

**HORITA SCT-50**  
**Serial Control Titler**

**USER MANUAL**

**For Models SCT-50, RM-50/SCT, SR-50/SCT**

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# 1 GENERAL

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The SCT-50 is a video character generator that operates either stand alone or with a computer to title, caption, or time-date stamp NTSC or PAL composite video images from TV cameras, video recorders, computers, etc.

The SCT-50 can insert up to nine lines of twenty characters each into the video image to add source ID information such as camera number and location for security applications, add measurement data during video data collection, or to simply add text in other video monitoring and display situations.

The SCT-50 operates stand alone via operation of front panel switches but can also be used with a computer and the supplied HORITA GMAN text editor and control software programs to provide complete computerized and automated remote control of one or more SCT-50's.

The GMAN software greatly simplifies the use of multiple SCT-50's to operate complex video information displays, add instructional information or subtitling, log and document experiments, etc.

The GMAN software program can control from 1 to 99 SCT-50s using only a single RS-232 PC comm port on the computer. The GMAN program stores up to 100 individual SCT-50 screens of text and setup information, any of which can quickly be selected and sent to individual, groups, or to all SCT-50 units. The sending of data to the SCT-50's can be done manually or can be automated to occur at timed intervals.

Note that a computer USB port can be used for communication with the SCT-50 with the use of a "USB-to-Serial" adapter cable. These cables are available online (Amazon.com) or from computer stores. There are many manufacturers. A well known manufacturer is "Belkin".

The SCT-50 can also be computer controlled using software programs written by the user in "C", "BASIC" ("Visual" or otherwise), or other computer languages as desired.

## 2 FEATURES

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### 2.1 SCT-50 UNIT

- Inserts up to nine lines of twenty characters each of text and graphic symbols, plus time and date.
- Operates stand alone via front panel switches or can be controlled by the included Windows-based Group Management software program called HORITA GMAN.
- Selectable character attributes for white or black characters, background on/off, contrast, size, position, etc.
- The nine lines of text can be automatically numbered and then un-numbered to assist in placement of text over the video image.
- Five separate onscreen setup menus titled System, Display, Time, Date, and Help, plus hardware and software system reset functions provide quick and easy setup of an SCT-50 via the front panel switches.
- Unique vertical "split-screen" mode displays text on only top and bottom of screen, leaving center of image uncluttered. The 9 lines of text are split into 5 lines at the top and 4 lines at the bottom of the screen. The amount of split is continuously adjustable and can be set so that the top most line of text can be positioned within the vertical interval, with the very next top and bottom lines then generally visible only on a monitor that has underscan.
- Internal crystal controlled clock/calendar has battery back up to maintain time and date when unit is powered off.
- Thirty-six time display formats (24 hour military, AM/PM, etc.) and sixty date display formats, including those which automatically calculate and display the day of the week., offer maximum flexibility for displaying time and date.
- Standard DB-9 connectors for serial port operation with RS-232 loop thru allows up to 99 SCT-50 units to be daisy chained

together and individually or group addressed by the GMAN.EXE program.

- When computer controlled, individual SCT-50 units can have their own unique address or can be set to respond to and display text sent to any SCT-50 unit in the chain.
- Three baud rates available for serial port operation; 4800, 9600, or 38.4K baud.

