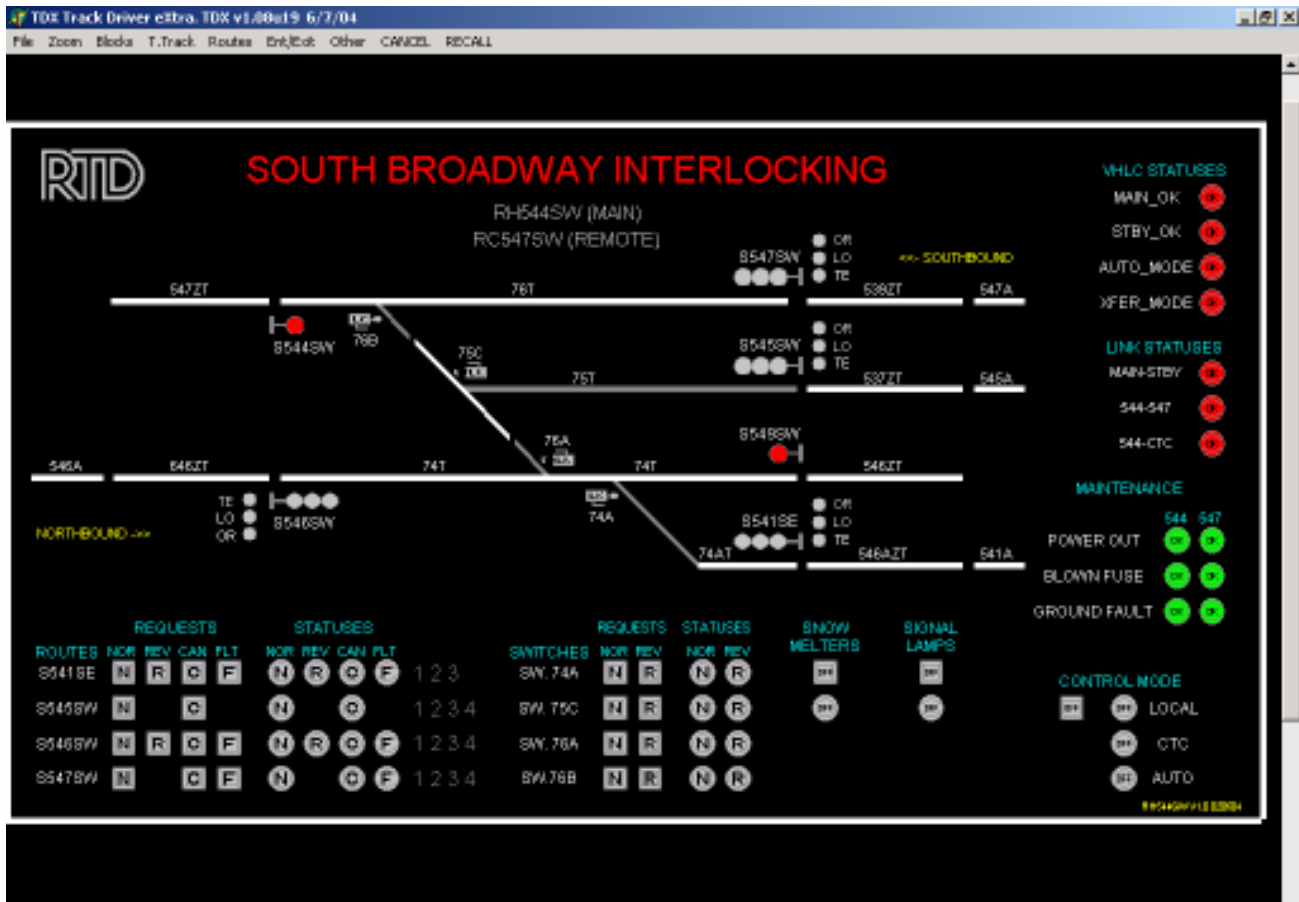


# TDX TRACK DRIVER EXTRA

*SMALL CTC,  
DARK TERRITORY,  
LOCAL CONTROL PANEL,*

**Track Driver eXtra (TDX)** is a complete traffic control system for rail and transit applications. It is compatible with Microsoft Windows (XP, 9x, Me, NT, 200x) and does not require a dedicated computer – it will work fine with your other applications.

All of the graphics and logic are created by the customer. Most configuration items are available online. TDX will support multiple monitors to allow display of large track sections, or greatly expanded displays of small sections.



