Models 5010 SIE
Source ID Encoder

Instruction Manual

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INFORMATION TO USERS IN EUROPE

NOTE

CISPR 22 CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the European Union EMC directive. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

INFORMATION TO USERS IN THE U.S.A.

NOTE

FCC CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or Modifications not expressly approved by Evertz Microsystems Ltd. could void the user's authority to operate the equipment.

Use of unshielded plugs or cables may cause radiation interference. Properly shielded interface cables with the shield connected to the chassis ground of the device must be used.

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Original issue	Feb 96
1.01	Manual Change Sheet 1.0-1 inserted	Apr 96
1.1	Incorporated change sht 1.0-1 Updated section on Model 7225	Mar 97
1.1.1.	Manual Change Sheet 1.0-2 inserted	Feb. 98

The following document describes the hardware changes to the 5010-SIE related to adding a bypass relay on the VITC generator output. References to the 5010-SIE manual are to version 1.0 printed Feb. 1996.

Section 2.1.1 should be changed to read:

2.1.1 Vertical Interval Timecode Video Connections

The VITC Generator program input is fitted with a hardware bypass relay which will pass the program video through to VITC output B when there is a power loss in the 5010-SIE.

PGM INPUT: A BNC for input for program video onto which vertical interval time code is to be inserted. When the relay is in the bypass condition, video applied to this input will be passed through to the VITC OUT B connector. When the bypass relay is in the active condition, this input is internally terminated with 75 ohms, and the program video will pass through the VITC Generator circuitry.

VITC OUT A A BNC connector which contains the PGM INPUT video with vertical interval time code inserted. This input is active only when the bypass relay is in the active condition. (Power applied to the 5010-SIE)

VITC OUT B: A BNC connector which contain the PGM INPUT video with vertical interval timecode inserted when the bypass relay is in the active condition. (Power applied to the 5010-SIE). When the relay is in the bypass condition, (no power to the 5010-SIE) the VITC OUT B connector will contain the PGM INPUT video with nothing inserted.

The following document describes the changes to the 5010-SIE that allow it to interface to Profile Disk Recorders with the LVS software. The section numbers of the 5010-SIE manual (version 1.0 printed Feb. 1996) are shown in bold. Units equipped with the LVS features can be distinguished from other units by the addition of two XLR connectors on the rear panels.

1 Introduction

The following additional features are added to those described in section 1

- RS-232 serial interface reads status, LVS info and CTL information from the Profile in LVS mode or Timecode and VTR status from a Panasonic D3 compatible serial port in non-LVS modes.
- LTC Time Code reader reads code from the Profile in LVS mode
- Character inserter displays LVS info and CTL information from the Profile
- Character inserter displays Reader Time from the LTC timecode input
- Programmable LVS address allows multiple units to be 'daisy-chained' on a single port of the Profile.

2 Installation

A new section 2.1.1 is inserted at the beginning of section 2. Subsections following are renumbered accordingly.

2.1.1 Linear Time Code Connections

LTC IN: A female XLR connector for input of SMPTE/ EBU linear timecode for the reader.

LTC OUT: A male XLR connector is a loop through from the LTC IN connector

2.1.6 Remote Control Connections

PARALLEL: A 9 pin female 'D' connector used for parallel remote control inputs. Loop through outputs have been provided on each of the inputs for ease of wiring multiple units in parallel.

Pin	Description
1	Ground
6	not used
2	VCG Keyer On/Off (Characters toggled On or Off each time this input grounded)
7	not used
3	ON AIR VCG Disable (Characters turned off when this input grounded)
8	not used
4	not used
9	VCG Keyer On/Off Loop Through Output
5	ON AIR VCG Disable Loop Through Output

SERIAL: A 9 pin female 'D' connector for connection to the RS-232 connector on the D3 video recorder, the 7225 time code/status converter used with the analog tape machines or the serial port on a Profile Disk recorder. A loop through output has been provided for ease of wiring to multiple units.

Pin	Description
1	Ground
2	not used
3	RS-232 Receive Loop Through Output
4	Receive Common
5	RS-232 Transmit
6	Transmit Common
7	not used
8	RS-232 Receive
9	Ground

A new section 2.5 is inserted and sections following are renumbered accordingly.

2.5 LINEAR TIME CODE IN/OUT

The LTC reader input provides a means if bringing linear time code from the Profile Disk recorder when the 5010-SIE is operating in LVS mode. When using an unbalanced input to the reader, the signal should be applied to pin 3 of the LTC reader input connector. Normally, the unused input, (pin 2) should be connected to ground (pin 1).

A loop through of this input signal is provided on the LTC OUT XLR connector to facilitate connecting LTC to multiple 5010-SIE units. Pin 1 of the XLR is ground, and pins 2 and 3 provide a balanced output.

A new section 2.8 is added at the end of chapter 2.

2.8 CONNECTING THE 5010-SIE TO THE PROFILE RS-232 PORT

When the 5010-SIE is in the LVS mode, it is designed to listen to a serial data stream from the Profile disk recorder. This serial communication is normally daisy-chained to each of the 5010-SIE units that are connected on the Profile outputs. This port is used to obtain status and LVS information from the Profile recorder.

In order to properly address each of the 5010-SIE units connected in the daisy chain, the Profile sends out an ‘address’ before each command. The **LVS ADDRESS** menu item on the Config menu of the 5010-SIE must be set to match the address that the Profile is using for a specific output.

3.1.2 The Character Window Pushbutton Group

CHAR GEN WINDOW Initiates VCG window select mode and highlights the Time VCG window. Use the arrow keys to move the window, use the **CHAR GEN ON/OFF** key to turn the

window on or off. Press the **WINDOW** key again to select the SRC ID VCG window. Press the **WINDOW** key again to select the next window and so on. The 5010-SIE returns to the normal VCG display mode after the last window has been selected. Some windows are only available when the 5010-SIE is in LVS mode.

3.3 ON SCREEN PROGRAMMING MENU - OVERVIEW

Some of the menu items have been expanded to make provision for the new LVS mode. The revised menu structure is shown in the new figures 3-2 and 3-3 below.

GENERATOR
- **SRC ID MODE**
  - 5 CHR SID
  - 9 CHR SID
  - 5 CHR SID+STS
  - TIME 5 CHR SID
  - TIME 9 CHR SID
  - TIME 5 CHR SID+STS
  - TIME 9 CHR SID+STS
  - TIME LVS SID +STS
- **VITC KEYER**
  - OFF
  - ON
- **VITC LINES**
  - GEN VITC LINES
  - LINE 1 LINE 2
  - 10 20
- **RDR MODE**
  - LTC
  - VITC
  - AUTO

VCG
- **CHAR SIZE**
  - TINY
  - SMALL
  - LARGE
- **CHAR STYLE**
  - WHITE
  - WHITE ON BLACK
  - BLACK
  - BLACK ON WHITE
- **VCG FRAMES**
  - DISPLAY
  - BLANK
- **VCG FIELDS**
  - DISPLAY
  - BLANK
- **VCG SYMBOLS**
  - DISPLAY
  - BLANK
- **ON AIR MODE**
  - OFF
  - ON

CONFIG
- **VIDEO TYPE**
  - VIDEO TYPE FIXED TO
  - NTSC
- **HORZ CHAR SIZE**
  - HORIZONTAL
  - CHAR SIZE = 02
  - ← OR → TO ADJUST
- **DISPLAY LEVEL**
  - DISPLAY LEVEL = 2
  - ↑ ↓ TO ADJUST
- **LVS ADDRESS**
  - GENERATOR
  - LVS ADDR = 02
  - ↑ ↓ TO ADJUST
- **FACTORY RESET**
  - ** WARNING **
  - THIS COMPLETELY
  - RESETS UNIT
  - PRESS THE SHIFT + SELECT
  - KEY TO PROCEED
  - PRESS THE SELECT KEY
  - TO CANCEL

Figure 3-2: On Screen Programming Menu Overview

GEN SRC ID MODE
Mod 5 id
Mod 9 id
Mod 5 id+sts
Mod tim 5 id
Mod tim 9 id
Mod tim 5 id+sts
Mod tim 9 id+sts
Mod tim lvs+sts
GEN VITC KEYER
Gvitc keyer off
Gvitc keyer on
GEN VITC LINES
Gvitc line1 = 10
Gvitc line2 = 20
GEN RDR MODE
Vtr rdr mod ltc
Vtr rdr mod vitc
Vtr rdr mod auto

VCG CHAR SIZE
Size tiny
Size small
Size large
VCG CHAR STYLE
Style white
Style wh on blk
Style black
Style bl on wh
VCG FRAMES
Frames display
Frames blank
VCG FIELDS
Fields display
Fields blank
VCG SYMBOLS
Symbols display
Symbols blank
ON AIR MODE
On air mode off
On air mode on

VIDEO TYPE
Vtype fixed ntsc
HORZ CHAR SIZE
Horz size 02
DISPLAY LEVEL
Dsplay level = 2
LVS ADDRESS
Gen lvs addr = 02
FACTORY RESET
Shift + select

Figure 3-3: Overview of Front Panel Menu

3.4.1 Configuring the Generator Operating Modes

The 5010-SIE encodes source ID information in a new extended 9 char source id format when it is in the LVS mode. In this mode scene number and control information is encoded in the user bits in addition to the normal 9 char source Id and status.

A new item has been added to the SRC ID MODE menu item to put the 5010-SIE into LVS mode.

TIME LVS SID + STS Operates the 5010-SIE in LVS mode. In this mode the serial port is automatically configured to the correct protocol to receive LVS and status information from the Profile Disk Recorder. Time code is read by the LTC reader and is put into the time bits of the generator. The source ID, status and LVS information is encoded into the user bits in the LVS source ID format.

3.6 PROGRAMMING THE OVERALL CONFIGURATION FUNCTIONS

A new section 3.6.4 has been added and the following subsections are renumbered.

3.6.4 Setting the LVS Address

The **LVS ADDRESS** menu item is used to set up the LVS address that the 5010-SIE will respond to. Use the ↑ and ↓ keys to adjust. Valid numbers are in the range of 01 to 09.

3.8 CHARACTER GENERATOR FUNCTIONS

Then the 5010-SIE is in LVS mode, there are three additional windows known as the LVS Info, CTL, and Reader Time windows.

3.8.1 ON AIR Character Keyer mode

Select **ON AIR MODE ON** to blank all the Charater windows when the VTR Status is Play or VAR, or when the ON AIR remote control input is closed to ground.

When **ON AIR MODE OFF** is selected, the Charater windows ignore the VTR Status and the ON AIR remote control input.

3.9 PARALLEL REMOTE CONTROL FUNCTIONS

For ease of wiring multiple 5010-SIE units together where the parallel inputs must be shared, loop through outputs have been provided for each of the GPI inputs. The loop through output for pin 2 is pin 9 and for pin 3 is pin 5. See section 2.1.6.