## 2.2 SCT-50 GMAN SOFTWARE

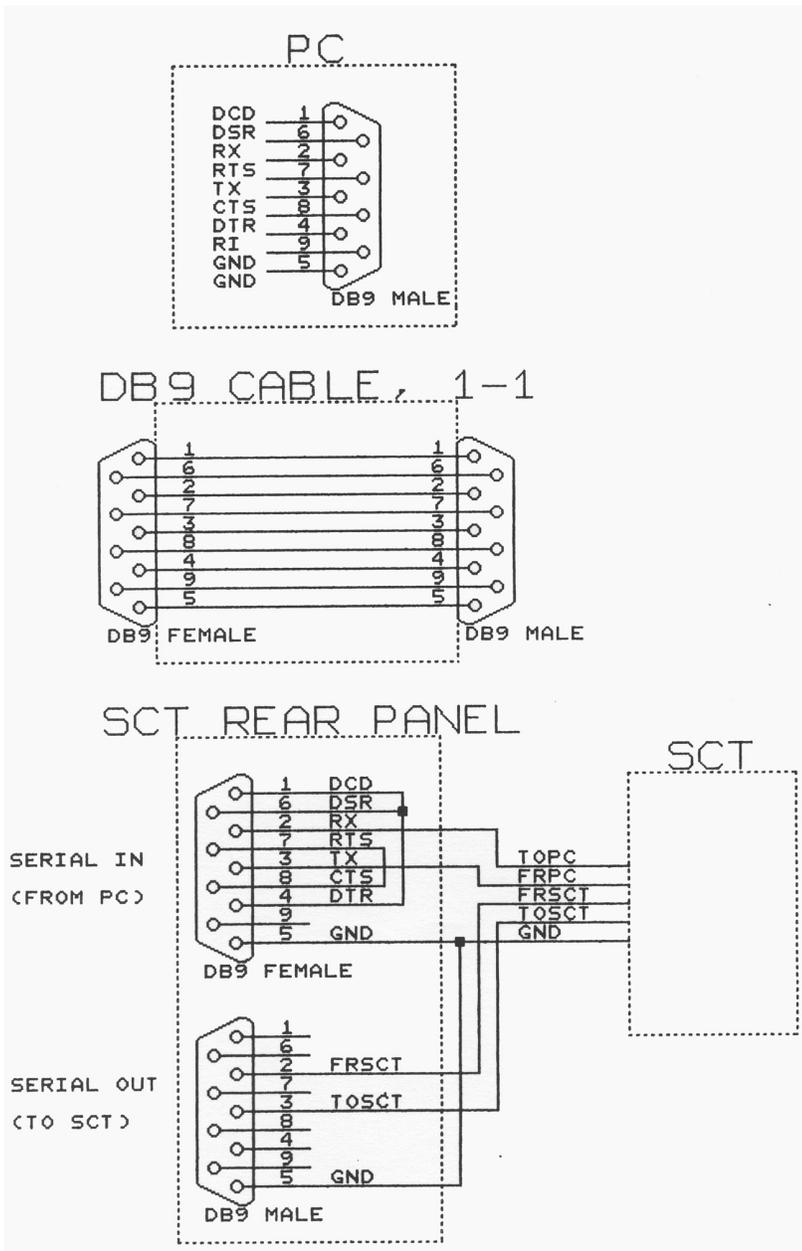
- The Windows-based GMAN text editor and control program works with from 1-to-99 SCT-50 units, individually or in groups.
- Individual SCT-50 units can have names assigned to them, rather than just a number from 01 to 99. These names can then be automatically sent to all of the SCT-50's and displayed on the associated video monitor video monitor for a quick visual ID. After the ID is complete, the names can be automatically removed and the previous text restored.
- Three send modes for communicating with SCT-50 units provide manual, end-of-line, or continuous send operation. Continuous send provides real time positioning of text within the video image.
- Simple to use but feature rich text editor creates, saves, and opens up to 100 9X20 screens of text. Each screen faithfully shows what will be displayed on an SCT-50 and can be assigned to an individual SCT-50 or group of SCT-50 units.
- The text editor provides typical search, justification, page scrolling, cut, copy, paste, etc., functions that operate on individual pages of text as well as groups of pages.
- SCT-50 control functions, such as character attributes, can be sent to an individual SCT-50 or to groups of SCT-50 units.
- Complete control of all SCT-50 time and date functions is provided. The on screen position as well as all of the various time and date display formats provided by an SCT-50 are also replicated on the text editor screen whenever the SCT-50 time and/or date display format is displayed.
- Full and thorough "Help" manual is indexed and searchable, printable in its entirety, and also printable as a .PDF file.
- The "effects" functions provided by the GMAN software include various automated operations such as random movement of onscreen text, timed turning on and off of various lines of text, and timed sending of pages of text to SCT-50 units. An additional feature is the ability to operate in a "loop" mode and continuously repeat the timed sending of a sequence of pages of text to the SCT-50 units.

## 3 CONNECTING

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1. Connect a source of composite video to the SCT-50 VIDEO IN. This input is looped to the output when power is OFF, terminated when power is ON.
2. Connect the SCT-50 VIDEO OUT to a video monitor, recorder, or other video device.
3. If using computer control, connect the SCT-50 SERIAL IN DB9 connector to the desired RS-232 COMM serial port on the PC. You can use any standard male-to-female, one-to-one DB9 cable
4. If you are connecting more than one SCT-50 to the serial port, use another DB9 cable to connect between units. You can also purchase special extra short 1' DB9 SCT-50 cables from HORITA. Routing of the serial cables to and between the SCT-50 units themselves can be in any order.
5. Connect power to the SCT-50 using the 9-Volt, 500mA power adapter supplied.



**Figure 3-1, SCT-50 Serial Port Wiring**

## 4 OPERATING

### 4.1 Power Up

To operate the SCT-50, apply power and set the SCT-50 POWER switch to ON. A red LED above the power switch lights when the SCT-50 is powered up.

When the SCT-50 is initially powered up, it operates in the "display" mode to display the time and date and any user source ID information entered. The POSITION and CHAR switches operate to provide quick and convenient control of the display's horizontal and vertical position, without going through any "menu" operations.

