Honeywell

Picture Editor Form Instructions

SW12-650

TotalPlant

Honeywell

Implementation
Engineering Operations - 3

Picture Editor Form Instructions

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Table of Contents

INTRODUCTION
Section 1

1.1 CUSTOM GRAPHIC DISPLAYS

Although they can have many uses, custom graphic displays are an excellent way to represent process conditions. These displays often contain user-built schematics such as shown in Figure 1-1. Objects in the display can be made to change color, change intensity, or blink to attract attention during alert conditions. Bar charts give the operator a good feel for fluid levels. Objects can be captioned by "live" text (called values) that describes present process conditions such as flow rates, pressures, temperatures, etc. By using targets and change zones in the display, the operator can control parts of the process or call up other displays. In addition to schematics, custom graphic displays often contain tables of values and/or messages for the operator.

1.1.1 Creating the Display

Creating a custom display begins with a sketch and a brief list of the expected characteristics. The sketch and its supporting information is placed on a series of paper forms often before the system is installed. This manual explains how to use the forms and tells what information is needed. The *Picture Editor Data Entry* manual (see References) tells how to build the actual video display using the sketch, the supporting Forms, and the Picture Editor functions. The *Picture Editor Reference Manual* (see References) is the master reference guide to picture building and editing. The Picture Editor itself is a function of the Universal Personality.

NOTE

Neither the *Picture Editor Form Instructions* manual nor the *Picture Editor Data Entry* manual is intended to describe the full capabilities of the Picture Editor. For certain functions, (such as language syntax) these publications require either a working familiarity with the Picture Editor or reference to the *Picture Editor Reference Manual* (see References) when more detailed information is needed.

1.1.2 Display Maintenance and Documentation

After the displays are built, they are typically stored on a History Module. Backup copies can be stored on cartridge or floppy disks. You should also store the original forms and sketches in a safe place for reference when designing other displays, and in case you ever have to rebuild any of them. In such cases, it is much easier and faster to rebuild the displays by referring to the original forms than to try to remember exactly what was in the display.

1.2 REFERENCES

Picture Editor Configuration Forms:

Picture Editor Forms (complete set)
- Display Form
- Behavior
- Values
- Conditional Behavior
- Targets
- Variants
- Subpictures
- Subpicture Detail
- Bar Charts

Picture Editor Data Entry

Picture Editor Reference Manual

Actors Manual

Command Processor Operation

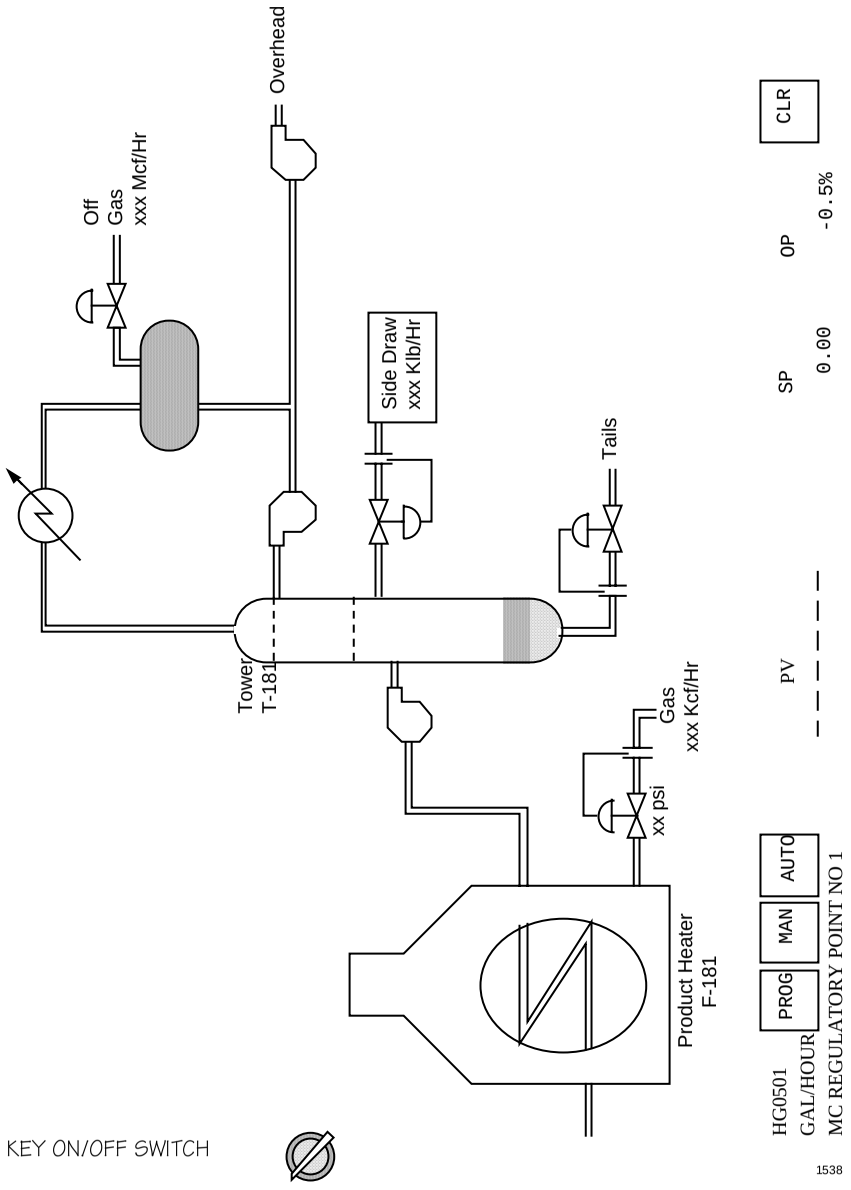


Figure 1-1 — Custom Display

1538

FORMS
Section 2

The first of the paper forms used to create a custom display is the SW88-551 Display Form. Behavior and characteristics of items on the display form drawing are described in detail by filling in a series of support forms.

2.1 DISPLAY FORM

Honeywell Display Form, illustrated in Figure 2-1, is used to draw custom displays. Graduations on this form represent 80 columns across the screen and 26 lines from top to bottom. Shaded lines at the top of the form are usable and the shading alerts the data entry person to adjust the edit region slightly when entering data into this area. The three bottom lines are often used for a change zone (explained later) but there are no restrictions.

The area between line and column graduations represents large character cells (the default). Each typed-in text character requires a full character cell but there are two cell sizes. Large character cells are eight pixels (picture elements) wide by 16 pixels high. Small character cells are eight pixels wide by eight pixels high. A pixel is the smallest picture element that can be drawn by the video system (for example, the point of intersection between lines that make up small letter t). Figure 2-1 shows how a character fits into the cell. Text is not necessarily centered in the cell, because of the differences in characters, especially those with descenders. Graphic objects (lines, solids, and bar charts) are pixel-oriented; therefore, they can occupy any available pixel position in the picture. Text, values, variants, targets and subpictures have a text size attribute that limits their position in the picture to large or small character cell boundaries. Text size is discussed in the Picture Editor Reference Manual.

If you want to define an action for this picture (e.g., Initial/Final Target, etc), fill in the Define section on the left edge of the display form (see this manual for more information).

If you want to use a custom Display Data Base (DDB) file with this picture, fill in the file name on the display form (see subsection 2.2.10 of this manual for more information). The suffix: .df is required.

If you want to use a color palette other than the standard, fill in the palette number. Color palettes are discussed in the Set Palette command in the Picture Editor Reference Manual.

2.1.1 Sketching the Displays

Before starting, you should be thoroughly familiar with the process and consider exactly what information needs to appear on the finished display. Experienced plant personnel and/or end users can help determine what the display should contain. The next step is to use the Display Form and sketch the desired process. Be sure to number each Display Form so it can be referenced by other forms. Some of the suggestions in the next few pages should help you with the sketch.

Pathnames—Select one or more pathnames for the display. If the picture contains critical process information or operating controls, you might want to store it on two different media. The system can search for and call in the display from alternate History Modules (HMs), cartridge disks, or floppy disks. This is a safeguard in case the primary media fails. The picture's filename must be the same, but either the Volume ID or the Logical Device ID in the pathname to each picture must be different. If the picture is stored on different HMs, the volume names must be different. For example the picture FRED could be stored under the following pathnames

NET>HMV1>FRED and NET>HMV2>FRED

In this example, HMV1 and HMV2 are user volumes on different HMs.

If the picture is stored on an HM and on a cartridge disk in drive 1, the logical device identifiers must be different. The pathnames could be

NET>HMV1>FRED and $F1>HMV1>FRED

In this example, NET indicates the HM path, and $F1 indicates the cartridge drive path. The volume name could be the same or different.

Refer to the Set Pathname command in the Picture Editor Reference Manual for acceptable pathname syntax. Enter the pathname(s) at the top of the Display Form.

2.1.1.1 Special Considerations

Keep the sketch simple and uncluttered. Display loading should not exceed about 25% for best comprehension. Use targets (explained later) to link with more detailed displays if necessary.

If an object is used several times in a drawing, you probably should specify that it is a subpicture. Subpicture images need be drawn only once, at data-entry time and can be used repeatedly thereafter. Subpicture images can be enlarged, reduced, or flipped horizontally or vertically. The valves and pumps shown in Figure 1-1 are a good example.

Labels placed near shapes are best understood if kept to no more than six text characters. Try to use abbreviations for longer words. Use full height characters to indicate large size text and half height characters when you want to indicate small size text. Values are best understood if they are limited to four numbers or less. Subpictures that display values require some additional planning and you should be sure that you understand them. Targets, values, and subpictures are briefly described in this publication and more completely in the Picture Editor Reference Manual.

2.1.1.2 Shapes

Shapes generally portray the process and are considered background information. To prevent overloading the display with static light, background information should be in a calm, low-emotion color at half intensity.

Figure 2-2 shows some standard shapes used in the past. You can create any 2-dimensional shapes that you like and they can be solid (fully colored) or hollow (outlined). Indicate solid objects on the sketch by shading (crosshatching) the object. When curves are needed, they can be used, but because this requires extra work during the picture-entry process, straight lines are preferred and, as shown by the pump in Figure 2-2, straight lines can often be substituted for curves.

2.2 SUPPORT FORMS

The support forms are used to provide detailed information about certain items on the SW88-551 Display Form Drawing. This information is requested when the display is built. Each display form drawing should have a separate set of support forms associated with it. Depending on picture content, not every support form will be needed in any particular set. For example, only pictures that contain targets will need a target support form.

2.2.1 Sketch/Support Form Relationship

In most cases, to keep from cluttering up the Display Form it will be to your advantage to draw small circles with arrows pointing to the part of the sketch that you wish to describe (see Figure 2-3). Use a key code in the circles to indicate the type of support form and item number on that form; for example, B-1 describes the first item on the Behavior Form. Enter the code number in the key column of the appropriate support form. The forms and codes are as follows:

• B	Behavior Form	SW88-552
• BR	Bar Charts	SW88-559
• CB	Conditional Behavior	SW88-554
• S	Subpictures	SW88-557
• SD	Subpicture Detail	SW88-558
• T	Targets	SW88-555
• V	Values	SW88-553
• VR	Variants	SW88-656