4.3 CIRCUIT DESCRIPTION

4.3.7 High Speed LTC Reader (5200-32) & (5200-34)

Incoming LTC is decoupled and amplified by U9, U10 and associated components to provide a regenerated reader data signal at the LR test point. This digital representation of the LTC is fed to the LCA where a series of timing pulses generated by the LCA are used to properly decode 0 and 1 bits. The LTC data is extracted by the LCA and is shifted into one half of shift register U26. The LCA generates an LTC RDY signal to the MCU when it has received one frame of data. Direction information derived from the last bit of the sync word is also fed to the MCU. A valid reader sync word toggles a flip flop in the LCA which enables the other half of shift register U26 to collect data from the next frame while the MCU is unloading data from the frame just completed through the LCA.

The following document describes the changes to the manual relating to the special 5010-SIE-NBC version. The section numbers of the 5010-SIE manual (version 1.1 printed March 1997) are shown in bold.

1. Introduction

The following additional features are added to those described in section 1

- RS-422 serial interface listens to communications between VTR and edit controller and reads time code and VTR status.
- Parallel remote control input to encode a GPI status bit into the Source ID VITC.
- Parallel port outputs added to follow GPI and VCG Keyer On/Off inputs. Parallel port pinout has changed.

2. Installation

The following sections have been changed to read as follows:

2.1.4 Remote Control Connections

PARALLEL: A 9 pin female 'D' connector used for parallel remote control inputs. Loop through outputs have been provided on two of the inputs for ease of wiring multiple units in parallel. These loop through outputs are driven in the software so that they follow the sense of the respective inputs. Each input has an internal pull-up to +5 volts. (See section 3.9 for a complete description of the parallel remote control input operation).

Pin	Description
1	Ground
6	not used
2	VCG Keyer On/Off Input
7	not used
3	ON AIR VCG Disable Input
8	not used
4	GPI Input
9	VCG Keyer On/Off Output
5	GPI Output

SERIAL: A 9 pin female 'D' connector for connection to the RS-232/RS-422 serial communications. This port is normally uses to sense status information from the VTR supplying video to the 5010-SIE-NBC

Pin	Description
1	Ground
6	no connection
2	RS-422 Transmit A(-)
7	RS-422 Transmit B(+)
3	RS-422 Receive B(+)
8	RS-232 Receive and RS-422 Receive A(-)
4	no connection
9	Ground
5	RS-232 Transmit (do not connect for RS-422)

2.5 CONNECTING THE 8010-SIE-NBC TO A VTR RS-422 PORT

When the 5010-SIE-NBC is in the VTR mode, the serial remote control port is used to eavesdrop on the RS-422 serial control between a VTR and its controller. The serial port is used to obtain timecode and status information from the VTR. At this time the 5010-SIE-NBC is customized to eavesdrop on the communications between a Lance HSE-100 Edit Controller and a Sony VTR. The use of other edit controllers may not give expected results on the VTR status of the 5010-SIE-NBC. The wiring diagram below can be used to make an appropriate cable.

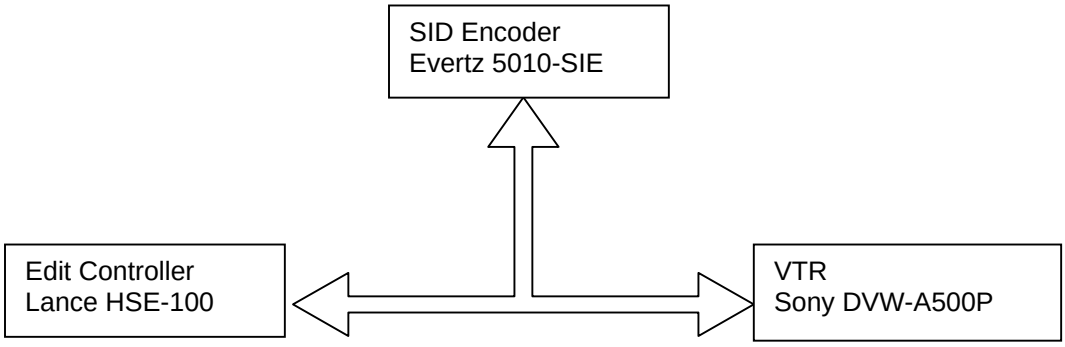

Figure 2-2: Connection of 8010-SIE-NBC in Eavesdropping Mode

Edit Controller (Lance HSE-100) RS422 Controller port		**VTR (Sony DVW-A500P) RS422 Tributary port**		**SID Encoder Evertz 5010-SIE Serial Port (RS422 Controller)**
Description	**Pin**	**Pin**	**Description**	**Pin**	**Description**
Frame Ground	1	1	Frame Ground	1	Frame Ground
Receive A (Rx+)	2	2	Transmit A (Tx+)	8	Receive A (Rx+)
Transmit B (Tx-)	3	3	Receive B (Rx-)	3	n/c
Transmit Gnd	4	4	Receive Gnd	4	n/c
Spare	5	5	Spare	5	Spare
Receive Gnd	6	6	Transmit Gnd	9	Receive Gnd
Receive B (Rx-)	7	7	Transmit B (Tx-)	3	Receive B (Rx-)
Transmit A (Tx+)	8	8	Receive A (Rx+)	8	n/c
Frame Gnd	9	9	Frame Gnd	9	Frame Gnd

Figure 2-3: RS-422 Eavesdrop Cable

3.9 PARALLEL REMOTE CONTROL FUNCTIONS

A 9 pin female 'D' connector used for parallel remote control inputs. Loop through outputs have been provided on two of the inputs for ease of wiring multiple units in parallel. These loop through outputs are driven in the software so that they follow the sense of the respective inputs. The pinout of the D connector is as follows:

Pin		Description
1		Ground
	6	not used
2		VCG Keyer On/Off Input
	7	not used
3		ON AIR VCG Disable Input
	8	not used
4		GPI Input
	9	VCG Keyer On/Off Output
5		GPI Output

VCG KEYER ON/OFF Provides an alternate method of turning the character inserter generator On and Off. The character inserter is toggled On or Off by a high to low transition on this input. This input has equal priority with the front panel **CHAR GEN ON/OFF** key.

ON AIR VCG Disable When closed to ground and the *On Air mode* is set to *On*, all the VCG windows will be turned off. When this input is released, the VCG windows will revert to the state they were in before the ON AIR disable input was activated.

GPI When closed to ground this input sets a GPI bit in the encoded source ID. When the source ID decoder senses this bit is on it will activate a GPI output.

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1. INTRODUCTION

The Model 5010-SIE Source ID Encoder provides a cost effective method of keying timecode, source ID and machine status information into the analog video.

Features:

- Character Inserter displays timecode, source ID and VTR status in the picture
- Separate positioning of each character window
- Active low 'ON AIR' GPI turns off all local displays of characters
- Active low 'VCG ON/OFF' GPI can be used to remotely turn the character generator on and off
- RS-232 serial interface to VTR to receive timecode, and VTR status
- Rack mountable
- 16 digit Alpha-numeric display, with 10 push buttons

1.1. HOW TO USE THIS MANUAL

This manual is organized into 4 chapters: Overview, Installation, Operation, and Technical Description.

Items of special note for all users are marked with a double box like this.

1.2. DEFINITIONS

LINEAR TIME CODE: A digital code used for timing and control purposes on video tape and associated audio tape machines. It is recorded on a longitudinal track with audio characteristics and is referred to as LTC (Sometimes this code is also referred to as longitudinal code or SMPTE). Each 80 bit code word is associated with one television frame, and consists of 26 time bits, 6 flag bits, 32 user bits and 16 sync bits.

VERTICAL INTERVAL TIME CODE: A digital code used for timing and control purposes on video tape recorded in the vertical blanking interval of the video picture, and is referred to as VITC. Each 90 bit code word is associated with one television field, and consists of 26 time bits, 6 flag bits, 32 user bits, 18 sync bits, and an 8 bit error check (CRC) code.

USER BITS: 32 bits in the time code are user assignable. They typically are used to contain reel numbers, scene and take numbers, or other user-oriented data.

DROP FRAME: In NTSC systems, where the frame rate is 29.97002618 frames per second, the drop frame mode permits time of day indexing of the frame numbers by dropping certain frame numbers. Specifically, frames 0, and 1 at the beginning of each minute except minutes 0, 10, 20, 30, 40 & 50 are omitted to compensate for an approximate timing error of 108 frames (3 seconds 18 frames) per hour. A flag bit is set in the time code to signal when the drop frame mode is in effect.

2. INSTALLATION

2.1. REAR PANEL CONNECTIONS

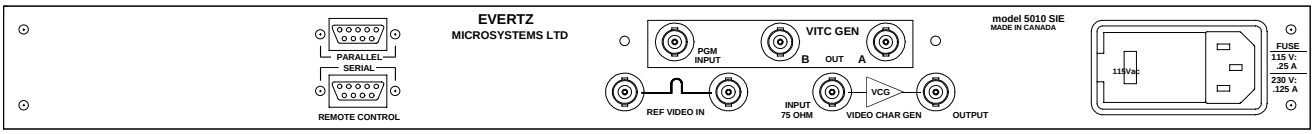

Figure 2-1: Rear Panel Layout

The following sections describe the purpose of the rear panel connectors of the model 5010-SIE. Figure 2-1 above shows the rear panel connectors provided on the model 5010-SIE. Sections 2.1.1 to 2.1.5 describe the specific signals that should be connected to the model 5010-SIE.

2.1.1. Vertical Interval Timecode Video Connections

The VITC Generator program input is fitted with a hardware bypass relay which will pass the program video through to VITC output B when there is a power loss in the 5010-SIE.

PGM INPUT: A BNC for input for program video onto which vertical interval time code is to be inserted. When the relay is in the bypass condition, video applied to this input will be passed through to the VITC OUT B connector. When the bypass relay is in the active condition, this input is internally terminated with 75 ohms, and the program video will pass through the VITC Generator circuitry.

VITC OUT A A BNC connector which contains the PGM INPUT video with vertical interval time code inserted. This input is active only when the bypass relay is in the active condition. (Power applied to the 5010-SIE)

VITC OUT B: A BNC connector which contain the PGM INPUT video with vertical interval timecode inserted when the bypass relay is in the active condition. (Power applied to the 5010-SIE). When the relay is in the bypass condition, (no power to the 5010-SIE) the VITC OUT B connector will contain the PGM INPUT video with nothing inserted.

2.1.2. Character Generator Connections

VIDEO CHAR GEN INPUT: A 75 ohm terminated input for program video onto which characters are to be inserted.

VIDEO CHAR GEN OUTPUT: A BNC connector which outputs the VIDEO CHAR GEN INPUT video with characters inserted. This output is also used to display the on screen programming menu and is normally connected to a video monitor.

2.1.3. Gen Lock Connections

REF VIDEO IN: A BNC loop used to provide a gen-lock reference for the 5010-SIE's generator.

2.1.4. Parallel Remote Control Connections

PARALLEL: A 9 pin female 'D' connector used for parallel remote control inputs.

Pin	Description
1	Ground
2	VCG Keyer On/Off (Characters toggled On or Off each time this input grounded)
3	ON AIR VCG Disable (Characters turned off when this input grounded)
4	not used
5	reserved - do not connect
6	not used
7	not used
8	not used
9	reserved - do not connect

SERIAL: A 9 pin female 'D' connector for connection to the RS-232 connector on the D3 video recorder / or the 7225 time code/status converter used with the analog tape machines.