*Simple TDX Control Screen – Local Control Panel style  
(Denver RTD)*

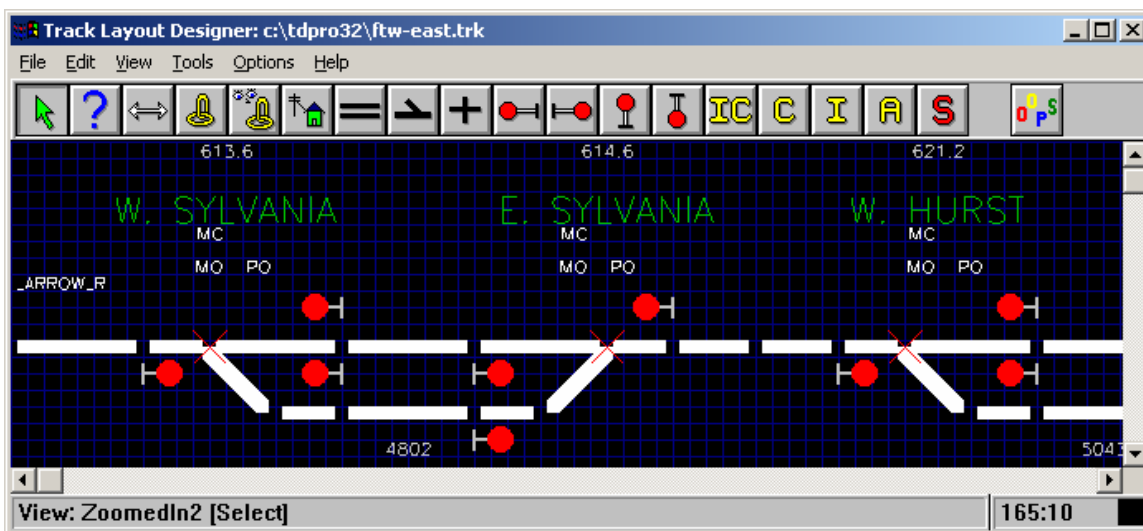
Only a **SINGLE COMPUTER** is needed to drive the graphics and to communicate with the field electronics, through serial or modem interfaces, making this product ideal for both desktop and laptop usage.

**INSTALLATION IS VERY SIMPLE** and does not require Windows Registry modifications or other complicated procedures. This also means that TDX is easy to uninstall – it will not leave remnants and components on your disk or in memory.

Online **HELP and TIPS** are offered for all system functions. Data generated by TDX is easily viewed by other systems using standard Windows programs.

**TRACK LAYOUT DESIGN.** The secret to TDX's power is the unique database that creates a complete model of your railroad by using an 'erector set' approach. The complete topology (structure and connectivity) of your track is modeled by a combination of components, including:

- Track,
- Switches, Diamonds (crosses)
- Signals (left and right), and
- Controls, Indicators, Logic Pieces

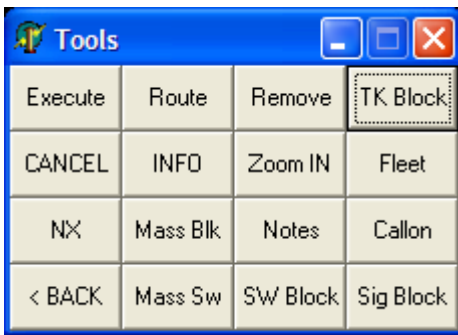


Sample Track Layout Designer Screen

Control of devices and reporting of the status of the field is done by using Indicator and Control pieces. These can be linked to the track to supplement validation rules, for example with draw bridges or traffic bits.

Most of these elements have 'links' that allow you to 'connect' them in the proper order. The system determines the signal and route validation rules, as well as all display aspects by applying standard railroad rules to the model. This is a very powerful approach, and very easy to use.

**COLORS, BITMAPS, BLINKING.** The colors of these objects are based on their status. Most of these colors are pre-set to correspond to standard railroad usage. Many of these colors can be adjusted for each piece. Blinking is used to show that a device is out of correspondence – or has an alarm. Additional elements are used to make the screens useful, including alpha text, bit maps (pictures) and Station names (to group data at an interlocking).



**DISPATCHING Tool Bar.** All of the most frequently used tools and menu choices are immediately available on a Tool Bar. (These can be customized!) Clicking the appropriate button is the same as selecting the function from the menus.

Each tool puts the system in a mode with a special cursor that reminds the user what operation is currently being used.

**EXECUTE** is the same as a Right Click and **CANCEL** will undo any active operation.

**ROUTE** will allow a stored route to be created. The cursor is a signal head. Next click the entry and the exit signals and the system will stack this route until it is valid. The entry signal head will be marked with a white dot.

**NX starts Entry Exit.** The cursor is a 'NX'. Select the entrance signal and then a series of exits or waypoints. The system will draw a yellow band to show the selected route. Preferred routes are considered.

**INFO** uses a '?' cursor to show of information for selected track.

**REMOVE** is used to delete a note, train ID or a Block. The cursor is the international circle-slash symbol.

**ZOOM-IN** uses a magnifying glass cursor to allow rubber band box to be 'dragged' around the area for zoom in. When the drag operation is over, the screen zooms in. Right Click to Zoom Out.

**NOTES** allows a note to be clicked to show detail and to offer edit or delete options. To add a note from this mode, use a right click where you want to add.

**BLOCK (Mass Blk, TK Block, SW Block)** uses a stop sign with a 'B' cursor. A switch, track or whole route can be BLOCKED. Options allow simple blocking or Forms-Based dispatch!

