RS232C Interface Specification

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ABBOTT TDxFLx® Revision 2.0/2.1

ABBOTT DIAGNOSTICS
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RS232C Interface Specification

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Section 1 Precautions

This document is designed to support the development of an interface to connect the Abbott TDxFLx® Instrument to a host computer. This document applies to TDxFLx® Instruments with system software Revision 2.0 or 2.1.

The specifications required to program the interface, a description of the instrument operation, the data generated by the instrument and a glossary are provided. The interface provides ASCII text to the host computer via the instrument serial port. The transmitted data is identical to the instrument printout data except for such items as start and end of run markers, start of transmission, character count and/or checksums.

The TDxFLx® System is manufactured by Abbott Diagnostics, Division of Abbott Laboratories, Abbott Park, IL, 60064 U.S.A. Direct all inquiries regarding this document to the X SYSTEMS™ Customer Support Center (1-800-527-1869) in the U.S.A. For all other customers, please call the local Abbott Customer Support Center.

PROPRIETARY INFORMATION

Failure to conform with this specification may result in incorrect data transmission and possibly erroneous readings. In no event shall Abbott be responsible for failures, errors, or other liabilities resulting from customer's noncompliance with the procedures and precautions outlined herein.

Precautions

Note:

ABBOTT MAKES NO WARRANTIES RESPECTING THE INTERFACE BEYOND THOSE EXPRESSLY SET FORTH IN THE OPERATOR'S MANUAL FOR THE TDxFLx® INSTRUMENT AND DISCLAIMS ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL ABBOTT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF THE INTERFACE.

THE SAMPLE PRINTOUTS USED IN THIS DOCUMENT ARE FOR TRAINING PURPOSES ONLY. THE INFORMATION ON THE PRINTOUTS IS NOT TO BE USED FOR CLINICAL OR MAINTENANCE EVALUATION.

TDxFLx® SYSTEM

The TDxFLx® Instrument is an automated system which has the ability to perform a variety of laboratory tests. Assays for therapeutic drugs, hormones, clinical chemistries, protein and toxicology/abused drugs can all be performed on the instrument. The TDxFLx® System is designed for use by trained laboratory and hospital personnel.

The TDxFLx® System can perform a number of tests in the random access mode of operation as well as in the batch mode. The addition of random access mode allows the user to perform as many as eight different assays on a single carousel run.

Summary of Revision 2.0 Output Changes

Some changes in Revision 2.0 software affect the format of the data output in a few instances. The FT4/F.T.I. calculation print format is different.

When an F.T.I. calculation is printed as a function of % T uptake without FT4 results, the F.T.I. data field has changed from 7 characters to 8. One space has been removed between the CALC% and F.T.I. data columns. When the results of an FT4C run are printed, the line

```
CONC=
```
after
```
****** FT4 CALCULATION ******
```
is
```
FT4 CONC=
```
with Revision 2.0 software.

When F.T.I. is calculated and printed as a function of T uptake and FT4 results are printed, the F.T.I. data field has been changed from 6 characters to 7. One space has been removed between the FT4C and F.T.I. data columns in Revision 2.0 software.

When F.T.I. is calculated and printed as a function of %T uptake and the FT4C results are also printed, there is a different format of headings and data spacing with Revision 2.0 software.

```
LOC^^^T4^^^^^^^^CALC%^^^^^FT4^^^^^F.T.I.
```

Spacing for data columns.

```
xx^^xxxxxxx^^^xxxxxxx^^^xxxxxx^xxxxxxxx
```

Other differences include the patient ID feature (Section 5-10), tested used / tests left (Section 5-11), date format (Section 5-25), dilution protocol can be enabled for random access assays (Section 5-25) and in random access operation the result output can be formatted by location, patient ID, or assay (Section 5-26).

Introductory Narrative

FLUORESCENCE POLARIZATION IMMUNOASSAY

The TDxFLx® System uses fluorescence polarization immunoassay (FPIA) technology as detailed in the following paragraphs.

The tungsten halogen lamp in the system emits light of different wavelengths or colors with random spatial orientation. An interference filter located in front of the light source, allows only blue light (481-489 nm) to pass through. The light is then passed through a liquid-crystal polarizer to produce plane polarized blue light.

The plane polarized blue light excites the tracer, or fluorophore, and raises it to an excited state. After excitation, the fluorophore returns to steady state by emitting green light (525-550 nm).

When the fluorophore is bound to a large antibody molecule, it does not rotate freely, and the emitted green light will be in the same plane as the blue excitation light and polarization is retained. Conversely, when the fluorophore is free to rotate, the emitted green light will be in a different plane than the blue excitation light and polarization will be lost.

Therefore, because of the rotational properties of molecules in solution, the degree of polarization is directly proportional to the size of the molecule. That is, polarization increases as molecular size increases.

COMPETITIVE BINDING IMMUNOASSAY

The TDxFLx® System uses a competitive binding immunoassay methodology to allow tracer-labeled antigen and patient antigen to compete for binding sites on the antibody molecules. The components in this competitive binding reaction are the antibody, the patient antigen, and the antigen labeled with fluorescein (tracer-antigen complex). When competitive binding occurs, the more tracer-antigen complex that binds to the antibody molecule, the less tracer-antigen complex that remains in solution.

If a patient sample contains a low concentration of antigen, after the competitive binding reaction reaches steady-state, there is a high concentration of bound tracer in the reaction mixture and polarization is high. Conversely, if a patient sample contains a high concentration of antigen, after the competitive binding reaction reaches steady-state, there is a low concentration of bound tracer in the reaction mixture and polarization is low. The precise relationship between polarization and concentration of the unlabeled drug or hormone in the sample is established by measuring the polarization values of calibrators with known concentrations of the drug or hormone.

Using the polarization values generated for each sample in the assay, concentrations of drugs or hormones in unknown samples are calculated using the stored calibration curve, and the results are printed out in reportable units.