Pin	Description
1	Ground
2	not used
3	not used
4	Receive Common
5	RS-232 Transmit
6	Transmit Common
7	not used
8	RS-232 Receive
9	Ground

2.1.5. Power Connections

LINE: The model 5010-SIE may be set for either 115v/60 Hz or 230v/50 Hz AC operation. The voltage selector switch is accessible on the rear panel. The line voltage connector contains an integral slow blow fuse (and a spare one).

2.2. MOUNTING

The model 5010-SIE is equipped with rack mounting angles and fits into a standard 19 inch by 1 3/4 inch (483 mm x 45 mm) rack space. The mounting angles may be removed if rack mounting is not desired.

2.3. POWER REQUIREMENTS

2.3.1. Selecting the Correct Mains Voltage

Power requirements are 115 or 230 volts AC at 50 or 60 Hz, switch selectable on the rear panel. Power should be applied by connecting a 3 wire grounding type power supply cord to the power entry module on the rear panel. The power cord should be minimum 18 AWG wire size, type SVT marked VW-1, maximum 2.5 m in length.

Before connecting the line power, be sure to select the proper line voltage. Also, check that the line fuse is rated for the correct value marked on the rear panel.

The power entry module combines a standard IEC 320 power inlet connector, voltage selector switch, two 5 x 20 mm fuse holders (one active, one spare) and an EMI line filter.

To change the mains voltage setting, open the cover of the power entry module using a small screwdriver. Remove the drum selector switch, and re-insert it so that the desired voltage is visible through the opening on the mains connector cover. Check that the correct fuse is in use as shown in section below.

2.3.2. Changing the Fuse

The fuse holder is located inside the power entry module. To change the fuse, open the cover of the power entry module using a small screwdriver. The fuse holder on the bottom contains the active fuse. The one at the top contains a spare fuse. Pull the bottom fuse holder out and place a fuse of the correct value in it. Use slo blo (time delay) 5 x 20 mm fuses rated for 250 Volts with the following current ratings:

For 115 Volt operation	250 mA
For 230 Volt operation	125 mA

Never replace with a fuse of greater value.

Make sure that the arrow is pointing down when you replace the fuse holder. Close the door on the power entry module and connect the mains voltage.

2.4. VIDEO CONNECTIONS

2.4.1. Generator Sync Lock

For proper frame/address synchronization in video tape applications, the generator must be locked to a stable 1 volt p-p composite video or colour black source, applied to the generator REF VIDEO IN video loop. The internal sync separator has a high impedance input tapped off the loop through, therefore, the video signal must be properly terminated at the end of the line.

2.4.2. Character Inserter Video

The input video on which the characters are to be displayed is connected to the VIDEO CHAR GEN INPUT connector. The video input has an internal 75 ohm termination.

The program video with characters inserted is available on the VIDEO CHAR GEN OUTPUT connector and may be used to drive a preview monitor or a video recorder. Characters are keyed into the video connected to the VIDEO CHAR GEN INPUT connector. Size, position, and style of the character displays are controlled from the on screen programming menu.

In order to use the on screen programming menu system, video must be applied to the VIDEO CHAR GEN INPUT connector and the VIDEO CHAR GEN OUTPUT must be connected to a video monitor.

2.4.3. VITC Generator Video In/Out

The program video source for the VITC generator is applied to the PGM Video Input loop. The internal sync separator has a high impedance input tapped off the loop through, therefore, the video signal must be properly terminated at the end of the line. Program video with VITC is available on two separate video outputs.

2.5. CONNECTING THE 5010-SIE TO THE VTR REMOTE CONTROL PORT

The 5010-SIE serial remote control port is designed to communicate with the RS-232 port on a Panasonic AJ-D350 VTR. This remote port is used to obtain timecode and status information from the VTR. The serial port on the VTR should be set to 9600 baud, 8 bits, no parity. The wiring diagram below can be used to make an appropriate cable.

5010-SIE to Panasonic AJ-D350/351 D3 Video Recorder RS-232C control Port

5010 END 9 PIN MALE "D"			AJ-D350 END 25 PIN MALE "D" TYPE	
DESCRIPTION	**PIN**		**PIN**	**DESCRIPTION**
Ground	1	----------	1	Frame Ground
RS-232 Transmit	5	----------	3	RS-232 Receive
Ground	6	----------	7	Signal Ground
RS-232 Receive	8	----------	2	RS-232 Transmit

2.6. USING THE OPTIONAL MODEL 7225 TIME CODE / STATUS CONVERTER

When the 5010-SIE is used with other VTR's which do not contain a dedicated RS-232 port for timecode and status (as does the Panasonic AJ-D350) then the 7225 Time Code/ Status converter is used to provide time code and VTR status to the 5010-SIE. The 7225 receives LTC from the timecode track of the VTR and machine status from its parallel remote control port, and converts this information into a serial data stream that is compatible with the Panasonic AJ-D350's remote port. The 7225 serial port is connected to the 5010-SIE serial remote port. Power for the 7225 is obtained from an external DC power pack.

2.6.1. Model 7225 Rear Panel Connections

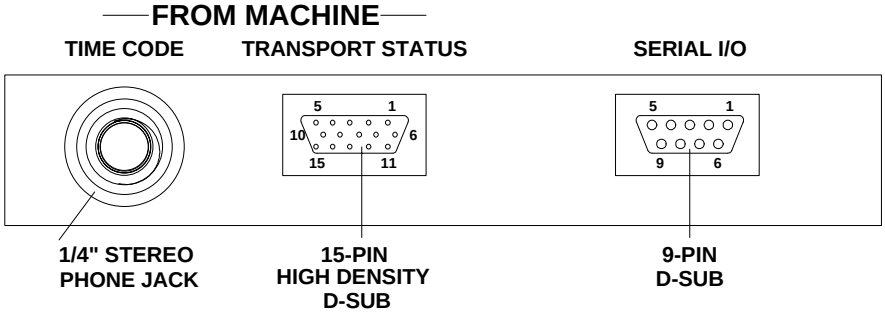

Figure 2-2: 7225 Rear Panel Connections

SERIAL I/O: A 9 pin female 'D' connector for connection to the 5010-SIE Source ID Encoders

Pin	Description
1	not used
2	not used
3	do not connect
4	not used
5	RS-232 Receive
6	Signal Ground
7	not used
8	RS 232 Transmit
9	not used

TRANSPORT STATUS: A 15 pin female high density 'D' connector for connection to tallies from the VTR. Each input has an internal 47 K ohm pull-up to +5 volts.

Pin	Description
1	Machine Select 1
2	Machine Select 2
3	Machine Select 3
4	Stop
5	Play
6	Fast Forward
7	Rewind
8	Record
9	Edit
10	Standby
11	Ground
12	Pause
13	Remote
14	Eject
15	Spare

LTC CONNECTION 1/4 " Stereo phone jack for connection if incoming LTC from the VTR. Connect the balanced LTC from the VTR to the Tip and Ring connections and the ground to the Sleeve.

POWER 12V DC Power input from power adaptor

2.6.2. Connecting The 5010-SIE To The 7225 Converter

The wiring diagram below can be used to make an appropriate cable.

5010-SIE END 9 PIN MALE "D"		7225 END 25 PIN MALE "D" TYPE	
DESCRIPTION	PIN	PIN	DESCRIPTION

RS-232 Transmit	5	----------	5	RS-232 Receive
Ground	6	----------	6	Signal Ground
RS-232 Receive	8	----------	8	RS-232 Transmit

Figure 2-3: 5010-SIE to 7225 Time Code / Status Converter Cable

2.6.3. Connecting the VTR Parallel Remote Control Port to the 7225 Converter

Figure 2-4 to Figure 2-7 are cable diagrams for connecting the 7225 to various VTR's. Machine Select 1,2 and 3 signals tell the 7225 what type of VTR is connected.

7225 END 15 PIN MALE HIGH DENSITY "D" AMP #748364-1				BVU 800 END 36 PIN TRW #77-30360 OR EQUIVALENT
DESCRIPTION	**PIN**		**PIN**	**DESCRIPTION**
Machine Select 1	1	----------	35	Ground
Machine Select 2	2	----------	35	Ground
Machine Select 3	3	----------	35	Ground
Stop	4	----------	16	Stop
Play	5	----------	13	Forward
Fast Forward	6	----------	12	Fast Forward
Rewind	7	----------	14	Rewind
Record	8	----------	18	Record
Edit	9	----------	19	Insert
Standby	10	----------		
Ground	11	----------	36	Ground
Pause	12	----------		
Remote	13	----------		
Eject	14	----------	15	Standby
Spare	15	----------		

Figure 2-4: 7225 To BVU 800 Parallel Tally Cable Wiring List

7225 END 15 PIN MALE HIGH DENSITY "D" AMP #748364-1			BVW 75 END 36 PIN TRW #77-30360 OR EQUIVALENT	
DESCRIPTION	**PIN**		**PIN**	**DESCRIPTION**
Machine Select 1	1	----------		
Machine Select 2	2	----------	35	Ground
Machine Select 3	3	----------	35	Ground
Stop	4	----------	16	Stop
Play	5	----------	13	Play
Fast Forward	6	----------	12	Fast Forward
Rewind	7	----------	14	Rewind
Record	8	----------	18	Record
Edit	9	----------	19	Cut In
Standby	10	----------		
Ground	11	----------	36	Ground
Pause	12	----------		
Remote	13	----------	34	Remote
Eject	14	----------	15	Standby
Spare	15	----------		

Figure 2-5: 7225 TO BVW 75 Parallel Tally Cable Wiring List

7225 END 15 PIN MALE HIGH DENSITY "D" AMP #748364-1				BVH 2000 END 50 PIN MALE "D" TYPE OR EQUIVALENT
DESCRIPTION	**PIN**		**PIN**	**DESCRIPTION**
Machine Select 1	1	----------	33	Ground
Machine Select 2	2	----------		
Machine Select 3	3	----------	33	Ground
Stop	4	----------	43	Stop
Play	5	----------	47	Forward
Fast Forward	6	----------	40	Fast Forward
Rewind	7	----------	37	Rewind
Record	8	----------	24	Record
Edit	9	----------	27	Edit
Standby	10	----------	46	Stand By On
Ground	11	----------	33	Ground
Pause	12	----------		
Remote	13	----------	48	Remote
Eject	14	----------		
Spare	15	----------		

Figure 2-6: 7225 TO BVH 2000 Parallel Tally Cable Wiring List

7225 END 15 PIN MALE HIGH DENSITY "D" AMP #748364-1				AU 600 END 50 PIN MALE "D" TYPE OR EQUIVALENT
DESCRIPTION	**PIN**		**PIN**	**DESCRIPTION**
Machine Select 1	1	----------		
Machine Select 2	2	----------		
Machine Select 3	3	----------	47	Ground
Stop	4	----------	31	Stop
Play	5	----------	28	Play
Fast Forward	6	----------	29	Fast Forward
Rewind	7	----------	30	Rewind
Record	8	----------	27	Record
Edit	9	----------	33	Cut In
Standby	10	----------	41	Stand By
Ground	11	----------	50	Ground
Pause	12	----------	32	Pause
Remote	13	----------	42	Remote
Eject	14	----------	24	Unthread
Spare	15	----------		

Figure 2-7: 7225 TO AU 660 Parallel Tally Cable Wiring List

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3. OPERATING INSTRUCTIONS

The model 5010-SIE Source ID Encoder combines the latest LSI technology with sophisticated microcontroller firmware to provide a powerful, flexible Source ID Encoder. The model 5010-SIE contains a Vertical Interval Time Code (VITC) generator and a high resolution character inserted. A 16 digit alphanumeric display can be quickly delegated to show the required data.