**FLEET** (flag cursor) allows the fleet mode to be toggled on signals.

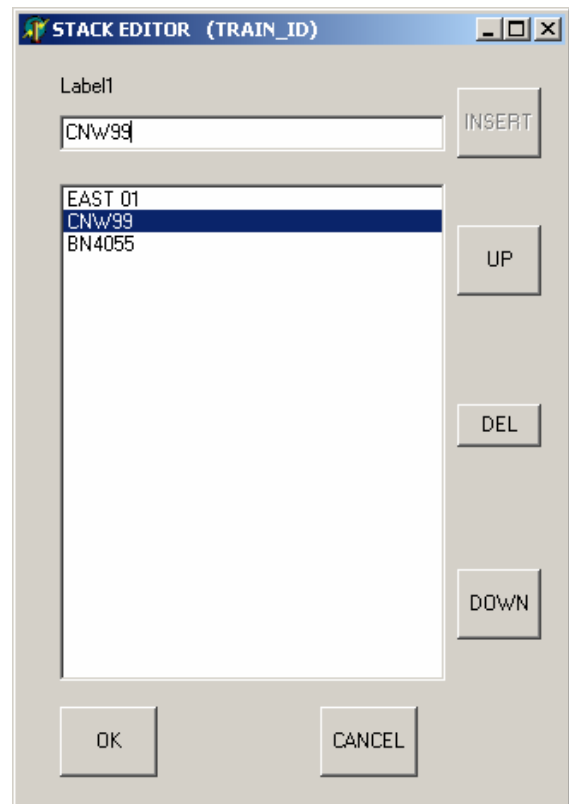
**CALLON** (arrow with 'CO') allows a signal to be placed in CALL ON mode. EXECUTE or Right click must be used to send the bit to the field.

**TRAINS** uses an 'ID' cursor and allows a new train ID to be added at a clicked track, or if a train already exists, it allows the name to be changed.

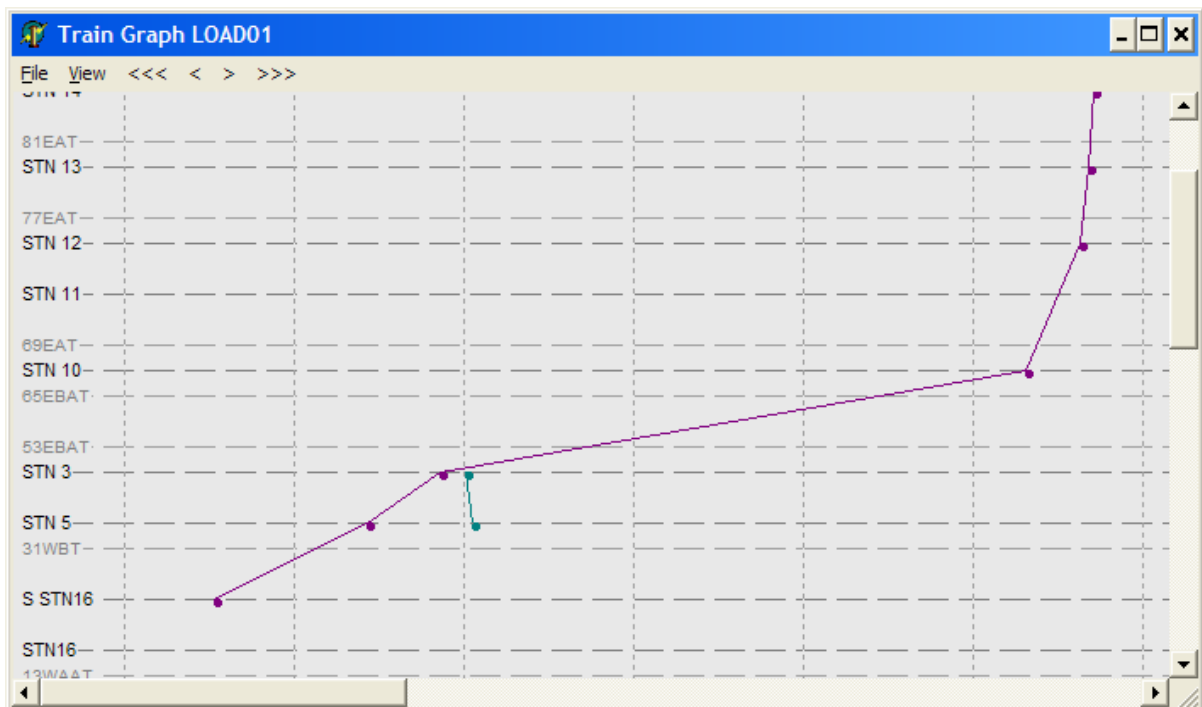
**TRAIN STACKING** allows a 'stack' of trains to be placed at various entries to the track. When real trains show occupancy on the entry tracks, the system automatically takes the next train ID from the stack.

The operator has the ability to add trains to this stack and to change the order of the trains as they wait.

