

Select foodprep for normal video operations. When expediter is selected, all items are sent to this video, regardless of SAM_650.dat programming.

REROUTE VIDEO

Leave this option set at 01. Alternate entries do not pertain to video operations with the ER-650.

SUMMARY

When this option is set to “ON”, a key item report appears in the lower right box upon system start-up. Report can be turned on and off with the Fn key on the key pad.

KEY ITEM

Key items may be selected for the purpose of creating a key item report, to be displayed in the lower right box of the video screen. Key item reports consist of the programmed descriptor and the number of uncleared items with matching descriptors currently in the system. The key item utility searches for items with matching descriptor beginnings. For example, if a key item is programmed to be HAMB, all items sent to the kitchen video with descriptors beginning with the letters HAMB will be counted in the key item report (hamb, hamb/cheese, hamb double, etc.). Key item descriptors may be as specific or general as necessary. For example, if a key item is programmed to be “H”, all items with a descriptor beginning with the letter H will be counted in the key item report (hamburger, hot dog, ham sandwich, etc.).

ORDER BEEPER

When enabled, if all orders are cleared from the video screen, the bump bar will beep when a new order is received.

AUTOBUMP

Select the number of minutes before orders are automatically bumped from the video monitor.

Register Specific Menu

```
;*************************************
; R E G I S T E R   S P E C I F I C
;   TYPE = COUNTER/DRIVE THRU
;   DISPLAY LOC's = TOP/BOTTOM
;   ROUTES = Y/N (for each video)
;   ALT ROUTES = Y/N (for eash video)
;*************************************

[REGISTER 1]
TYPE                  = COUNTER
DISPLAY LOCATION      = TOP
ROUTES                = YYYY
ALTERNATE ROUTES      = YYYY
```

Register specific options must be set for each register in the system. One video specific menu is shown above, but one must be programmed for each register. The following is a description of the menu selections and choices pertaining to each selection.

TYPE

This option is not currently used with the ER-650. Leave this option set to counter.

DISPLAY LOCATION

Set the row (top or bottom) that items from the specific register are to appear in when the video is set for split screen.

ROUTES

Use Y and N designations to send or block video data to specific video monitors. Designations programmed here will supersede SAM_650.dat programming.

ALTERNATE ROUTES

This option is not currently used with the ER-650.

```
;*************************************
; O T H E R   S E C T I O N
; USED FOR EXTERNAL ROUTINES TO ALLOW PROGRAMMING (later)
;*************************************

[OTHER]
```

This menu is not currently used.

KDS Video Operations

Overview

Once the system has been programmed, as discussed in the previous sections, the system is ready for operations. All remaining options are controlled from the Main Menu on the KDS 650 video controller. The following sections discuss various system operations.

Menu Options

The Menu Screen displays the following options:

```
SAMSUNG 650/5100        PRESS [D] FOR DIAGNOSTICS
                        PRESS [L] FOR INCOMMING DATA
                        PRESS [M] FOR MENU
                        PRESS [Q] RETURN TO DOS
```

The daily operation of the KDS 650 Video System is covered in the KDS 650 Video System - Operator's Manual. Therefore, it will not be discussed in this programming manual.

Starting Up

Insert the KDS 650 Video Software floppy disk (if optional hard drive is not utilized) and turn on the PC. If you have a hard drive, copy the software to it. The program will automatically start and display the 8-box or 4 long box order screen.

If your PC does not autoboot into the KDS 650 Video Program: 1) change directories from the DOS prompt to the one with SAM_650.EXE in it, or 2) edit the PATH command in AUTOTEXEC.BAT file to include that sub-directory, and type the following commands at the DOS prompt (here, for example, the video programs are in sub-directory\KDS):

```
C:\KDS>MXKERNEL<Enter>
C:\KDS>SAM_650<Enter>
```

This will start the KDS 650 Video Software running according to the parameters that have already been set up. Each of the kitchen videos will come up as they were setup in MXKERNEL.INI.

In addition, the PC's VGA monitor will become a kitchen video, if the system is a single video (STANDALONE) system. This is also set up in the MXKERNEL.INI and SAM_650.DAT files.

Background Operation

The KDS 650 Video Software program has two parts: MXKERNEL.EXE and SAM_650.EXE. MXKERNEL.EXE is started as a background TSR (Terminate and Stay Resident) task from AUTOEXEC.BAT when the PC boots up and it will continue running until the computer is shut off.

In systems that only want to use the Video Controller PC exclusively for the video system, SAM_650.EXE is started from AUTOEXEC.BAT. In systems that want to use the video controller for other tasks while the video is running in the background, SAM_650.EXE can be started from a WINDOWS icon.