The character inserter provides an on screen programming menu system, which is used to configure the various operating modes. The use of drop down menus and dedicated programming keys, allows the model 5010-SIE to be conveniently configured for particular customer requirements.

3.1. FRONT PANEL OVERVIEW

Operational control is handled by 10 front panel keys. Six LED's provide operational status at a glance.

Figure 3-1: Front Panel Layout

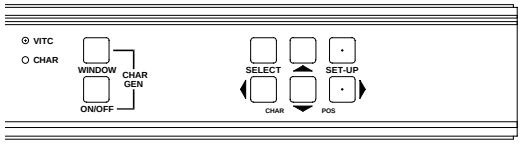
The display area consists of an 16 digit alphanumeric display, 6 LED status indicators and an 10 pushbutton keypad.

The keypad is used to program the source ID message that will be encoded, to control the front panel menu system, to position the character display windows, and to provide control of the front panel display. When the **SHIFT** key is held down, the meanings of some of the keys are modified, gaining quick access to a wider variety of functions. (Throughout this manual **SHIFT +** indicates that you should hold down the **SHIFT** key while pressing the second key.)

A front panel programming menu provides a quick and simple method of configuring the 5010-SIE Source ID Encoder for your application.

Sections 3.4 to 3.9 gives detailed information on the specific operations required to control the 5010-SIE.

3.1.1. The Setup Pushbutton Group



The Setup key group consists of the **SELECT, SETUP** and ←, →, ↑, ↓ keys and is used to navigate the front panel programming menu system, to position character windows and to enter the source ID message.

SETUP Enters the Setup mode which is used to set up various modes of operation. Pressing **SETUP** again while in this mode exits the Setup mode. (See also section 3.3.)

SHIFT + SETUP Enters the Source ID programming mode. (The front panel display must be showing SRC ID before you can enter the Source ID Programming mode). In this mode the user can program the source ID message that will be encoded into the VITC and displayed in the Source ID character window. Pressing SETUP in this mode exits the Source ID programming mode and returns to normal operating mode without saving the entered data. (See also section 3.7)

SELECT When in the Setup mode the **SELECT** key is used to activate/deactivate sub menus from the drop down menu

When in the Source ID programming mode, the **SELECT** key is used to accept the Source ID message that has been entered.

↑ ↓ ← → When in the Setup mode, the ↑ ↓ ← → arrow keys are used to move to various items in the menu system. (See also section 3.3.)

When in the Source ID programming mode, the ← & → arrow keys are used to move between characters in the message and the ↑ & ↓ arrow keys are used to change the characters of the message. (See also section 3.7.)

When in the VCG window select mode, the arrow keys are used to position the individual character windows on the screen. (See also section 3.8.1.)

When not in the Setup mode, Source ID programming mode or the VCG window select mode, the arrow keys are used to position all the character windows on the screen. (See also section 3.8.2.)

3.1.2. The Character Window Pushbutton Group

CHAR GEN WINDOW Initiates VCG window select mode and highlights the Time VCG window. Use the arrow keys to move the window, use the **CHAR GEN ON/OFF** key to turn the window on or off. Press the **WINDOW** key again to select the SRC ID VCG window. Press the **WINDOW** key again to select the STATUS VCG window. Press the **WINDOW** key a fourth time to return to the normal VCG display mode.

CHAR GEN ON/OFF Turns the character generator ON and OFF. When in the VCG window select mode the **CHAR GEN ON/OFF** key is used to turn individual windows ON and OFF.

3.1.3. The Display-Pushbutton Group

DISPLAY Selects what data is being displayed on the front panel. Each time it is pressed it cycles to the next display data.

3.1.4. An Overview of the Status Indicators

There are 6 status indicators located on the front panel that show operational status of the 5010-SIE at a glance.

TIME Indicates that 5010-SIE is transferring time information received from the serial port into the time bits of the Source ID VITC. When it is blinking, it indicates that it is programmed to encode time information but there is no incoming time data on the serial port.

STATUS Indicates that 5010-SIE is transferring VTR Status information received from the serial port into the user bits of the Source ID VITC. When it is blinking, it indicates that it is programmed to encode status information but there is no incoming status data on the serial port.

COMM Indicates that communications to the VTR or 7225 is present.

VIDEO Indicates that the gen-lock reference video is present. If it is blinking, it indicates a valid video signal is not present.

VITC Indicates that the VITC keyer is enabled.

CHAR Indicates that the character generator keyer is enabled.

3.2. FRONT PANEL DISPLAY FUNCTIONS

The **DISPLAY** key is used to select which data is being displayed in the alphanumeric display. Each time the **DISPLAY** key is pressed, the front panel display cycles to the next available display. Currently there are three types of display data:

SRC ID: VTR-10	Source ID Message
SRC STATUS: STOP	VTR Status
TIME 12:34:56:00	VTR Timecode

3.2.1. Special Front Panel Indicators

The following special indicators are used between the seconds and frames digits of the front panel time display to identify non drop frame and drop frame code (NTSC only)

Non Drop Frame	Colon (:)
Drop Frame (NTSC)	Period (.)

3.3. ON SCREEN PROGRAMMING MENU - OVERVIEW

The key to the operational flexibility of the model 5010-SIE lies in the powerful on screen programming menu system which uses the built in character generator. This method of configuring the model 5010-SIE is quick and simple, guiding you to the correct setup for your application. Six front panel pushbuttons (🡐, 🡒, 🡑, 🡓, and **SELECT** and **SETUP**) are used to cycle through the various items on the programming menu.

The 5010-SIE menu system consists of a main menu with three drop down menus. The titles of each of the drop down menus are shown on the top line of the character display. Selecting an item on one of the drop down menus reveals a sub-menu showing the choices for that item. Figure 3-2 is an overview of the on screen menu system and shows all the menu choices and where you will find the menu items. Note that some menu choices will be hidden or show the message **NOT APPLICABLE IN CURRENT MODE** depending on the programmed mode of operation.

GENERATOR
- **SRC ID MODE**
  - 5 SRC ID
  - 9 SRC ID
  - 5 SRC ID+STS
  - TIME 5 SRC ID
  - TIME 9 SRC ID
  - TIME 5 SRC ID+STS
- **VITC KEYER**
  - OFF
  - ON
- **VITC LINES**
  - GEN VITC LINES
  - LINE 1 LINE 2
  - 10 20
- **VTR RDR MODE**
  - LTC
  - VITC
  - AUTO

VCG
- **CHAR SIZE**
  - TINY
  - SMALL
  - LARGE
- **CHAR STYLE**
  - WHITE
  - WHITE ON BLACK
  - BLACK
  - BLACK ON WHITE
- **VCG FRAMES**
  - DISPLAY
  - BLANK
- **VCG FIELDS**
  - DISPLAY
  - BLANK
- **VCG SYMBOLS**
  - DISPLAY
  - BLANK

CONFIG
- **VIDEO TYPE**
  - VIDEO TYPE FIXED TO NTSC
- **HORZ CHAR SIZE**
  - HORIZONTAL
  - CHAR SIZE = 10
  - ← OR → TO ADJUST
- **DISPLAY LEVEL**
  - DISPLAY LEVEL = 2
  - ↑ ↓ TO ADJUST
- **FACTORY RESET**
  - ** WARNING **
  - THIS COMPLETELY RESETS UNIT
  - PRESS THE SHIFT + SELECT KEY TO PROCEED
  - PRESS THE SELECT KEY TO CANCEL

Figure 3-2: On Screen Programming Menu Overview

Abbreviated menu descriptions are also shown on the front panel display allowing the menu system to be used without a video monitor. Figure 3-3 shows an overview of the front panel menu descriptions for the SETUP menu. When the drop down menu items are selected, they are shown in UPPERCASE. When the sub menus are selected, they are shown in lower case.

GEN SRC ID MODE
- Mod 5 id
- Mod 9 id
- Mod 5 id+sts
- Mod tim 5 id
- Mod tim 9 id
- Mod tim 5 id+sts

GEN VITC KEYER
- Vitc keyer off
- Vitc keyer on

GEN VITC LINES
- Gvitc line1 = 10
- Gvitc line2 = 20

GEN VTR RDR MODE
- Vtr rdr mod ltc
- Vtr rdr mod vitc
- Vtr rdr mod auto

VCG CHAR SIZE
- Size tiny
- Size small
- Size large

VCG CHAR STYLE
- Style white
- Style wh on blk
- Style black
- Style bl on wh

VCG FRAMES
- Frames display
- Frames blank

VCG FIELDS
- Fields display
- Fields blank

VCG SYMBOLS
- Symbols display
- Symbols blank

VIDEO TYPE
- Vtype fixed ntsc

HORZ CHAR SIZE
- Horz size 02

DISPLAY LEVEL
- Dsplay level = 1

FACTORY RESET
- Shift + select

Figure 3-3: Overview of Front Panel Menu

To enter the on screen programming menus, press the **SETUP** key. The character generator will show the last format screen that was used with the currently selected item highlighted. The two horizontal arrow keys (🡐, 🡒) allow you to move horizontally to another drop down menu when the sub menu is hidden. Using these two keys you can quickly scan the entire menu system for the item you wish to change.

The two vertical arrow keys (🡑, 🡓) allow you to move vertically within the drop down menus. When you have selected the desired menu item, press the **SELECT** key to reveal the sub menu choices for that item. Use the two vertical arrow keys (🡑, 🡓) to move vertically within the sub menu. When you have selected the desired sub menu choice press the **SELECT** key to hide the sub-menu and return to the drop down menu.

When you have made all the desired changes, press the **SETUP** key to return to the normal display mode.

Changes made using the SETUP menu are only activated when you exit the SETUP menu and return to normal display mode.

The GENERATOR drop down menu is used to program various generator modes Source ID Mode, VITC Keyer On/Off, VITC Generator Line numbers, etc. The VCG drop down menu is used to program the size and style of the character generator and whether the time code frames will be displayed or not (See section 3.5). The CONFIG drop down menu is used to program various hardware related items such as display brightness, horizontal character size, etc., and is also used to reset the 5010-SIE to its factory defaults. (See section 3.5).

SRC ID MODE
- 5 SRC ID
- 9 SRC ID
- 5 SRC ID+STS
- TIME 5 SRC ID
- TIME 9 SRC ID
- TIME 5 SRC ID+STS

To aid in finding the descriptions of the various menu items in sections 3.4 to 3.6, the drop down menu items and its sub menu items are shown in the margin of the manual, next to the description as shown.