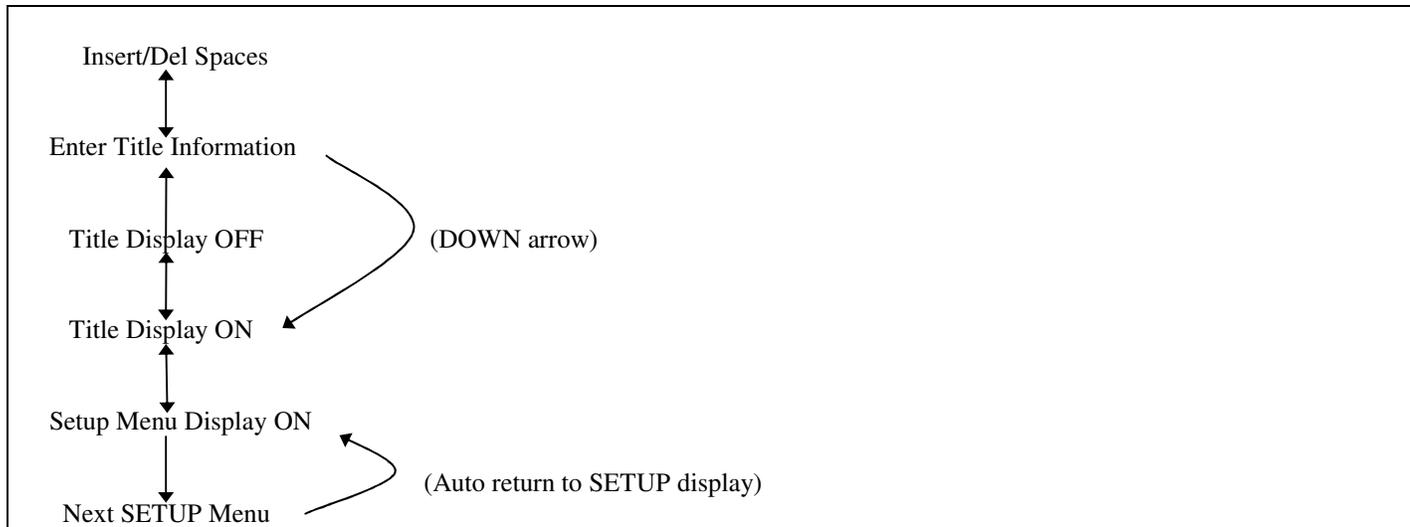
The SCT-50 can be operated locally using the front panel switches or from both the switches and the PC to enter text and setup information. Operation is first described for entering and changing "setup" data, then entering and editing text using the SCT-50 front panel switches. Operation with the GMAN software is described in the GMAN manual provided within the GMAN software.

## 4.2 Mode Flow Diagram Explanation

Figure 4-1 shows how the SCT-50 modes change as the MODE switch is actuated between TITLE and SETUP

↑ UP arrow = TITLE

↓ DOWN arrow = SETUP



**Figure 4-1, SCT-50 Mode Flow Diagram**

As previously stated, when first powered up, the SCT-50 enters the Display mode. Actuating the MODE switch to SETUP causes the SCT-50 to enter the Setup mode and display the same Setup Menu and Item that was displayed before the SCT-50 was last powered down. Further actuating of the MODE switch to SETUP causes the SCT-50 to cycle through its five setup menus.

Actuating the MODE switch to TITLE when in Setup mode causes the SCT-50 to enter the Display mode. Further actuation causes the SCT-50 to turn the display off, enter the titling mode, and finally enter the insert/delete text mode.

## 4.3 LED Operation

The front panel LED blinks at different rates to provide indication of SCT-50 operation.

<u>LED Condition</u>	<u>Meaning</u>
Off	Power off
Steady on	Setup/Display On/Off modes
Very slow blink, 1-sec. on/off	No video
Slow blink, .5-sec. on/off	Data entry mode
Fast blink, .25-sec. on/off	Insert data mode
Fast flash on/off	Receiving serial data

## 4.4 Entering and Exiting the Setup Menus

The setup menus allow selection of various character attributes such as black or white characters, character size, time and date display formats, etc. Some selections, for example black or white characters, affect the setup menu display so you can see their immediate effect. Other selections, for example character size, display their effect after the setup menu is exited.

To display the setup menus, toggle the MODE switch to SETUP and release. Depending on the actual mode that the SCT-50 is operating in, you may have to toggle the switch several times to enter a setup menu.

The selected item on the setup menu is indicated by its "flashing" on and off. In setup mode, the POSITION and CHAR switches serve to select and change menu items.

To exit the setup mode, actuate the MODE switch to TITLE and release.

## 4.5 Selecting Different Setup Menu Items

Menu items are selected via the POSITION switch. Flashing of the menu selection moves on to the next item each time the POSITION switch is actuated and released. Actuating the switch down causes the selection to move to the right and down, actuating the switch up causes the reverse action. Holding the POSITION switch actuated causes quick scanning through the menu items.

## 4.6 Changing the Selected Menu Item

After a menu item is selected, the choices available for that item are accessed via the CHAR switch. Actuating the CHAR switch down or up scans forward or backward through the choices available. Holding the switch actuated causes automatic scanning through the choices. The setup menu items, functions, and selections available are described for each of the setup menus in the following paragraphs.

## 4.7 SYSTEM SETUP Menu

A typical SYSTEM SETUP menu appears on the SCT-50 screen as follows:

```
*SYSTEM SETUP*
ONLINE           Y
ADDRESS          00
MODE             NOR
BAUD             9600
SYSTEM RESET     N
```

```
VER SCT334      NTSC Y
```

The following paragraphs provide a detailed explanation of each of the SYSTEM SETUP menu items.

<u>ITEM</u>	<u>FUNCTION</u>	<u>SELECTIONS</u>
ONLINE	Enables/disables serial communications with PC	Y = Enable communications N = Disable communications
ADDRESS	Assigns unique address to SCT-50 for serial communications with PC.	00 - 99

Note that setting the SCT-50 address to "00" places it in the "promiscuous" mode which enables it to respond to all information sent via the serial port from the computer, ignoring any specific SCT-50 address.

MODE	Places SCT-50 into normal or "hex" mode of operation. Hex mode is useful for debugging computer programs being developed to control the SCT-50	NOR = Normal SCT-50 operation HEX = SCT-50 displays hexadecimal value of all serial data received from the computer to control the SCT-50.
BAUD	Set baud rate of serial communications.	4800, 9600, 38.4K. Note that the actual communications rate at 38.4K baud rate should not be greater than one byte per millisecond or the SCT- 50 will miss serial characters.

cont.