To set up a WINDOWS video icon:

1. In WINDOWS, click on the start icon.
2. Choose "Programs" from the pop-up menu, find the KVS start-up program and right click the mouse on it.
3. From the pop-up menu, click on "Send To" and choose "Desktop (create shortcut)" from the pop-up menu.

You can put your new icon in a group box titled StartUp and it will start up the video system automatically when WINDOWS is started up. Or you can just double click on the KVS icon to start it up. Once the video system is running, pressing Alt-Tab will minimize the program.

Video Status Report (Speed of Service)

If the down arrow 🡻 on the keypad is pressed, the Individual Video Status Report is displayed on the video associated with that keypad. This consists of the number of orders that were bumped, the time it took for each order to be bumped and the average bump time for all videos in the system. A report may also be started from the menu on the Video Controller PC by pressing (P). A System-wide Video Status Report will be displayed and printed out at the parallel printer port (LPT1:). The report has orders versus times to bump for eight videos (even if there are less videos in the system) and the system-wide average. If (Z) is chosen from the menu, or if the Video Controller PC is rebooted, all numbers in the report are reset to zero.

Diagnostic Mode

Commands from the ER-650 and the KDS video system can be displayed and logged. This can be helpful for isolating problems with system operations. The following sections provide instructions for accessing system diagnostics and for interpreting data.

Accessing from the KDS 650 Video System Main Menu

From the main menu of the KDS video program, press D to display the diagnostics. To log the incoming lines to a file named kdslog.dat, press L. These commands will display the diagnostics on the PC monitor.

Accessing from SAM_650.DAT

The diagnostics feature may also be started in SAM_650.dat. If [ALPHA39] has the word “LOGGING”, with or without the Y for “Autostart Journalling”, diagnostic logging will start up at boot up time. This is helpful for video systems that don’t have optional keyboards or PC monitors. See section 4.5 for additional details regarding SAM_650.dat programming.

Each time diagnostic logging is started, manually or automatically, the previous kdslog.dat is deleted. It should be renamed or copied, should you wish to save it. Along with the video files is xlog.bat (and vlog.bat for the 13½ 4-Port VGA boards). If you run this, a special copy of autoexec.bat is used that saves four copies of the kdslog.dat as kdslog.bk1,2,3,4. When you’re done logging run x.bat (or v.bat).

On a color VGA monitor the white lines are incoming. The green lines which start with digits in square brackets: [1][1][FF]...etc. are output lines from SAM_650.exe to the MXKERNEL.EXE program. The input lines from the ER-650 have three different formats: item sales lines, sales total lines and single command lines.

Input/Output

```
DIAGNOSTIC MODE ACTIVE . . . . Press [T] to send test data
PORT- 1 =  ** ORDER# 0045 **
===== line type = 0 =====
^Order# Line^
[1][1][1][FF][0][0][30][30]ORDER# 0045 **  **
PORT- 1 = KP # 1
===== line type = 94 =====
PORT- 1 = HAMBURGER  ;
===== line type = 2 =====
^Item/Modifier^
[2][1][0][FF][1][0][30][30]01 HAMBURGER  ; **
PORT- 1 = CLERK 1     04/07/2000 07:000000 000065
===== line type = 6 =====
^CLERK/EOT Line^
[7][1][1][FF][FF][0][30][30]CLERK 1 00 000065**
```

Output Lines

The following is an example of an output line. All output lines have the same general format, regardless of line type. This particular file output line is a main item sales line.

[2][1][0][FF][3][0][1][51] 01 0151 HOT DOG

The following is a brief explanation of each item specified in file output:

LINE TYPE	REG. #	COLOR #	NOT USED	ROUTE BYTE high	NOT USED	ADDON (BCD)	DISPLAY AREA	NOT USED
1 BYTE	1 BYTE	1 BYTE	1 BYTE	1 BYTE	1 BYTE	2 BYTES	18 BYTES	2 BYTES

The following sections provide details regarding the various items specified in the file output.

Line Type

Refers to the different types of output for each line item. The following is an explanation of what line types correspond with each line type designator:

1) Header
2) Menu Item
3) Condiment
4) Void Menu Item
5) Void Condiment
6) Message
7) End of Transaction
8) Alternate Route Toggle
9) Bump-Bar Emulation
A) Disable Video Output
B) Enable Video Output
C) Add-On Header
D) Not Used
E) Not Used
F) Re-Open Order
10) Delete Order By ADD-ON number
11) Clear Productivity Totals
12) Write TEXT to Top/Bottom of Screen
13) Not Used
14) Clear All Orders
15) Clear All Items in an Order

Reg #

Refers to the PC Comm Port number, from which the video data was sent.