3.4. PROGRAMMING THE GENERATOR SETUP FUNCTIONS

The GENERATOR drop down menu is used to program various generator modes such as selecting source ID encoding modes, VITC keyer enable, VITC generator line numbers, etc. Figure 3-4 shows the items on the GENERATOR drop down menu. The following descriptions appear in the order they appear on the menu.

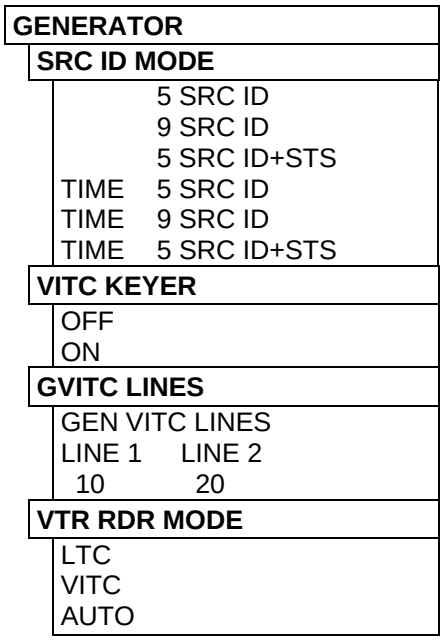
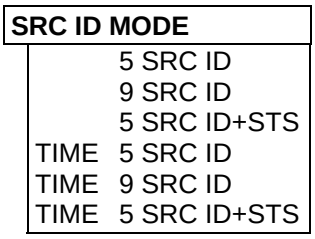


Figure 3-4: GENERATOR Drop Down Menu

3.4.1. Configuring the Generator Operating Modes



The **SRC ID MODE** menu item is used to choose a method of encoding the source ID information. There are 3 parts of the Source ID - time (usually VTR time code), the source ID message, and VTR Status. The source ID message itself may be in one of two formats. The first format consists of a five alphanumeric character message followed by a source number from 000 to 999. The source message and number are usually separated by a dash(-) in the source id display. The 5 character ID format takes two frames of VITC to transmit a complete message. The second format consists of a nine alphanumeric character message. The time and status portions of the encoded source ID may be turned on and off with this menu also. The 9 character ID format takes three frames

5 SRC ID Turns off the time and status and encodes the 5 character ID format.

9 SRC ID Turns off the time and status and encodes the 9 character ID format.

5 SRC ID + STS Turns off the time, turns on the status and encodes the 5 character ID format.

TIME 5 SRC ID Turns on the time, turns off the status and encodes the 5 character ID format.

TIME 9 SRC ID Turns on the time, turns off the status and encodes the 9 character ID format.

TIME 5 SRC ID + STS Turns on the time and status and encodes the 5 character ID format.

3.4.2. Turning the VITC Generator On

VITC KEYER
OFF
ON

The VITC KEYER menu item controls whether the VITC keyer will be on or off.

Select **OFF** to disable the VITC Keyer

Select **ON** to enable the VITC keyer.

3.4.3. Selecting the Lines to Generate VITC On

VITC LINES	
GEN VITC LINES	
LINE 1	LINE 2
10	20

The **VITC LINES** menu item is used to select the lines on which the VITC will be inserted.

When the **VITC LINES** sub menu is first selected, the LINE 1 number will be in reverse video indicating it can be changed. Press the up and down (↑, ↓) keys to change LINE 1. Press the right (→) key to highlight LINE 2, indicating that it can be changed. Press the up and down (↑, ↓) keys to change LINE 2.

The user will have to determine by experience the most suitable lines for generating VITC according to the following criteria.

It is recommended that two non-adjacent lines be used, however adjacent lines and a single line (selected when both lines are the same) are permitted.

3.4.4. Selecting the Generator Drop Frame Mode

In NTSC, the video frame rate of approximately 29.97 frames per second causes an error between real time and 'colour time'. To overcome this problem, the drop frame mode was created. This mode compensates for the approximate 4 minute per day error by dropping the first two frame counts (0, 1) at the start of each minute, except minutes 0, 10, 20, 30, 40, and 50. A drop frame flag bit is set in the code when the drop frame format is used. When the SRC ID mode is set to one of the modes that encodes

time information, the generator drop frame mode follows the source of the time information (usually VTR time)

3.4.5. Configuring Whether the 5010-SIE Will Use LTC or VITC from the VTR

The **VITC RDR MODE** menu item on the GENERATOR menu controls whether the 5010-SIE will use LTC or VITC from the VTR when it is encoding time information.

VTR RDR MODE
LTC
VITC
AUTO

Select **LTC** to use the LTC reader in the VTR.

Select **VITC** to use the VITC reader in the VTR.

Select **AUTO** to use whichever reader the VTR is using. The VTR must be set to the Auto Reader mode.

3.5. PROGRAMMING THE CHARACTER GENERATOR FUNCTIONS

VCG
CHAR SIZE
TINY
SMALL
LARGE
CHAR STYLE
WHITE
WHITE ON BLACK
BLACK
BLACK ON WHITE
VCG FRAMES
DISPLAY
BLANK
VCG FIELDS
DISPLAY
BLANK
VCG SYMBOLS
DISPLAY
BLANK

Figure 3-5: VCG Drop Down Menu

The VCG drop down menu is used to select various characteristics of the VCG display. Figure 3-5 shows the items on the VCG drop down menu. The following descriptions appear in the order they appear on the menu.

CHAR SIZE
- TINY
- SMALL
- LARGE

The **CHAR SIZE** menu item is used to select one of three sizes for the character generator's display. The on screen format menus always use the small character size.

The **TINY** character size occupies 8 lines per field for each character row. This permits 28 vertical positions on the raster in NTSC or 32 in PAL.

The **SMALL** character size occupies 16 lines per field for each character row. This permits 14 vertical positions on the raster in NTSC or 16 in PAL.

The **LARGE** character size occupies 32 lines per field for each character row. This permits 7 vertical positions on the raster in NTSC or 8 in PAL.

CHAR STYLE
- WHITE
- WHITE ON BLACK
- BLACK
- BLACK ON WHITE

The **CHAR STYLE** menu item is used to select whether the background mask will be used and whether the characters will be white or black. The on screen format menus are always white characters keyed into a black background mask.

Select **WHITE** to disable the background and key white characters directly into the picture.

Select **WHITE ON BLACK** to key white characters on a black background mask into the picture.

Select **BLACK** to disable the background and key black characters directly into the picture.

Select **BLACK ON WHITE** to key black characters on a white background mask into the picture.

VCG FRAMES
- DISPLAY
- BLANK

The **VCG FRAMES** menu item is used to select whether the frames will be shown when the time is displayed.

Select **DISPLAY** to display the frames of the time displays.

Select **BLANK** to blank the frames of the time displays. When Frames are blanked, fields will also be blanked.

VCG FIELDS
- DISPLAY
- BLANK

The **VCG FIELDS** menu item is used to select whether the fields will be shown when the time is displayed.

Select **DISPLAY** to display the fields of the time displays.

Select **BLANK** to blank the fields of the time displays.

VCG SYMBOLS
DISPLAY BLANK

The **VCG SYMBOLS** menu item is used to select whether ⅄ symbol will be shown in front of the source ID displays of the VCG.

Select **DISPLAY** to display the VCG symbols.

Select **BLANK** to blank the VCG symbols.

3.6. PROGRAMMING THE OVERALL CONFIGURATION FUNCTIONS

The CONFIGURATION drop down menu is used to select the video standard, and to set various hardware related parameters such as display brightness. It is also used to reset the 5010-SIE to its factory defaults.

The CONFIGURATION menu items are normally required only during installation.

Figure 3-6 shows the items on the CONFIGURATION drop down menu. The following descriptions appear in the order they appear on the menu.

CONFIG
VIDEO TYPE
VIDEO TYPE FIXED TO NTSC
HORZ CHAR SIZE
HORIZONTAL CHAR SIZE = 10 ← OR → TO ADJUST
DISPLAY LEVEL
DISPLAY LEVEL = 2 ↑ ↓ TO ADJUST
FACTORY RESET
** WARNING ** THIS COMPLETELY RESETS UNIT PRESS THE SHIFT + SELECT KEYS TO PROCEED PRESS THE SELECT KEY TO CANCEL

Figure 3-6: CONFIG Drop Down Menu

3.6.1. Selecting the Video Standard

VIDEO TYPE
VIDEO TYPE FIXED TO NTSC

The **VIDEO TYPE** menu item is used to select the video standard of the program video. For the 5010-SIE the video type is fixed to NTSC

3.6.2. Adjusting The Horizontal Character Size

HORZ CHAR SIZE
HORIZONTAL CHAR SIZE = 10
← → TO ADJUST

The **HORZ CHAR SIZE** menu item is used to adjust the character width. Use the ← and → keys to adjust the right side of the raster. You will see the width of the raster adjust as you press the ← and → keys.

3.6.3. Adjusting the Front Panel Display Brightness

DISPLAY LEVEL
DISPLAY LEVEL = 2
↑ ↓ TO ADJUST

The **DISPLAY LEVEL** menu item is used to adjust brightness of the front panel display. Use the ↑ and ↓ keys to adjust. You will see the front panel brightness change as you press the ↑ and ↓ keys.

3.6.4. Resetting the 5010-SIE to its Factory Defaults

FACTORY RESET
** WARNING **
THIS COMPLETELY RESETS UNIT

PRESS THE SHIFT + SELECT KEYS TO PROCEED
PRESS THE SELECT KEY TO CANCEL

The **FACTORY RESET** menu item is used to reset the 5010-SIE to the factory default parameters. Press the **SHIFT + ENTER** keys when the sub menu screen is displayed to reset the 5010-SIE to factory defaults. The 5010-SIE will perform a power-on configuration before returning to the normal operating mode.

3.7. PROGRAMMING A SOURCE ID MESSAGE INTO THE ENCODER

The 5010-SIE Source ID Encoder is capable of encoding a source ID message in one of two formats.

3.7.1. 5 Character Source ID Format

The first format consists of up to 5 alpha-numeric characters followed by a 3 digit source number. Source ID messages are shown in the following format:

AAAAA-NNN

The A represents alpha-numeric message characters and the N represents message number digits. Leading spaces in the source ID message are automatically blanked and the messages are right justified (moved adjacent to the dash '-') by the encoder and local character display. Leading zeros

of the Source ID number are also blanked and the numbers are left justified (moved adjacent to the dash '-').

3.7.2. 9 Character Source ID Format

The second format consists of up to 9 alphanumeric characters, and are shown in the following format:

AAAAAAAAA

The A represents alpha-numeric message characters. Leading spaces in the source ID message are automatically blanked and the messages are right justified.

3.7.3. Source ID Data Entry Mode

A special data entry mode is provided to allow the user to program the source ID message. Press DISPLAY one or more times until the SRC ID is displayed on the front panel. Press **SHIFT + SETUP** to enter the Source ID programming mode. The four arrow keys (↑, ↓, ←, →) are used to select individual characters in the message and change them.

The following detailed procedure should be used to enter the source ID message.