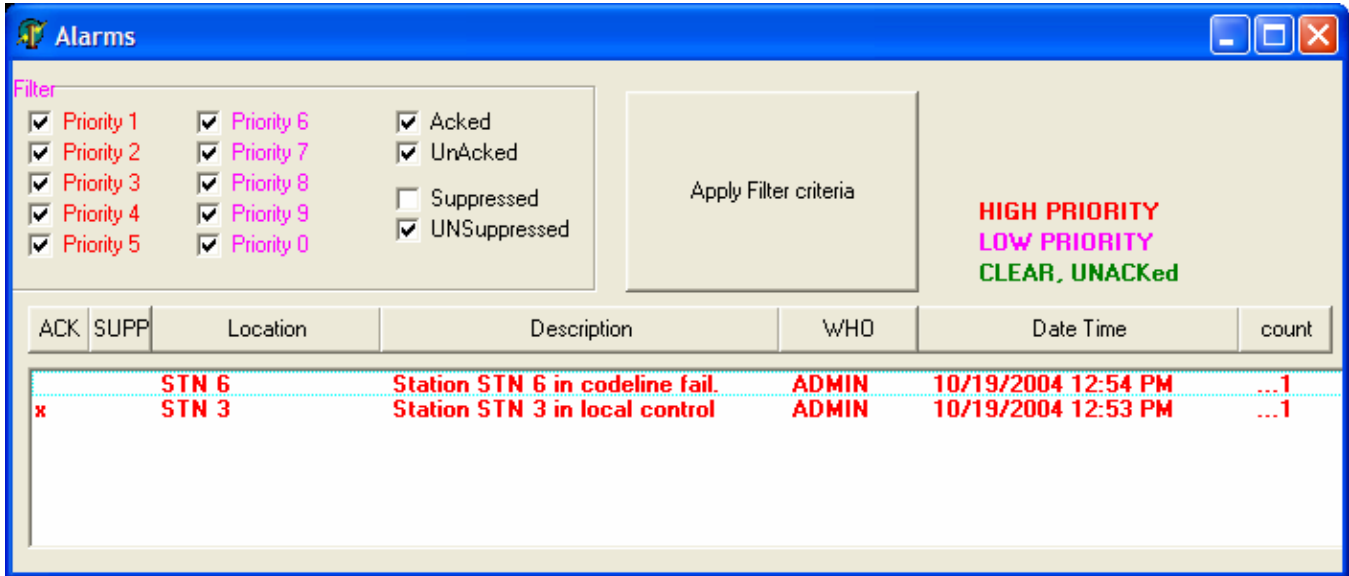
The system automatically tracks the trains based on track circuits.



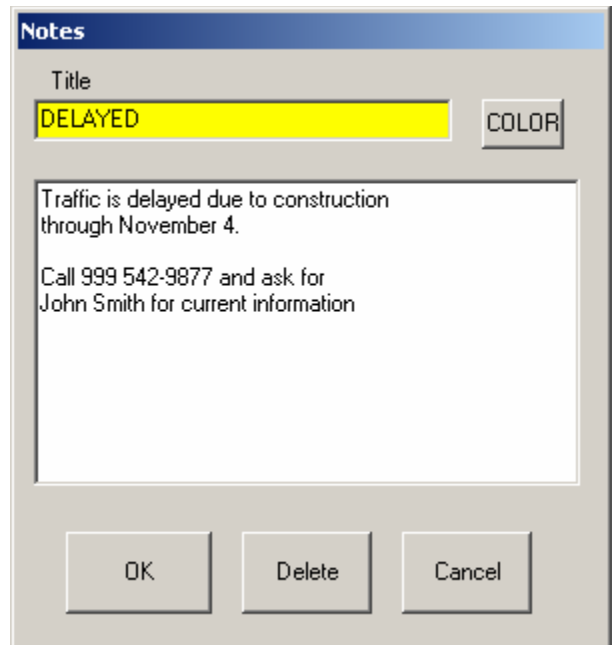
**TRAIN TRACKING and TRAIN GRAPH.** A Train Graph shows the progress of all trains. Stations are listed down the side and the time scale is scrollable left to right. All of these scales can be changed as needed. The system will automatically mark the progress of trains graphically.



**ALARM SYSTEM.** TDX provides User customizable alarms, including color, priority, alarm-noise and whether the alarms need to be ACKnowledged. The alarms are presented in a special alarm window, which can be filtered. Nuisance alarms can also be suppressed.



**NOTES** can be placed anywhere on the graphic screen to remind operators of unusual conditions. These are permanently stored on hard disk for display when the system is restarted. The operator can change the color of the title which displays on the screen. Clicking on the note will bring up the Note Display which has a complete notepad for detailed information.



**BLOCKING** is used to mark certain track, switches, signals or devices as UNAVAILABLE to protect men and equipment. TDX marks the display with a distinctive BLUE color. Additionally, TDX prevents any use of this equipment while the block is placed. TDX supports multiple and overlapping blocks. TDX can block an entire route with a single operation. Blocks are stored on disk for recovery in the event of a system restart.