Introductory Narrative

RADIATIVE ENERGY ATTENUATION TECHNOLOGY

Radiative Energy Attenuation (REA®) technology applies the fundamental principles of Beer's Law. These principles are used in order to perform analysis of clinical chemistries on the TDxFLx® System.

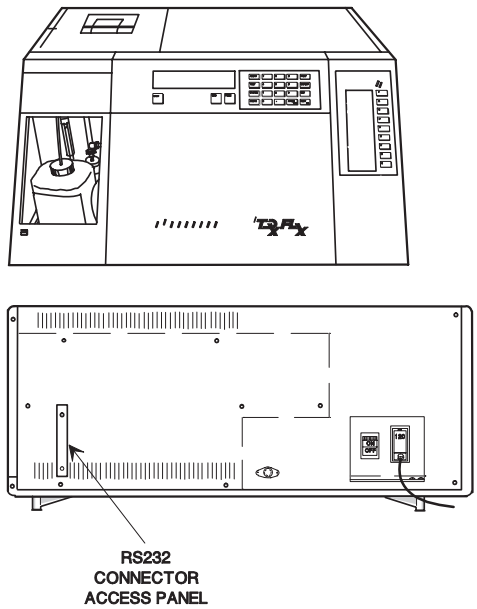
The measured fluorescence intensity of a solution containing a fluorophore is proportional to the absorbance of the solution. If the solution has an absorbance greater than zero, an attenuation of the fluorescence intensity will be observed. The degree of attenuation will be directly proportional to the absorbance of the solution.

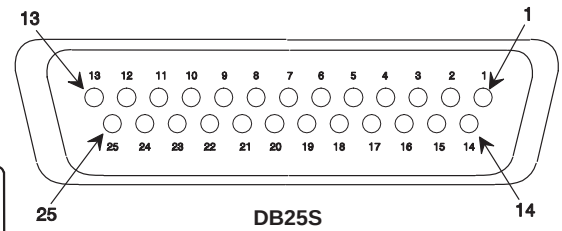
Radiative energy attenuation can be used to measure the concentration of specific analytes. When a reagent-analyte reaction generates a chromogen in the presence of a fluorophore, an attenuation of the fluorescence intensity is observed when the chromogen absorbs either the blue fluorophore-excitation or green fluorophore-emission light. If the chromogen absorbs the excitation light only, primary attenuation will be observed. If the chromogen absorbs the emission radiation only, secondary attenuation will be observed. If the chromogen absorbs both the excitation and emission radiation, the total attenuation will be proportional to the sum of the absorbances of the solution at each wavelength. Final fluorescence intensity will be inversely proportional to the amount of chromogen in the solution.

Through the use of calibrators, fluorescent intensities can be compared, and the analyte concentration in a patient's sample can be calculated. In a sample containing a low concentration of analyte, a small amount of chromogen will be produced, a small amount of light will be absorbed, the attenuation will be small, and the fluorescence intensity will be large. In a sample containing a high concentration of analyte, a large amount of chromogen will be produced, a large amount of light will be absorbed, the attenuation will be large and the fluorescence intensity will be small.

The fluorescence intensity is measured before and after the generation of the chromogen and the percent of light that was not attenuated is calculated. Concentrations of analyte are determined from a previously stored calibration curve and printed in reportable units.

The TDxFLx® System interface is via an EIA RS232c serial port located on the back of the instrument. The interface connector is accessed by removing a protective panel. Data transmission is unidirectional except for the ability of the instrument to receive status, transmit, and backup command messages from the host when spooler mode is enabled. A DB25 connector is configured as a DTE; data is transmitted on pin 2. A diagram detailing the location of the connector access panel and a chart of the connector pinouts are shown below.





TDx	FUNCTION
pin 2	transmitted data
pin 3	received data
pin 4	RTS (EIA+, not active, always high)
pin 7	signal common
pin 20	DTR (EIA+, not active, always high)

Note:

CONNECT ONLY THE PINS THAT ARE SHOWN IN THE ABOVE TABLE. PINS 4 AND 20 ARE OPTIONAL DEPENDING ON THE INSTALLATION. TDxFLx DOES NOT REQUIRE THE USE OF PIN 4 AND 20. THEY ARE PROVIDED FOR USE AS NEEDED FOR EXTERNAL SYSTEMS.

Signal Description:

Binary 0 (Space) = +3 to +25 volts DC
Binary 1 (Mark) = –3 to –25 volts DC
EIA+ = +3 to +25 volts DC
EIA- = –3 to -25 volts DC

CABLE DIAGRAM

Examples of cables suitable for data transfer to a personal computer (PC) are shown below. Cable length for this application is limited to 25 feet. Shielded cable must be used. PC software that checks the status of other pins may not work with these cables.

	TDxFLx® (DB-25S)		PC (DB-9)	
From TDxFlx	2 > . . . . .]	[	. . . . . > 2	**To Host**
To TDxFLx	3 < . . . . .]	[	. . . . . < 3	**From Host**
Reference	7 . . . . .]	[	 5	**Reference**

	TDxFLx® (DB-25S)		PC (DB-25)	
From TDxFLx	2 > . . . . .]	[	. . . . . >3	**To Host**
To TDxFLx	3 < . . . . .]	[	. . . . . < 2	**From Host**
Reference	7 . . . . .]	[	 7	**Reference**

Note:

CONNECT THE CABLE SHIELD TO THE TDxFLx® INSTRUMENT ONLY. DO NOT CONNECT THE CABLE SHIELD TO THE PC.

DO NOT CONNECT THE CABLE SHIELD TO PIN 1 OF THE TDxFLx® INSTRUMENT.

COMMUNICATION PARAMETERS

The baud rate is the only modifiable communications parameter. Baud rates of 110, 300, 600, 1200, 2400 and 4800 are supported. The default baud rate is 4800.