1. Press DISPLAY one or more times until the SRC ID is displayed on the front panel.

2. Press the **SHIFT + SETUP** keys to enter Source ID programming mode. The display will show:

   `ID AAAAA-NNN` If you are in the 5 character mode

   or

   `ID AAAAAAAAA` If you are in the 9 character mode

   The leftmost character of the message will blink indicating that it is selected for entry. If the character is a space then it will be shown as a blinking underline (__) character.

3. Use the ↑ & ↓ arrow keys to change the character. Only the letters A-Z, the numbers 0 to 9 and a space are permitted for the message characters. Only the numbers 0 to 9 are permitted for the message number characters.

4. Use the ← or → arrow keys to select the next character to be entered.

5. Repeat steps 2 and 3 until all the characters have been entered.
6. When you have entered the desired Source ID message press **SELECT** to accept the new Source ID message. If you want to

exit the Source ID programming mode without changing the programmed message press the **SETUP** key.

3.8. CHARACTER GENERATOR FUNCTIONS

Two separately positionable character windows displaying Time or Source ID/Status (user bits) are available. Although the Source ID and Status windows move together, they can be independently turned on and off. The four arrow keys (↑, ↓, ←, →) control the position of all the windows. The **CHAR GEN ON/OFF** key selects whether the video character generator (VCG) keyer is on or off. The use of these keys in combination with the **CHAR GEN WINDOW** key selects which windows are displayed and their position on the screen. The CHAR SIZE item of the Setup menu is used to select character size.

3.8.1. Selecting and Positioning the Individual Character Inserter Windows

Press **CHAR GEN WINDOW** to enable the window select mode. All the character windows will appear on the screen with the window for the Time highlighted. Use the arrow keys (↑, ↓, ←, →) to position the Time window on the screen. Use the **CHAR GEN ON/OFF** key to turn the Time window on or off. Press the **CHAR GEN WINDOW** key to highlight the Source ID window. Use the **CHAR GEN ON/OFF** key to turn the Source ID window on or off and the arrow keys to move it to the desired location. Press the **CHAR GEN WINDOW** key to highlight the Status window. Use the **CHAR GEN ON/OFF** key to turn the Status window on or off and the arrow keys to move it to the desired location. Press the **CHAR GEN WINDOW** key to return to normal display mode.

For example, to move only the Time window down, leaving the Source ID/ Status window in the same place, press **CHAR GEN WINDOW** and press the ↓ key. Press the **CHAR GEN WINDOW** key three times to return to the normal display mode.

Note that the Source ID and Status windows always move together.

3.8.2. Positioning the Overall Character Display

In the normal VCG display mode, when none of the windows are highlighted, the arrow keys (↑, ↓, ←, →) move all the displayed windows by the same relative amount. For example, to move the time and source ID/status windows both down by one line, press the ↓ key.

3.8.3. Character Generator On/ Off Controls

There are several factors that control whether the character generator will be turned on or off. In order of priority these are:

1. When the VTR is in Play the characters will always be turned off. The CHAR LED will blink if the characters were turned off by the PLAY mode of the VTR.

2. An On Air remote control tally input is provided on the 5010-SIE rear panel. (See section 3.9 for connector pinouts). When this input is grounded the characters will be turned off. The CHAR LED will blink if the characters were turned off by the On Air input.

3. The **CHAR GEN ON/OFF** key on the front panel alternately turns the characters on and off.

4 The VCG Keyer On/Off remote control input on the rear panel alternately turns the characters on and off. This input has equal priority with the front panel **CHAR GEN ON/OFF** key.

5. If the source does not have timecode associated with it, (SRC TIME setting is off) the time window will be turned off.

   If the source does not have status associated with it, (SRC STATUS setting is off) the status window will be turned off.

   If the 5010-SIE loses communications to the VTR (or 7225) the time and status windows will be turned off.

6. The individual windows can be turned off using the **CHAR GEN ON/OFF** key in window select mode.

3.8.4. Special VCG Indicators

The following special indicators are used between the seconds and frames digits of the time window in the character inserter to identify non drop frame and drop frame code.

Non Drop Frame	Colon (:)
Drop Frame (NTSC)	Period (.)

3.9. PARALLEL REMOTE CONTROL FUNCTIONS

A 9 pin D connector located on the rear panel labelled REMOTE CTL provides 6 parallel control inputs for remote control of some of the model 5010-SIE functions. The pinout of the D connector is as follows:

Pin		Description
1		Frame Ground
	6	not used
2		VCG On/Off
	7	not used
3		On Air Tally Input
	8	not used
4		not used
	9	reserved - do not connect
5		reserved - do not connect

VCG ENABLE Provides an alternate method of turning the character inserter generator On and Off. The character inserter is toggled On or Off by a high to low transition on this input. This input has equal priority with the front panel **CHAR GEN ON/OFF** key.

ON AIR TALLY INPUT When closed to ground all the VCG windows will be turned off.

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4. TECHNICAL DESCRIPTION

4.1. OVERVIEW

The model 5010-SIE Source ID Encoder combines the latest LSI technology with sophisticated microcontroller firmware to provide a powerful, flexible system. A 16 digit alphanumeric display can be quickly delegated to show the required data.

The character inserter provides an on screen programming menu system, which is used to configure the various operating modes. The use of drop down menus and dedicated programming keys, allows the model 5010-SIE to be conveniently configured for particular customer requirements.

4.2. JUMPERS AND SWITCHES

Figure 4-2 shows the location and function of the switches and jumpers inside the model 5010-SIE. The jumper positions marked in **bold** face type are the default settings.

4.2.1. DIP Switch Functions

The main circuit board of the model 5010-SIE contains an 8 position DIP switch which is used to invoke various diagnostic and calibration functions. The functions of each switch are described below.

Switch	Name	Normal	Function when Open	Function when Closed
1	Not used	Open		
2	Not used	Open		
3	Not used	Open		
4	Not used	Open		
5	Not Used	Open		
6	Factory Reset	Open	none	Resets 5010-SIE to factory defaults on power up
7	Diagnostics	Open	none	Enters diagnostics mode on power up
8	Not used	Open		

Figure 4-1: DIP Switch Functions

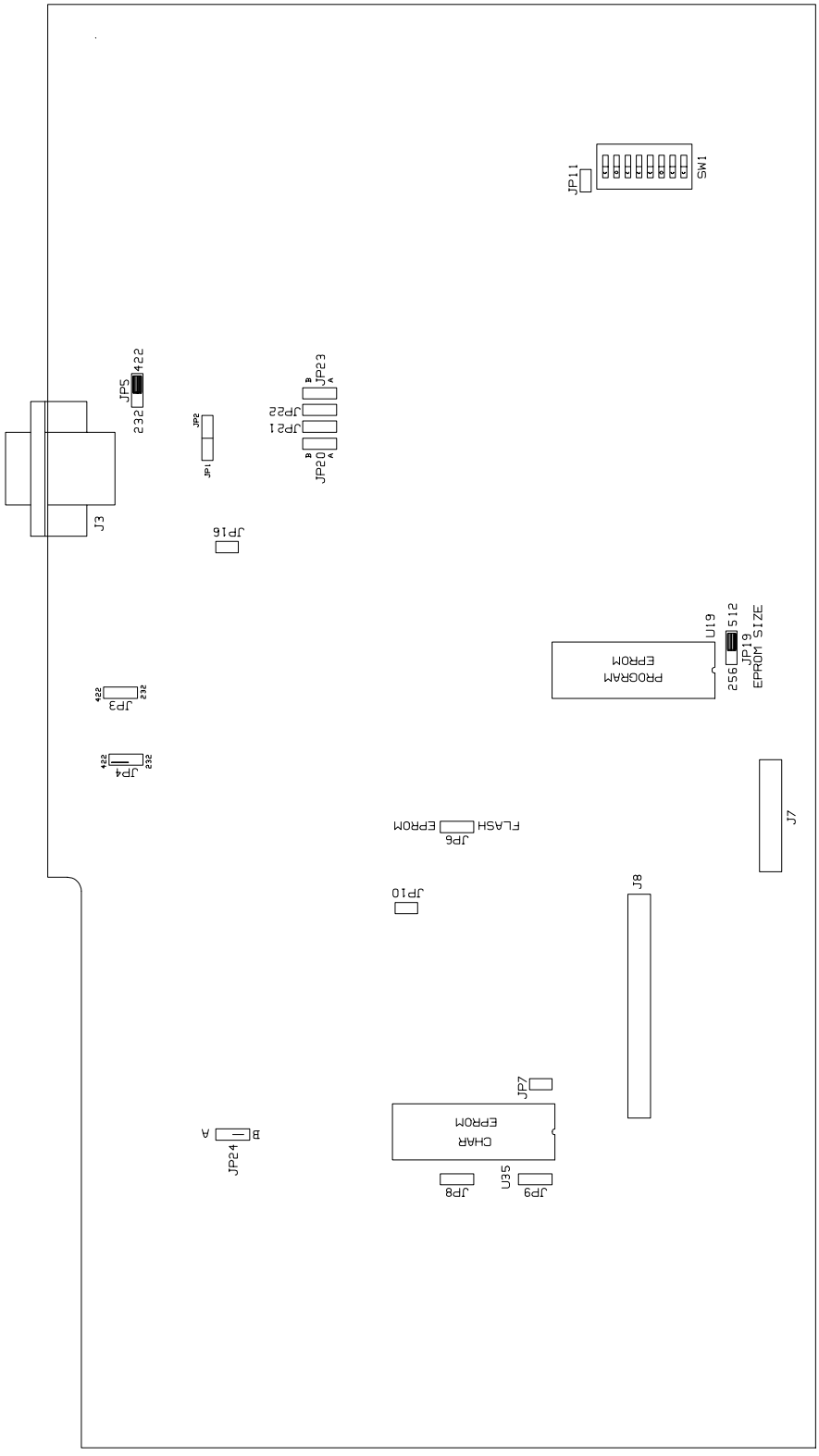

Figure 4-2: Main Board Jumper Locations

4.2.2. Jumper Functions - Main Board

All jumpers except JP9 are printed circuit board links and are installed in the default position. To change the position, the board link must be cut and a wire link must be installed in the desired location.