**BLOCKS ON 1 1T**

Enter Permit Information:

Frank

Existing Permits (BLOCKS)

**Block Status Information**

Block Number: 311

Block granted to: Rogers

Craft: MOW

Notes:

- FormD Line2
- FormD Line4
- FormD Line13
- FormD Other
- Line2 BOTH
- Switch

Block

Given by: USER

Block Time: 05/03/06 10:46:53

Released by:

Block Time:

Release Block

Cancel

Forms-Based Blocking Options

**Block Detail Information**

Block Number: 1

Block granted to: Johnson

Craft: MOW

Notes: Eastbound from 25W @ Saunders to #5 Switch. Good until 3pm

Given by: ADMIN

Block Time: 08/09/04 11:28:14

Released by:

Block Time:

Block

Release Block

Cancel

Simple Blocking

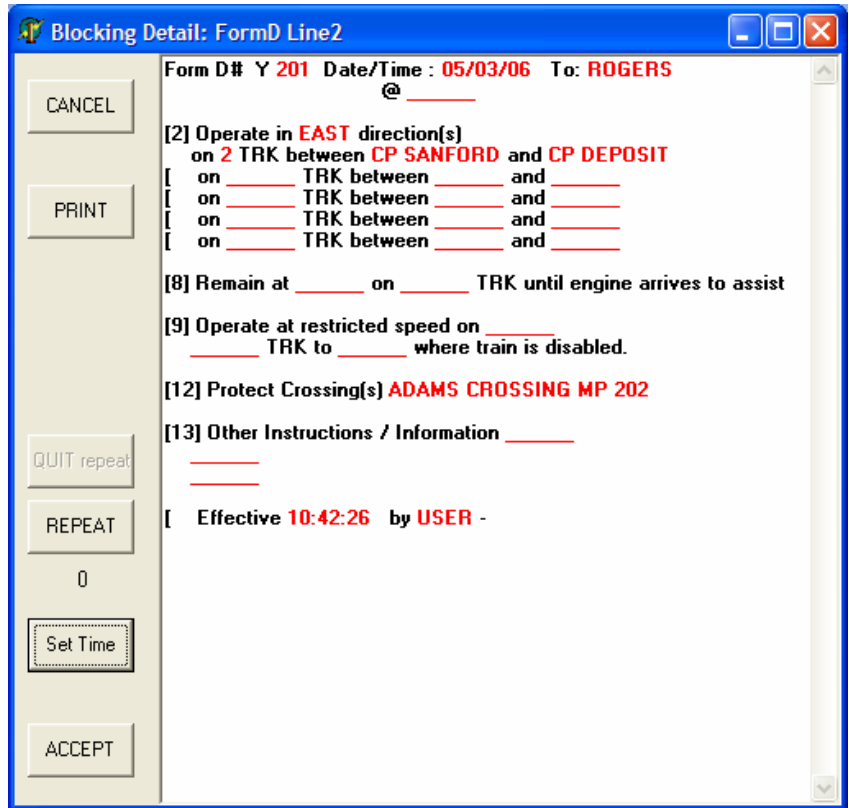
# FORMS-BASED DISPATCHING

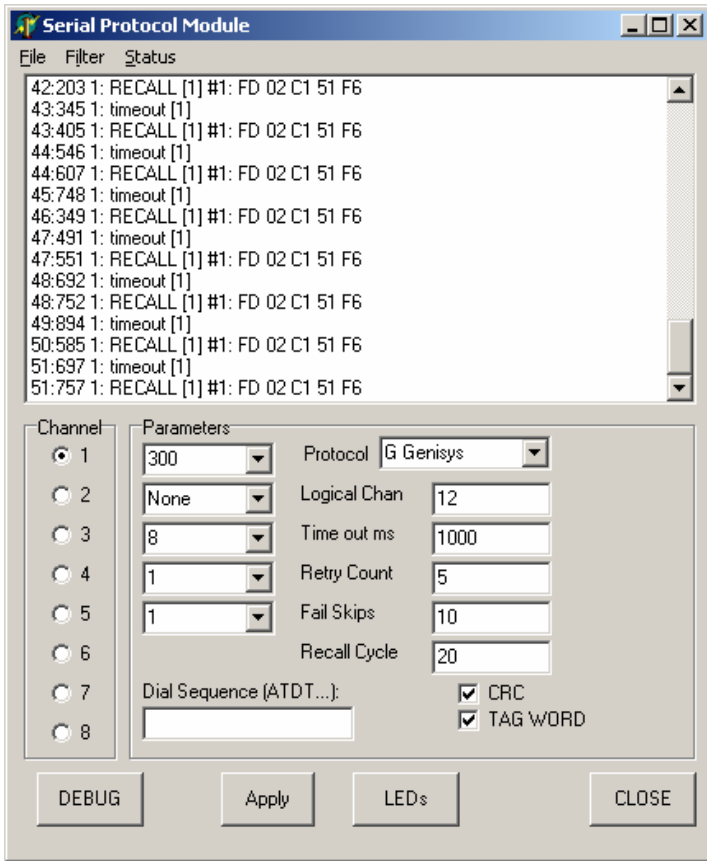
TDX supports integrated Forms-Based Dispatching, including **Track Warrant** and **Form D**. Actually, the forms are easily customized to provide any special localization or other rules.

Bulletins or other track condition information is captured graphically on the dispatch console using **NOTES**. This information (e.g. 'Protect Crossings') is automatically entered on any Authorities that are created. This is controlled by simple text forms and can be customized by the System Administrator.