<b>ITEM</b>	<b>FUNCTION</b>	<b>SELECTIONS</b>
SYSTEM RESET		Y = Reset SCT-50 system

System reset initializes all variable data in the SCT-50 to default values. A hardware selected SYSTEM RESET function is accessible by powering up the SCT-50 while holding the MODE switch in the "SETUP" position, then releasing it.

NTSC/PAL	Selects video standard for SCT-50 video display vertical positioning.	NTSC = Y = USA 525/60 PAL = Y = Euro 625/50
----------	-----------------------------------------------------------------------	------------------------------------------------

## 4.8 DISPLAY SETUP Menu

A typical DISPLAY SETUP menu appears on the SCT-50 screen as follows:

```

*DISPLAY SETUP*
CHAR = WHT  BACK= ON
CONT = HI   FLSH = OFF
SIZE =      H = 1X  V = 2X
POSITION    H = 17  V = 01

PAGE NUMBER          1
NUMBER LINES 1-9:   N
CLEAR PAGE           N

```

The following paragraphs provide a detailed explanation of each of the DISPLAY SETUP menu items.

<b>ITEM</b>	<b>FUNCTION</b>	<b>SELECTIONS</b>
CHAR	Selects character "color".	WHT = white characters BLK = black characters
BACK	Selects character background.	ON = background is on OFF = background is off
SIZE	Character Horizontal and Vertical size.	
	H (Horizontal)	1X = 1 time (1.0 H pixels) 2X = 2 times (2.0 H pixels) 3X = 3 times (3.0 H pixels) 4X = 4 times (4.0 H pixels)
	V (Vertical)	1X = 1 time (7 H lines) 2X = 2 times (14 H lines) 3X = 3 times (28 H lines) 4X = 4 times (42 H lines)
POSITION	H (Horizontal) display position	01-64 numerical reference.
	V (Vertical) display position	01-64 numerical reference, for vertical sizes 1X,2X,3X,4X. 00-80 numerical reference, for vertical size 1S, 00-40 for vertical size 2S.

The H and V position value controls the horizontal and vertical position of entire matrix of 9 lines of 20 characters each.

PAGE NUMBER	Selects one of two screen memory pages for display, reading,	1 = page 1 display and attributes. 2 = page 2 display and
-------------	--------------------------------------------------------------	--------------------------------------------------------------

cont.

<u>ITEM</u>	<u>FUNCTION</u>	<u>SELECTIONS</u>
	writing, and selects all associated attributes.	attributes.

Note that there are two independent display screens but with common time and date and attribute setup information.

NUMBER LINES 1-9	Number lines on display with numbers 1 -9 on left side of screen.	Y = Add line numbers N = Remove line numbers
---------------------	-------------------------------------------------------------------	-------------------------------------------------

Numbering of the lines is used to help adjust H and V position and size and locate where to place text or the time and date on the screen. Automatically numbers the lines with 1-9 at the left side of the display when "Y" is selected. The numbers are automatically removed when "N" is selected

CLEAR PAGE	Clear memory page and screen of all text page and screen of all text.	Y = Perform clear function
------------	-----------------------------------------------------------------------	----------------------------

## 4.9 TIME SETUP Menu

A typical TIME SETUP menu appears on the SCT-50 screen as follows:

```
*TIME SETUP*
TIME          HH:MM:SS
DISPLAY       ON
START POSITION  130
FORMAT        05
09:30:21 AM
```

The following paragraphs provide a detailed explanation of each of the TIME SETUP menu items.

<u>ITEM</u>	<u>FUNCTION</u>	<u>SELECTIONS</u>
TIME	Unformatted time display	HH:MM:SS HH = 00-99 Hours MM = 00-59 Minutes SS = 00-59 Seconds

Displays current hours, minutes, and seconds value of internal real time clock and allows value to be changed. The TIME value can be accessed for setting by using the POSITION switch to move the cursor up the screen into the desired HH, MM, or SS fields.

DISPLAY	Turns display ON and OFF	ON = display ON OFF = display OFF
START POSITION	Starting character position of formatted Time display	001-180 001 is upper left hand corner of screen, 180 is lower right hand corner.

When the starting position of the time display is changed via actuating the CHAR switch while the "START POSITION" menu item is selected, the SCT-50 temporarily exits the TIME SETUP menu to show the display screen. Further actuation of the CHAR switch moves the position of the time display on a character by character basis in a serpentine fashion so that you can observe its actual position within your normal video display.

There are 20 character positions available on each of the 9 lines. Character "001" is located at the upper left of the screen; character "180" is located at the lower right of the screen. It is also helpful to use the "NUMBER LINES 1-9" function to help see where the time is displayed as its starting position on the screen is changed. Even though the time display "erases" any text that was on the screen as it is moved, the text can be restored simply by actuating the MODE switch to SETUP, then back to TITLE.

After two seconds of no change in position, the display returns to the TIME SETUP menu.

cont.

<b>ITEM</b>	<b>FUNCTION</b>	<b>SELECTIONS</b>
FORMAT	Selects format for displaying the time.	01-36 - one of 36 Time display formats.

Table 4.1 shows the first 9 time display formats which use a colon ":" as the separator character. After the first nine formats the basic pattern repeats but with different separator characters between the time digits. The time displayed right below the FORMAT selection line shows how the selected format for the time display appears.

