DECADE ENGINEERING

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COG-4 Operator's Guide ~ Firmware V20 ~ October 4, 2004

Introduction

COG-4 is a video character overlay generator board with numerous interfaces intended to complement the requirements of commercial and industrial video systems. It can superimpose text over video from composite or Y/C (S-Video) sources and distribute the output video to as many as six destinations. Data for the overlay can come from an on-board clock, distance encoder, pan/tilt angle sensors, keyboard, GPS receiver (soon), and other peripheral devices. COG-4 is also capable of controlling camera pan/tilt platforms through analog output channels. COG-4 can be controlled directly from a PC-compatible keyboard, or through an RS-232 serial link to a host computer. An Ethernet remote control interface is planned for later introduction.

Basic Operation

At power-up time, system measurement data normally appears on screen as a block of text superimposed over video from the camera. This "data stack" overlay contains up to six data display fields as shown below:


```
01:19PM
21Sep04
Pan:359
Tlt:359
-howdy-
   +0.0f
```

A full data stack of six fields includes:

Time in AM/PM format
Date
Camera Pan angle in degrees
Camera Tilt angle in degrees
Identification text
Distance in one of two possible formats

Strike the F5 key once if you don't see something resembling this figure. Use the keyboard arrow keys to move the data stack to any desired position on screen. The stack automatically eliminates blank lines if any data fields are disabled, so the display you see may appear substantially different from this example.

The F1 key brings up the primary Help screen, which lists the most commonly used keyboard commands:

```
F2 Pointer On/Off
F3 Comment Mode On/Off
F4 Clear Comment Text
F5 Overlay On/Off
F6 Toggle Distance Mode
        (Primary/Alternate)
F7 Display Title Screens
ALT+P Preset Distance
ALT+Z Zero Distance
F12 Setup Menu

ENTER More
ESC Return To Overlay
```

Once memorized, these commands may be entered during normal operation without first striking F1. Additional description for each command follows:

- **F2** toggles an on-screen video pointer on and off. When it's on, the pointer may be moved to any position in the display with the arrow keys on the keyboard.

- **F3** toggles the comment editing cursor on and off. When it's on, comment text may be typed freely at any location on screen. Use the arrow keys to move the cursor before typing. Only simple typewriter-like functions are supported—the Backspace and Enter keys work as expected, but words break if typed past the right margin.

- **F4** erases all comment text from the screen.

- **F5** toggles the entire text overlay on or off. It does not affect the underlying video signal, and it does not clear any text from display memory.

- **F6** toggles the distance data display between primary and alternate formats. These formats are **feet** and **meters** by default, but they're easily configured for other units.

- **F7** triggers an automatic sequential display of the Title Screen memories, much like a slide show. Title Screens are full-page text memories that can be edited and saved in semi-permanent memory space as described later in this document.

- **Alt+P** is a two-key combination. Hold the Alt key down while striking the P key to enter this command. Alt+P causes a pre-configured distance value to be loaded into the distance register. The preset value immediately appears in the data display. This operation cannot be reversed, so a two-key combination was chosen to reduce the chance of accidental command invocation.

- **Alt+Z** immediately clears the distance register to zero.

- **F12** brings up the first system configuration screen. See later discussions.

- **Enter** brings up the secondary Help screen. See below.

- **Esc** returns the system to normal operation.

The **Enter** and **Esc** keys have similar functions elsewhere in COG-4, so they are often omitted in subsequent discussions.

```
(Ctrl) + Arrow keys
    Move Camera Slow Speed
(Alt) + Arrow keys
    Move Camera Medium Speed
(Ctrl)+(Alt) + Arrow keys
    Move Camera Fast Speed
(Shift) + F1-F12
    Save Camera Position
(Ctrl) + F1-F12
    Restore Camera Position

ENTER About COG 4
ESC Return To Overlay
```

This image shows the secondary Help screen, which lists commands available in systems offering keyboard control of camera platform pan and tilt angles.

- **Ctrl+Arrow** keys drive the pan/tilt platform at a pre-configured "slow" speed in any of four directions.

- **Alt+Arrow** keys drive the camera platform at a pre-configured "medium" speed.