JP1	Parallel I/O 1 (pin 9)	**Installed**	When link is installed, Output 1 has 4.7K pull-up to +5 Volts
		Open	When link is cut open, Output 1 is Open collector
JP2	Parallel I/O 2 (pin 5)	**Installed**	When link is installed, Output 2 has 4.7K pull-up to +5 Volts
		Open	When link is cut open, Output 2 is Open collector
JP3	Editor Serial I/O		Not installed for 5010-SIE
JP4	VTR Serial I/O		Not installed for 5010-SIE
JP5	Remote Serial I/O	**232**	Configures serial I/O for RS-232
		422	Configures serial I/O for RS-422
JP6	FLASH / EPROM		Not installed for 5010-SIE
JP7	Char EPROM 512K	**Open**	Used when Char EPROM is 128K or 256K.
		Installed	Connects Char EPROM U35 address A15 to LCA U36 when Char EPROM is 512K. Jumper JP9 must also be in the '256' position.
JP8	Char EPROM CE	**Pin 2,3**	Board link installed connects Char EPROM CE to ground.
		Pins 1,2	Board link installed connects Char EPROM CE to +5 Volts after LCA loads.
JP9	Char EPROM Size	**128**	Board link installed connects Char EPROM U35 Address A14 to +5 volts for use with 128K size EPROM.
		256	Board link installed connects Char EPROM U35 Address A14 to LCA U36 for use with 256K size EPROM.
JP10			Not installed for 5010-SIE
JP11	Diagnostics 1		Not installed for 5010-SIE
JP16	Diagnostics 2		Not installed for 5010-SIE
JP19	MCU EPROM Size	**512**	Board link installed connects MCU EPROM U19 Address A15 to microprocessor A15 for use with 512K size EPROM.
		256	Board link installed connects MCU EPROM U19 Address A15 to +5 volts for use with 256K size EPROM.
JP20	UART RX		Not installed for 5010-SIE

JP21	UART TX		Not installed for 5010-SIE
JP22	MCU RX		Not installed for 5010-SIE
JP23	MCU TX		Not installed for 5010-SIE
JP24	VCG Video In	A	VITC Reader Video connected to RDR IN Loop. VCG video connected to Gen Video In loop.
		B	VITC Reader and VCG Video connected to either RDR IN Loop or Gen Video In loop as selected by U38.
		A & B	VITC Reader Video and VCG video connected to RDR IN Loop. U38 not installed.

4.2.3. Jumper Functions - VITC Generator Submodule

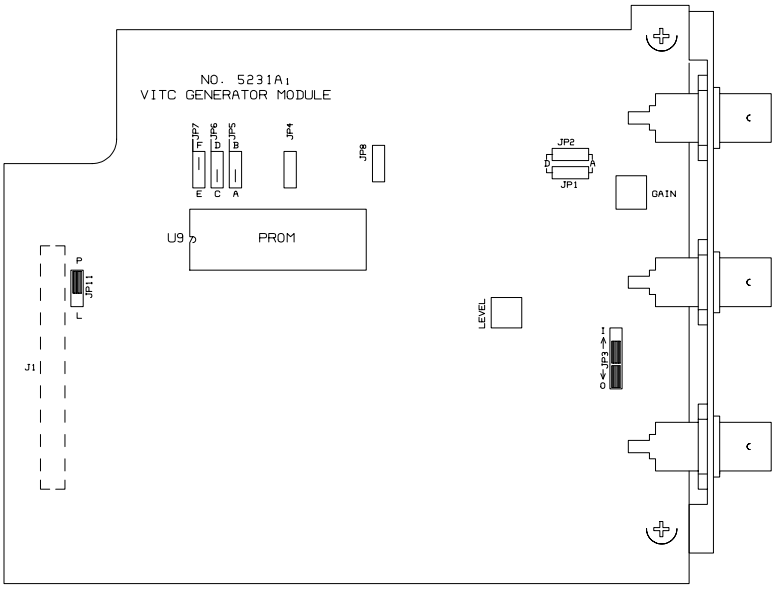

Figure 4-3: VITC Generator Sub-module Jumpers

JP1	Fill	**A**	Install for Analog Video Out
		D	Install for Digital Video Out
JP2	Key	**A**	Install for Analog Video Out
		D	Install for Digital Video Out
JP3	Video Out Sel	**O**	Selects Terminated Video In and assigns Out A and B as outputs
		I	Selects high impedance video in loop and Out B as an output.
JP4	VITC PROM CEl	**Pin 1,2**	Board link installed connects VITC EPROM CE to + 5 volts after LCA loads.
		Pin 2,3	Board link installed connects VITC EPROM CE to ground.
JP5	LCA Config Select	**A**	Default for use with VITC generator
JP6	LCA Config Select	**C**	Default for use with VITC generator
JP7	LCA Config Select	**F**	Default for use with VITC generator

4.3. CIRCUIT DESCRIPTION

The model 5010-SIE is a microcontroller based device functionally divided into the following hardware subsystems:

1 Microcontroller & I/O
2 Display and Pushbuttons
3 VITC Generator
7 Character generator video keyer
8 Character generator logic

The microcontroller, character generator logic and video processing circuits are all contained on the main circuit card (5200). The display and keypad circuitry is contained on a separate circuit board (5220) which plugs into the main board via a twenty conductor ribbon cable. The VITC generator circuitry is contained on a separate circuit board (5235) which plugs into the main board via a forty pin header. The relevant schematic drawings are shown in brackets for each section of the circuit. The heart of the model 5010 circuitry are two programmable logic array (LCA) devices. One LCA (U25) contains the support circuitry for addressing various devices on the board. The other LCA (U36) contains the character generator raster scanning logic. The VITC generator submodule LCA (U8) contains the VITC generator logic.

4.3.1. Microcontroller (5200-33)

At the heart of the model 5010-SIE is an 8032 microcontroller, (MCU) U17. Its three 8 bit bi-directional ports and 8 bit bus provide peripheral interfacing to the rest of the circuits. Program memory is contained on EPROM U19. Scratch pad and data RAM are provided internally by the MCU. An onboard oscillator, also part of the MCU, is crystal controlled. Its

15.36 MHz frequency is internally divided by 12, resulting in a processor operating frequency of 1.28 MHz.

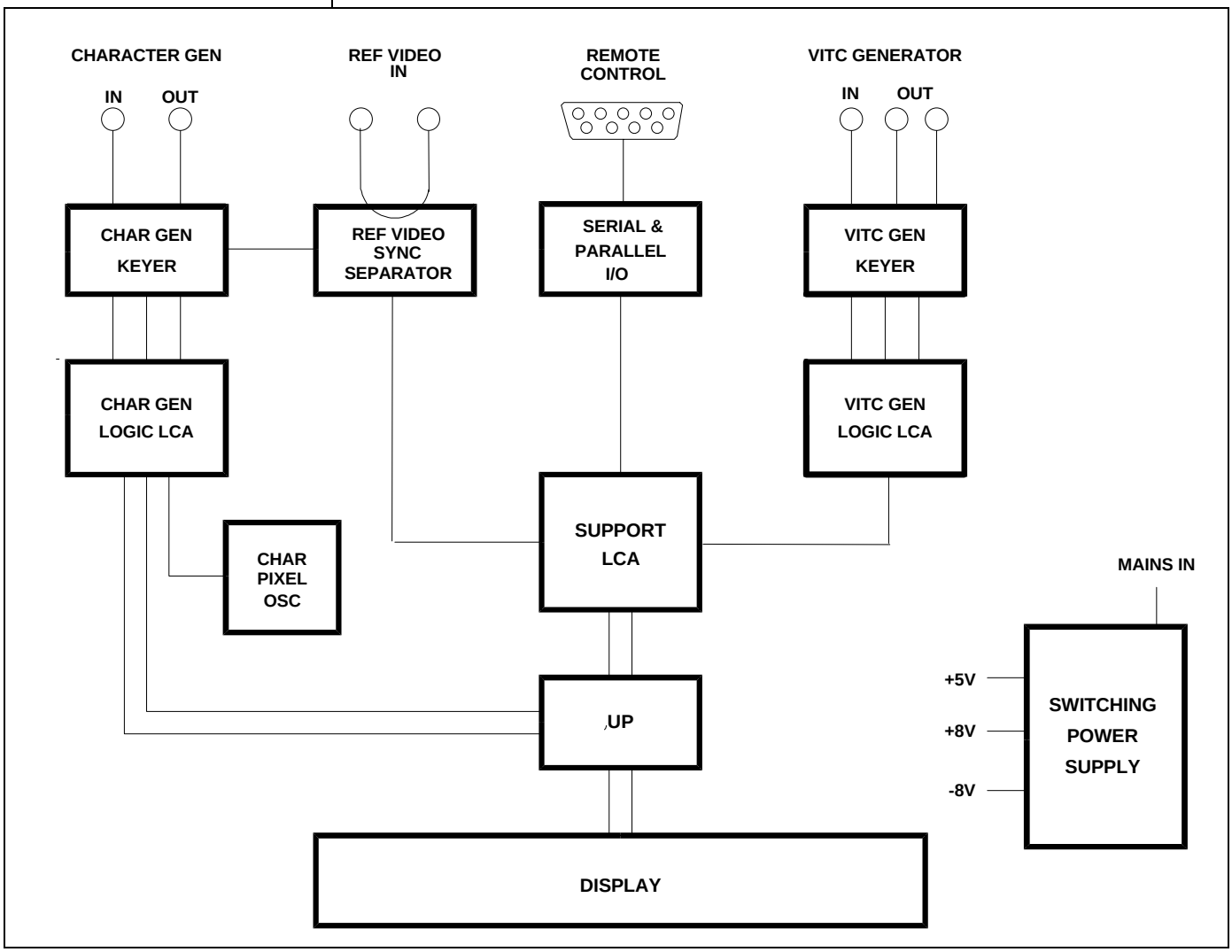

Figure 4-4: Block Diagram

4.3.2. Front Panel Display and Pushbuttons (5220-31)

A 16 digit alphanumeric display, and a 10 button keypad are contained on a separate circuit card (5220) which is connected to the main circuit board via a 20 conductor ribbon cable.

The 16 digit display is self scanning and contains its own character display memory. Data is written to the displays once per frame. Address Latch U1 generates chip enable and address information to the display devices to allow the MCU to write data to the display and control registers.

The status LED's are controlled by interface driver U3. This driver is accessed with a serial clock and data stream once per frame. When all the LED information has been shifted into the driver, it is latched there by the LEDSTB signal from the MCU (display header pin 10).

LED diagnostics can be invoked by holding down any key on power up. When any key is pressed, all the front panel LED's should come on. To exit LED test mode, remove and re-apply power to the unit.

The 10 pushbuttons are arranged in a 8 x 2 matrix. Data from 8 keys at a time is latched into U2 by signal SH/LD on U2 pin 1. Address decoder U1 selects which set of 8 switches is latched into U2 using enable lines A0 and A1. Each time a key is pressed, the MCU firmware generates a key scan code corresponding to the position of the key in the key matrix.

Keyboard diagnostics can be invoked by pressing any key during power up. The front panel display will show the message SCAN CODE and the keyboard scan code. When no keys are depressed, the key scan code is ??. Pressing a key will show the corresponding key scan codes, as shown in the table below. To exit the keyboard test, remove and re-apply power to the unit.

Key	Scan Code	Key	Scan Code
SHIFT	41	DISPLAY	01
VCG ON/OFF	02	VCG WINDOW	42
SELECT	45	SETUP	47
↕	46	←	05
↕	06	→	07

Figure 4-5: Keyboard Scan Codes

4.3.3. VITC Generator (5235-31 to 5235-33)

The 5235 video keyer submodule contains the VITC generator circuitry. Video in and out come directly from connectors mounted on the rear panel sub-panel. The MCU address and data bus are fed up the header from the main board. The majority of the logic for the VITC generator functions is contained in a programmable logic device (LCA) U8. Its program is loaded from EPROM U9 on power up

The VITC bit rate is generated by a crystal controlled oscillator consisting of XT1 and U14a, and associated components. The oscillator output is buffered by U14c and may be measured at the **DCLK** test point. The frequency of 14.425 MHz is 8 times the VITC bit rate. The VITC oscillator is divided by 8 in the LCA to generator the correct VITC bit rate.