<b>FORMAT #</b>	<b>DISPLAY</b>	<b>MEANING</b>
01	13:02	24 hour H:M
02	13:02:36	24 hour H:M:S
03	13:02:36.7	24 hour H:M:S.1S
04	1:02 PM	12 hour H:M AM/PM
05	1:02:36 PM	12 hour H:M:S AM/PM
06	1:02:36.7 PM	12 hour H:M:S.1S AM/PM
07	02:36.7	No hours M:S.1S
08	27:24	1/2 H:S 1/2 hour downcounter
09	57:24	H:S 1 hour downcounter
10-to-18		Period "." separator.
19-to-27		Blank (transparent) separator.
28-to-36		No separator except for a period whenever tenth of a second is displayed.

**Table 4-1, Time Display Formats**

## 4.10 DATE SETUP Menu

A typical DATE SETUP menu appears on the SCT-50 screen as follows:

```
*DATE SETUP*
DATE          MM-DD-YY
DISPLAY       ON
START POSITION  140
FORMAT        05
              JAN 6/1999
```

The following paragraphs provide an explanation of each of the DATE SETUP menu items.

<b>ITEM</b>	<b>FUNCTION</b>	<b>SELECTIONS</b>
DATE	Unformatted date display	MM-DD-YY MM = 00-12 Months DD = 00-31 Days YY = 00-99 Years

Displays current month, day, and year value of internal calendar and allows value to be changed. The DATE value can be accessed for setting by using the POSITION switch to move the cursor up the screen into the DATE MM-DD-YY year fields.

DISPLAY	Turns display ON and OFF	ON = display ON OFF = display OFF
START POSITION	Starting character position of formatted Date display	001-180 001 is upper left hand corner of screen, 180 is lower right hand corner.

When the starting position of the date display is changed via actuating the CHAR switch while the "START POSITION" menu item is selected, the SCT-50 temporarily exits the DATE SETUP menu to show the display screen. Further actuation of the CHAR

switch moves the position of the date display on a character by character basis in a serpentine fashion so that you can observe its actual position within your normal video display.

There are 20 character positions available on each of the 9 lines. Character "001" is located at the upper left of the screen; character "180" is located at the lower right of the screen. It is also helpful to use the "NUMBER LINES 1-9" function to help see where the date is displayed as its starting position on the screen is changed. Even though the date display "erases" any text that was on the screen as it is moved, the text can be restored simply by actuating the MODE switch to SETUP, then back to TITLE.

After two seconds of no change in position, the display returns to the DATE SETUP menu.

<u>ITEM</u>	<u>FUNCTION</u>	<u>SELECTIONS</u>
FORMAT	Selects format for Date display	01-60 selects one of 60 formats for displaying the date.

The following nomenclature is used to describe the date format:

<u>ITEM</u>	<u>MEANING</u>	<u>VALUE RANGE</u>
mm	numeric month value	(01-12)
dd	numeric day value	(01-31)
yy	numeric year value	(00-99)
cc	numeric century value	(19-20)
MMM	month abbr.	(JAN,FEB,MAR,etc.)
DAY	day-of-week abbr.	(SUN,MON,TUE,etc.)

Table 4-2 shows the first 12 date display formats which use a slash "/" as the separator character. After the first twelve formats the basic pattern repeats but with different separator characters between the date digits. The date displayed right below the FORMAT selection line shows how the selected format for the date display appears.

<u>FORMAT #</u>	<u>DISPLAY</u>
01	mm/dd
02	mm/yy
03	mm/dd/yy
04	MMM/dd/yy
05	MMM/dd/ccyy
06	DAY/MMM/dd
07	DAY/MMM/dd/yy
08	DAY/MMM/dd/ccyy
09	dd/MMM
10	dd/mm/yy
11	dd/MMM/yy
12	yy/mm/dd
13-to-24	Hyphen "-" separator.
25-to-36	Period "." separator
37-to-48	Blank (transparent) separator.
49-to-60	No separator

**Table 4-2, Date Display Formats**

## **4.11 Selecting Local Titling Mode and Entering and Editing Data.**

To select the text entry TITLE mode for the SCT-50, actuate and release the MODE switch to TITLE until the front panel LED flashes at about once per second and the screen displays a flashing cursor. The flashing cursor shows the position of where the next character will be entered.

## **4.12 Character Selection**

Use the POSITION and CHAR switches to move the cursor and select the desired characters for entry as shown in Table 4.3. A blank (transparent) character is available between each grouping, and the numeric characters can be quickly accessed by scanning in the reverse ("-") direction.

These switches operate in much the same manner as those found on the simple titlers on many camcorders. The POSITION "arrow" switches select a character's position, and the CHAR "+/-" switches select a particular character from various numeric, alpha, punctuation, and math symbols. You can actuate a switch for a single selection at a time, or hold it down for 2-seconds and cause automatic and rapid selection.

When starting in the "+" direction, the character set goes from A-Z, 0-9, punctuation, math symbols, back to A-Z, etc. Starting "-" goes in exact reverse, proceeding from 9-0, then Z-A, math symbols, punctuation, etc. This is so you don't have to go through the alphabet to get to the numbers, or go through the numbers to get to the alpha characters. A blank space character is placed between each group of characters for added convenience.

