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Annunciator Sequences and Options

This appendix discusses Verbatim operations in the context of the *ANSI/ISA-S18.1 Annunciator Sequences and Specifications* standard. It also describes the options available for configuring the Verbatim to support a variety of sequence models. This information will be useful for users needing calling sequences different from the one discussed in Section 5.

Note that the ANSI specification uses slightly different terminology from that used here and elsewhere in this manual. Hopefully, this won't cause much confusion.

One concept central to this discussion is that of *channel state*. At any given time every armed channel is in one of the following 5 states: *normal, alarm, acknowledged alarm, return to normal (RTN), acknowledged RTN*. The precise meaning of these terms will be clarified later on.

The term *annunciator state* is used here to describe the actions and indications of the Verbatim. These include LED illumination, voice reporting and status logging.

An *annunciator sequence* consists of specifying how transitions between the channel states occur and how they impact the annunciator state. The Verbatim supports three distinct types of annunciator sequences. These are each discussed in the subsections below. The next several paragraphs discuss the properties they all share in common.

The normal, alarm and RTN states are determined by comparing the channel's value with the criteria settings. A transition into these states requires that the condition persist for a time period referred to as the *alarm trip delay*. This provides hysteresis, or debouncing between the real-world signals and the channel state.

The two acknowledged states are determined by operator actions. Unacknowledged alarms and RTNs transit to the acknowledged states by pressing keys on the front panel or entering DTMF tones over the phone.

The Verbatim gives visual indications for the state of each channel or group of channels. If normal, the LED is OFF. When alarmed, the LED is blinking. When acknowledged the LED is steady ON. The visual indications for the RTN states are sequence dependent, and described later.

Audible indications for the channel states are also given. These take the form of voice reports either from the speaker or over the phone. These reports may be requested at any time by pressing the CHECK STATUS key, or phoning the unit.

Whenever any channel is in the unacknowledged alarm or RTN state, the Verbatim will solicit acknowledgment by phoning personel. The calling sequence itself is determined by the alarm call grouping and alarm ready scheduling configuration.

All audible indications can be silenced by pressing the ARM/DISARM key on the front panel. This action will also always acknowledge all unacknowledged conditions. Also, all annunciator state transitions and actions are suspended whenever the box is in program mode. Channel state transitions will still occur.

The annunciator state may at any time be completely reset by pressing the ARM/DISARM key twice. This action will also reset the state of each channel.

In terms of *ANSI/ISA-S18.1*, there is one more property that all Verbatim annunciator sequences share: there is no support for the *first out* sequence designations (**F1, F2, F3**). Groups of alarms and RTNs are always registered, reported and reset without regard to which one tripped out first.

K.1   Standard Annunciator Sequence (Manual Reset)

This section describes the default annunciator sequence used by the Verbatim . It is a minor variant of the *ANSI/ISA-S18.1* designation **M-1** (Manual Reset with silence pushbutton). It may be configured by entering code **923 1** in program mode.

Operations in this sequence are detailed in Section 5. Briefly, channel states transit from normal to alarm when criteria violations persist for the trip delay. The alarm state is then locked in until acknowledgment is made. The transition from acknowledged back to normal happens upon manual reset or expiration of the alarm reset timer. The RTN states are omitted from the sequence.

The annunciator states include only those visual and audible indications described above. Also, the annunciator sequence follows the transitions described there too.

This sequence differs from the vanilla **M-1** designation in two ways. The first involves the operation of the automatic reset timer. The true **M-1** sequence is obtained by turning the alarm reset timers off (code **922**). The second distinction involves configurations where no phone numbers are programmed. Here the transition from alarm to acknowledged happens automatically and immediately. There are never any audible or visual indications of the unacknowledged state. This sequence has ANSI designation **M-1-5-6**.

K.2 Clear On Return To Normal (Automatic Reset)

This section describes annunciator sequence options that are variants of the ANSI designation **A-1** (automatic reset with silence pushbutton). The main distinction of these from the **M-1** sequence is that the alarm state is automatically reset when the channel enters the RTN state. The Verbatim sequences in this category differ amongst themselves mainly in when   this RTN transition is allowed to occur.

The basic **A-1** sequence is obtained by executing code **923 3**. Channel states transit from normal to alarm when criteria violations persist for the trip delay. The alarm state is then locked in until acknowledgment is made. If no phone numbers are configured, then this transition happens automatically and immediately (**A-1-5-6**). Otherwise, operator action is required. The transition from acknowledged back to normal happens via manual reset or expiration of the alarm reset timer. It also happens whenever the criteria violation for an acknowledged alarm returns to normal.

Designation **A-1-4** is obtained by code **923 2**. This sequence differs from **A-1** only in that the unacknowledged alarms are not locked in. All visual and audible indications are automatically reset whenever the criteria violations return to normal for the trip delay period.

A minor variant of **A-1-4** is obtained by code **923 4**. Here, the indications for an acknowledged alarm will not be reset until it has been reported once, regardless of RTN status. Unacknowledged alarms will be reset completely without any lock-in whatsoever.