Color

Refers to the color number for the specified line item. Colors are assigned in SAM_650.dat. Please refer to “Sample SAM_650.dat Configuration File” on page 25 for colors.

Route Byte (high)

The route byte designates which video screens a video line will appear at. The following defines the video output associated with each route byte entry:

0 = None
1 = Video 1
2 = Video 2
3 = Video 1 & 2
4 = Video 3
5 = Video 1 & 3
6 = Video 2 & 3
7 = Video 1, 2, & 3
8 = Video 4
9 = Video 1 & 4
A = Video 2 & 4
B = Video 1, 2 & 4
C = Video 3 & 4
D = Video 1, 3 & 4
E = Video 2, 3, & 4
F = Video 1, 2, 3 & 4

If the system has more than 4 video screen, two route bytes may be entered together. The first digit will designate video screens 5-8, the second digit will designate screens 1-4. Each sequence of four video screens is programmed separately. For example, if just video 5 was to be designated, the entry should read [10]. The 1 designated the first video screen from videos 5-8, while the 0 designates no video screens from 1-4. For another example, if video screens 1, 3 and 7 were to be designated, the number sequence should read [45]. If all video screens (1-8) are to be designated, the output should read [FF].

ADDON (BCD)

Two bytes (separate bracketed entries) are displayed for add-on information. This is used to address a specific order. The KDS 650 video system uses the register number for the first entry and the transaction number for the second entry.

Display Alpha

The information displayed here is the message printed on the video screen. It consists of 18 characters, and varies depending on the line type designated at the beginning of the line.

Sample Diagnostic Screen

The following is a sample diagnostic screen. The keys to outputs can be used to "decode" the diagnostics lines. In general, the transaction displayed below consists of an item sales input line, an output header line, a sales output line, a sales total input line, a sales total output line and

```
DIAGNOSTIC MODE ACTIVE . . . . Press [T] to send test data
PORT- 1 =  ** ORDER# 0045 **
===== line type = 0 =====
^Order# Line^
[1][1][1][FF][0][0][30][30]ORDER# 0045 **  **
PORT- 1 = KP # 1
===== line type = 94 =====
PORT- 1 = HAMBURGER  ;
===== line type = 2 =====
^Item/Modifier^
[2][1][0][FF][1][0][30][30]01 HAMBURGER  ; **
PORT- 1 = CLERK 1     04/07/2000 07:000000 000065
===== line type = 6 =====
^CLERK/EOT Line^
[7][1][1][FF][FF][0][30][30]CLERK 1 00 000065**
```

Logging

When the kitchen video system is set to log, the incoming part of the above diagnostic video data is stored in file KDSLOG.DAT (the lines without the square brackets). This must be chosen every time the video system is started. Any previous KDSLOG.DAT file is deleted and a new one is started each time the video system is started.

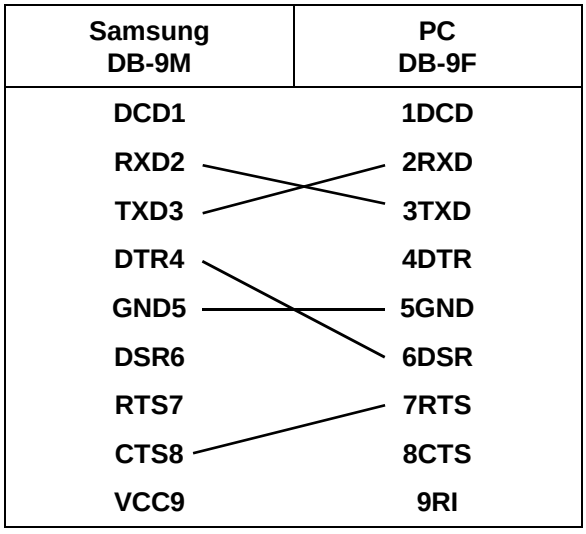
Do not confuse video data logging with electronic journal, which logs an image of the printed journal from the ER-650 onto a file labeled J_mm.dd, where mm is the month and dd is the day of the month. See Appendix C for setting up electronic journaling.