**Alphabet**

A-Z                    upper case only  
 blank                    transparent

**Punctuation**

.                        period  
 ,                        comma  
 '                        apostrophe  
 &                       ampersand  
 :                        colon  
 ?                        question mark  
 !                        exclamation point  
 blank                    transparent

**Graphics**

white box              white cursor size box  
 black box              black cursor size box  
 up arrow  
 down arrow  
 left arrow  
 right arrow  
 center dot  
 underscore            (not actually under a character)  
 blank                    transparent

**Math Symbols**

~                        approximately  
 )                        right parentheses  
 (                        left parentheses  
 /                        slash (divide)  
 \*                        asterisk (multiply)  
 -                        hyphen (minus)

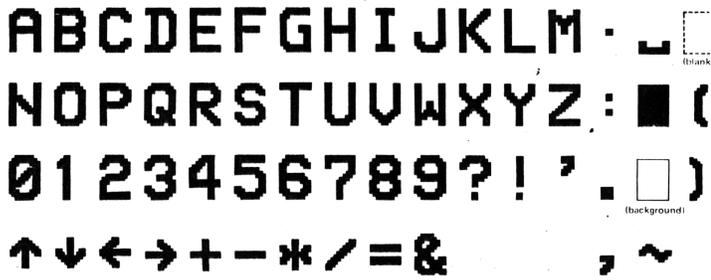
**Math Symbols (cont.)**

+                        plus (add)  
 =                        equal  
 blank                    transparent

**Numbers**

0-9  
 blank                    transparent

**Table 4-3, Character Set**



**Table 4-3, Character Set (cont.)**

### 4.13 Inserting Spaces and Deleting Characters

Actuating the MODE switch to TITLE when in the Title mode places the SCT-50 into the Insert/Delete mode. In this mode both the cursor and LED flash rapidly.

The POSITION switch is used to move the cursor to a desired line or character. Actuating the CHAR switch to "-" deletes the character under the cursor and pulls the remainder of the line to the left. Actuating the CHAR switch to "+" inserts a space under the cursor and moves the line to the right.

### 4.14 Centering a Line of Text

The Insert/Delete mode is convenient for centering a line of text once entered. First, enter the text desired on each line, starting at the left of the screen. After the desired text is entered, switch to the Insert/Delete mode, position the cursor at the start of the line, and insert (or delete) spaces using the "+/-" switch until the line of text is centered or placed where desired.

### 4.15 Turning the Display Off and On

When the MODE switch is first actuated to TITLE after the SCT-50 is displaying the normal time, date, and titles, the display is turned off. If actuated to SETUP, the SCT-50 display is turned back on. In this manner the SCT-50 display can be quickly switched on and off from the front panel switches.

### 4.16 Split Screen Display

The "split screen" type of display is selected by choosing the "1S" or "2S" mode for the vertical size when in the DISPLAY SETUP menu. The split screen mode splits the nine display lines into 5 lines that move towards the top of the screen, and 4 lines that move towards the bottom.

When split screen is selected, the amount of the vertical split is continuously adjustable, either by changing the value of the vertical position when in the DISPLAY SETUP mode, or by operating the front panel POSITION switch when in the normal display mode. In split screen mode, changing the vertical position value increases or decreases the amount of the vertical split, rather than moving the display vertically, as it does when 1X, 2X, 3X or 4X vertical size is selected.

With this arrangement, you can place data on line-1 and line-9 and it will just barely be visible (if at all) on most standard monitors when the screen is split to its maximum value.

### 4.17 Operating The SCT-50 using the GMAN Software Program

The following paragraphs provide only a brief description of how to setup the SCT-50 to operate with the GMAN software. Refer to the GMAN manual for a more complete description of the GMAN software and its operation with individual and groups of SCT-50s.

### 4.18 Setting the SCT-50 Address

The SCT-50 device address displayed on the SCT-50 SYSTEM SETUP menu must correspond to the device address sent from the GMAN program in order for the GMAN program to operate the SCT-50. The only exception to this is if the GMAN enters the broadcast mode by outputting address "00". Broadcast mode addresses all SCT-50 regardless of their individual unique addresses.

If an individual SCT-50's address is set to "00", that SCT-50 will receive and display all text and commands sent from the PC for any SCT-50, regardless of any unique address sent out from the PC. This is called the "promiscuous" mode.

If not done previously, switch to the SYSTEM SETUP menu on the SCT-50 and set its address to the desired value using the front panel switches. When using multiple SCT units, be sure none have the same address assigned to them, unless you want them to respond to the same text and commands sent from the PC.

## 4.19 Serial Communications Check

During operation with a PC, the SCT-50 LED blinks quickly each time a character is received from the PC. This indicates that the serial port connection is operating.

### *NOTE:*

At 9600 baud the number of SCT-50 units that can be operated by a single serial port is at least 100 units. Also note that there are active RS-232 repeater circuits in each SCT-50 and this requires that power must be applied to all of the SCT-50 units that are connected together and operating from a single PC serial port so that the serial data can proceed from unit to unit.

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# 5 SERIAL COMMUNICATIONS

## 5.1 Serial Communications Method

Computer control of the SCT-50 is via the computer sending a defined sequence of ASCII command, control, and data characters to the SCT-50 using the RS232 serial communications port. The sequence of characters consist of escape-address-command/data. Data is optional, depending on the command type.