The starting position of the VITC on the line is fixed internally in the LCA such that the first bit of code is 10.5 µsec (11.5 µsec for PAL) after the leading edge of horizontal sync.

Once per field, the MCU loads the VITC bit pattern for a particular line into static RAM U10. On lines where VITC is enabled, the LCA accesses the static RAM and fetches the VITC data one byte (8 bits) at a time. The VITC sync bits and cyclic redundancy check byte (CRC) are generated internally in the LCA and inserted into the VITC bit stream in the appropriate place. The VITC data is clocked out of the LCA on the KEYFILL output (U7 pin 7) and into buffer U8a. The VITC keyer is controlled by the KEY signal generated in the LCA (U7 pin 6). The data is clocked out of the LCA with the VITC clock so that the bit width is not dependent on propagation delays in the LCA. VITC bits are shaped by U6b and associated components and presented to the video keyer.

Composite video is AC coupled and buffered by Q1 before going into the sync separator LM1881 U4. The sync separator provides H Sync, V Sync, a Frame pulse (active low for field 1) and a back porch clamp pulse to drive the DC restorer circuitry U1, Q2, and Q3 and associated components. The back porch clamp pulse allows U1 to compare the actual DC level of the video to ground potential. If they are not equal, U1 generates an error signal which adjusts the bias point of Q2 thus ensuring proper operation of the video keyer with varying video and sync levels.

The Video keyer U2 is controlled by the KEY signal generated in the LCA. KEY switches U2 between the program video path and the KEYFILL data. When the KEY signal is LOW the active video is passed through the keyer. When the KEY signal is HIGH the KEYFILL data is added to the black level of the video.

To calibrate the video keyer, connect colour bars from your sync generator to the Video input loop of the 5010 and to channel A of your oscilloscope and terminate it. Connect the video output to channel B of your scope and terminate it. Adjust the **GAIN** trimpot (VR2) so that the output amplitude matches the input. Adjust the **LEVEL** trimpot (VR1) so that the inserted VITC/characters are approximately 550 millivolts above video black level.

4.3.4. Character Generator Sync Separator and Keyer (5200-36)

The Character inserter composite video is taken from the Reader Video input loop and is buffered by Q2 and distributed to the character generator sync separator and keyer/ amplifier. The sync separator U54 provides H Sync, V Sync, a Frame pulse (active high for field 1) and a back porch clamp pulse to drive the DC restorer circuitry U55 and associated components.
The Video keyer U40 is controlled by the VCGKEY signal generated in the LCA U36. VCGKEY switches U40 between the program video path and the VCGWHITE data. When the VCGKEY signal is LOW the active video is passed through the keyer. When the VCGKEY signal is HIGH the VCGWHITE data is added to the black level of the video.

To calibrate the video keyer, connect colour bars from your sync generator to the Reader Video input loop of the model 5010 and to channel A of your oscilloscope and terminate it. Connect one of the video outputs of the model 5010 to channel B of your scope and terminate it. Adjust the **GAIN** trimpot (VR3) so that the output amplitude matches the input. Adjust the **CHAR LEVEL** trimpot (VR2) so that the inserted characters are approximately at the peak white video level.

4.3.5. Character Generator Logic (5200-35)

The majority of the logic for the character generator functions is contained in a programmable logic device (LCA) U36. Its program is loaded from EPROM U35 on power up. The character display is formatted to display 28 (32 for PAL) rows of 32 characters each in the tiny size, 14 (16 for PAL) rows the small size, and 7 (8 for PAL) rows in the large size. Each of the character positions corresponds to one location in static RAM 37. The MCU writes characters into specified locations in the RAM corresponding to the position of the characters on the screen. RAM locations are scanned during each television field. Valid characters address corresponding sections of the character EPROM U35 and are loaded into the LCA one byte (8 bits) at a time. Each byte corresponds to either the left or right half of a character pixel line. The internal logic in the LCA controls how many lines per character and how many character lines there are on the raster according to registers set by the firmware.

The character data is clocked out of the LCA on the VCGWHITE output (U36 pin 73). A special character with all bits set to 1 is written into all positions of the RAM where no characters are to be displayed. These characters disable the keyer by the VCGKEY signal generated in the LCA (U36 pin 79). When other characters are present the VCGKEY signal becomes active, allowing the characters to be keyed into the video signal. The character data is clocked out of the LCA with the dot clock, so that the pixel width is not dependent on propagation delays in the LCA. The pixels are presented to the video keyer U40 through CHAR LEVEL trimpot VR2. A control register in the LCA selects whether the characters will be white or black and whether they will be keyed into a contrasting background. Character style selection is accomplished by the on screen programming menu.

The pixel oscillator consists of monostable U32b and associated components. The oscillator frequency which determines horizontal size of the characters is adjusted by the digital trimpot (NOVPOT) U34 and associated components. The MCU writes different values to the NOVPOT which control the adjustment input to voltage regulator U33, which in turn sets the voltage present for the RC timing network of the monostable. The starting position of the characters at the left of the screen is determined by monostable U32a. The left position of the characters is adjusted by trimpot VR1.

4.3.6. Reference Video (5200-37)

The Reference Gen-lock video is buffered by Q8 and Q6 and distributed to the reference video sync separator. The sync separator U54 (EL4581) slices the input video at 50% of the sync tip level to provide precision timing for the colour frame circuitry. The sync separator provides H Sync, V Sync and a Frame pulse (active high for field 1).

4.4. UPDATING TO A NEW FIRMWARE VERSION

The 5010-SIE is equipped with an electrically erasable and re-programmable program memory device called a FLASH PROM. This facilitates firmware upgrades in the field. The following procedures should be followed to reprogram the 5010-SIE.

1. Connect the 5010-SIE to the computer's serial port. Most computers have two serial communications ports (known as COM1 and COM2). If you have both serial ports available, connect the 5010-SIE to COM1. There are two different types of connectors commonly used for the COM ports on computers. The diagram below shows the correct cable pinouts for both the 9 pin and 25 pin connector types.

5010-SIE Serial I/O Male				Computer End Female
Description	DB-9	DB-25	DB-9	Description
Shield Ground	1	1	1	Shield Ground
RS 232 Transmit	5	3	2	RS 232 Receive
Ground	6	7	5	Signal Ground
RS 232 Receive	8	2	3	RS 232 Transmit

2. If you received the firmware update on floppy disk, insert the reprogramming diskette in the drive of the computer. Change directories to the root of the reprogramming diskette's drive (A: or B:)

   If you received this update from our Support Bulletin Board, change to the directory of your hard disk where you have the upgrade files located. The upgrade files you downloaded have been compressed using PKZIP and will need to be expanded before you can proceed. Expand the upgrade files into this directory by running the PKUNZIP utility (available on our BBS if you do not have a copy) as follows:

   PKUNZIP AG52A8.ZIP

3. To set up the 5010-SIE for programming at 38400 baud hold down the **SETUP** key while you apply power to the 5010-SIE. When the 5010-SIE completes its boot-up sequence, the front

panel will display `LOAD FLASH - 38400.` The default baud rate for reprogramming is 38400.

To set up the 5010-SIE for programming at 9600 baud hold down the ➔ key while you apply power to the 5010-SIE. When the 5010-SIE completes its boot-up sequence, the front panel will display `LOAD FLASH - 9600`

4. The 5010-SIE firmware is contained in an Intel HEX format file and is called AG52A8.HEX. A Flash Loader software utility (called FL.EXE) was provided along with the upgrade files you received. This utility uploads the HEX file to the 5010-SIE. Run FL.EXE, with the appropriate '.hex' file as the first argument. For example:

   FL AG52A8.HEX

   This will run the Flash loader program in its default configuration: COM1, 38400 baud, software flow control.

   If you connected the computer using COM2 you will need to use additional command line parameter to specify the COM port as follows:

   FL AG52A8.HEX /p2

   If you set up the 5010-SIE for programming at 9600 baud you will need to use additional command line parameter to specify the baud rate as follows:

   FL AG52A8.HEX /b9600

   Entering the FL with no file name will generate a usage message to show you all the available options for the Flash Loader program.

5. The Flash Loader will announce that it is erasing the FLASH PROM, The 5010-SIE front panel display will show `FLASH ERASING...`

6. When the Flash PROM is erased, the Flash loader will start to send the new firmware to the 5010-SIE. The Flash loader will give a status report as it sends each line of the HEX file to the 5010-SIE. During programming the 5010-SIE front panel display will show `LOADING - XXXXX`. The XXXXX will be the actual PROM address currently being programmed.

7. If there are programming errors an appropriate message will be shown on the 5010-SIE front panel. You will need to abort the Flash loader program by pressing the ALT+x keys on your computer keyboard. (Hold the ALT key down while pressing the

x key.) Repeat steps 3 to 6 to try to correct the problem. If you still have trouble, try programming at 9600 baud.

8. The reprogramming will be complete when the Flash Loader announces "Hex file transmitted successfully" and returns you to the DOS prompt. The 5010-SIE will automatically switch to its FLASH program memory if programming is successful. As a part of the 5010-SIE boot-up cycle it will say `SWITCH TO FLASH` to indicate that it is running on the FLASH EPROM now.

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INSTRUCTIONS FOR UPGRADING 5010-SIE WITH BYPASS RELAY MODIFICATION

These devices are subject to damage by electrostatic charge buildup which can occur with improper handling. The devices should always be carried and stored in the anti-static carrier tube provided.

REMOVING THE VITC GENERATOR SUBMODULE

- With the top cover removed, unscrew the two screws holding submodule to main printed circuit board.
- Remove two hex socket screws, holding the submodule to rear panel. (Use hex socket wrench provided)
- Carefully lift up on the front of the of the submodule until it unplugs from the main board.
- Set aside submodule in a safe place.

RE-INSTALLING THE VITC GENERATOR SUBMODULE

- Position the new submodule inside the chassis so that the connector panel protrudes through the rear panel cut-out.
- Push **firmly** on the front edge of submodule printed circuit board until the two mounting holes align with the stand offs on the main printed circuit boards. The submodule connector and main board header should now be in perfect alignment.
- **Firmly** push down on the front end of the submodule until the connector plugs into the mating connector on the main circuit board. Make sure that all pins are mated.
- Install two screws to secure the submodule to the main board.
- Install two hex socket screws to hold the connector panel to the chassis rear panel.

CHANGING THE 5010-SIE FIRMWARE

- Using a small screwdriver lift out the EPROM U20, being careful not to bend the pins. Also take note of the orientation of the device (where the end with the notch is located).
- Install the new EPROM in the same socket and in the same orientation as the old one (i.e.: with the notched end pointing in the same direction)
-

Severe damage may result from an improperly installed PROM. Double check the installation before restoring power.

- Replace chassis top cover.
- Restore power.
  Place old EPROM and VITC Generator Board in the anti-static packaging provided and return to us (BY AIRMAIL)