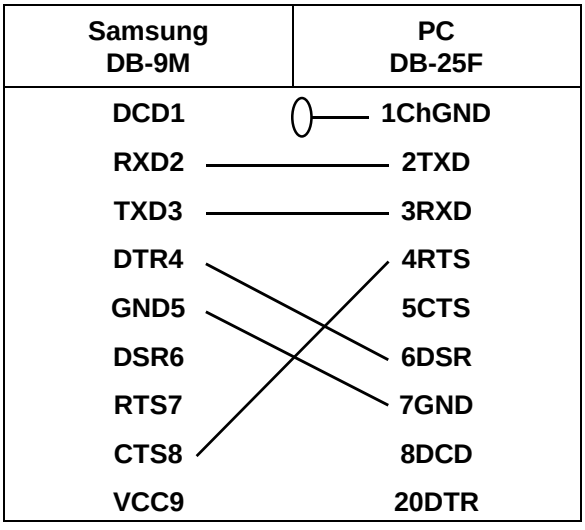
Appendix A

Cabling and Jumper Setting Diagrams

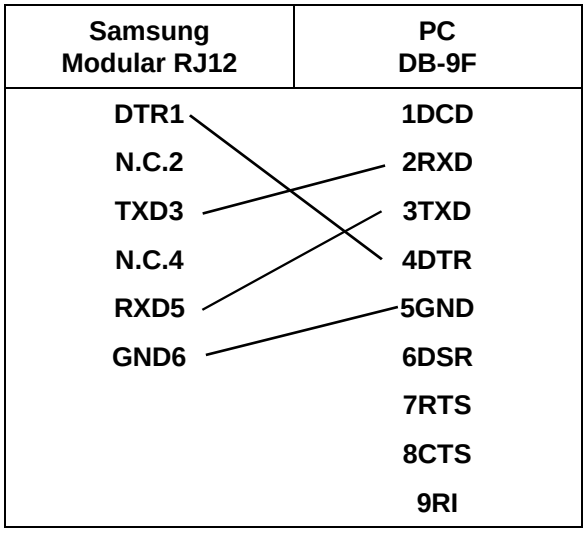
Serial Cables between the ER-650 and Video Controller PC

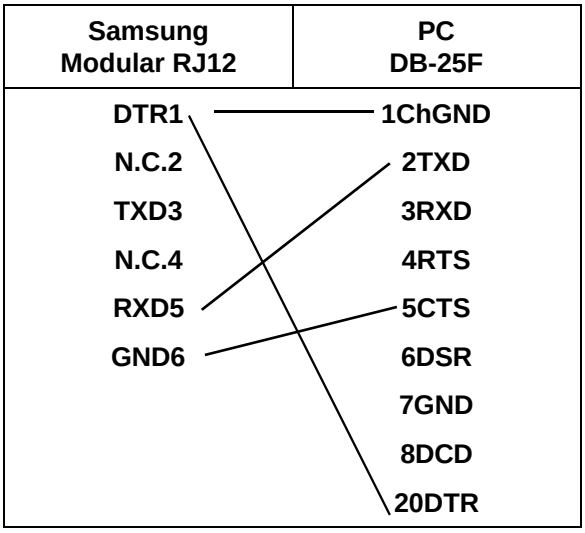
The following diagrams show the proper wiring for connecting modular serial RS-232C-Port 1, 2 or 3 on the ER-650 to the COM1 (usually DB9) or COM2 (usually DB25) on the Video Controller PC. These cables also work for Polling and Save/Load (add the shaded wire).





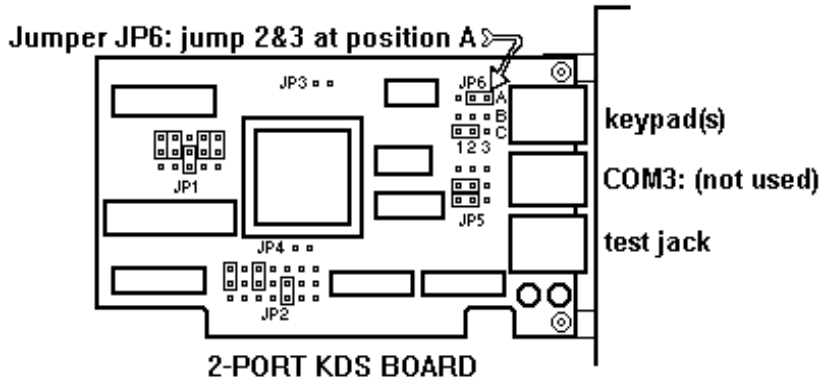
Serial Cables between the ER-5100/5140 and Video Controller PC