Because the serial data is looped through all SCT-50 units, all SCT-50 units listen for and respond to the serial data from the PC. All units listen for and decode the address sent immediately after the escape character is sent. When an SCT-50's address matches that of the address sent by the computer, that SCT-50 is "online" and all other SCT-50's are "offline".

After the addressed SCT-50 goes online it remains in this state from then on to continuously decode and execute commands or process text data until another escape character is sent. Receipt of an escape character always returns all of the SCT-50s to the address listen and compare mode.

## 5.2 Broadcast And Promiscuous Modes

If the PC sends out address 00, the PC will control all SCT-50's, regardless of their individual addresses. This is called "broadcast" mode.

If an individual SCT-50's address is set to "00", that SCT-50 will receive and display all text and commands sent from the PC for any SCT-50, regardless of any unique address sent out from the PC. This is called the "promiscuous" mode.

## 5.3 Single Function Commands

For single function commands the SCT-50 performs the specified command function then returns to and stays in the command decoding mode. In this situation, it is not necessary to re-send another "escape-address-command" sequence to change commands, only the new command itself. To exit this mode another escape-address-command sequence must be sent to the SCT-50.

## 5.4 Function/Data Commands

For commands that have accompanying data, the command is first decoded, then the SCT-50 switches to and stays in the data mode until receipt of another escape-address-command sequence.

When processing data, the SCT-50 operates in two ways depending on whether the data is for commands whose data fields are fixed or variable length.

For commands with variable length data fields, such as random text entry, the SCT-50 processes each data character as it is received.

For fixed field length commands, such as time/date positioning, the SCT-50 interprets the data and, in this case, repositions the time or date each time the field length is reached.

## 5.5 Serial Command Set

The following list shows all of the serial commands and data that can be sent to operate an SCT-50 via its serial port. As can be seen, an address requires two (ASCII) bytes of data, a command requires two bytes, and any subsequent data itself can be none or one or more bytes.

ADD	CMD	DATA	FUNCTION
00			"Broadcast" mode, addresses all SCTs
01-99			Unique addresses 01 to 99
	00		System reset (allow 300mS)
	01		N/U
	02		N/U
	03		Select time display Format to #3
	04		Select time display Format to #2
	05		N/U
	06		N/Ucont.
	07		Video display ON
	08		Video display OFF
	09		Background ON
	10		Background OFF
	11		White characters
	12		Black characters
	13		Line numbers ON
	14		Line numbers OFF
	15		Blink mode ON *
	16		Blink mode OFF
	17	1-3 (d)	Set contrast = 1=low, 2=medium, 3=high
	18		Select memory Page-1
	19		Select memory Page-2
	20		Enable write to screen
	21		Disable write to screen
	22		Enable write to selected memory Page-1/2
	23		Disable write to selected memory Page-1/2
	24	1-9 (d)	Clear selected line number 1-9 from memory page and screen if associated memory and screen "write" is enabled.(allow 7mS.)
	25		Clear all lines from memory page and screen if associated memory or screen "write" is enabled (allow 100mS)
	26	001-180(ddd)	Set CP = address 001-180
	27	(d.....)	Write character @ CP & increment CP
	28	001-180 (d)	Set CP=address 001-180, write character (d) @ CP, increment CP
	29		Copy selected memory Page-1/2 to screen (allow 10mS).
	30		Copy memory Page-1 to memory Page-2 (allow 150mS).
	31		Copy memory Page-2 to memory Page 1 and to screen (allow 150mS).
	32		Save SETUP values (allow 7mS).
	33		Write character @ CP (no inc CP)
	34		Time display ON
	35		Time display OFF
	36	hhmmss	Set Time = hhmmss
	37	001-180 (ddd)	Set Time H position = 001-180
	38		Send SCT time to computer
	39		Date display ON
	40		Date display OFF
	41	mmddy	Set Date = mmddy
	42	001-180 (ddd)	Set Date H position = 001-180
	43		Send SCT date to computer
	44	01-63 (dd)	Set H position = 01-63
	45	1-4 (d)	Set H size = 1-4
	46	01-63 (dd)	Set V position = 01-63

47	1-6 (d)	Set V size = d. Note: sizes 5/6 are split screen modes. 5 is 1S and 6 is 2S.
48	01-36 (dd)	Selects 1 of 36 time display formats.
49	01-60 (dd)	Selects 1 of 60 date display formats.
50-99		N/U

H = Horizontal, V = Vertical, CP = Character Pointer, (d) = 1 data character, ,mS = milliseconds, \* = causes those data characters whose most significant bit (bit-7) has been set to a "one" to blink.

## 5.6 Character Set and ASCII Codes

<u>CHAR</u>	<u>HEX</u>	<u>DECIMAL</u>	<u>CHAR</u>	<u>HEX</u>	<u>DECIMAL</u>
A	41	65	:	3A	58
B	42	66	?	3F	63
C	43	67	!	21	33
D	44	68		09	09 clear*
E	45	69		01	01 white*
F	46	70		02	02 black*
G	47	71	↑	03	03
H	48	72	↓	04	04
I	49	73	←	05	05
J	4A	74	→	06	06
K	4B	75	•	07	07
L	4C	76	—	08	08
M	4D	77	~	7E	126
N	4E	78	)	29	41
O	4F	79	(	28	40
P	50	80	/	2F	47
Q	51	81	*	2A	42
R	52	82	-	2D	45
S	53	83	+	2B	43
T	54	84	=	3D	61
U	55	85	0	30	48
V	56	86	1	31	49
W	57	87	2	32	50
X	58	88	3	33	51
Y	59	89	4	34	52
Z	5A	90	5	35	53
.	2E	46	6	36	54
,	2C	44	7	37	55
'	27	39	8	38	56
&	26	38	9	39	57
ESC	1B				

\* = space character

## 5.7 Serial Communications Example

The following provides an example of a typical command sequence for turning an SCT-50 display OFF.