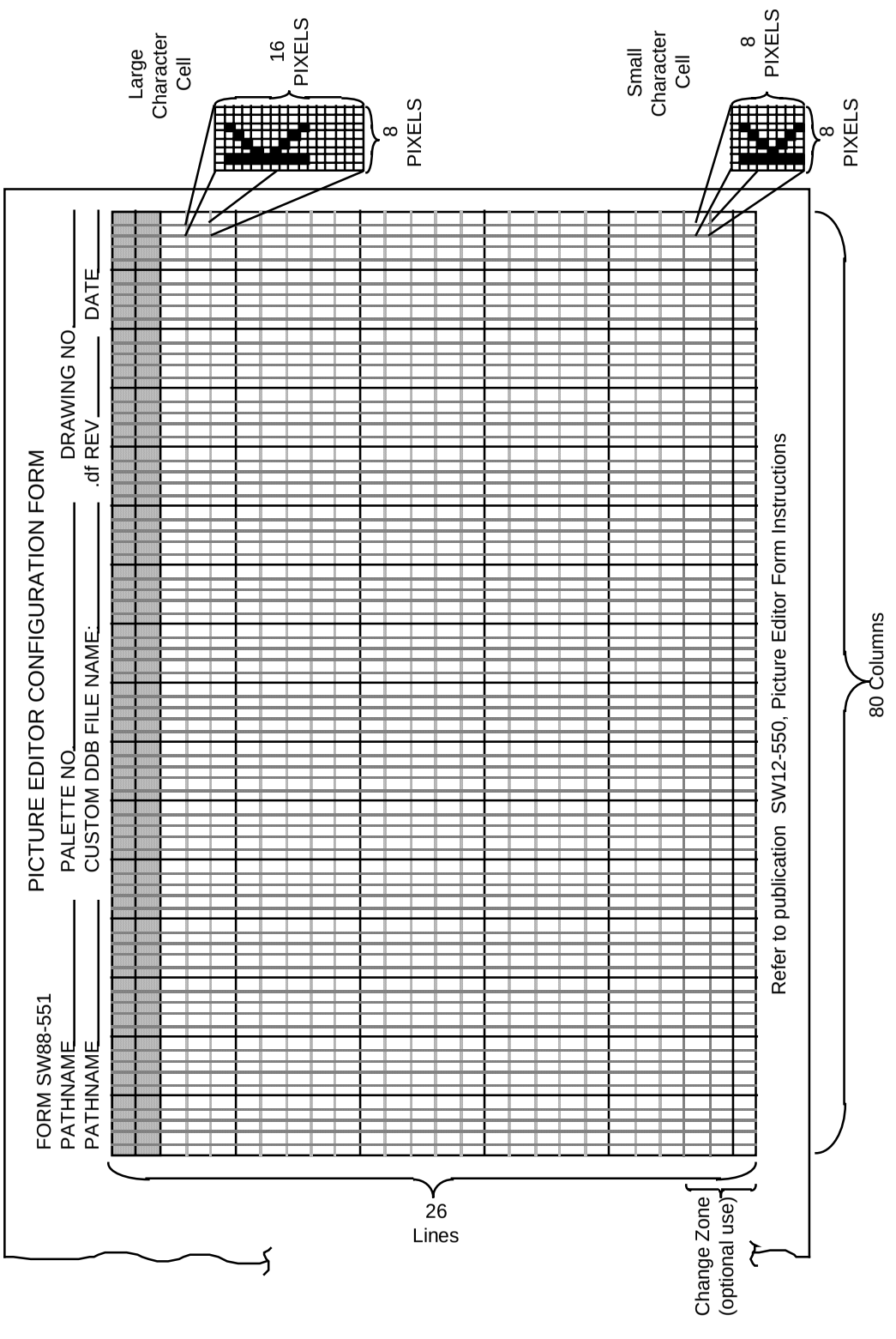


Figure 2-1 — Display Form

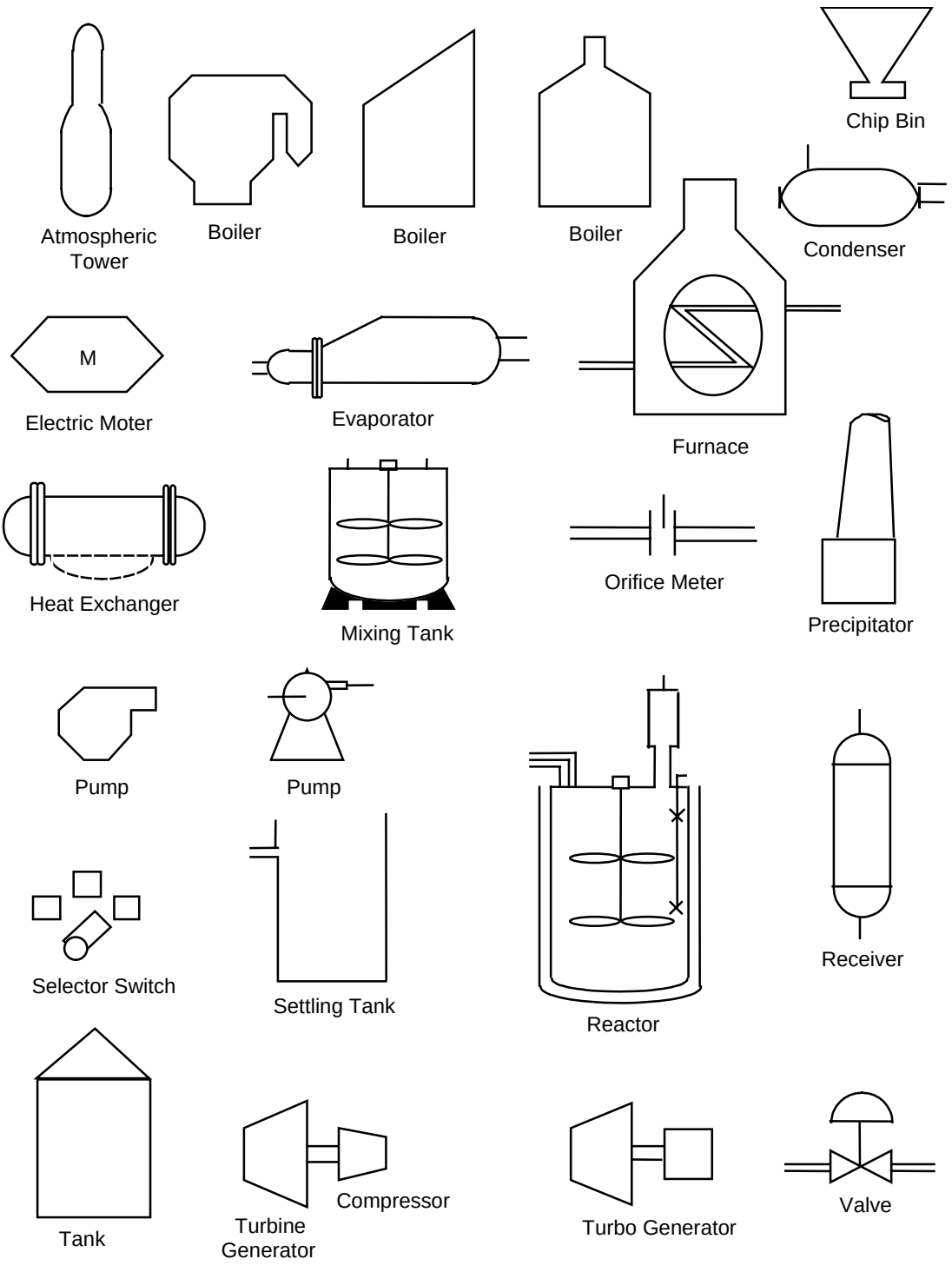


Figure 2-2 — Shapes

1540

2.2.1.1 Alternate Methods

Instead of using the circle and pointer method shown in Figure 2-3, and depending on the complexity of the display form drawing, you may prefer to use one of these alternate methods to collect the support information:

- If a simple uncluttered sketch was created, you might prefer to write all or part of the support information directly on the Display Form. For example, behavior codes for color and intensity could be written beside the objects they describe. Use the standard abbreviations (shown on the Behavior Form) and assume that blink and reverse-video-field characteristics are not used unless called for specifically.

- You can make several copies of the completed Display Form drawing and designate each of them to show one of the functions (fixed behavior, values, targets, etc.). Then, key the Fixed Behavior Support Form to Display Form 2, the Values Support Form to Display Form 3, etc.

2.2.2 Filling in the Support Forms

Each support form is explained in the pages that follow. In most cases, an object from Figure 2-3 is used as an example to show how the forms are used. You may want to refer back to Figure 2-3 to see how the object fits in. Default entries on the forms are shown underlined. In this publication, example information is shown to help the user, and it should be understood that these are only examples. Although the example information is shown in capital letters, the information can be written in upper or lower case or a combination of both.

Coordinate information is more easily determined during the picture-entry process but space has been left on the forms that use this optional entry. The bottom left-hand corner of the drawing area is the reference point for coordinates (0000,0000). When precise coordinate information is needed, count each full column as eight pixels and each full line as 16 pixels to obtain the coordinate position. Partial lines and columns can be interpolated.

2.2.3 Fixed Behavior Form

Form SW88-552 is used to describe shapes and text when the behavior remains fixed under all conditions. Behavior characteristics that are entered on this form are color, intensity, blink, and normal/reverse video. Some things to consider when choosing these characteristics are discussed in the next few pages.

In Figure 2-4, Key B-1 refers to the outside line of the furnace drawing. The partially shown Behavior Form has been filled in to indicate that behavior for the item identified as Key B-1 will be blue, no blink, normal video, and half intensity. Abbreviations shown at the bottom of the form are the actual codes needed later during the picture-entry process; therefore, using them right from the start saves system time later.

The common-behavior section of this form can be used when all similar items in a display have the same behavior. As shown in Figure 2-4, behavior for all of the lines that represent pipes is specified as green, no blink, normal video field, and half intensity. Other parts of the drawing with common characteristics can be specified here (text for example).

2.2.3.1 Color Selection

Color is useful to separate different groupings shown on the same display, to call attention to certain items, and to indicate status. Items can also be made to change color when process conditions change (as described elsewhere in this publication). Table 2-1 shows some of the color choices that have been used to represent process conditions. You may choose any color convention you wish, but once chosen, stick with it to avoid confusion. Consider color choices for:

Text
Normal or desired states
Alarm states
Hardware failure and other states

NOTE

Printed copies of the screen image are in black and white; therefore, the significance of any condition implied by color is lost on the printout.

Table 2-1 also shows abbreviations used by the Picture Editor and the color priorities. Color priority means that where two graphic items with different colors overlap, only the higher-priority color shows (e.g., blue covers green).

Again, a few colors are preferred to many.

Table 2-1 — Typical Use of Color

Priority	Color	Abbreviation	Common Use
1	White	(W)	Intermediate condition between ON/OFF, Open/ Closed, etc.
2	Cyan	(CY)	Essential text, values, hardware failure indication, messages
3	Magenta	(M)	Danger, immediate attention required (power industry)
4	Blue	(BLU)	Labels, nonessential data, PVs
5	Yellow	(Y)	Caution, attention required, abnormal condition, analog alarm, output values
6	Green	(G)	Status: OFF, de-energized, closed, normal(power industry); ON, energized, (others)
7	Red	(R)	Status ON, energized, open, bypassed, digital alarm (power industry); Danger (others)
8	Black	(BLK)	Background

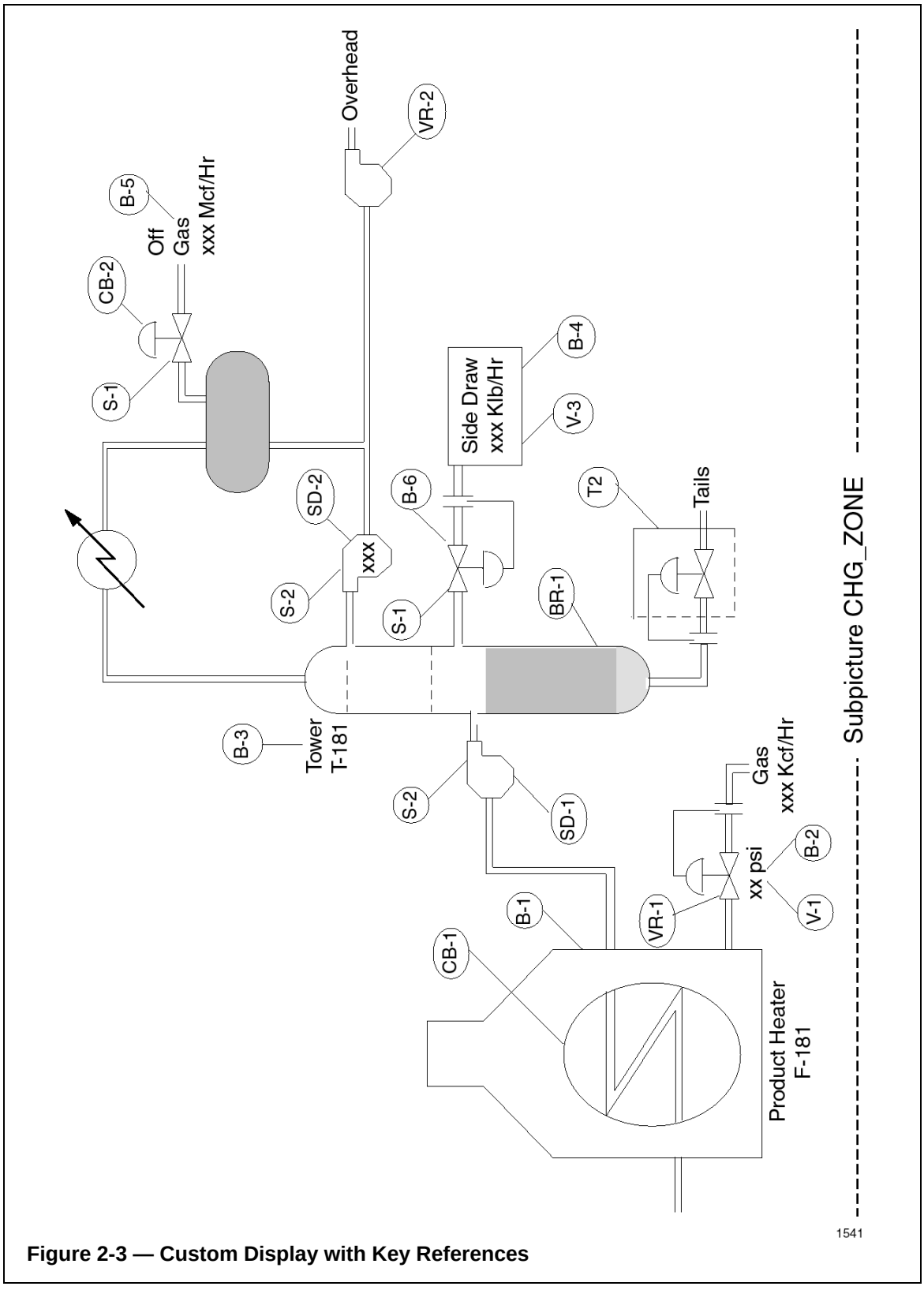


Figure 2-3 — Custom Display with Key References

Color Palettes—If you need a different background tint (other than black) due to lighting, etc., the color palettes allow several shades of gray or low intensity blue. Some of the color palettes also allow you to draw the objects in nonstandard colors such as brown, orange mauve and others. Several things to keep in mind are that you must choose one palette for the entire picture, and that subpictures called into the main picture are forced to the same palette as the main picture. Also, the special palette colors do not have unique abbreviations and must be treated as combinations of intensity and standard colors (however the background tint is automatic when a palette is selected). Refer to the Set Palette command in the *Picture Editor Reference Manual* for more information.