TDX supports:

- FORMD (NORAC)
- Track Warrant (GCOR)
- Device Blocks (Switch, Signal, etc)
- Multiple block types to simplify creation. E.G. FORMD and FORMD Line2
  
- Repeat function and count (stored with image)
- Time Effective button
- Cancel / Release
- Rollup of directional blocks
- Custom Overlap logic
- Automatic fill-in-the blank.
- Integrates with Notes/ Bulletin system
  
- Image of forms stored on disk. New images created for each Rollup or Release
- Printed Authority Summary
- Automatic 'Handle' created for each Block. Block number and owner shown graphically on screen
- May be mixed with CTC
- Optional warning when block release will enable CTC operations



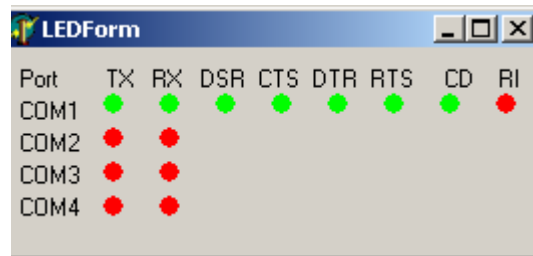


## CODELINE CONFIGURATION

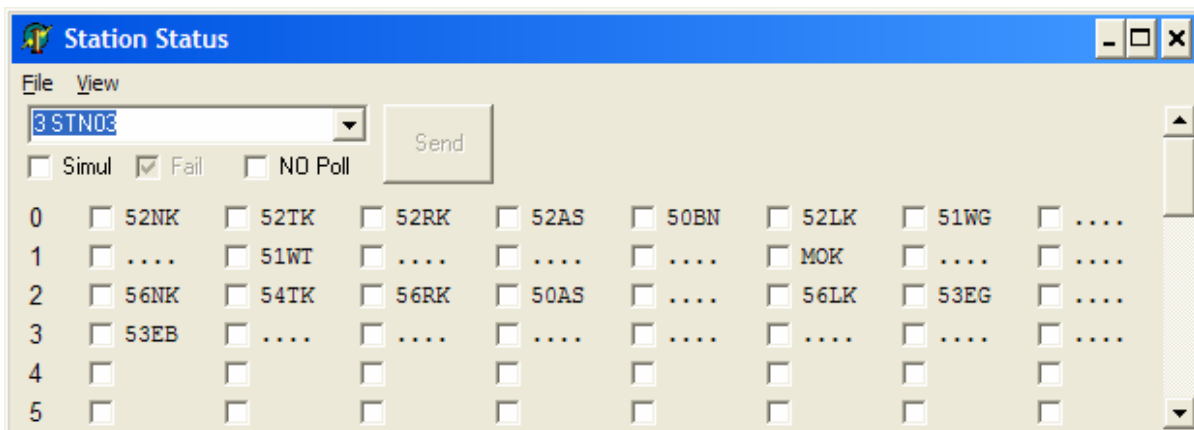
The Protocol module allows easy set up of up to eight (8) codelines. Here is an example of protocol analysis of an active Genisys (US&S) line. Other protocols, including DT4, DT8 (GRS Datatrain IV and VIII), SCS128 (Safetran) 504DC, and LCP (Harmon Local Control Panel) are available. Users can assign the COM port, and parity, stop bits and data bits. Other parameters include logical channel, time out and retry counts.

Dial Connection (or backup) is configurable on screen along with CRC and Tag word options. The parameters are permanently stored on disk for next restart.

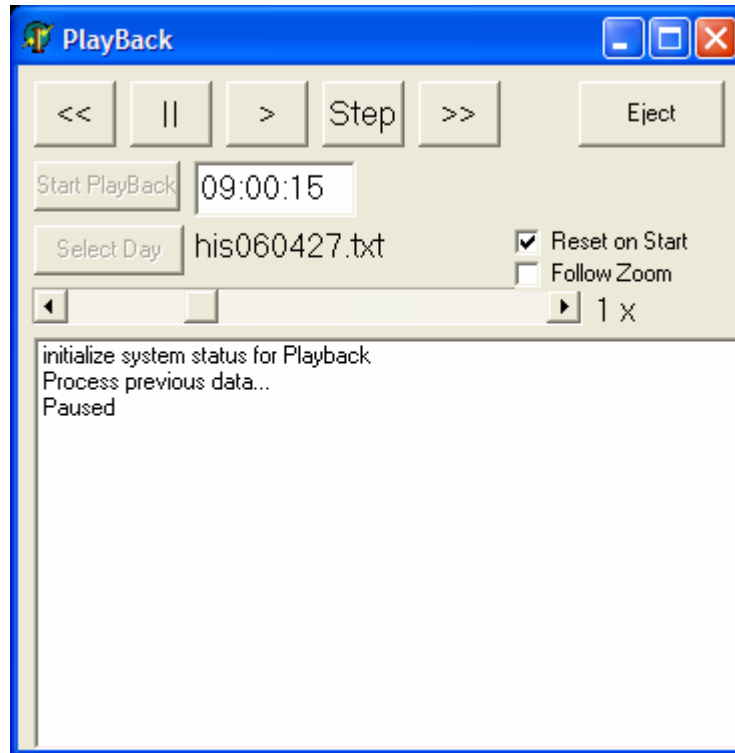
**LED Status.** In addition to a complete protocol display, TDX gives quick access to the LED display, which shows at a glance the RS232 status of all of the COM ports.



**Station Status.** The complete received-bit status of any station connected on the system can be shown dynamically with the new Station Status screen. This can also be used to simulate bits for desktop checkout of TDX.