The serial data to be sent to the SCT-50 is: Escape, Address, Command. As described earlier, the DISPLAY OFF command is decimal "08", and assuming the address of the SCT-50 is set to "01", the sequence of serial data sent to the SCT-50 to turn the display off would be as follows:

Hex Value	Function
1B	ESCAPE character
30	ASCII "0" of address "01"
31	ASCII "1" of address "01"
30	ASCII "0" of command "08"
38	ASCII "8" of command "08"

## 5.8 Software Programming Examples

Included on the CD with the SCT-50 GMAN program are two programming examples for controlling the SCT-50. One of the examples, SCTBAS.BAS, is written in the "BASIC" programming language and the other, SCTEXPL.C, is written in the "C" programming language.

These programs, the fundamentals of which can be converted into their "Visual" equivalents, show how to operate and control the SCT-50 from a serial port and serve to get you started writing custom control software for the SCT-50.

# 6 MAINTENANCE

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## 6.1 Cleaning

1. Do not attempt to disassemble your SCT-50 to clean it.
2. Clean your SCT-50 using only a damp cloth.
3. NEVER use water or solvents such as alcohol, window cleaner, etc., to clean your SCT-50.

## 6.2 Service and Troubleshooting

If you suspect your SCT-50 is not operating properly, check the following:

1. Check all cables for opens or shorts.
2. If using an AC power adapter different from the one supplied with the SCT-50, make sure it supplies the SCT-50 with at least 9 volts(maximum of 14 volts) when the SCT-50 is switched on.
3. If it appears that GMAN or the RS232 serial port is not working, check the following:
  - a. Make sure SCT-50 is "ONLINE".
  - b. Check that the SCT-50 LED blinks off when serial data is sent.
  - c. If the LED blinks off, make sure that the SCT-50 address is setup correctly and has been sent out by the PC. A quick test is to enter address "00" into the GMAN software to place it into the broadcast mode.

Another test is to place the SCT-50 into the HEX mode and check the data on the screen for the proper HEX escape-address-command characters. This requires more detailed computer knowledge.

You may return your SCT-50 to HORITA for service. Please contact HORITA first, either by phone or mail, before returning your unit.

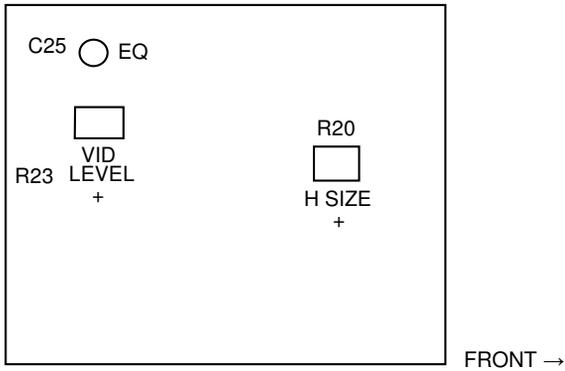
## 6.3 Adjustments

Adjustments are provided for video level and equalization and horizontal size.

To access the adjustments, remove the bottom cover from the SCT-50 by removing the two screws from the front panel and then sliding the bottom cover out towards the front.

If you have a Rackmount or Shortrack packaged SCT-50, remove the four screws from the top cover and remove the cover.

All adjustments are located on the circuit board as shown in Figure 6-1.



**Figure 6-1, Adjustment Locations**

## 6.4 Horizontal Size Adjustment

1. Adjust H-SIZE control R20 for the desired horizontal size. Note that this adjustment also affects the size of the setup screen displays.

## 6.5 Video Level & Equalization Adjustment

1. Connect a 1-volt P-P video sweep signal to VIDEO IN and a waveform monitor or oscilloscope to VIDEO OUT. Make sure the video output is terminated.
2. Adjust VID LEVEL control R23 for a 1-volt P-P output level (unity gain)
3. Adjust C25 for flattest frequency response out to 5 MHz.
4. Re-assemble the SCT-50

# 7 SPECIFICATIONS

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## Power

Operation	9-to-14V DC, 150 milliamperes
Connector	3.5mm mini phone jack, center positive
AC Adapter	9 Volt, 500 milliamperes

## Video

Standard	NTSC 525/60 (RS170A), PAL 625/50
Level	1-Volt p-p
Impedance	75-Ohm

## Connectors

Video In/Out	BNC
Serial In	DB9 Female
Serial Out	DB9 Male

## Switches and Controls

Power	On/Off Toggle Switch with Red LED
Mode, Position, Character	Momentary Toggle

## Vertical Size

## No. of H Lines

	<u>Mask on</u>	<u>Mask off</u>
1	9	7
2	18	14
3	27	21
4	36	28

## Environment

Operating	5C to 40C (41F to 104F)
Storage	-10C to 60C (14F to 140F)

## Dimensions

1.75"H, 3.5"W, 4.5"D

## Weight

Approx 13 Oz. (shipping wt. approx. 29 Oz., including power adapter)