2-Port KDS Board Jumper settings

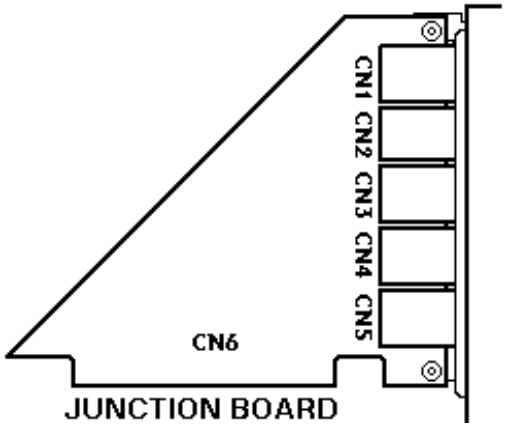
Jumper JP6 must have position A jumped between 2 and 3, providing the correct 12 volts to the keypads. See Appendix D for changing the memory I/O Range with JP1 and the IRQ with JP2, especially for running the KDS system with Windows95/98.



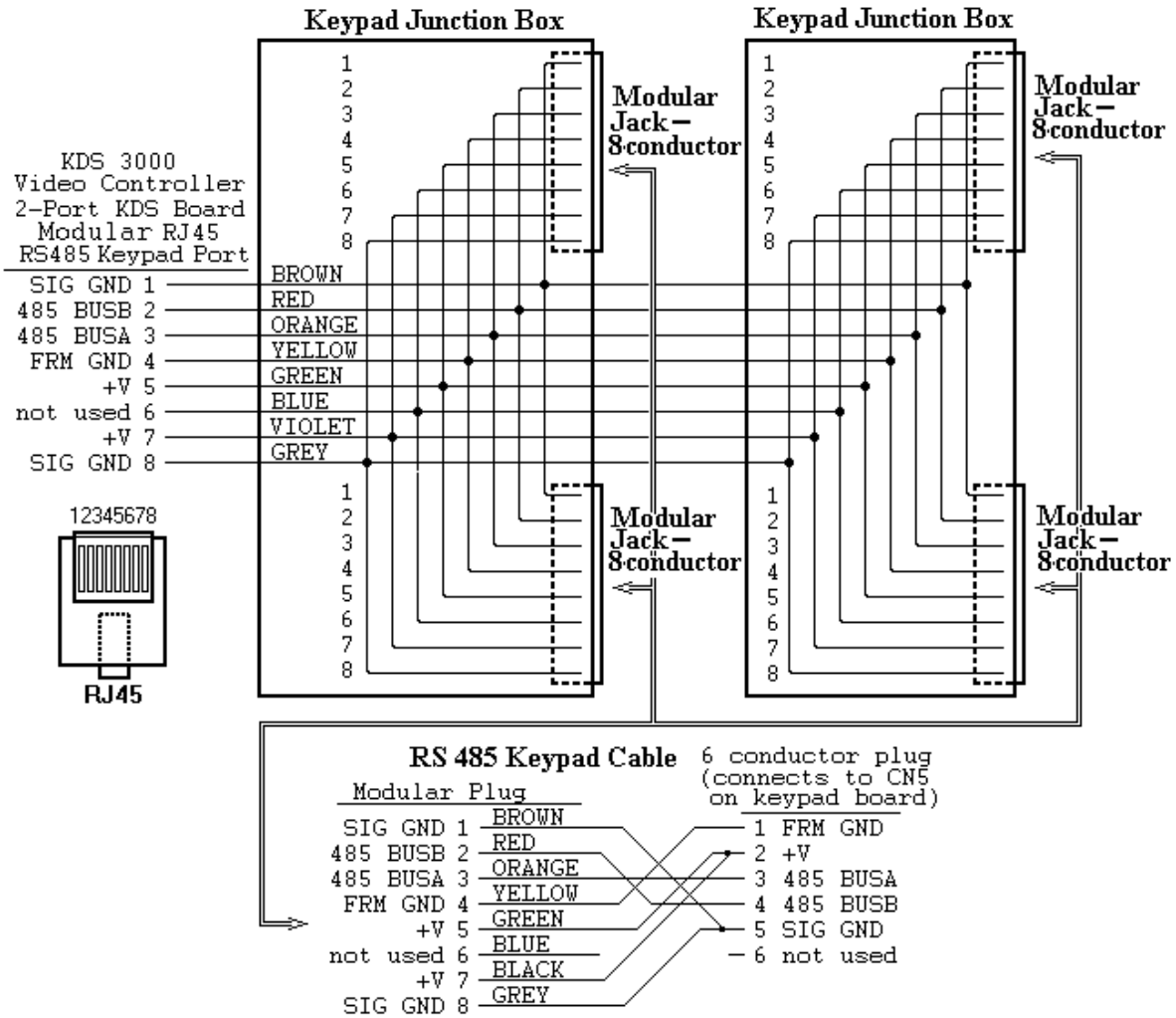
Cabling between Keypads (Bump Bars) and the KDS 650 Video Controller PC

The following diagrams show the wiring for connecting the "485" Keypads to the PC. These cables and the Keypad Junction Board (and Junction Boxes) are provided with the system, but are shown here if you need to build different length cables for your installation.