2.2.3.2 Intensity, Blink, Field

Half Intensity—Half intensity allows additional shades of colors. For operators who spend long periods watching the display, it also produces a more acceptable display by lowering the static-light output. Ambient light and color choice can determine whether a half-intensity display is usable. Background objects are usually low intensity, while PVs and setpoints are usually in high intensity to get attention.

Reverse-Video Background—Reversed video is useful to provide a contrasting background for text and to draw attention. It is one substitute for color change, especially when a color-blind operator might be involved or when the screen print must show a changed condition. In a table of data, it quickly calls attention to the right item, but overused, it adds a lot of static light for the amount of information it provides.

Blink—Blink is best used to call attention and aid searches, but it is also distracting. It should be used only in small amounts and in one area of the display at a time. Certainly large objects should not be made to blink. One suggestion is a black underline that changes to a bright color and blinks on alarm. Also, remember that printed copies may not capture the blinking item. Conversely, a color-blind operator would have a better chance of noticing the blinking item than a simple color change. The design can be such that acknowledging the situation causes a change to no blink.

NOTE

Overuse of any of these functions can degrade the display. The best rules of thumb are keep it simple and keep the static-light level low.

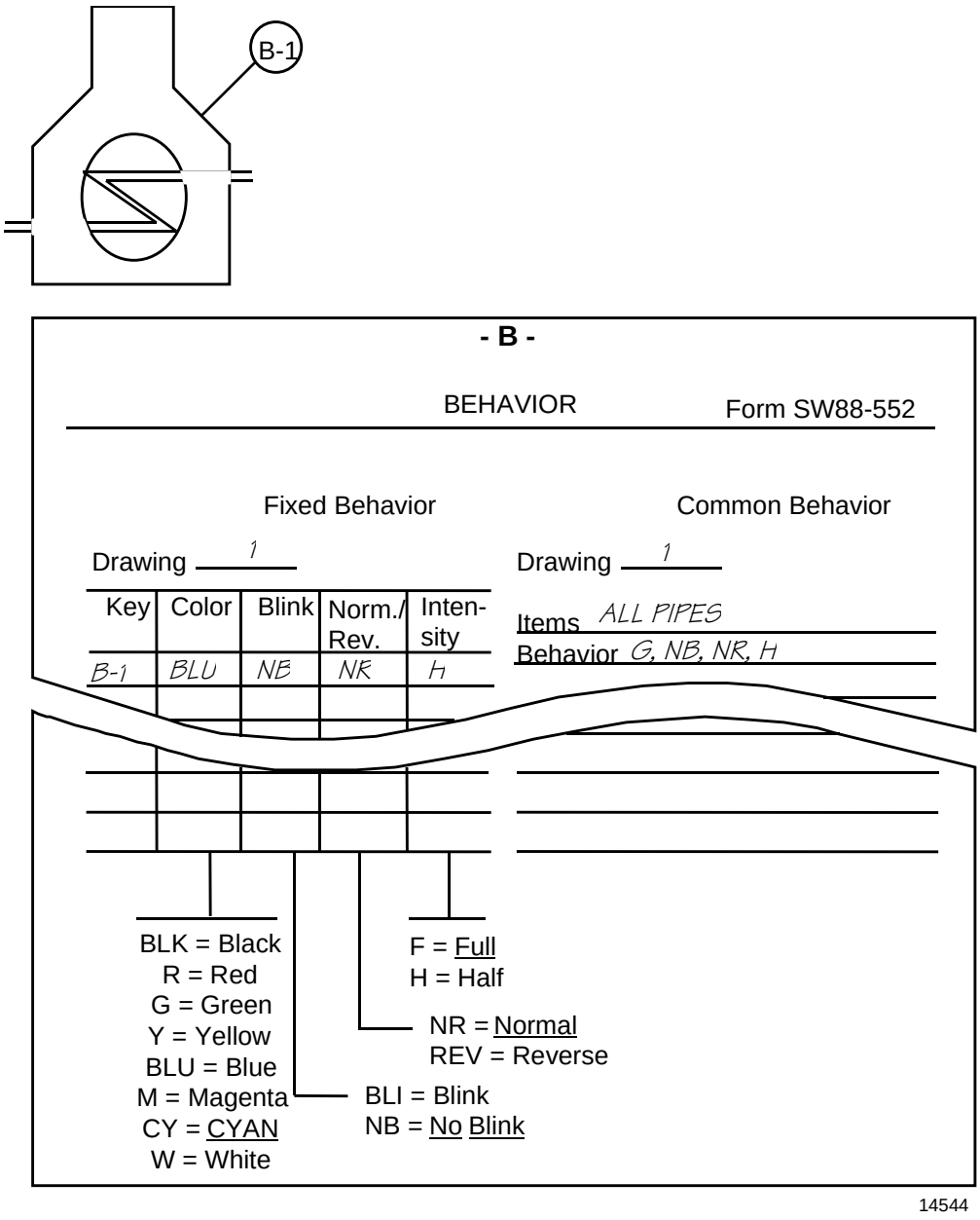


Figure 2-4 — Behavior Form

2.2.4 Values

Values provide "live" numbers or status conditions (OFF, TIMEOUT, etc.) on the screen to represent measured quantities or conditions in the process. For each value that you wish to place on the custom display, fill in a section of the *SW88-553* Values Form. Key V-1 in Figure 2-5 shows an example of a value. Key B-2 in Figure 2-5 identifies steady-state text associated with the value. Labels such as exit temperature, head pressure, etc., and the proper engineering units usually accompany value items.

Fill in the Value Form as follows:

Text Size Large Small

Circle the desired text size. Text size is discussed in subsection 2.1 of this manual. The default is large.

Expression _____

Enter the expression to be evaluated. Appendix C in the *Picture Editor Reference Manual* describes allowable syntax for valid expressions. The expression is often a single variable (e.g., A100.PV) or simple expression (e.g., A100.PV + 3.0).

Variable Type _____

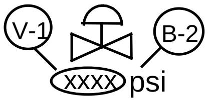
Enter the variable type if it is unknown to the system (e.g., real). The variable type for an entity is unknown to the system if either the data point has not yet been built or a parameter name appears in the expression. Refer to the appropriate parameter reference manual and to Appendix A in the *Picture Editor Reference Manual* for more information on variable types.

Format _____

The variable types, their abbreviations, and default formats are shown in Appendix A in the *Picture Editor Reference Manual* (see References).

At ____, ____ is the optional X,Y coordinate location (in pixels) for the value. The lower-left corner of the left-most value digit will appear at the specified coordinate location.

In practice, it is probably easier for the data-entry person to place the value into the picture, using the drawing as a reference, than for the designer to specify a coordinate.



— V —

VALUES

Form SW88-553

Dwg. 1 , Key V-1 At ___ , ___	Dwg. ___ , Key ___ At ___ , ___
Text Size Large Small	Text Size Large Small
Expression A100.PV	Expression ___
Variable Type* REAL	Variable Type* ___
Format* R - ZZZ 99.99	Format* ___
Dwg. ___ , Key ___ At ___ , ___	Dwg. ___ , Key ___ At ___ , ___
Text Size Large Small	Text Size Large Small
Expression ___	Expression ___
Variable Type* ___	Variable Type* ___
Format* ___	Format* ___
Dwg. ___ , Key ___ At ___ , ___	Dwg. ___ , Key ___ At ___ , ___
Text Size Large Small	Text Size Large Small
Expression ___	Expression ___
Variable Type* ___	Variable Type* ___
Format* ___	Format* ___
Dwg. ___ , Key ___ At ___ , ___	Dwg. ___ , Key ___ At ___ , ___
Text Size Large Small	Text Size Large Small
Expression ___	Expression ___
Variable Type* ___	Variable Type* ___
Format* ___	Format* ___
Dwg. ___ , Key ___ At ___ , ___	Dwg. ___ , Key ___ At ___ , ___
Text Size Large Small	Text Size Large Small
Expression ___	Expression ___
Variable Type* ___	Variable Type* ___
Format* ___	Format* ___

14545

* If unknown to the system.

Figure 2-5 — Values

2.2.5 Conditional Behavior

Conditional behavior allows shapes, lines, text, etc. to behave according to user-specified conditions. Behavior changes are limited to reverse-video field (text only), color, intensity, and blink.

For each item on the Display Form that is to have conditional behavior, fill in a section of the *SW88-554* Conditional Behavior Form. Key CB-1 in Figure 2-6 shows an example of conditional behavior. Abbreviations are the same as those shown on the *SW88-552* Behavior Form.

Fill in the Conditional Behavior Form as follows:

Behavior For Bad Value _____

Bad-value behavior is presented if evaluation of the indicator gives an unreasonable value or the value cannot be obtained (usually because of hardware failure).

Initial Behavior _____

Initial behavior is an implied ELSE statement for the conditional-behavior entry below.

Condition _____

Write a statement specifying the behavior conditions. The language syntax is described in the *Picture Editor Reference Manual*. In the example, the item(s) will be red when the condition is true and blue when the condition is false.

Variable Type _____

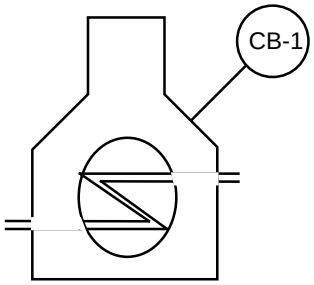
If any variable name is unknown to the system, the type has to be specified. Refer to the Values section of this manual for a list of variable types.

2.2.6 Targets

Targets allow the operator to cause some action, either by touching the screen (if the touch-screen option is present) or by positioning the cursor over the target and pressing the SELECT key on the keyboard. For example, each target can be used to call up any one of several displays. Refer to the Actors Appendix in the *Picture Editor Reference Manual* for a complete description of Actors and examples showing how to use them.

Key T-1 in Figure 2-7 shows an example of how a target could be used.

Sketch each target as a box at the desired position on the display form drawing. Targets should not overlap. Note that targets, like all objects with large text size, align with large character-cell boundaries.



— CB —

CONDITIONAL BEHAVIOR Form SW88-554

Dwg. 1 , Key CB-1
Bad Value Behavior R, BLI, NR, F
Initial Behavior BLU, NB, NR, F
Condition
IF A 100.SP =
THEN SET RED
ELSE
SET BLUE

Dwg. , Key
Bad Value Behavior
Initial Behavior
Condition

Variable Type*

Variable Type*

* If unknown to the system

14546

Figure 2-6 — Conditional Behavior

For each target fill in a section of the *SW88-555* Targets Form as follows:

Solid/Box/Invisible _____

There are three choices for the target shape

Solid targets appear as filled rectangles: 

Box targets appear as hollow rectangles: 

Invisible targets are visible only during the picture-entry process and can, therefore, be placed over an item on the screen without obscuring it. They are often used in menus, so that touching the desired item activates the target and calls up a related display.

The default value is Solid. You can circle the choice or write it in.

Action _____

Specify the action or actions that will occur when the target is activated. Refer to Appendix F in the *Picture Editor Reference Manual* for a description of legal actors. Typically, the desired action is to call up another display. In the example, activating the target calls up Group Display 1 with point 4 selected.

Two examples are shown for target T-2.

The first case is used when the standard Change Zone subpicture is added to the schematic.

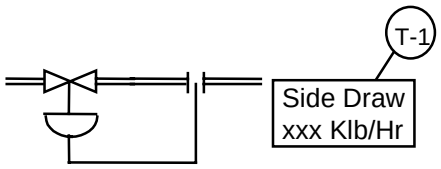
The second case shows how the standard Change Zone subpicture can be used as an overlay. The first actor calls the object file named CHG_ZONE.DO as an overlay, and the second actor (CHGZONE) specifies the point and screen region.