## Graphical PLAYBACK



TDX allows any previous operation to be reviewed with a “VCR-like” control. This simple control will restore the screen and system state to the time displayed. The HISTORY file has similar details but it is difficult to understand and visualize.

The PLAYBACK can be paused and the status of NOTES, or BLOCKS, or any other device can be opened up, printed or changed.

This is an excellent way to review incidents or to provide training for Dispatchers.

Playback includes complete graphical and logical presentation of:

- All device status, including switches, track, traffic, signals,
- Station status, including codeline failure
- All NOTES, BULLETINS
- ALL BLOCKS, including images
- Alarms
- All Train Locations



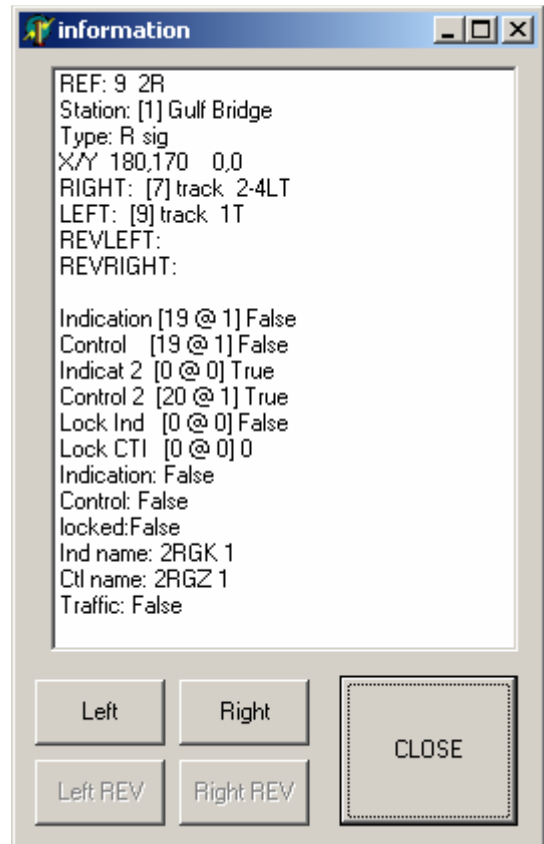
**KEYBOARD COMMANDS** are entered into a special window. All recently entered commands are stored for easy recall in the 'pull down' list

**INFORMATION** on the internal state of all components and variables is provided on screen as a debugging tool and to help diagnose system behavior during operation.

This display allows review of static information (track structure, bit number for indication and control) name and type of component.

Also shown is the current state, for example this signal is current indicated (Indication is true), which means that it is green in the field.

The Left and Right buttons allow you to navigate to adjacent 'linked' components to examine their status. Reverse links are also provided for switches, diamonds and other more complicated pieces.



# CONFIGURATION

## ***Stand-Alone***

TDX easily runs on a stand-alone PC. All history files are accessible to other Windows applications. All field communications are performed directly from the PC.

## ***Additional NETWORK Workstations.***

Using the NETWORK option, up to 3 additional workstations can be configured to provide remote viewing and control of all aspects of TDX. The remote workstations are very useful for maintenance, conference viewing of the graphics and playback independent of the main workstation. All networking is via Ethernet LAN/WAN connections.

## ***Remote Serial***

If serial code-lines are being used, they can be directly attached to COM ports on the main workstation, or they can be configured using simple Terminal Servers connected via Ethernet. Terminal Servers allow quick re-configuration in the event that a main workstation fails.