To set the baud rate:

1. Press the “SYSTEM” key.
2. Enter “2.4”.
3. Press the “EDIT” key. The current baud rate is displayed.
4. Enter the new baud rate.
5. Press the “STORE” key.
6. Press the “STOP” key. This returns the instrument to the ready state.

The other parameters are fixed as follows:

1. 7 bit ASCII code in an 8 bit word; bit 8 is always 0.
2. Start bit = 1
3. Stop bit = 1
4. Parity = none

The following procedure can be performed to verify the operation of the instrument’s serial port.

Loopback Test:

1. Verify that power is applied to the analyzer and that it is not performing any function.
2. Jumper pin 2 to pin 3 of the DB25 connector.
3. Press the “TEST” key.
4. Enter “5.5.1”.
5. Press the “DISPLAY” key. UART TEST is displayed.
6. Press the “RUN” key. The instrument tests the communication port and displays PASS or FAIL UART 31.
7. Press the “STOP” key. This returns the instrument to the ready state.
8. Remove the jumper from pins 2 and 3.

RESULTS TRANSMISSION

Transmissions between the TDxFLx® System and a host computer via the RS232 port may experience interferences from external environmental factors such as static or electromagnetic fields.

The following precautions will minimize this risk:

1. High quality shielded cable must be used. To ensure integrity of transmissions, the maximum cable length should be limited to 25 feet.
2. The TDxFLx® System, the host computer and any associated cables should not be placed near any sources of static or electromagnetic radiation. In particular, proximity to electromagnetic interference sources such as centrifuges, vortex devices and their power cords must be avoided.
3. Cable connectors must be firmly seated and secured with screws on both the TDxFLx® System and the host computer ports.
4. When using modes A, B or C no error checking information is provided. Results provided through the host computer must be compared with the instrument printouts for verification of data.

INSTRUMENT SOFTWARE REVISION

The following procedure can be used to obtain the software revision number. The instrument must not be active in any other function when the software revision number is displayed.

To display the software revision number:

1. Press the “SYSTEM” key.
2. Enter “1.6”.
3. Press the “DISPLAY” key. The current software revision is reported on the system status display.
4. Press the “STOP” key. This returns the instrument to the ready state.

Section 4 Data Content Layer

INTRODUCTION

The assays that can be performed on the TDxFLx® Instrument with revision 2.0 software are listed in the appendix. This list is current as of the date of publication of this manual. Assays are grouped by the format in which assay results are reported. There are six types of assays, grouped as shown in the table below.

TYPE	NATURE OF ASSAY
1	Therapeutic Drugs/Special Chemistries
2	REA®
3	Abused Drugs
4	Unit dose
5	Turbo®/Specific Proteins
6	Random Access

The appendix also contains a printout of each type of assay result. These printouts will help in determining how the output is to be parsed.

The TDxFLx® Instrument has four serial output modes. These modes are A, B, C and D. Serial output mode selection is made via the instrument keypad. The current serial mode can only be determined through a keypad inquiry.

System 2.9 and System 2.10 are the parameters that are set in order to select a serial mode. Mode selection is detailed in the table below.

System 2.9	System 2.10	Mode
0	0	A
0	1	B
1	0	C
1	1	D

Use the following procedure to set the serial mode.

1. At the READY prompt press the “SYSTEM” key.
2. Enter either “2.9” or “2.10”.
3. Press the “EDIT” key. The current parameter setting is displayed.
4. Press “0” or “1”.
5. Press the “STORE” key.
6. Press the “STOP” key. This returns the instrument to the READY state.

Data Content Layer

When in spooler mode, the instrument can store assay results in a buffer memory area. When the data in the buffer exceeds one percent of the total storage capacity, a two-digit number will be reported on the system status display. This number indicates the percentage of buffer memory used. When this buffer memory is full, the analyzer will begin to overwrite the data.

Warning:

IF THE TOTAL STORAGE CAPACITY USED REACHES 90%, BUFFER DATA IS AT RISK OF BEING OVERWRITTEN. THIS CONDITION USUALLY OCCURS WHEN THE BUFFER IS NOT BEING EMPTIED BY THE HOST SYSTEM.

SERIAL OUTPUT MODES A AND B

Output modes A and B are both unidirectional. Operation of these two modes is identical. Calibration and unknown run data are transmitted in the same form as the data is printed except for such items as start and end of run markers, start of transmission and character count. A checksum is NOT transmitted for modes A and B.

The following components comprise this data link layer:

- First line of an assay (unknown) run: !U<CRLF>
- First line of a calibration run: !C<CRLF>
- Last line of an assay or calibration run: !!<CRLF>

FILE

A file is a single assay printout consisting of multiple lines of data. The file transmission starts with the first line as defined in the above table. Header and data lines follow. The last line of the transmission is the last line of the file as defined above. Each line ends with <CRLF>.

FIELDS

There are varying numbers of different sized fields within a line. The fields are not delimited. The printout samples in the appendix will indicate the number of fields within a line for any assay. Descriptions of the printouts can be found in the MESSAGE CONTENT section of this document.

ERROR MESSAGES

Error messages cause changes in field length within a line of data. Some error messages are more than one data field in length. An error message can be printed on any line. A number of error messages are included with the printout samples in the appendix. A complete list of error messages is also included in the appendix.

SERIAL OUTPUT MODE C

Output mode C is bidirectional. The instrument buffer stores **all** printed data in a “SPOOLER” and transmits that data one line at a time when a request is sent by the host computer. In this mode, the data transfer time is independent of the time that an assay is performed. A checksum is not transmitted for mode C.

The “SPOOLER” supports unidirectional communication except for the ability to receive status, transmit, and backup commands and act upon them. These requests may be communicated from the host as described below.

The “SPOOLER” stores data in a refreshed memory module. Powering off the instrument or removing the memory module does not affect the stored data.

The “SPOOLER” transmits data on a FIFO (first in-first out) discipline and performs operations on the stored data based on commands received from the host. The host commands are listed below.