Of course, only one T-2 action sequence, or the other, could be used. Refer to the Change Zone and Overlay actors for additional information.

2.2.6.1 Define Command

The Define command causes an actor or string of actors to trigger when a specified action takes place. For example, a Define Initial command (often called an initial target) can bring in an overlay or automatically start a trend display on a certain schematic whenever that schematic is called up. The Page/Display Forward/Backward actions allow the operator to page through a series of schematics. You can configure the HELP or ASSOC keys to call up a specific display if pressed when a certain picture is on screen.

The Define command is explained in Section 3 of the *Picture Editor Reference Manual*. Note that there are a few restrictions. Space is provided on the main display form to enter the specific type of Define command and list the actors. You can specify more than one Define command for the same display. These actors are the same as used with ordinary targets.



— T —

TARGETS **Form SW88-555**

Dwg. 1 Key T-1 Solid/Box/Invisible BOX

Action:
GROUP (1,4)

Dwg. 1 Key T-2 Solid/Box/Invisible INVISIBLE

Action:
CHG_ZONE (A100,2)

Dwg. 1 Key T-2 Solid/Box/Invisible INVISIBLE

Action:
OVERLAY ("CHG_ZONE"); CHG ZONE (A100,3)

Dwg. _____ Key _____ Solid/Box/Invisible _____

Action:

14547

Figure 2-7 — Targets

2.2.7 Variants

Variants are used to choose one of several items for presentation on the screen. The choices are:

- One of n subpictures
- One of n text strings
- One of n values (R610)
- One of n subpictures, one of n text strings, one of n values (in R610) or blank screen

The decision is based on evaluating one or more Boolean expressions and n is the number of alternatives stated in the variant body (below).

Key VR-1 in Figure 2-8 identifies a variant where one of two subpictures is used to show the status of the valve: the hollow subpicture if the valve is open, or the filled subpicture if the valve is closed. Subpictures are defined elsewhere in this publication and must exist before the variant is built.

Fill in a section of Form *SW88-556* for each variant on the Display Form as explained below. Note that text strings must be enclosed in quote marks and subpicture names must be preceded by the word **subpicture** (or one of its abbreviations).

Text Size Large Small

Circle the desired text size. Text size is discussed in subsection 2.1 of this manual. The default text size is large.

Subpic, Text Or VAL (in R610) For Bad Value _____

Enter the subpicture name, text string or values (in R610) to be displayed if evaluation of the expression gives an unreasonable result, or if the value of any variable in the expression cannot be obtained.

Variant Body _____

Write a statement or series of statements for the variant body. The language is described in the *Picture Editor Reference Manual*. In the example, the choice is between one subpicture or the other.

Variable Type _____

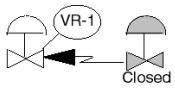
If any variable name is unknown to the system, the type has to be specified. Refer to Appendix A in the *Picture Editor Reference Manual* for a list of variable types.

At ____ , ____ is the optional X,Y coordinate location (in pixels) for the variant. For text strings and (in R610) values, the lower-left corner of the left-most digit corresponds to the specified coordinate. For subpictures, the origin of the subpicture corresponds to the variant coordinate.

In practice, it is probably easier for the data-entry person to place the variant into the picture, using the drawing as a reference, than for the designer to specify a coordinate.

NOTE

The Picture Editor reserves an area of the display for the variant subpictures, text string(s) or values (in R610). This area is sufficient to hold the longest and highest object(s). When subpictures are substituted into a schematic (as in the example), the objects must be the same size to get a perfect fit. Also, if any text string (e.g., BAD VAL) is longer than the subpicture(s), part of the main schematic may be obliterated by the reserved area. In the example, a long text string would cut the pipes short. Obviously, when text or a subpicture is substituted for an area that contains only blank space, much more latitude in the size of subpictures or text is possible.



- VR -

VARIANTS

Form SW88-656

Dwg. 1 , Key VR-1
Variant At _____ _____
Text Size Large Small
Subpic, Text Or VAL for
Bad Value "BAD VAL"
Variant Body:
IF A101.SP > 50 THEN
SUBPICTURE GVALV
ELSE
SUBPICTURE CVALV
Variable Type*

Dwg. _____ , Key _____
Variant At _____ _____
Text Size Large Small
Subpic, Text Or VAL for
Bad Value
Variant Body:
Variable Type*

Dwg. _____ , Key _____
Variant At _____ _____
Text Size Large Small
Subpic, Text Or VAL for
Bad Value
Variant Body:
Variable Type*

Dwg. _____ , Key _____
Variant At _____ _____
Text Size Large Small
Subpic, Text Or VAL for
Bad Value
Variant Body:
Variable Type*

* If unknown to the system

14548-A

Figure 2-8 — Variants

2.2.8 Subpictures

Subpictures are useful when several shapes in the custom display are similar, such as the pumps and valves in Figure 2-1. Subpictures can be repeatedly used in the same or different custom displays. Copies of an image can be enlarged, reduced, rotated, or reversed horizontally or vertically and then each version is stored as a different subpicture. Subpictures can save a lot of time for both the designer and the data-entry person, and they have some interesting capabilities. Be sure to study the subpicture discussion in the *Picture Editor Reference Manual* before attempting to add values or inherited behavior to them.

Sketch the subpicture on the *SW88-557* Subpicture Form. The grid lines on this form have the same spacing as the Display Form.

Subpicture Pathname _____

Choose a pathname for the subpicture. Refer to the Set Pathname command in the *Picture Editor Reference Manual* for allowable subpicture-pathname syntax.

Figure 2-9 shows subpicture-1 (S-1), the first of two examples. This is a simple drawing that can be repeatedly used in custom displays.

Because it was the next drawing designed after the Display Form, it is identified as drawing 2 and it is keyed to drawing 1, where it is called for. Space is provided to designate a palette number if necessary. This subpicture does not contain any values but inherited behavior is specified. Wherever S-1 was used in Figure 2-3, there is a second key (B-6 or CB-2) pointing to the same shape. The second key leads to an entry on a standard behavior form where fixed behavior is described for one use and conditional behavior is described for the other use of that subpicture.

If only fixed behavior had been wanted for subpicture S-1, the behavior codes for color, intensity, etc. could be written on the subpicture form near the shape (because this a simple uncluttered drawing). For more complicated subpictures, you could use one or more behavior-key codes and refer to a supporting Behavior Form. In either case, a second behavior key would not be used on the Display Form because behavior would be fixed as built at the subpicture level. No further form entries are needed.

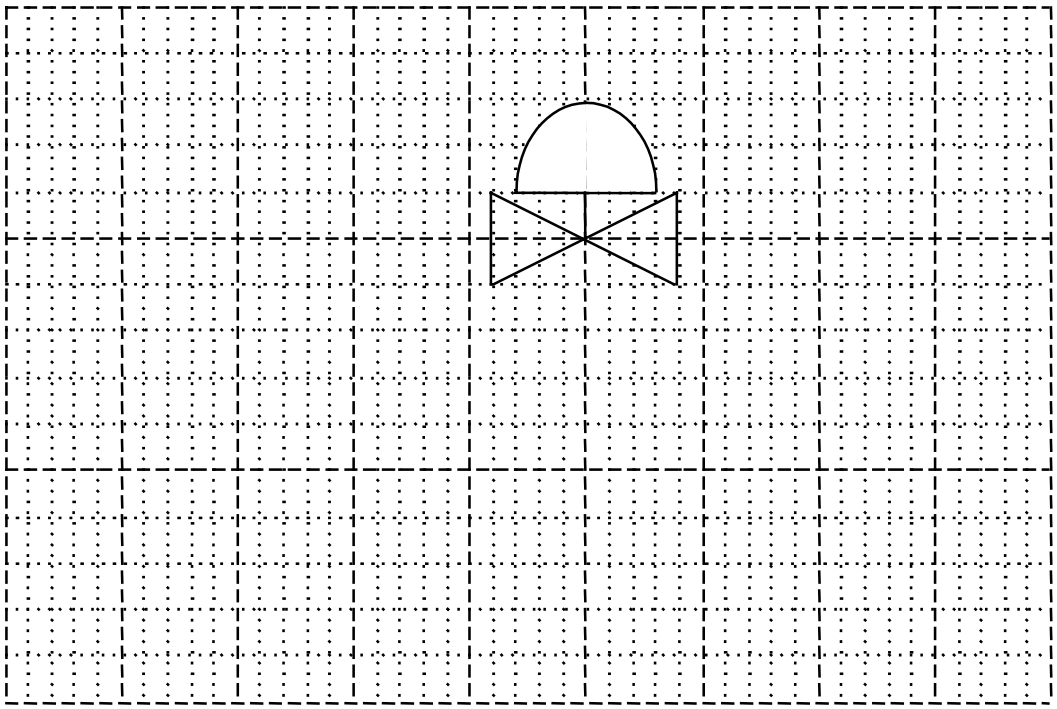
Text size—Note that subpictures have a text size attribute. If the subpicture contains any object with a text size attribute of large (e.g., a target), the subpicture's text size is also large; otherwise it is small.

Figure 2-10 shows a subpicture that contains conditional behavior and a value specified as a parameter. Notice that this subpicture is labeled drawing 3 and it is keyed to drawing 1, which calls for it. The support forms needed for this subpicture drawing will refer to drawing 3.

-S-

SUBPICTURES FORM SW88-557

Drawing No. 2 Date _____ Rev. _____



SUBPICTUR

Dwg. 1 , Key S-1 _____

Subpicture Pathname GVALV

Inherited Behavior ? ✓

Item	Parameter	Prompt

14549

Figure 2-9 — Simple Subpicture

Additional information for each parameter must be specified on the subpicture. The prompt question ("Point ID?" in this example) shown at the bottom of Form *SW88-557* comes up each time this subpicture is added to a display, and a different point ID can be specified for each case as described below.

Figure 2-11 illustrates the forms needed to collect detailed information related to subpictures that contain values and conditional behavior. The *SW88-553* Values Form shows that a value (Key V-1 from Drawing 3) is being specified with a parameter (&A.PRESS). Otherwise, it is filled out as described in the Values Section of this manual.

Wherever subpicture S-2 was called for in Figure 2-3, an additional key (SD-1 or SD-2) was used. Keys SD-1 and SD-2 refer to entries on the *SW88-558* Subpicture Detail Form. In Figure 2-11, the Subpicture Detail Form has been filled in to specify the point IDs needed to provide the pressure for each use of the subpicture.

The standard Conditional Behavior Form *SW88-554* identifies the behavior for the pump/value combination. In this case, the subpicture turns red and goes to full intensity under alarm conditions; otherwise it is blue and half intensity.

2.2.8.1 Application Subpictures

These are predesigned subpictures built with software. They cannot be changed with the Picture Editor, but they can be used in a custom display much like any other subpicture. Application subpictures can also be combined with other items into another subpicture.

Refer to the Application Subpictures Appendix in the *Picture Editor Reference Manual* for a list of standard application subpictures.

Use—Sketch the image onto the same forms but indicate that it is an application subpicture and provide the subpicture-file name (e.g., PIE4).

Many application subpictures require support information, so be sure to include whatever information is needed with the standard forms. Make your own form if necessary.

2.2.8.2 Standard Change Zones

A Honeywell supplied subpicture called CHG_ZONE allows the operator to call up a control-panel-type display for use with a specified point. The change zone at the bottom of Figure 1-1 is for a typical analog point as seen at operating time. Construction information and the change-zone displays are illustrated in the Actor's Appendix to the *Picture Editor Reference Manual* (see Call Up Change Zone). Standard change zones are 80 columns wide and three lines deep and are normally placed at the bottom of the display. No support information is required for this subpicture. The subpicture is supplied on volume &DSY.

You must place a target somewhere in the display, other than in the change zone area (or use one of the configurable buttons). The actor for this target is CHGZONE or CHG_ZONE. For faster operation, you can call the change zone in on an overlay display. In that case, the action sequence is `OVERLAY("CHG_ZONE");CHGZONE`(*point name,region)*. The type of point used with this actor determines the exact change zone schema. More than one target (each for a different point) can call the change zone subpicture. T2 in Figures 2-3 and 2-7 shows how a target was used with a change zone.