- **Ctrl+Alt+Arrow** keys drive the camera platform at its highest pre-configured rate.

- **Shift+(F1~F12)** keys store the current camera pan/tilt angles in one of 12 semi-permanent memories.

- **Ctrl+(F1~F12)** keys cause automatic slewing to pan/tilt angles recalled from the corresponding memory.

- **Enter** brings up information about COG-4, including the current firmware version.

- **Esc** returns the system to normal operation.

The Help screens shown above do not currently list two other keyboard commands that are available during normal system operation:

- **Ctrl+(A~Z)** displays one of 26 Observation Codes.

- **Alt+(F1~F5)** displays one of five Title Screens for a programmed number of seconds.

See below for additional details on these operations.

Advanced Operation

```
                Setup Options


   F1 Set Time/Date
   F2 Set Display Options
   F3 Set Motor Speeds
   F4 Set Encoder Options
   F5 Set Title Screens
   F6 Set Observation Codes
   F7 Set Header Line


   ESC Return To Overlay
```

Here's the primary COG-4 configuration menu that appears in response to an F12 command. Secondary configuration screens are called up as follows:

- **F1** brings up the clock setting screen.

- **F2** allows the data stack field display and identification text field to be configured.

- **F3** allows the pan/tilt platform motor drive speeds to be configured.

- **F4** is for calibrating and configuring the distance data display (both modes).

- **F5** allows for editing Title Screen text and display options.

- **F6** brings up the Observation Code editing screen.

- **F7** is for editing Header Line text and header display options.

Each of these items is shown and described in more detail below.

```
               Set Time and Date

   Hour     <01 PM>
   Minute   <24>
   Date     <21>
   Month    <Sep>
   Year     <04>

     ENTER - Save changes and exit.
     ESC - Discard changes and exit.
     TAB - Change field.
     ARROW UP/DOWN - Change value.
```

[F12, F1] Here's the clock setting screen. Use the Tab key to select an edit field, which is indicated by highlighting. The up and down arrow keys may then be used to edit the value in the selected field. Hit Enter to set the clock in COG-4 to the new values, or Esc to exit this function without consequences.

```
                 Setup Data Display

    Show Time        (Yes)
    Show Date        (Yes)
    Show Pan/Tilt    (Yes)
    Show ID          (Yes)
    ID Text          (-howdy-)
    Show Encoder     (Yes)

      ENTER - Save changes and exit.
      ESC - Discard changes and exit.
      TAB - Change field.
      ARROW UP/DOWN - Change value.
```

[F12, F2] This is the data stack configuration screen. It behaves much like the clock-setting screen, except that a text edit field is included. When this field is selected, a flashing cursor will appear, and the identification text line may be freely edited. "Encoder" refers to the distance data display field.

```
                 Set Pan/Tilt Rates

    Pan Fast             (127)
    Pan Medium           (096)
    Pan Slow             (064)
    Tilt Fast            (127)
    Tilt Medium          (096)
    Tilt Slow            (064)

      ENTER - Save changes and exit.
      ESC - Discard changes and exit.
      TAB - Change field.
      ARROW UP/DOWN - Change value.
      ARROW LEFT/RIGHT - Test value.
```

[F12, F3] If your system implements the keyboard-controlled pan/tilt function, this is where you configure camera platform slew rates. These six values depend heavily on hardware design parameters, so it's wise to consult system technical support staff before altering any of them (and they probably do not match this example). Note that a test function appears in the last line. This enables new values to be tested for acceptability without first returning to normal system operation.

```
        Set Encoder Primary Mode

Counting Sense    <Up>
Decimal Places    <1>
Units Label       <f>
Preset Value      <10.00>
Scale Factor      <0.1000000>
                  (units per count)
  ENTER - Save changes and proceed to
          alternate mode setup.
  ESC - Discard changes and exit.
  TAB - Change field.
  ARROW UP/DOWN - Change value.
  F9 - Calibrate encoder
```

[F12, F4] The first distance data display setup screen, for configuring one of the two distance data display formats. Do not change any of these values without consulting technical support staff.