The implementation of these **A**-designates involves one wrinkle. The check for RTN condition is not performed continuously, but rather only at specific times. Hence, changes that happen in the midst of a report may not be reflected in the annunciator state until some time later.

K.3 Report Return To Normal (Ringback)

This section describes the annunciator sequence option that provides explicit indications of RTN conditions. This is a variant of the **R-1-8** designation (ringback with silence pushbutton and common ringback audible). There are two differences between **R** and **M** or **A** designations. First is that the RTN state can be entered only from the acknowledged alarm state. **M** has no notion of RTN at all, and **A** allows the transition at any time. Second is that **R** locks in RTN states until acknowledged, whereas **A** immediately resets.

A variant of the **R-1-8** sequence is obtained by executing code **981 1**. Channel states transit from normal to alarm when criteria violations persist for the trip delay. The alarm state is then locked in until acknowledgment is made. If no phone numbers are configured, then this transition happens automatically and immediately (**R-1-5-6**). Otherwise, operator action is required.

The transition from acknowledged alarm to unacknowledged RTN is made whenever the criteria violation goes away for the trip delay period. The RTN state is then locked in until acknowledged. RTN acknowledgment is made in the same fashion as alarm acknowledgments. The channel states are reset either manually or by expiration of the reset timer. The reset timer begins running when the original alarm condition is acknowledged. This means that if a sufficiently long interval exists between acknowledgment of the alarm and the RTN, then the reset will happen immediately.

The main differences between this variant and the standard **R-1-8** sequence are as follows. First, there is no registration of momentary alarms once the RTN state is entered. Once the RTN state is acknowledged, no further calls will be triggered until the channel is reset. This is to say transitions in the channel state may continue, but will not be reflected in the annunciator state. Still, all reports will reflect the current state of the channels. Second, there is no visual indication for the RTN states. The LEDs will continue to reflect the acknowledged alarm status. Third, the silence pushbutton stops all flashing LED indications. Fourth, there is the automatic reset timer.

Unlike the implementation for the **A** designations, RTN conditions are checked continuously for all channels. So long as any unacknowledged alarm or RTN condition exists, the Verbatim will be making calls. Alarm conditions have priority. Hence, if an alarm is one call group and an RTN is in another, no calls will be placed to the RTN group until the alarm is acknowledged.

If the trigger for a call is an RTN, then the report will explicitly mention this before reporting the status of all channels in the group. An RTN report mentions RTN conditions only. Any acknowledgment while in RTN calling state acknowledges RTN conditions only. In contrast, any operator acknowledgment during an alarm call will also acknowledge all RTNs. But, the alarm reports do mention all unacknowledged RTN conditions.

If a new alarm occurs on any channel while in the RTN calling state, a change from RTN to alarm calling will occur as soon as possible. This can happen no sooner than the completion of any report in progress. Such reports may or may not include mention of the new condition depending on whether that channel has already been announced.

K.4 | Annunciator Sequence Option Summary

The following paragraphs provide a concise summary of the available annunciator sequence options. The ANSI designator is given, along with the Verbatim configuration code, followed by a short functional description.

M-1: Manual Reset with Silence Pushbutton.
Code (923 1)

Alarm states are registered directly from configured criteria without regard for return to normal conditions. Alarm states are locked in and dialer will continue to call until acknowledged. Acknowledged alarms are reset via automatic timer. Total dialer reset andsilence via arm/disarm key.

M-1-5-6: Manual Reset with Silence Pushbutton, No Flashing, and No Audible.
Code (923 1) - with no phone numbers programmed

Same as **M-1**, except the alarm state is immediately converted to acknowledged state.

A-1: Automatic Reset with Silence Pushbutton.
Code (923 3)

Same as **M-1** except the acknowledged alarm state will be cleared if the channel returns to normal. The check for this transition occurs only when all alarms have been acknowledged.

A-1-5-6: Automatic Reset with Silence Pushbutton, No Flashing, and No Audible.
Code (923 3) - with no phone numbers programmed.

Same as **A-1**, except the alarm state is immediately converted to the acknowledged state.

A-1-4: Automatic Reset with Silence Pushbutton and No Lock-in.
Code (923 2)

Same as **M-1** except BOTH the acknowledged and unacknowledged alarm states will be cleared if the channel returns to normal. The check for this transition occurs only in between alarm calls.

A-1-4 variant: Automatic Reset with Silence Pushbutton, No Lock-in, and Single Acknowledge Report.
Code (923 4)

Same as **A-1-4** except the clearing for the acknowledged alarm can't happen until after a single report has been made.

R-1-8: Ringback with Silence Pushbutton and Common Ringback Audible. *Code (981 1)*

Alarm and Return to normal states are registered from criteria and locked-in. Dialer will continue to call until all alarm and RTN states are acknowledged. Acknowledged alarms and RTNS are reset via automatic timer. Total dialer reset and silence via arm/disarm key.

R-1-5-6: Ringback with Silence Pushbutton, No Flashing, and No Audible. *Code (981 1) - with no phone numbers programmed.*

Same as **R-1-8** except all unacknowledged alarm and RTN states are immediately converted to the acknowledged state.