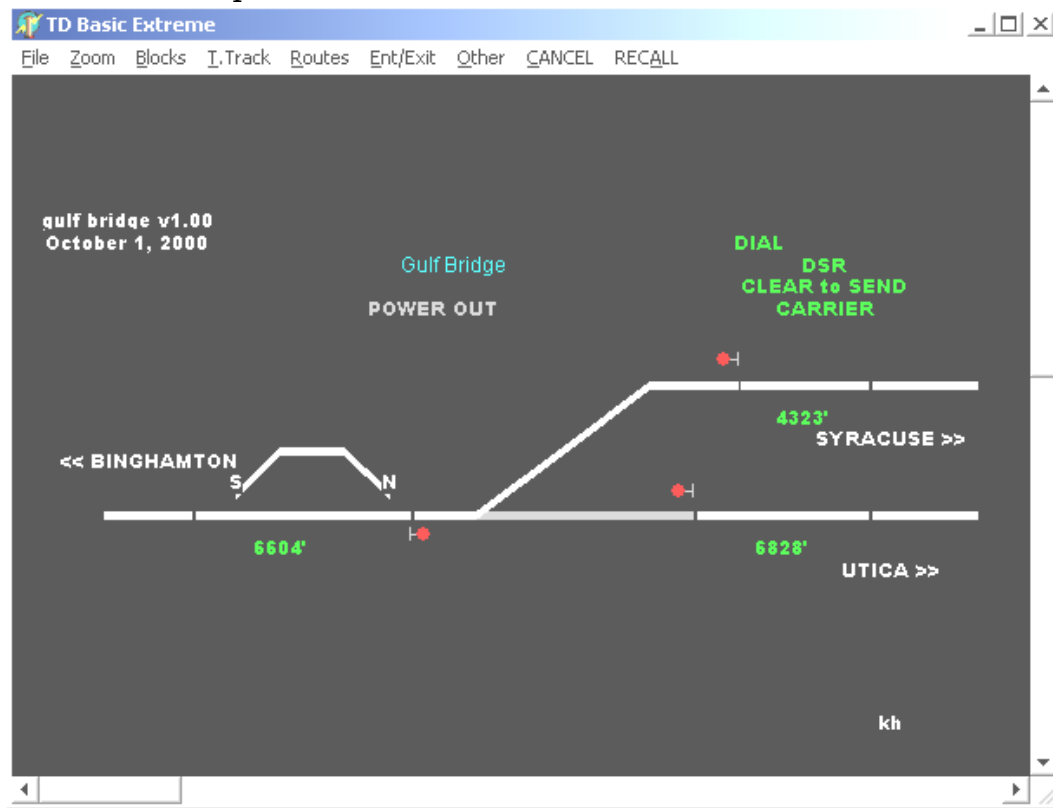
# SPECIFICATIONS

- CPU: Pentium 400+ PC,  
CDROM, 4GB disk,  
128MB ram  
Sound Card
- Video: 1-4 VGA monitors
- OS: Windows XP, 95, 98, ME, NT4.0, 2000, 2003
- Track: 3000 Pieces
- Codelines: 8 Serial codelines (COM ports)  
Genisys, DataTrain 2,4 or 8, SCS-128, Harmon LCP
- Disk: 1.5MB runtime + daily log files  
total install 6MB

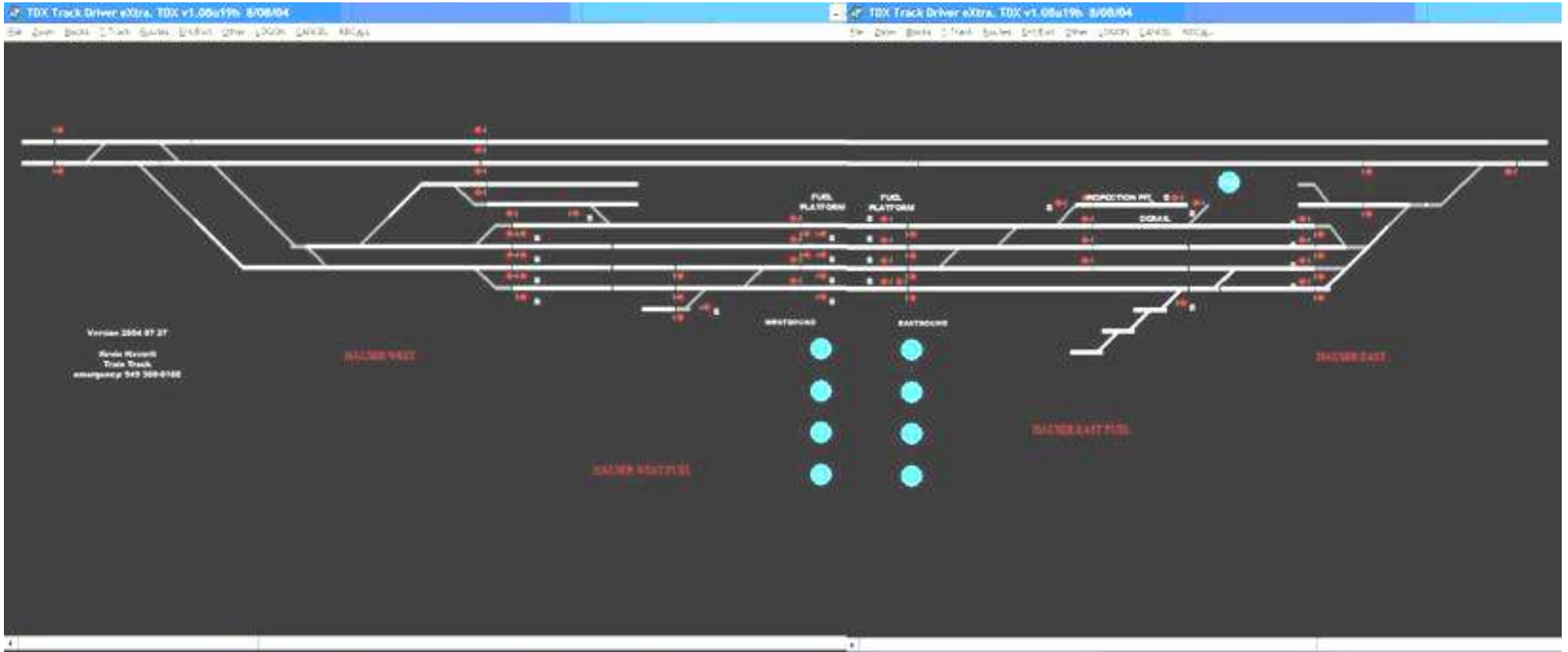
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## Other Examples



*Simple TDX Control Screen – Single Interlocking*



*Yard Application (Two Display Monitors) with Blue Flag Blocking  
BN Hauser Fueling Depot*