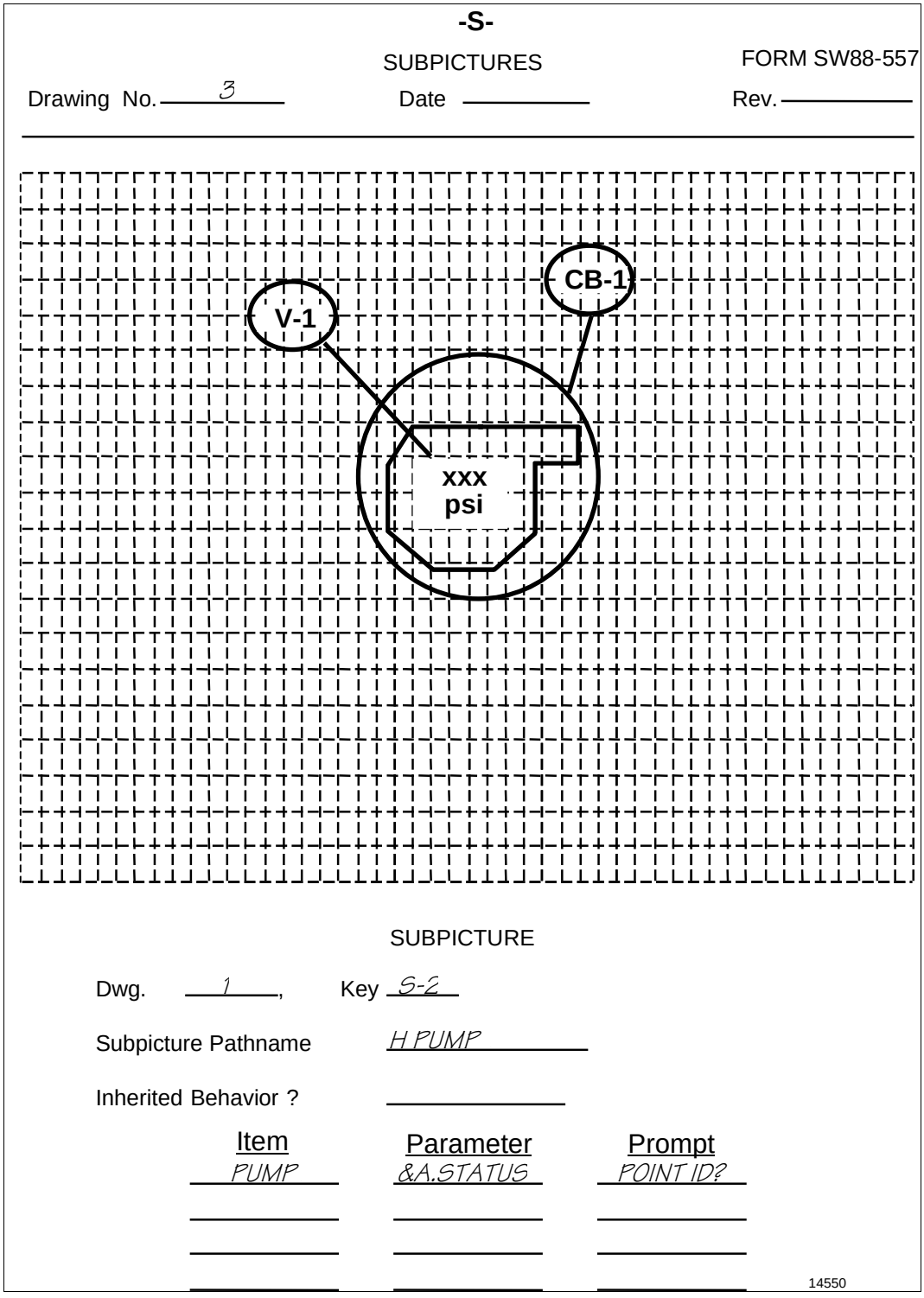


Figure 2-10 — Subpicture with Conditional Behavior and One Parameter

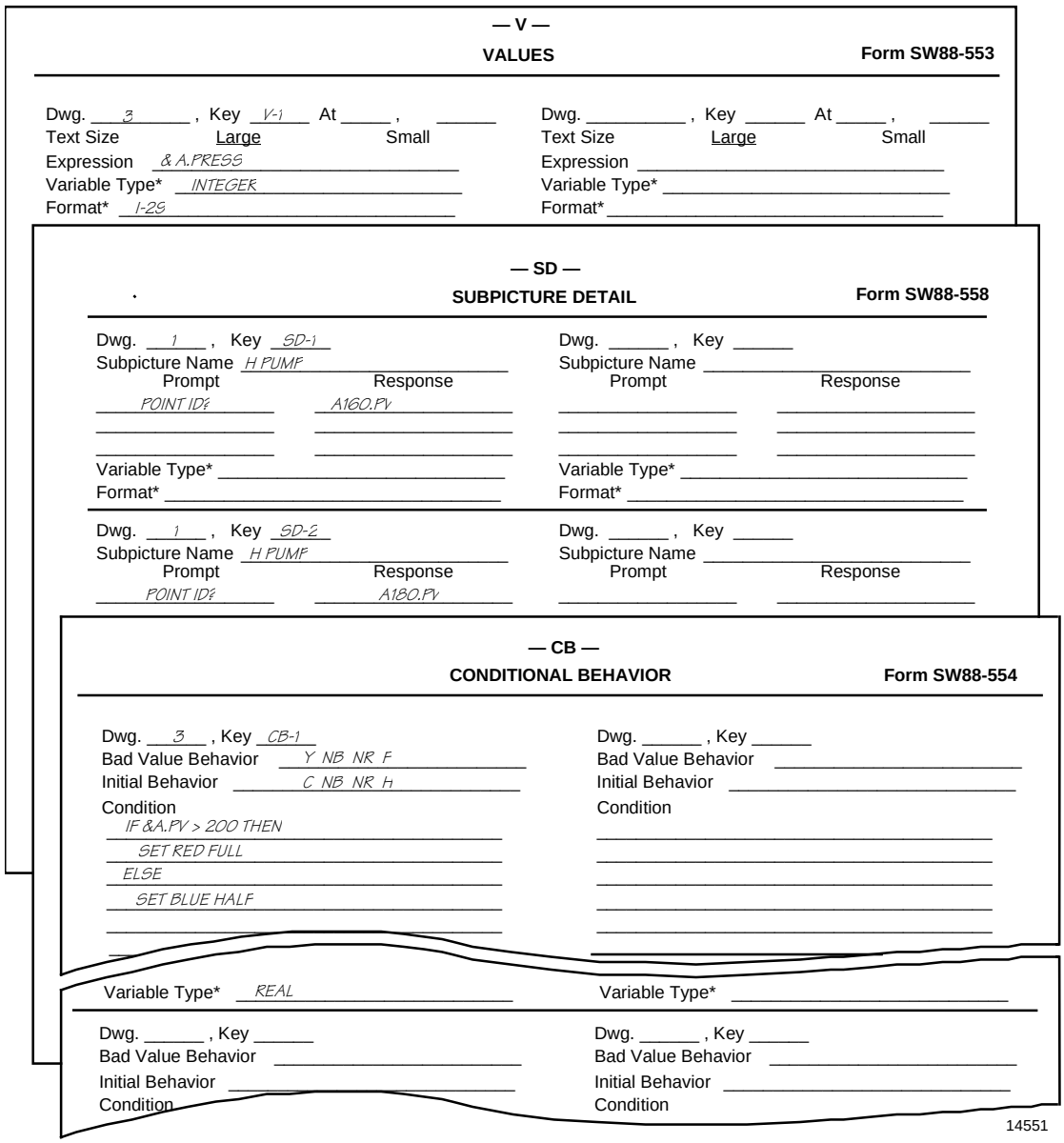


Figure 2-11 — Support Information for Subpictures

2.2.9 Bar Charts

Bar charts are often used to show relative quantities such as production for several periods. For this type display, groups of three bars are most effective for comparison; more may be used if needed. In a process schematic, single bar charts are sometimes used to represent the level in a tank because they provide a good "feel" for the level or magnitude. There are a couple of points to keep in mind: a wide bar chart can dramatically increase the light output, especially when the bar is at full scale, and narrow bars provide the same information as wide bars.

The length of the bars depends on evaluation of an expression (an analog value). The bars can be horizontal or vertical. In all cases, it is important to provide a scale or reference mark of some sort to compare the bar's magnitude.

2.2.9.1 Drawing Bar Charts

Sketch each bar on the *SW88-551,* Display Form. Allow enough room for the bar to reach full scale and indicate that point. A single bar is often used to represent a level in a process schematic. Production-type or management-type displays usually contain groups of bars with appropriate X/Y scales.

For each bar, fill in a bar chart section of Form *SW88-559* as described below.

Expression _____

Enter the expression that will be evaluated to determine bar length. Refer to the *Picture Editor Reference Manual* for allowable syntax of expressions.

Solid/Hollow _____

Solid/Hollow specifies whether the bar is to be drawn solid or hollow. A hollow bar is drawn as a rectangle with the open end at the origin. The default value is Solid. (You can circle your choice or write it in).

Vert/Horiz _____

Vertical/Horizontal specifies the direction the bar is to be drawn. The default value is Vertical. (You can circle your choice or write it in).

Left/Bottom Bound _____

If the bar is vertical, Left/Bottom Boundary means that this value represents the bottom boundary relative to the origin (see Figures 2-12 and 2-13). If the bar is horizontal, this number represents the left end of the bar. The default value is 0. You can circle your choice or write it in.

Right/Top Bound _____

If the bar is vertical, Right/Top Boundary means that this number specifies the top boundary relative to the origin (see Figure 2-13). If the bar is horizontal, this number specifies the right boundary relative to the origin. The default value is 100. The dashed lines in Figures 2-12 and 2-13 indicate the bar chart's potential length, but do not show up in the display at runtime. You can circle your choice or write it in.

Origin _____

The origin sets the starting point for the bar. The default value is 0.

Figure 2-13a shows a vertical bar with the origin at 0, a top boundary of 100, and a bottom boundary of -100. Figures 2-12/2-13b and 2-12/2-13c show how positive and negative values of the expression affect the bar chart in this example.

Figure 2-14 shows how bar charts can be used in a process schematic. Key BR-1 identifies a solid, vertical, bar chart that fluctuates to represent the level in the tower. The remainder of the tower is created with Add Line and Add Solid commands.

2.2.10 Custom Display Database

If custom variables are required in a picture, you must declare them in a custom Display Database (DDB). Refer to the heading User Defined DDB Files in Appendix A of the *Actors Manual*. Note the format and syntax. Create the list of custom variables and choose a file name (e.g., DBFILE1.df). The suffix .df is required. No form is needed for the variable list, but label the list as a custom DDB file. Write the file name on the list and in the space provided on the main display form. Attach the variable list with the other forms.

At data entry time, the file is built with the Text Editor and the Load command is used to declare the variables. There is one precaution: unlike standard DDB variables, custom variables are not initialized. Reading from a custom variable before writing to it returns a bad value.

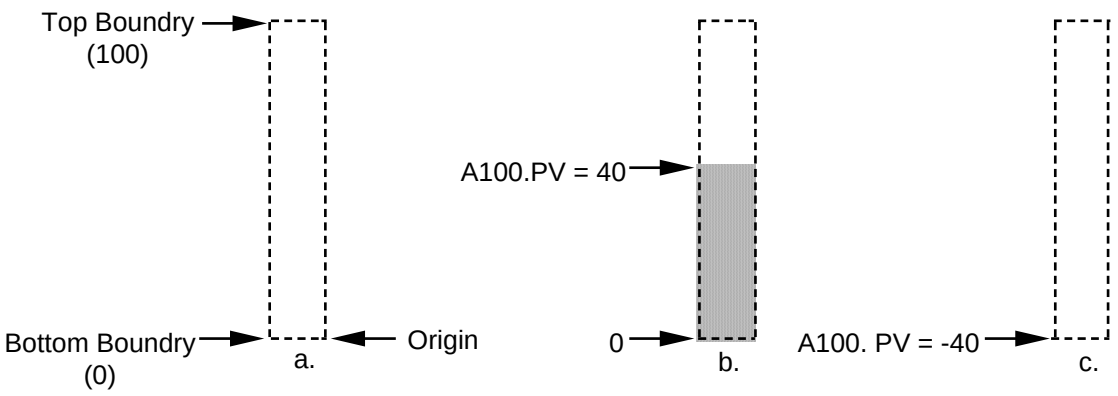


Figure 2-12 — Bar Chart with Origin at Bottom Boundary 1547

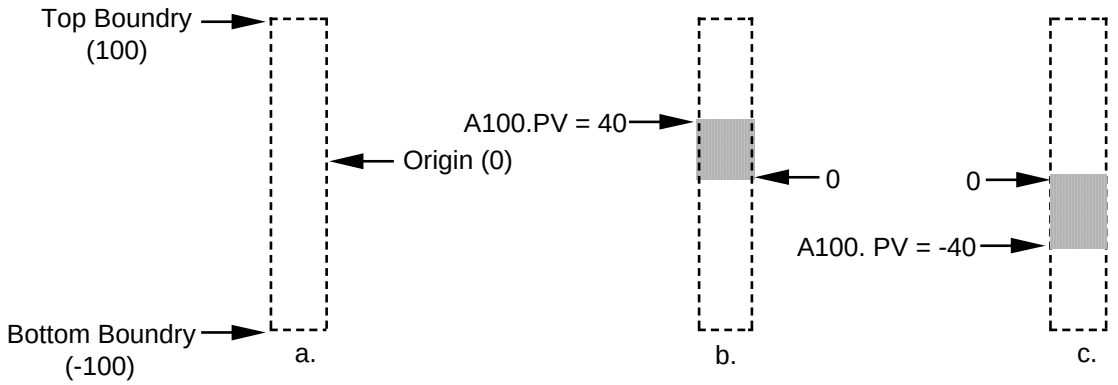
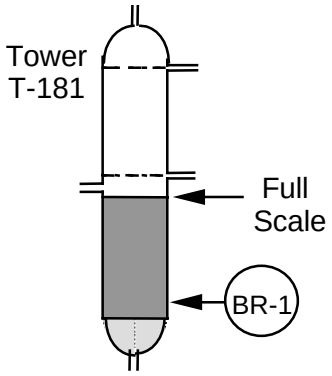