- Counting Sense refers to the encoder count register, which can count in either direction relative to actual encoder shaft movement.

- Decimal Places is the number of digits to the right of the displayed decimal point.

- Units Label is a single character to denote the units of distance, usually "f" for feet or "m" for meters.

- Preset Value is the distance value that is used by the Alt+P command.

- Scale Factor is the multiplier used internally to convert encoder counts to displayed distance units. Encoder calibration may be achieved by directly entering the scale factor here if it is known. We strongly recommend that system operators and support staff keep written records of this value!

- The Enter key, in this case, proceeds to a second distance data display setup screen, for the second of two available distance display formats.

- F9 invokes an interactive encoder calibration procedure that requires a precisely measured length of cable. Consult technical support staff before using this function.

```
       Set Encoder Alternate Mode

Units Label       <m>
Decimal Places    <1>
Scale Factor      <0.3048>
                  (Alt/Main)
If Main=feet and Alternate=meters
    Scale Factor = .3048
If Main=meters and Alternate=feet
    Scale Factor = 3.281
  ENTER - Save changes and exit
  ESC - Discard changes and exit.
  TAB - Change field.
  ARROW UP/DOWN - Change value.
```

Here's the secondary distance display configuration screen, which allows a different units label and number of digits after the decimal point in the alternate display format. The scale factor used here is relative to the primary

display format, not the actual encoder cycle count. In normal COG-4 operating mode, F6 toggles between the primary and alternate distance data display formats.

```
                Edit Title Screens

    Number of screens    <5>
    Seconds to display   <10>
    Edit screen number   <1>



     ENTER - Save changes and exit.
     ESC - Discard changes and exit.
     TAB - Change field.
     ARROW UP/DOWN - Change value.
```

[F12, F5] Edit and configure the Title Screen displays here. Up to five full screens of text may be edited and stored in semi-permanent memory. During normal operation, F7 causes the specified number of Title Screens to be displayed sequentially, much like a slide show, with each screen appearing for the number of seconds entered here. Title Screens not displayed in sequential mode are retained in memory. Individual Title Screens may be displayed with the key combinations Alt+(F1~F5) during normal operation. Title Screens displayed in this way are cleared automatically after the programmed time delay.

When the "Edit screen number" field is selected, additional instructions appear: Hit F1 to edit the selected Title Screen, then Esc to return here. In edit mode, F4 clears all text from the screen.

```
                Edit Observation Codes

    Seconds to display   <05>
    Display on line      <15>
    Edit code CTRL +     <A>

    ----------------------------------------
    enter observation code here
    ----------------------------------------

     ENTER - Save changes and exit.
     ESC - Discard changes and exit.
     TAB - Change field.
     ARROW UP/DOWN - Change value.
```

[F12, F6] Up to 26 Observation Codes may be stored in semi-permanent memory. Observation Codes are single lines of text. During normal operation, Observation Codes can be displayed for the specified time, on the specified line number, by typing any of the 26 key combinations Ctrl+(A~Z). Note that screen lines are numbered from 1 to 15 starting at the top of the screen.

For editing, the contents of Observation Code memories are displayed in the center of this screen. Choose the memory to be edited by stepping through the letters of the alphabet when "Edit code Ctrl+" is selected. The current contents of each memory are displayed instantly as the letter changes. Pressing the Tab key will then put a cursor into the Observation Code editing area. The edited code is automatically saved when another code is selected, or

when leaving this screen by hitting Enter. We suggest choosing Observation Code command letters to aid the operator's memory if possible.

```
                Edit Header Line

Display on line        ⟨01⟩
Show Header            ⟨Yes⟩


----------------------------------------
MH 000              TO            MH 000
----------------------------------------


   ENTER - Save changes and exit.
   ESC - Discard changes and exit.
   TAB - Change field.
   ARROW UP/DOWN - Change value.
```

[F12, F7] A single Header Line may be stored in semi-permanent memory. During normal operation, the Header Line stays on screen at the chosen location if enabled. Header Line editing is similar to Observation Code editing, as discussed above. In most cases, the Header Line should display at the top of the screen as configured here.

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