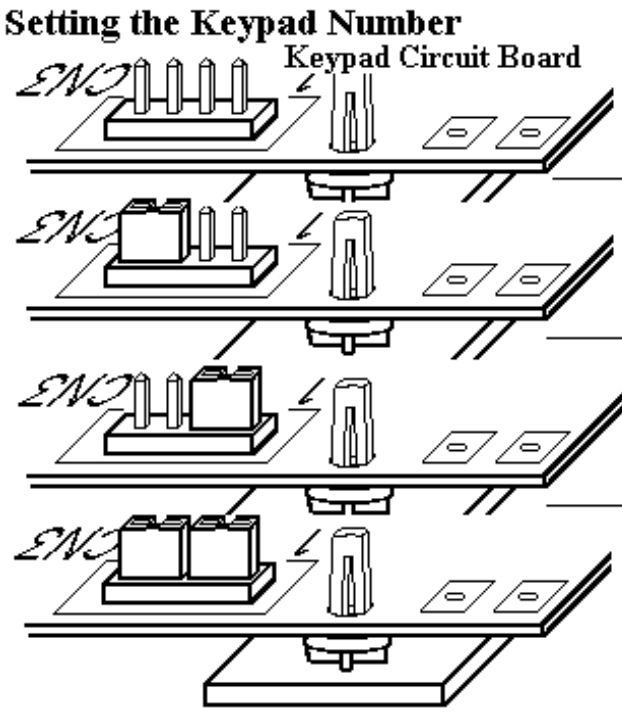
The Keypad Junction Board is shown below (replacing the junction boxes shown on page 3). A short jumper goes between the keypad jack on the 2 Port KDS Board and any connector on the Junction Board (usually CN1). Then the keypads can connect to any other jack on this board.



The Keypad Junction Boxes, shown below, are most often replaced by the above Junction Boards, but are still used in installations where there are no available slots in the PC.