Figure 2-13 — Bar Chart with Center Origin 1551



— BR —

BAR CHARTS **Form SW88-559**

Dwg. 1 , Key BR-1

Expression A150.PV
Solid/Hollow SOLID
Vert/Horiz VERT
Left/Bottom Boundary (0-XXX) C
Right/Top Boundry X-100 100
Origin At (0-XXX) C
Variable Type*
Format*

Dwg. _____ , Key _____

Expression
Solid/Hollow
Vert/Horiz
Left/Bottom Boundary (0-XXX)
Right/Top Boundry X-100
Origin At (0-XXX)
Variable Type*
Format*

Variable Type*
Format*

Dwg. _____ , Key _____

Expression
Solid/Hollow
Vert/Horiz
Left/Bottom Boundary (0-XXX)
Right/Top Boundry X-100
Origin At (0-XXX)
Variable Type*
Format*

Dwg. _____ , Key _____

Expression
Solid/Hollow
Vert/Horiz
Left/Bottom Boundary (0-XXX)
Right/Top Boundry X-100
Origin At (0-XXX)
Variable Type*
Format*

* If unknown to the system.

14552

Figure 2-14 — Bar Chart Example

SPECIAL DISPLAYS
Section 3

This section describes special or unusual displays that can be built with the Picture Editor. These displays typically contain actors, subpictures, and collectors. Actors are described in the Actors Manual. Subpictures, and collectors are described in the Picture Editor Reference Manual, Appendices G, and H, respectively.

3.1 TRENDS IN SCHEMATICS

Trends in schematics are a combination of trend actors, trend subpictures, and usually, trend collectors. They can be included with other items in a picture.

Overview—Up to 12 trend subpictures can be put in a single display. Each subpicture is associated with a Trend Record and each actor contains a parameter to specify the Trend Record (therefore, subpicture) it affects.

Up to four traces can be added to each subpicture. Each trace represents and displays the trend of one variable. The traces and other configuration parameters are added by using actors (hence, targets or configurable buttons are required).

The system can determine the most appropriate source of data for each variable if you do not specify it and default range/timebase values are used unless otherwise specified. Collectors can be used to display information about the traces, such as the timebase, scroll period, etc.

Example 1

Figure 3-1 illustrates a simple trend picture that is intended to show the trend of variables HG0501.PV, HG0501.SP, and HG0501.OP. The subpicture TREND_AX at the center contains a series of dummy traces when it is added in the build phase. Trend Record 1 (TREND01) was assigned to this subpicture. The subpicture was enlarged by using the scale command.

The target "Start Trend" contains the following action sequence

Start Trend	TR_TIME(1,1); TR_ADD(1,HG0501.PV,1); TR_ADD(1,HG0501.SP,4); TR_ADD(1,HG0501.OP,2);

The TR_TIME actor specifies a 1-minute timebase before the three traces are added. If a timebase was not specified, the system would request 20 minutes of history as the traces are added. The 20-minute default timebase might be acceptable or inefficient depending on the circumstances.

Traces are numbered and made active when the TR_ADD actors execute (i.e., HG0501.PV is represented by trace 1, etc.). The first two actor parameters specify the trend record (subpicture) and the variable. The last parameter in the actor specifies the trace color (1 = cyan, 4 = green, and 2 = yellow).

The targets "1 Min," "5 Min," etc., set the current timebase. The actors for these targets have the form

t Min	TR_TIME(1,t);UPDATE(0,0)

where t is a number that specifies the time period.

A collector is used following the word "Timebase =." The procedure is to add a value and for the value expression, enter the collector

TR_TIME(1)

At operating time, the current timebase for trend record 1 appears and changes as the operator selects different timebase targets. Trend collectors are described in Appendix H of the Picture Editor Reference manual.

The targets with left/right arrows are used to scroll backward or forward (if HM data is being used).

The backward scroll actor has the action

<	TR_SCRLL(1,1)

and the forward scroll target has the actor

>	TR_SCRLL(1,-1)

At the lower right edge of the trend subpicture, a value was added with the expression TR_SCRLL(1). TR_SCRLL(1) is a collector that displays the scroll time for Trend Record 1 (when scrolling is active).

The words "PV--," SP--," and "OP--" are in colors that match the trace colors for those variables. For example, the operator knows the yellow trace represents the setpoint because SP-- is yellow.

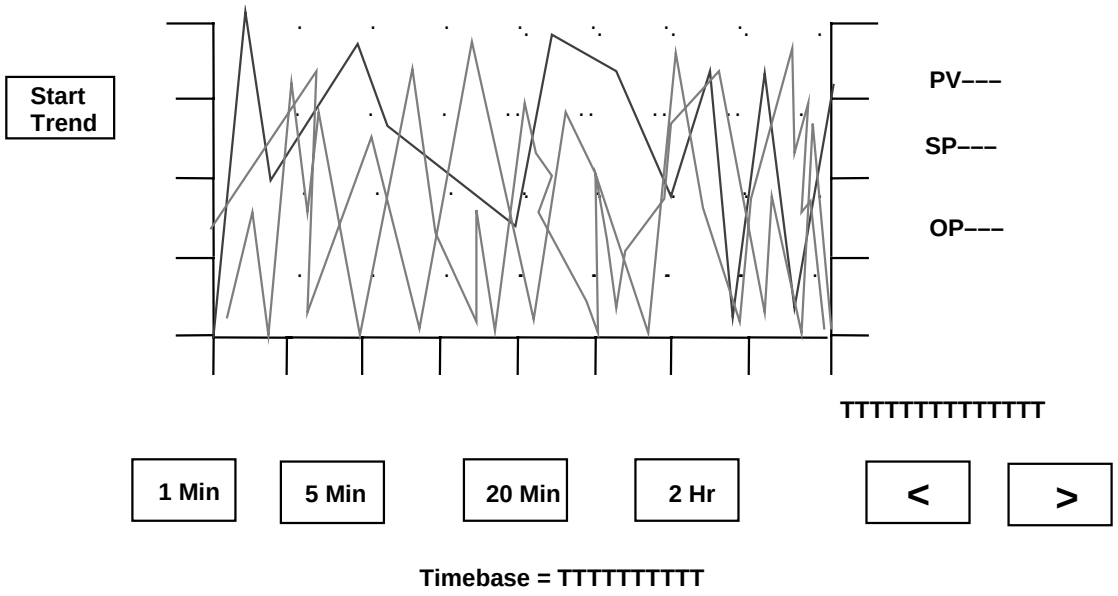


Figure 3-1 — Trends in Schematics 13783

Improvements—There are many ways to increase the functionality of this trend picture. For example, more "Start Trend" targets could be used, each of which adds a different entity set. Another way to do this is to add a target with an action sequence such as:

RS_LOC(ENT01,0,23,8,"Enter Entity Name",True,0);UPDATE(0,0)

This actor would open a text input port and let the operator type in a point name. You could label it ENTER ENTITY.

Then a TR_ADD actor for the Start Trend target must be changed to:

TR_ADD(1,ENT01G.PV)

etc., so they would use the specified point.

For either of the preceding modifications, a useful change would be to replace the text "PV--," "SP--," and "OP--" with values. For each value expression use the collector

TR_NAME(1,n)

where n is the trace number. Add behavior of cyan, green, and yellow, respectively, to the values. At operating time, the variable name will appear in the same color as the trace that represents it (e.g., HG0501.PV appears in cyan).

Example 2

Figure 3-2 shows how centerline trending can be added to the example shown in Figure 3-1.

The target “Center Line On” was added and has the action

Center Line On	TR_CLINE(1,2,DATIME1)

This target enables centerline trending without changing the trend data.

The target “Center Line Off” was added to turn centerline trending off and cancel scrolling. It has the action

Center Line Off	TR_CLINE(1,1,DATIME1)

An additional value added below the center of the trend subpicture uses the centerline collector TR_CLINE(1). When centerline trending is active, this collector returns the date and time at the center of the trend.

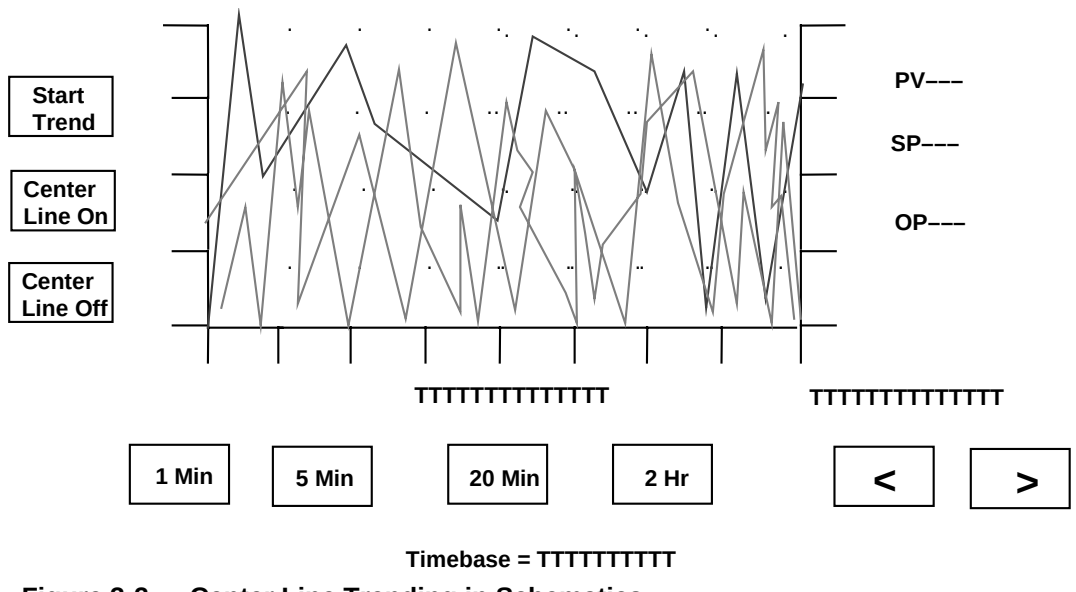


Figure 3-2 — Center Line Trending in Schematics

Improvements—In the above example, the TR_CLINE target actions ignored the Date/Time DDB. You could add an invisible target that allows the operator to enter a centerline date and time. For example, you could add an invisible target around the centerline value under the time axis with a target action of:

```
S_DATE(DATIME1,C_DATTIM(R_DATE(30,1,9,"Enter Centerline
Date",TRUE,1),R_TIME(30,1,5,"Enter Centerline Time",TRUE,1)));
TR_CLINE(1,3,DATIME1)
```

The Center Line On and Off targets can be replaced with one target that toggles between modes. To do this, add a Define Initial action to the display that initializes a flag. For example, set BOOL01 false when the display is called: S_BOOL(BOOL01,FALSE).

Then use a single target that will toggle the trend mode. The target action could be:

```
IF(G_BOOL(BOOL01));
    S_BOOL(BOOL01,FALSE);
    TR_CLINE(1,0,DATIME1);
ELSE;
    S_BOOL(BOOL01,TRUE);
    TR_CLINE(1,2,DATIME1);
ENDIF;
```

Label the target “C-Line,” or “Trend Mode,” or something similar. You can also add conditional behavior to the target and label. For example, set yellow if BOOL01 is True (if centerline trending is enabled) or set green if BOOL01 is False. For example:

```
IF BOOL01
THEN SET YELLOW
ELSE SET GREEN
```

3.2 OVERLAYS

3.2.1 Standard Overlay

It may be desirable to build a picture in two parts, such that one part is updated at a higher priority. For example, drawings of most objects such as furnaces, tanks, etc., never need to change once they are called into the display, while information about flow rates, temperatures, and control functions could be critical.

The less critical parts of the picture can be built into a base display and the critical parts can be put into an overlay. In the Operating Personality, both the base display and the overlay can be called onto the screen where they appear as a single picture, but the overlay updates at a priority rate.

The two displays are built as if they were separate pictures. The base display (or a configurable button) can contain a target to call the overlay or both displays can be called by the same target or button if desired.