<s> =	Status request from host device Instrument response <y> means one or more complete lines of data available for transmission. Instrument response <n> means no data available for transmission (both <y> and <n> are followed by <CRLF>.
<l> =	Host device request to transmit one line of data Instrument response: IF data available, transmits it ELSE response is <n> <CRLF>
<b> =	Host request to backup pointer by one line (host then sends <l> to retransmit last line)

Notes:

s, l and b must be lower case (l is a lower case L).

If the host sends <b>, the spooler acknowledges by sending <b> and <CRLF> back to the host. The SPOOLER will then back up the pointer one complete line.

If the host sends an illegal character, the spooler returns that character , without a <CRLF>. The host can then send any other request or terminate the dialog.

Buffer Synchronization:
Because the TDxFLx® Analyzer performs an assay in real time, there can be periods when a complete assay run is not yet in the buffer. If the host is polling the buffer continuously, the host must wait for the assay terminator before initiating processing of the data. If an assay is aborted, a terminator will be entered into the spooler file. if the Analyzer loses power during a run, a terminator is not entered into the file.

SERIAL OUTPUT MODE D

Output mode D is bidirectional. The instrument buffer stores **all** printed data in a "SPOOLER" and transmits that data one line at a time when a request is sent by the host computer. In this mode, the data transfer time is independent of the time that an assay is performed. Unlike modes A, B and C, mode D does provide a checksum to the host. Error detection and correction are therefore possible. Calculation of the checksums is presented later in this section.

The "SPOOLER" supports unidirectional communication except for the ability to receive status, transmit, and backup commands and act upon them. These requests may be communicated from the host as described below.

The "SPOOLER" stores data in a refreshed memory module. Powering off the instrument or removing the memory module does not affect the stored data.

The "SPOOLER" transmits data on a FIFO (first in-first out) discipline and performs operations on the stored data based on commands received from the host. The host commands are listed below.

<s> =	Status request from host device Instrument response <y> means one or more complete lines of data available for transmission. Instrument response <n> means no data available for transmission (both <y> and <n> are followed by <CRLF>.
<l> =	Host device request to transmit one line of data Instrument response: IF data available, transmits it ELSE response is <n> <CRLF>
<b> =	Host request to backup pointer by one line (host then sends <l> to retransmit last line)

Notes:

s, l and b must be lower case (l is a lower case L).

If the host sends <b>, the spooler acknowledges by sending <b> and <CRLF> back to the host. The SPOOLER will then back up the pointer one complete line.

If the host sends an illegal character, the spooler returns that character , without a <CRLF>. The host can then send any other request or terminate the dialog.

Buffer Synchronization:
Because the TDxFLx® Analyzer performs an assay in real time, there can be periods when a complete assay run is not yet in the buffer. If the host is polling the buffer continuously, the host must wait for the assay terminator before initiating processing of the data. If an assay is aborted, a terminator will be entered into the spooler file. if the Analyzer loses power during a run, a terminator is not entered into the file.

Data Content Layer

Each line of data (a record) has the following format:

<$>	beginning of record
<2 bytes>	character count of the data fields in ASCII-HEX
<data>	data fields
<2 bytes)	checksum in ASCII hex
<CRLF>	carriage return and line feed

CHECKSUM CALCULATION

The checksum transmitted at the end of each line is calculated using only the data portion of the line. The calculation does not include the beginning of record marker “$”, the character count, the checksum itself, the final carriage return or line feed characters.

The checksum is calculated by initializing the starting value of the checksum accumulator to zero. The value of each data byte is subtracted (modulo 256) from the checksum accumulator. A technique for checking a particular checksum is to take that checksum value and add each data byte to it. The final result will be zero if everything is correct.

Note:

THE CHECKSUM AND THE CHARACTER COUNT ARE IN ASCII ENCODED HEXADECIMAL. A BYTE VALUE OF “9E” WOULD BE ENCODED INTO TWO BYTES AS “5769” WHERE 57 IS THE BASE 10 ASCII CODE FOR “9” AND 69 IS THE BASE 10 ASCII CODE FOR “E”.

DATA CONTENT SAMPLES

Six different types of printouts are produced by the TDxFLx® Instrument. Each of the six types has a corresponding calibration printout. Each type of assay data printout plus one calibration run for each type will be presented. In addition, printouts of the T-Uptake with F.T.I. assay, the T-Uptake with FT4c assay and the Methotrexate assay will be presented. All notes that are referenced in the sample printouts are located at the end of this section.

The lexical rules that are used with the sample printouts are described below.

All lines end with a <CRLF>.

9	denotes any digit in a header
X	denotes any alphanumeric character
<b>	denotes a transmitted character
<CRLF>	denotes a CR and a LF together. also denotes a blank line
MM/DD/YY	denotes the date
99:99:99	denotes the time of day
^	denotes a blank character space
(Note 9)	denotes a reference to a note and is not a part of the data transmission

REPRINTED DATA

All printouts will be changed when a reprint of the data is requested by the operator. The last assay run is reprinted and the data is transmitted from the serial port. The retransmitted data is identical to the original data with the following exceptions.

Also see Note 26.