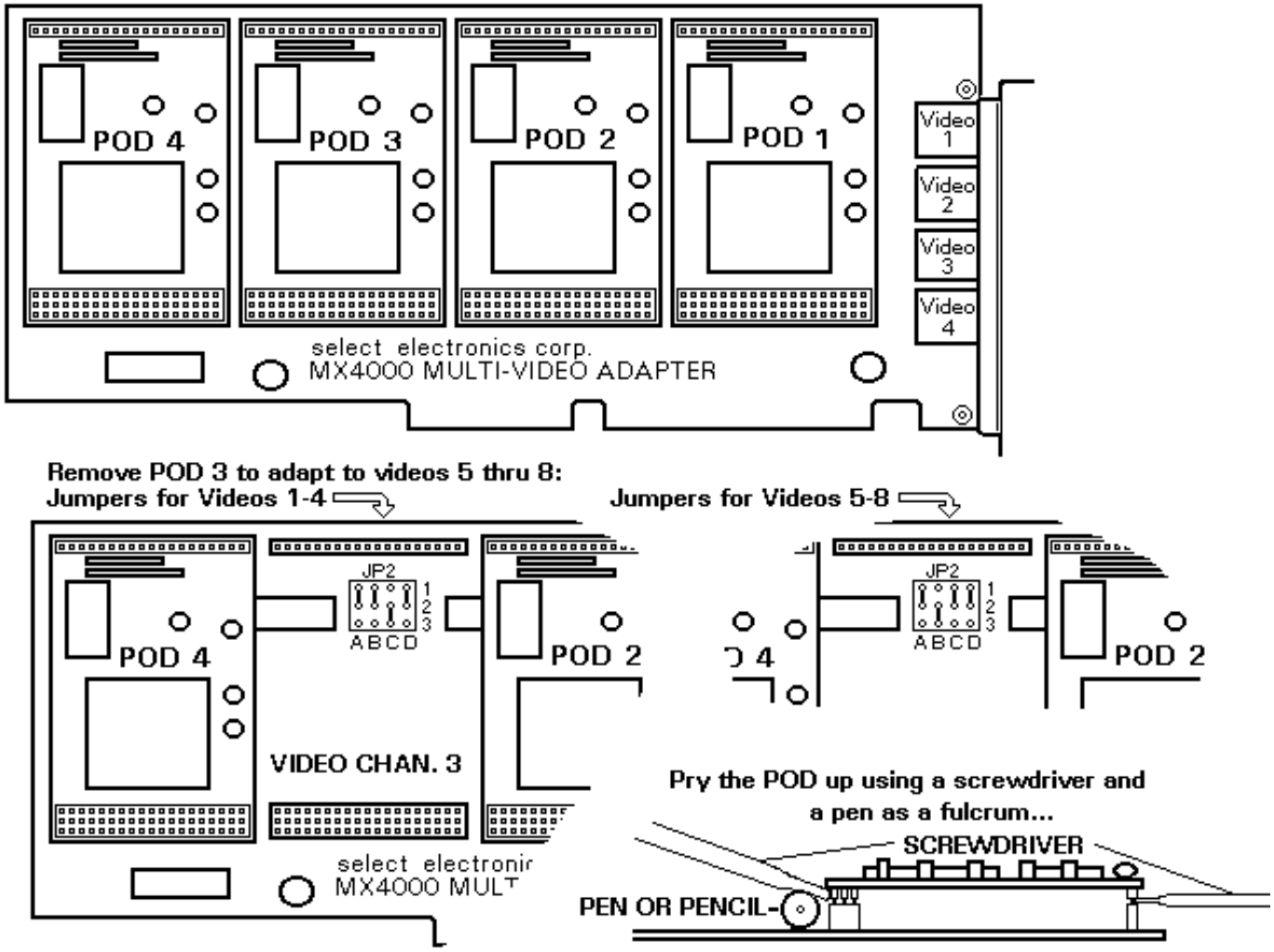


Keypad Jumper Settings to Set Keypad Number

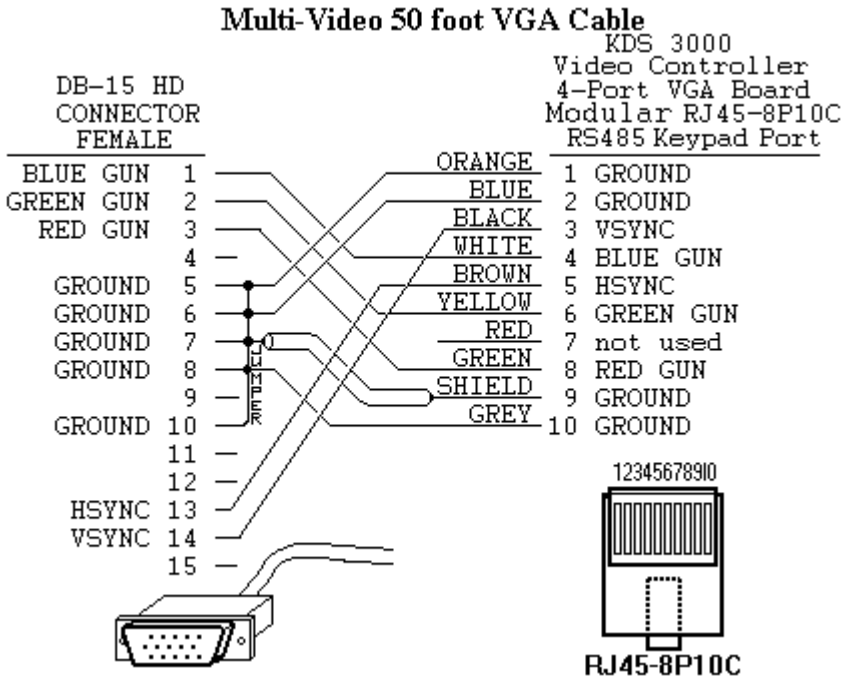


	Kybd485A EPROM	Kybd845A 5-8 EPROM
	Keypad #1	Keypad #5
	#2	#6
	#3	#7
	#4	#8

VGA Mother Board (9½) with one to four pods



Multi-Video 50 foot VGA Cable Diagram

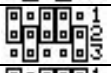


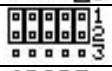
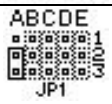
Appendix B