When laying out an overlay sketch, you should indicate that it is an overlay for Drawing Number xxxx. The data entry technician can probably effect a more accurate fit by building both pictures as a single display and electronically separating them with techniques explained in the *Picture Editor Data Entry* manual.

Example 1

Figure 3-3 shows the base picture stored as D122. The target SHOW DETAIL contains the action sequence

```
OVERLAY("D123")
```

When the operating personality is running and this target is selected, the picture stored as D123 overlays D122. Figure 3-4 illustrates D123. Note that it contains values, a bar chart, a variant, and additional targets that overlay the base picture. Figure 3-5 illustrates the composite display as it would appear in the Operating Personality.

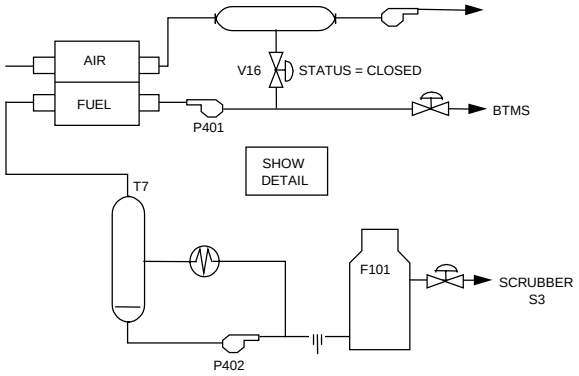


Figure 3-3 — Schematic D122 1398

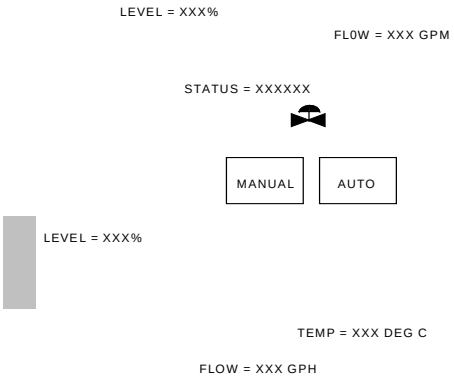


Figure 3-4 — Overlay D123 1399

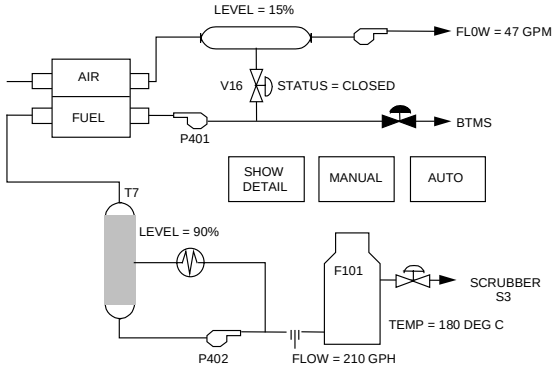


Figure 3-5 — Composite Picture 1400

Example 2

A base schematic contains various targets (e.g., as indicated by K, L, M, etc., shown in Figure 3-6) and each target has the action sequence

S_BOOL(BOOL01G,TRUE);S_ENT(ENT01G,*POINT*);OVERLAY("CTL1")

POINT is a different point name for each target.

The overlay shown in Figure 3-7 contains a variant with the statement:

IF BOOL01G THEN SUB CZ1

This variant calls up a custom change zone if Global Display Database variable BOOL01G tests true. The overlay display also contains values that indirectly reference the point (e.g., a value with the expression ENT01G.PV will display the value of *POINT*.pv).

When any of the targets K, L, M, etc., is selected on the base display, the value of BOOL1G is set true and the specified point name is stored in ENT01G. Overlay CTL1 is called up, the variant finds that BOOL01G status is true, and therefore, calls up the subpicture CZ1. The overlay functions are updated at a priority rate over the base subpicture.

A target in the overlay display labeled CLEAR contains the action sequence:

S_BOOL(BOOL01G,FALSE);UPDATE(0,2)

Selecting the CLEAR target sets BOOL01G false and updates the display, making the change zone disappear.

3.2.2 Multiple Serial Overlays

The Multiple Serial Overlay actor (MULT_OV) allows a series of overlays to be called into a picture. As before, design a base schematic first. Do not draw anything in the area where you want the overlay.

Design the overlays as a series of pictures, each with a different file name. Typically, strip overlays are called in as illustrated in Figure 3-8. As each overlay is called in, the area occupied by the previous overlay is blanked.

Targets that call in the overlays can be on the base schematic or on configurable buttons. The actor parameters for each target must specify the name of the overlay, the lower left X-Y coordinates and upper right X-Y coordinates for the overlaid area.

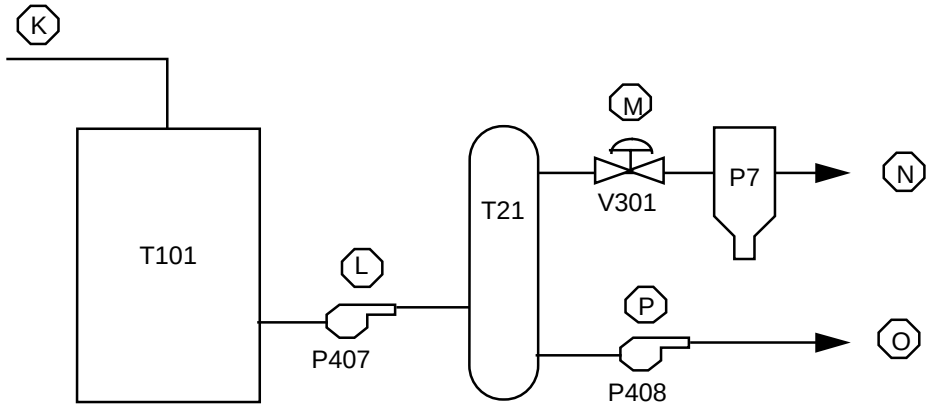


Figure 3-6 — Base Picture

1401

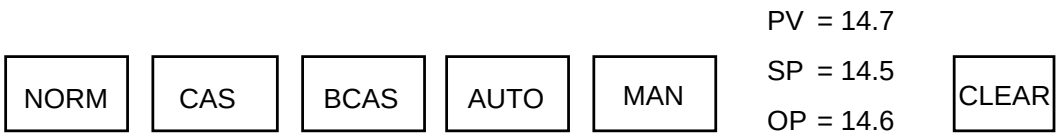


Figure 3-7 — Overlay CTL1

1402

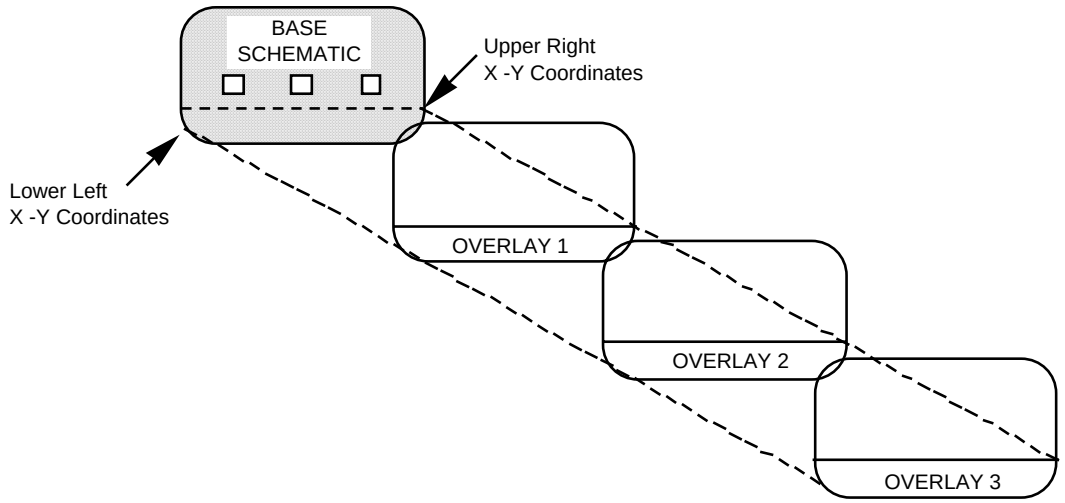


Figure 3-8 — Multiple Serial Overlays

2699

3.2.3 Custom System Status Display

Custom System Status displays can be built to show all or any part of the of the LCN nodes on a system. A Custom System Status display can have as many as 5 pages and you can build a different display set for each of up to 10 consoles. Refer to the *Picture Editor Reference Manual*, Appendix G for a complete description of the subpictures.

Overview—In this example, the first page shows all LCN Nodes configured on this system. The second page shows the HM and AM nodes, and the third page shows the NIM and related UCN nodes. Note that other picture editor objects such as targets, lines, color and conditional behavior can be added to enhance the Custom System Status display. Each page is compiled in a format that specifies a certain console and identifies it as a certain page of a Custom System Status display. The object (.DO) files are then copied to the &DSY directory where they are invoked when the System Status Display is selected.

Build Procedure—Invoke the Picture Editor and begin building the Custom System Status display by adding the subpicture SS_Frame. Specify the origin at the lower left corner.

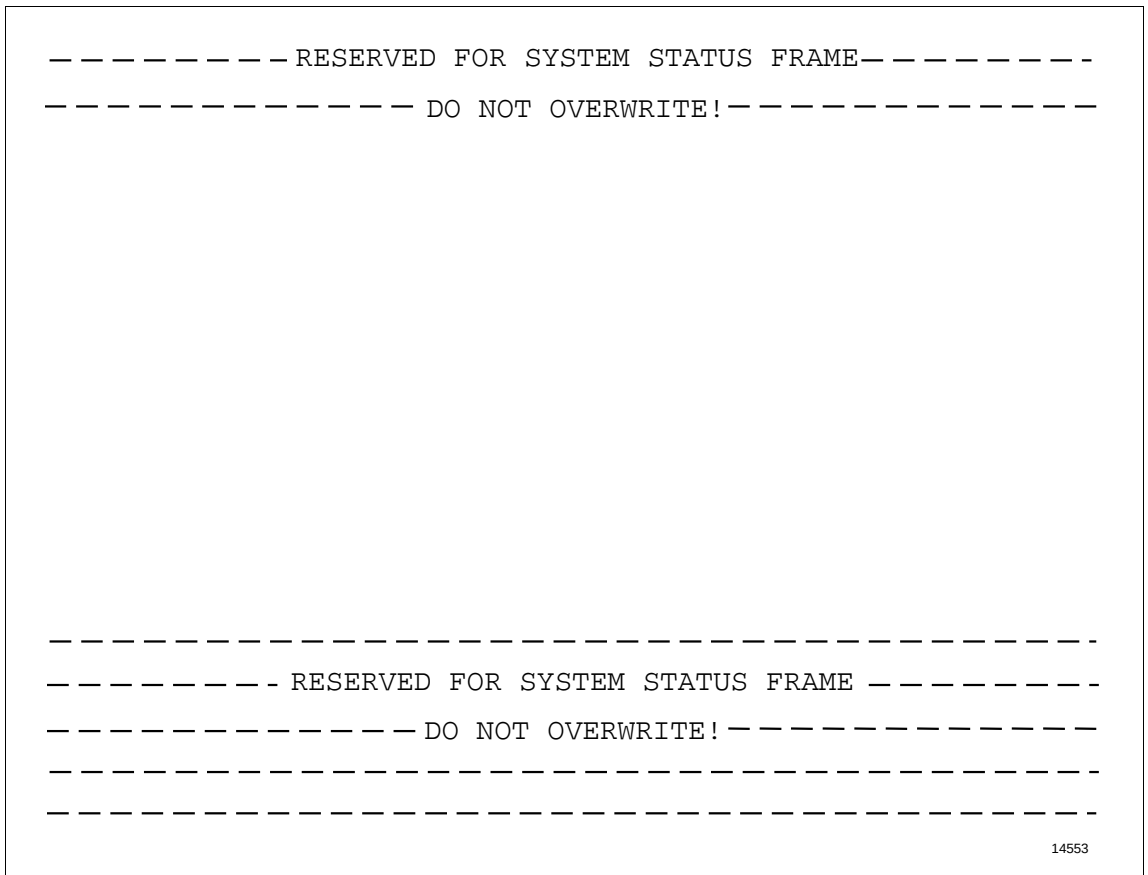


Figure 3-9 — SS_Frame Subpicture

The next step is to add node boxes to the blank area of the SS_Frame subpicture. Each box represents a unique LCN node. The small boxes are subpicture SS_PN_SM and the large boxes are subpicture SS_PN_LG. For each subpicture, you are prompted to enter a coordinate (origin) and the LCN node number that the box represents.

Figure 3-10 shows how a series of small node boxes were added to represent all the LCN nodes on this system. A target was added below the Hiway Gateway Node. The target action is HWY_STAT(02). A similar target added under the NIM node has the target action UCN_STAT(03). Each target was labeled using the Add Text command and lines from the target boxes to their respective nodes were drawn using the Add Line command.