1. Start of transmission markers, !U or !C, are not sent.
2. The information for date and time is changed from

```
DATE:^MM/DD/YY
TIME:^99:99:99
```

To

```
REPRINT^DATE:^MM/DD/YY
REPRINT^TIME:^99:99:99
*****^REPRINTED^DATA^*****
```

Message Content/Format

Type 1: TDM/Special Chemistries

```
!U
DATE:^MM/DD/YY          (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
OP ID: 999999999        (NOTE 1)
RGT^LOT^#:^999999999    (NOTE 2)
EXP^DATE:^MM/DD/YY      (NOTE 23)
ASSAY:^PHENYTOIN
<CRLF>
CAROUSEL:^99
<CRLF>
SPLVOL=^^^9.99
REPS=^9
GAIN=^99
CALIB.DATE:^MM/DD/YY    (NOTE 23)
CALIB.TIME:^99:99:99
<CRLF>
CONC=^UG/ML             (UNITS ARE LISTED IN THE APPENDIX)
<CRLF>                  (NOTE 11)
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
^1^^^^^^28.75^^^^^^117.31^^^^^^^^97.04
^2^^^^^^29.38^^^^^^116.48^^^^^^^^94.40
^3^^^^^^29.19^^^^^^116.73^^^^^^^^96.17
^4^^^^^^29.28^^^^^^116.61^^^^^^^^94.40
^5^^^^^^28.50^^^^^^117.65^^^^^^^^94.85
^6^^^^^^14.75^^^^^^148.38^^^^^^^^89.98
^7^^^^^^14.57^^^^^^149.04^^^^^^^^90.86
^8^^^^^^14.35^^^^^^149.85^^^^^^^^91.31
^9^^^^^^14.74^^^^^^148.42^^^^^^^^91.31
10^^^^^^14.62^^^^^^148.83^^^^^^^^92.18
11^^^^^^^7.70^^^^^^184.03^^^^^^^^94.41
12^^^^^^^7.62^^^^^^184.59^^^^^^^^92.63
13^^^^^^^7.67^^^^^^184.25^^^^^^^^93.51
14^^^^^^^7.77^^^^^^183.52^^^^^^^^93.96
15^^^^^^^7.58^^^^^^184.85^^^^^^^^92.64
<CRLF>                  (NOTES 3, 6)
TESTS^USED=999          (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

An exception to the printout for this type is for assay TOTAL T3, which has the following header lines changed:

Like this:

```
ASSAY:^TOTAL^T3         (left margin one space left)
```

Like this:

```
CALIB.DATE:^MM/DD/YY    (left margin one space left)
```

Like this:

```
CONC= NG/ML             (left margin one space left)
```

Remainder of left margin same as shown for Type-1.

Type-2: REA®

```
!U
DATE:^MM/DD/YY              (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
OP^ID:^999999999            (NOTE 1)
RGT^LOT^#:^999999999        (NOTES 2, 18)
ASSAY:^GLUCOSE
<CRLF>
CAROUSEL:^99
<CRLF>
SPLVOL=^^^9.99
REPS=^9
GAIN=^^9
CALIB.DATE:^MM/DD/YY        (NOTE 23)
CALIB.TIME:^99:99:99
<CRLF>
CONC=^MG/DL                 (UNITS ARE LISTED IN THE APPENDIX)

<CRLF>                      (NOTE 11)
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^PERCENT^^^^^FINAL^V
^1^^^^^252.44^^^^^^^36.89^^^^^^3258.32
^2^^^^^255.70^^^^^^^36.47^^^^^^3290.39
^3^^^^^252.33^^^^^^^36.90^^^^^^3271.82
^4^^^^^250.39^^^^^^^37.15^^^^^^3279.73
^5^^^^^257.64^^^^^^^36.23^^^^^^3244.96
AVG:^^^253.70^^^^^^^36.73^^^^^^3269.04      (NOTE 7)
<CRLF>
^6^^^^^103.77^^^^^^^63.22^^^^^^5517.49
^7^^^^^103.12^^^^^^^63.37^^^^^^5545.35
^8^^^^^^99.16^^^^^^^64.34^^^^^^5550.95
^9^^^^^107.57^^^^^^^62.31^^^^^^5612.66
10^^^^^101.23^^^^^^^63.83^^^^^^5583.49
AVG:^^^102.97^^^^^^^63.41^^^^^^5561.98
<CRLF>
11^^^^^^71.75^^^^^^^71.52^^^^^^6387.29
12^^^^^^68.19^^^^^^^72.52^^^^^^6392.73
13^^^^^^71.02^^^^^^^71.72^^^^^^6363.03
14^^^^^^67.52^^^^^^^72.71^^^^^^6415.46
15^^^^^^68.31^^^^^^^72.49^^^^^^6367.08
AVG:^^^^69.36^^^^^^^72.19^^^^^^6385.12
<CRLF>                                      (NOTES 3, 6)
<CRLF>
TESTS^USED=999                              (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

An exception to the printout for this type is for these assays, GLUCOSE, ETHANOL, HDL CHOLESTEROL which have the following header lines changed:

Like this:

```
GAIN=^^99   (4 digits left of decimal instead of 3)
```

Note:

ON BUN ASSAYS THE PERCENT COLUMN HEADING IS CHANGED TO LN%

Type 3: Abused Drugs with System 6.7 = 0

```
!U                                  (NOTE 9)
DATE:^MM/DD/YY                      (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
OP^ID:^999999999                    (NOTE 1)
RGT^LOT^:^999999999                 (NOTE 2)
EXP^DATE:^MM/DD/YY                  (NOTES 1, 23)
ASSAY:^AMPHET/METH^U
<CRLF>
CAROUSEL:^99
<CRLF>
SPLVOL=^^^9.99
REPS=^9
GAIN=^99
CALIB.DATE:^MM/DD/YY                (NOTE 23)
CALIB.TIME:^99:99:99
<CRLF>
CONC=^UG/ML                         (UNITS ARE LISTED IN THE APPENDIX)
<CRLF>                              (NOTE 11)
^^^^^^^^STORED^THRESHOLD^=^^^^^0.30
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
^1^^^^^^^3.79^>=T^^163.62^^^^^^^185.88
^2^^^^^^^4.24^>=T^^161.70^^^^^^^182.13
^3^^^^^^^4.11^>=T^^162.23^^^^^^^186.67
^4^^^^^^^4.22^>=T^^161.78^^^^^^^181.71
^5^^^^^^^4.08^>=T^^162.34^^^^^^^182.13
AVG:^^^^^4.09^>=T^^162.34^^^^^^^183.70
<CRLF>
^6^^^^^^^1.61^>=T^^179.29^^^^^^^183.91
^7^^^^^^^1.71^>=T^^178.13^^^^^^^186.08
^8^^^^^^^1.57^>=T^^179.69^^^^^^^184.49
^9^^^^^^^1.63^>=T^^179.03^^^^^^^187.84
10^^^^^^^1.81^>=T^^177.07^^^^^^^186.66
AVG:^^^^^1.67^>=T^^178.64^^^^^^^185.79
<CRLF>
11^^^^^^^0.55^>=T^^198.93^^^^^^^187.25
12^^^^^^^0.59^>=T^^197.61^^^^^^^187.42
13^^^^^^^0.56^>=T^^198.37^^^^^^^188.44
14^^^^^^^0.60^>=T^^197.43^^^^^^^188.42
15^^^^^^^0.58^>=T^^197.95^^^^^^^189.80
AVG:^^^^^0.58^>=T^^198.06^^^^^^^188.26      (NOTES 3, 6)
<CRLF>
<CRLF>
TESTS^USED=^15                              (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

Type 3: Abused Drugs with System 6.7=1