Running KDS 650 under Windows 95

Removing Conflicts

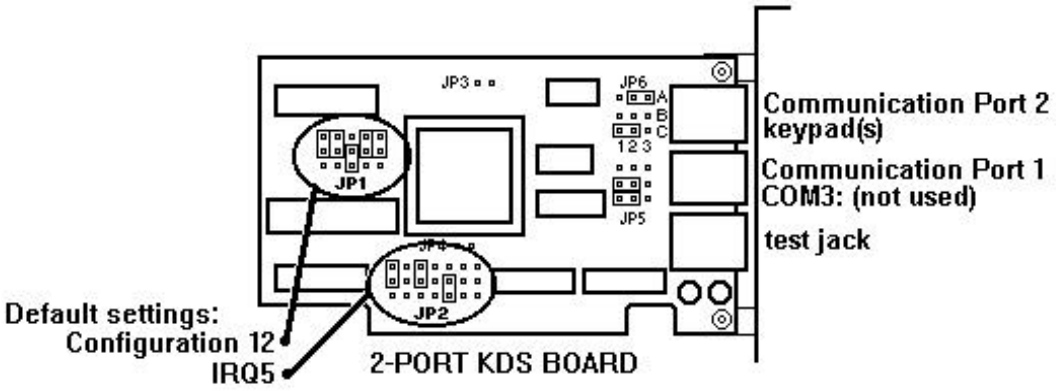
To get KDS 650 Video System to run under Windows 95 you have to remove conflicts in the interrupts (IRQs) and I/O Range that may exist between the KDS Board (MC2000) and other boards and drivers in your computer. To find out what other IRQs and memory I/O Ranges you are using then 1) click on Control Panel / System / Device Manager / Print and choose System Summary. Concentrate on I/O Range conflicts first, because some of the IRQs are shared and can overlap. 2) See the table below for I/O Range used by each configuration and the jumper settings to set that configuration:

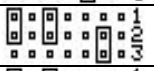
	Memory I/O Range			
Config-uration	Communi-cation Port1	Communi-cation Port2	Interrupt Status Register	Jumper 1 (JP1)setting ABCDE
01	3F8-3FF	2F8-2FF	110	
02	3F8-3FF	2F8-2FF	150	
03	3F8-3FF	2F8-2FF	190	
04	3F8-3FF	2F8-2FF	1D0	
05	100-107	108-10F	120	
06	140-147	148-14F	160	
07	180-187	188-18F	1A0	
08	1C0-1C7	1C8-1CF	1E0	
09	240-247	248-24F	220	
10	280-287	288-28F	2A0	

11	130-137	138-13F	1B0	
12	300-307	308-30F	260	
13	330-337	338-33F	3E0	
14	350-357	358-35F	200	
15	3F8-3FF	2F8-2FF	210	
16	0B0-0B7	0B8-0BF	090	
17	off	off	off	

The KDS boards are shipped with default configuration 12 and IRQ5, if you are using addresses 300 to 30F or 260, find another configuration that does not have an I/O range conflict with the I/O Ranges in the above table and set jumpers JP1 accordingly.

IRQs only have three possibilities - IRQ5, IRQ6 and IRQ7, and their jumper settings are shown in the table following.



IRQ	Setting for JP2 - Jumper 2
IRQ5	
IRQ6	
IRQ7	

If you decide to change IRQ, set jumpers JP2 accordingly.

Once you have selected an I/O Range Configuration and IRQ that has no conflicts with existing boards and drivers in your computer and have set the jumpers accordingly, you have to edit MXKERNEL.INI and SAM_650.DAT to match your choices. Edit MXKERNEL.INI, the [GENERAL] section.

Starting and Running the KDS 650 Video System under Windows 95

To run KDS 650 Video System under Win95:

1. Open a DOS window, make the window less than whole screen (Alt-Enter).
2. While pressing the tool bar click on Properties/Misc and remove the check mark in Background/Always Suspend.
3. While you are in this DOS window check that you have a good RAM Drive. If your RAM Drive is D, type D: at the DOS prompt to see if the drive is really there, then return to the C: drive.
4. Start MXKERNEL by typing MXKERNEL at the DOS prompt. Once it says "SUCCESSFUL", move this window off to the side or minimize it, but keep it running.
5. Start up another DOS window and again remove the Always Suspend check mark. This time type SPS at the DOS prompt. This window will have the KDS menu. Both these windows can be minimized (but left running) so that the computer can be used for other things.
6. SPS.EXE will be using the COM1: port (and COM2: port if journalling is being done). COM4: will be used by MXKERNEL.EXE and the keypad(s), other tasks cannot use these ports simultaneously.
7. Rather than opening DOS windows, you can double click on MXKERNEL.EXE under Windows Explorer, after setting the properties of that file so that Always Suspend is not checked, or you can set up a ShortCut Icon to do the same. Similarly, you can double click and ShortCut SPS.EXE for quicker startup of the video system. Always start MXKERNEL first.