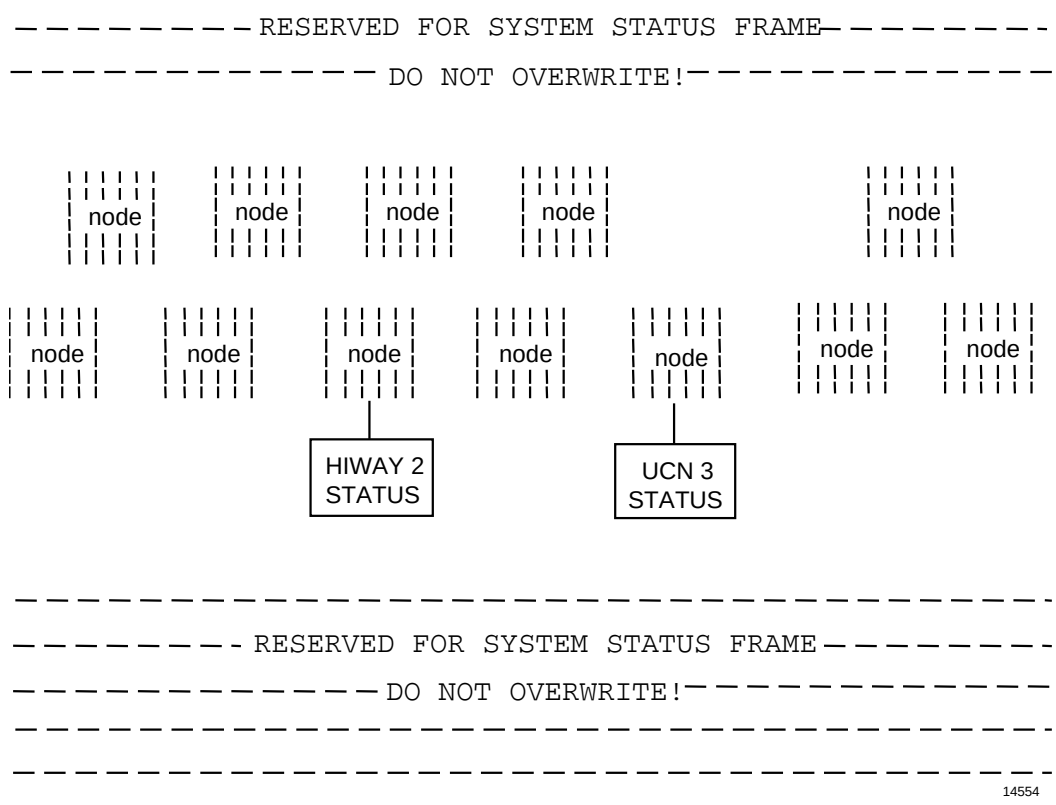


Figure 3-10 — Page 1 at Build Time

This page can now be compiled to a user volume as Cnn_SSp where nn is the console number and p is a single digit page number. For console number 01 and page 1, the command is COMPILE NET>HMV1>C01_SS1 (where HMV1 is a HM user volume).

Helpful Hints

After adding a few node boxes, you may choose to enter several Node box coordinates at a time. The LCN Node number ports then appear one after the other for you to fill in.

If you need to move, modify, or delete an object, it must first be selected. Anything selected on the SS_Frame background also selects SS_Frame. If the US has a touch screen, just touch the frame part twice to deselect it. You can of course do the same thing by positioning the cursor and pressing the Select key twice.

Note that if you have several consoles which use the same System Status Display, you could compile the source pictures once and then copy/rename the object files for each console instead of rebuilding the displays.

In R600, a System Status Journal actor (SYS-JRNL) is available (see *Actors Manual)* and can be added to a custom display. This actor will display the system status change journal when the target is selected. After viewing the journal, press the PRIOR DISP button to return to this display.

Figures 3-11, 3-12 and 3-13 shows how pages 1, 2 and 3 of the custom System Status Display will look at run time.

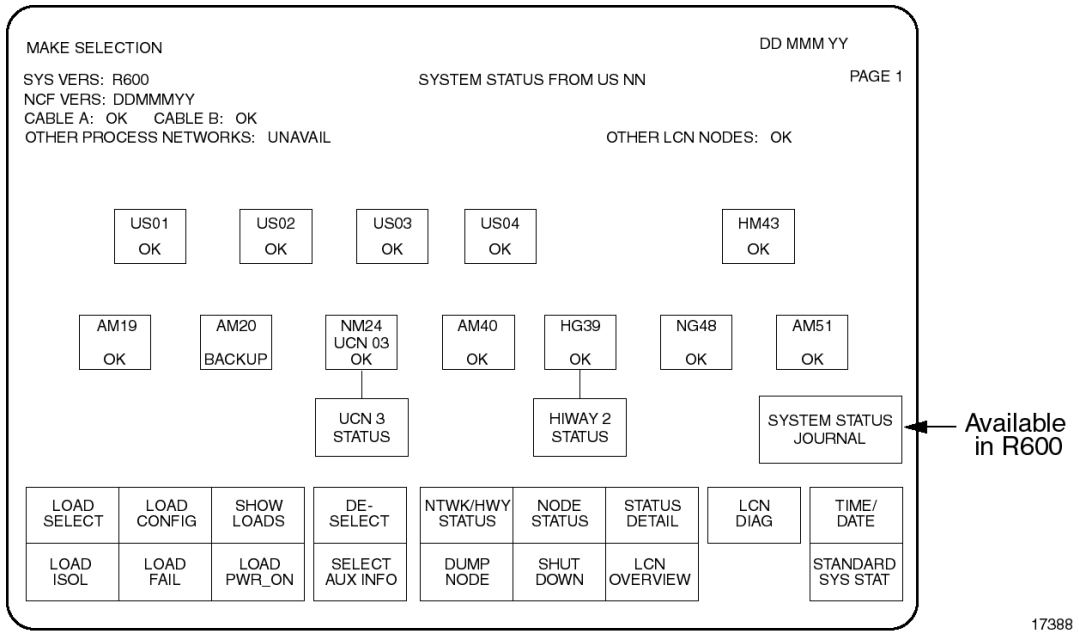


Figure 3-11 — Page 1 of the Custom System Status Display Example

Page 2—This page is built much like the first by adding subpicture SS_Frame to a blank display. This time we added a large node box to represent the HM and several small node boxes to represent the AMs.

The ADD LINE command was used to draw connections between the node boxes.

We added two targets. The one in the upper right uses the actor SCHEM("HELP1") and the target in the lower right and uses the actor QUE_KEY(ENTER). We used the ADD TEXT command to label the targets. This is completely optional and only to show more ways to use targets in the display. You will of course have to build and compile a display with the name HELP1 for the HELP target to work. It could be a simple text only display containing instructions that tell what to do if an AM node fails. The ENTER target is useful, for example, to shutdown and reload nodes from an upper tier display.

Page 2 is compiled with the command COMPILE NET>HMV1>C01_SS**2** where user volume HMV1.

When viewed at operating time it looks like Figure 3-12.

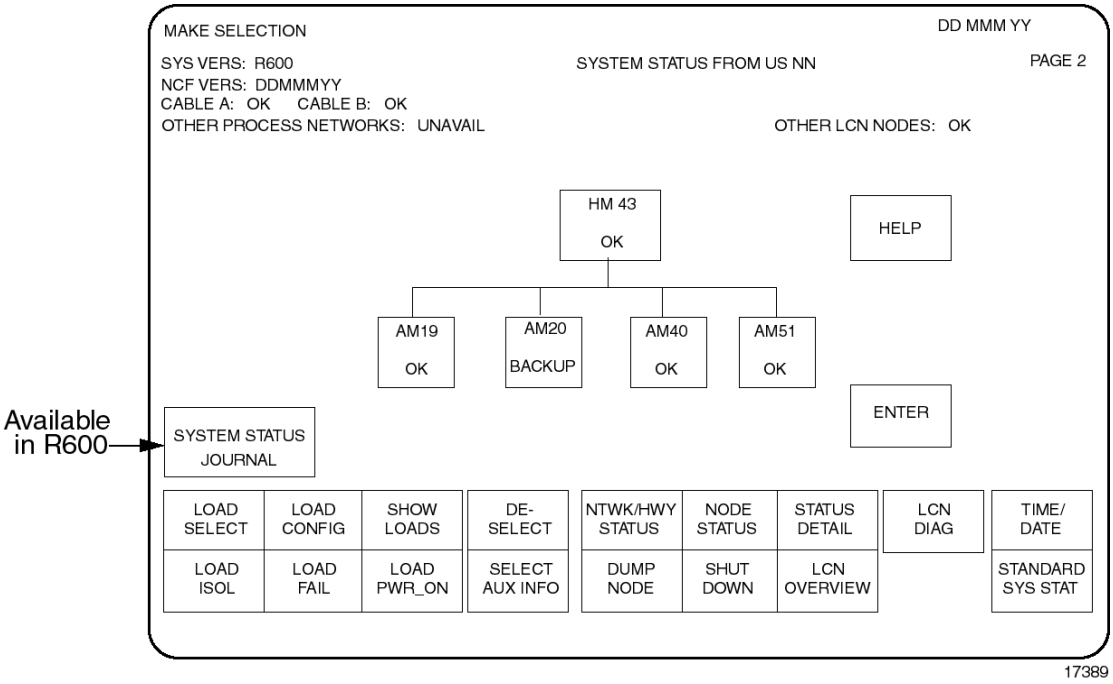


Figure 3-12— Page 2 of the Custom System Status Display Example

Page 3—On this page we added a large node box to represent the NIM. Three targets were added to call up the UCN Status display for the PM, APM, and HPM on this system using PM_STAT(UCN,NODE) actors.

Page 3 is compiled with the command COMPILE NET>HMV1>C01_SS**3**.

When viewed at operating time it looks like Figure 3-13.

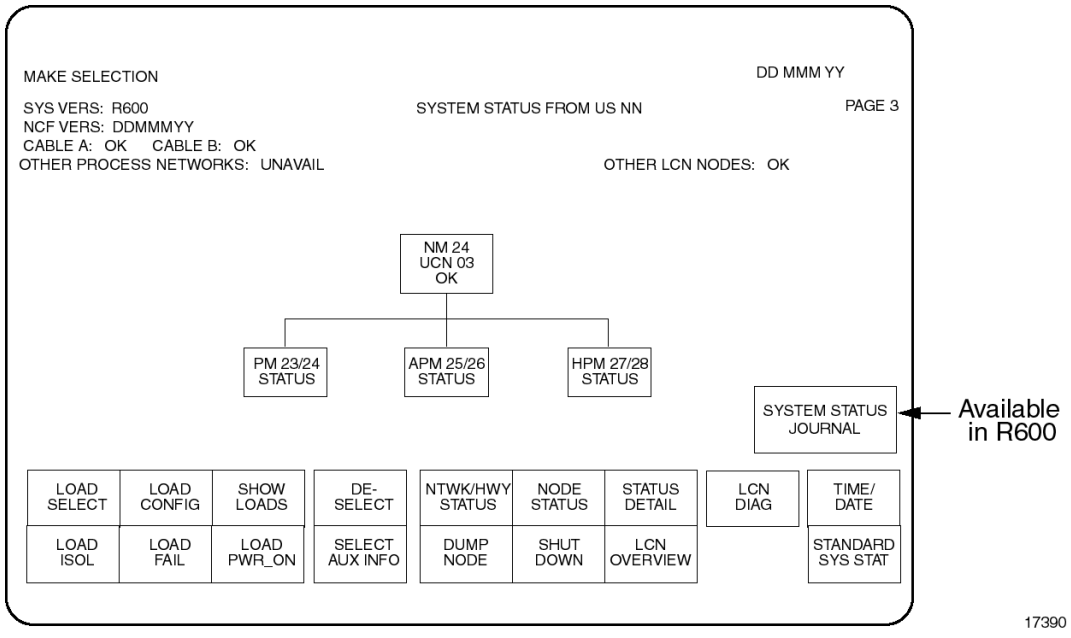


Figure 3-13 — Page 3 of the Custom System Status Display Example

Completion—When all pages have been built and compiled, copy the object files to the &DSY volume. If you had compiled the pages for console 1 in a user volume named HMV1, the command would be:

CP Net>HMV1>C01_SS∗.DO NET>&DSY>= -D

If you have a second History Module with the &DS2 volume configured, copy the custom Status Display pages to it too:

CP Net>HMV1>C01_SS∗.DO NET>&DS2>= -D

In order to get the displays into US memory, you must perform an Area Change or reload the Universal Stations at operating time.

When the System Status display is called, the pages would appear as shown in Figure 3-11 through 3-13. The Node boxes work with the two lower rows of targets in the same way as on the standard System Status display. The Hiway and UCN status targets built into this custom display save a step when calling up the Hiway or UCN Status display.

You can return to the standard System Status Display by selecting the target in the lower right hand corner.

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