```
!U                                (NOTE 9)
DATE:^MM/DD/YY                    (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
OP^ID:^999999999                  (NOTE 1)
RGT^LOT^#:^999999999              (NOTE 2)
ASSAY:^AMPHET/METH^U
<CRLF>
CAROUSEL:^99
<CRLF>
SPLVOL=^^^9.99
REPS=^9
GAIN=^99
CALIB.DATE:^MM/DD/YY              (NOTE 23)
CALIB.TIME:^99:99:99
<CRLF>
CONC=^UG/ML                       (UNITS ARE LISTED IN THE APPENDIX)
<CRLF>                            (NOTE 11)
^^^^^^^^STORED^THRESHOLD^=^^^^^0.30
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^^^^^^^^^^^^^^BLK^I
^1^^NONE^DETECTED
^2^^NONE^DETECTED
^3^^>=^THRESHOLD
^4^^>=^THRESHOLD
^5^^NONE^DETECTED
^6^^NONE^DETECTED
^7^NET^I^SMALL
^8^^>=^THRESHOLD
^9^^>=^THRESHOLD
10^INSUFFICIENT^SAMPLE
11^^NONE^DETECTED
12^^NONE^DETECTED
13^^NONE^DETECTED
14^^NONE^DETECTED
15^^NONE^DETECTED
16^^NONE^DETECTED
17^^NONE^DETECTED
18^^NONE^DETECTED
19^^>=^THRESHOLD
20^^NONE^DETECTED
<CRLF>                            (NOTES 3, 6)
TESTS^USED=999                    (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

Message Content/Format

Type 4: Unit Dose

```
!U                                  (NOTE 17)
<CRLF>
UNIT^DOSE^SAMPLES                   (NOTE 8)
DATE:^MM/DD/YY                      (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
OP^ID:^999999999                    (NOTE 1)
<CRLF>
^^^^^^^^^^ASSAY^KEY
<CRLF>
LOC^^1^^^VALPROIC^ACID^^^CDATE:^03/30/93        (NOTE 4)
LOC^^2^^^CARBAMAZEPINE^^^CDATE:^03/30/93
LOC^^3^^^VALPROIC^ACID^^^CDATE:^03/30/93
LOC^^4^^^CARBAMAZEPINE^^^CDATE:^03/30/93
LOC^^5^^^VALPROIC^ACID^^^CDATE:^03/30/93
LOC^^6^^^CARBAMAZEPINE^^^CDATE:^03/30/93
<CRLF>                                          (NOTE 3)
<CRLF>
<CRLF>
<CRLF>
^1^^VALPROIC^ACID^^^^^^132.00^^^^^UG/ML
<CRLF>
^2^^CARBAMAZEPINE^^^^^^^14.98^^^^^UG/ML
<CRLF>
^3^^VALPROIC^ACID^^^^^^^76.93^^^^^UG/ML
<CRLF>
^4^^CARBAMAZEPINE^^^^^^^^HI^^^^^^^UG/ML
^^^^^NET^P:^^^95.38^^BLK^I:^^^95.90
<CRLF>
^5^^VALPROIC^ACID^^^^^^^39.94^^^^^UG/ML
<CRLF>
^6^^CARBAMAZEPINE^^^^^^^^2.93^^^^^UG/ML
<CRLF>                                          (NOTES 3, 10)
<CRLF>
!!
```

Type 5: Turbo®/Specific Proteins

```
!U
<CRLF>
TURBO^SAMPLES
<CRLF>
DATE:^MM/DD/YY              (NOTES 5, 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
^^^^^^^^^^ASSAY^KEY
LOC^^1**^IGM^^^^^^^^^^^^^^CDATE:^MM/DD/YY      (NOTE 23)
LOC^^2**^IGA^^^^^^^^^^^^^^CDATE:^MM/DD/YY
LOC^^3***IGG^^^^^^^^^^^^^^CDATE:^MM/DD/YY
LOC^^4**^TRANSFERRIN^^^^^CDATE:^MM/DD/YY
<CRLF>                                         (NOTE 3)
**^^ELEVATED^SAMPLE^VOLUME                     (NOTE 14)
<CRLF>
***^CSF^PROTOCOL                               (NOTE 14)
<CRLF>
TURBO^REF^1^=^^1037.00
TURBO^REF^2^=^^1000.00
<CRLF>
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^^^RSIU^^^^^INITIAL^H
^1**^^IGM^^^^^^^^^^^MG/DL   (UNITS ARE LISTED IN THE APPENDIX)
^^^^^^^^^HI^^^^^^^^106.00^^^^^^^126.00
^2**^^IGA^^^^^^^^^^^MG/DL
^^^^^^^^^HI^^^^^^^^113.80^^^^^^^136.00
^3***^IGG^^^^^^^^^^^MG/DL
^^^^^^^^25.96^^^^^^^60.57^^^^^^^^89.00
^4**^^TRANSFERRIN^^^MG/DL
^^^^^^^^^HI^^^^^^^^131.25^^^^^^^^85.00
<CRLF>                                    (NOTE 3, 20, 22)
<CRLF>
!!
```

Type 6: Random Access

```
!U
<CRLF>
^**TDXFLX^REAGENT^CAROUSEL^LOADLIST**
RGT^^^^^^^^^^^^^^^^^^^^^^^^^^^^EXP
LOC^^^^REAGENT^^^^^^RGT^LOT#^^DATE
--^----------------^---------^-----
C^^THEOPHYLLINE
^^^^^^CAL^DATE:^MM/DD/YY        (NOTES 23, 25)
E^^GENTAMICIN
^^^^^^CAL^DATE:^MM/DD/YY
<CRLF>                          (NOTES 21, 29)
<CRLF>
<CRLF>
<CRLF>
TDXFLX^RUN
<CRLF>
DATE:^MM/DD/YY                  (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
OP^ID:^999999999                (NOTE 1)
RGT^LOT^#:^999999999            (NOTE 2)
CAROUSEL:^99
^^^^^^^^^^SAMPLE^LOADLIST
<CRLF>
LOC^^1*GENTAMICIN               (NOTE 26)
LOC^^2^THEOPHYLLINE
LOC^^3*GENTAMICIN
LOC^^4^THEOPHYLLINE
LOC^^5*GENTAMICIN
LOC^^6^THEOPHYLLINE
*^^DILUTION^PROTOCOL
<CRLF>
<CRLF>
<CRLF>
LOC^ASSAY^^^^^^^^^^^^^^^^CONC
---^-----^^^^^^^^^^^^^^^^----              (NOTE 27)
^1*^GENT^^^^^^^^^^^^^^^^^10.05^HI^^UG/ML   (NOTE 26)
^^^^^NET^P:^^111.20
^^^^^BLK^I:^^^96.14
<CRLF>
^2^^THEO^^^^^^^^^^^^^^^^25.76^^^^^UG/ML
^^^^^NET^P:^^111.67
^^^^^BLK^I:^^531.15
<CRLF>
^3*^GENT^^^^^^^^^^^^^^^^10.00^HI^^UG/ML
^^^^^NET^P:^^111.44
^^^^^BLK^I:^^100.65
<CRLF>
^4^^THEO^^^^^^^^^^^^^^^^25.10^^^^^UG/ML
^^^^^NET^P:^^113.20
^^^^^BLK^I:^^530.38
<CRLF>
^5*^GENT^^^^^^^^^^^^^^^^10.13^HI^^UG/ML
^^^^^NET^P:^^110.84
^^^^^BLK^I:^^^96.28
<CRLF>
^6^^THEO^^^^^^^^^^^^^^^^24.87^^^^^UG/ML
^^^^^NET^P:^^113.72
^^^^^BLK^I:^^521.57
<CRLF>
^^^^^^^^^TESTS^USED^PER^WEDGE              (NOTE 24)
RGTA=^^^^^RGTB=^^^^^RGTC=^39^^RGTD=
```

```
RGTE=^^3^^RGTF=^^^^^RGTG=^^^^^RGTH=
<CRLF>
<CRLF>
<CRLF>
!!
```

Type 6: Random Access with Patient ID

```
!U
<CRLF>
^**TDXFLX^REAGENT^CAROUSEL^LOADLIST**
RGT^^^^^^^^^^^^^^^^^^^^^^^^^^^EXP
LOC^^^^REAGENT^^^^^^RGT^LOT#^^DATE
--^----------------^---------^-----
A^^PHENYTOIN^^^^^^^TOO^LITTLE^RGT
^^^^^^CAL^DATE:^MM/DD/YY                (NOTES 23, 25)
B^^PHENOBARBITAL
^^^^^^CAL^DATE:^MM/DD/YY
<CRLF>
<CRLF>
<CRLF>
<CRLF>
TDXFLX^RUN
<CRLF>
DATE:^MM/DD/YY          (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
CAROUSEL:^99
^^^^^^^^^^SAMPLE^LOADLIST
<CRLF>
LOC^ASSAY^^^^^^^^^^^^^PATIENT^ID
---^-----^^^^^^^^^^^^^----------
^1^^PHENYTOIN^^^^^^^^^123456789
^^^^^^^^^^^^^*TOO^LITTLE^RGT*
^2^^PHENYTOIN^^^^^^^^^987654321
^^^^^^^^^^^^^*TOO^LITTLE^RGT*
^3^^PHENYTOIN^^^^^^^^^246802468
^^^^^^^^^^^^^*TOO^LITTLE^RGT*
^4^^PHENYTOIN^^^^^^^^^086420864
^^^^^^^^^^^^^*TOO^LITTLE^RGT*
^5^^PHENOBARBITAL^^^^^123456789
^6^^PHENOBARBITAL^^^^^987654321
^7^^PHENOBARBITAL^^^^^246802468
^8^^PHENOBARBITAL^^^^^086420864
<CRLF>
<CRLF>
<CRLF>
LOC^ASSAY^^PATIENT^ID^^^^CONC
---^-----^^----------^^^^----           (NOTE 27)
^1^^TOO^LITTLE^RGT
<CRLF>
^2^^TOO^LITTLE^RGT
<CRLF>
^3^^TOO^LITTLE^RGT
<CRLF>
^4^^TOO^LITTLE^RGT
<CRLF>
^5^^PHNOB^^123456789^^^^^6.25^^^^^^UG/ML
^^^^^NET^P:^^323.53
^^^^^BLK^I:^^^17.81
<CRLF>
^6^^PHNOB^^987654321^^^^^7.98^^^^^^UG/ML
^^^^^NET^P:^^^10.94
^^^^^BLK^I:^^^16.57
```

Message Content/Format

```
<CRLF>
^7^^PHNOB^^246802468^^^^^5.76^^^^^^UG/ML
^^^^^NET^P:^^^12.24
^^^^^BLK^I:^^^17.81
<CRLF>
^8^^PHNOB^^086420864^^^^^7.02^^^^^^UG/ML
^^^^^NET^P:^^^11.73
^^^^^BLK^I:^^^19.05
<CRLF>
<CRLF>
^^^^^^^^^TESTS^LEFT^PER^WEDGE                    (NOTE 24)
RGTA=^91^^RGTB=^91^^RGTC=^^^^^RGTD=
RGTE=^^^^^RGTF=^^^^^RGTG=^^^^^RGTH=
<CRLF>
<CRLF>
<CRLF>
!!
```

---Special TDM/Special Chemistry--- METHOTREXATE mode 11 or mode 43

```
!U
DATE:^MM/DD/YY            (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
ASSAY:^METHOTREXATE
<CRLF>
CAROUSEL:^99
<CRLF>
SPLVOL=^^99.99
REPS=^9
GAIN=^99
CALIB.DATE:^MM/DD/YY      (NOTE 23)
CALIB.TIME:^99:99:99
<CRLF>
CONC=^UM/L                (UNITS ARE LISTED IN THE APPENDIX)
<CRLF>
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
^1^^^^^^^0.72^^^^^^^73.27^^^^^^^655.15
^2^^^^^^^0.72^^^^^^^73.14^^^^^^^657.36
^3^^^^^^^0.61^^^^^^^78.84^^^^^^^602.46
^4^^^^^^^0.72^^^^^^^73.27^^^^^^^650.48
^5^^^^^^^0.71^^^^^^^73.67^^^^^^^650.95
AVG:^^^^^0.69^^^^^^^74.44^^^^^^^643.28
<CRLF>
^6^^^^^^^0.71^^^^^^^73.35^^^^^^^646.16
^7^^^^^^^0.73^^^^^^^72.74^^^^^^^650.55
^8^^^^^^^0.61^^^^^^^78.36^^^^^^^611.54
^9^^^^^^^0.72^^^^^^^72.89^^^^^^^658.03
10^^^^^^^0.70^^^^^^^73.77^^^^^^^651.71
AVG:^^^^^0.70^^^^^^^74.22^^^^^^^643.60
<CRLF>
11^^^^^^^0.73^^^^^^^72.61^^^^^^^647.36
12^^^^^^^0.72^^^^^^^73.00^^^^^^^664.36
13^^^^^^^0.71^^^^^^^73.34^^^^^^^643.21
14^^^^^^^0.72^^^^^^^72.88^^^^^^^653.48
15^^^^^^^0.73^^^^^^^72.84^^^^^^^653.70
AVG:^^^^^0.72^^^^^^^72.93^^^^^^^652.42
<CRLF>
16^^^^^^^0.73^^^^^^^72.84^^^^^^^656.95
17^^^^^^^0.71^^^^^^^73.71^^^^^^^643.01
18^^^^^^^0.72^^^^^^^72.98^^^^^^^656.37
19^^^^^^^0.72^^^^^^^73.14^^^^^^^653.07
20^^^^^^^0.72^^^^^^^72.97^^^^^^^634.97
AVG:^^^^^0.72^^^^^^^73.13^^^^^^^648.87
<CRLF>                                  (NOTES 3, 6)
<CRLF>
TESTS^USED=999                          (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

Message Content/Format

---Special TDM/Special Chemistry--- METHOTREXATE with auto dilution option mode 3 or mode 42

```
!U                                  (NOTE 28)
DATE:^MM/DD/YY                      (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
ASSAY:^METHOTREXATE
<CRLF>
CAROUSEL:^99
<CRLF>
SPLVOL=^^99.99
REPS=^9
GAIN=^99
CALIB.DATE:^MM/DD/YY                (NOTE 23)
CALIB.TIME:^99:99:99
<CRLF>
CONC=^UM/L                          (UNITS ARE LISTED IN THE APPENDIX)
<CRLF>                              (NOTE 11)
^^^^^^^^^MTX^DILUTION^PROTOCOL
<CRLF>
<CRLF>
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
^1^^^^^^^^^^^^^^^^^40.88^^^^^^^646.79
^2^^^^^^^5.07^^^^^^^88.04^^^^^^^361.96
^3^^^^^^^^^^^^^^^^^170.93^^^^^^^341.03
^4^^^^^^^^^^^^^^^^^181.35^^^^^^^343.26
*****^CONCENTRATION^= ^^^^5.07 *****
<CRLF>
^5^^^^^^^^^^^^^^^^^34.08^^^^^^^624.38
^6^^^^^^^5.15^^^^^^^41.34^^^^^^^355.68
^7^^^^^^^^^^^^^^^^^89.09^^^^^^^335.54
^8^^^^^^^^^^^^^^^^^171.90^^^^^^^342.07
*****^CONCENTRATION^= ^^^^5.15 *****
<CRLF>
^9^^^^^^^^^^^^^^^^^32.89^^^^^^^542.16
10^^^^^^^^^^^^^^^^^34.51^^^^^^^348.58
11^^^^^^^^^^^^^^^^^41.46^^^^^^^338.42
12^^^^^^^^^^^^^^^^^86.99^^^^^^^349.20
*****^CONCENTRATION^LOW^*****
<CRLF>
13^^^^^^^^^^^^^^^^^168.57^^^^^^^667.02
14^^^^^^^^^^^^^^^^^181.29^^^^^^^373.41
15^^^^^^^^^^^^^^^^^183.13^^^^^^^340.89
16^^^^^^^^^^^^^^^^^182.76^^^^^^^350.83
*****^CONCENTRATION^LOW^*****<CRLF>
<CRLF>
17^^^^^^^^^^^^^^^^^100.02^^^^^^^646.86
18^^^^^^^5.09^^^^^^174.96^^^^^^^374.01
19^^^^^^^^^^^^^^^^^181.95^^^^^^^337.03
20^^^^^^^^^^^^^^^^^182.33^^^^^^^338.25
*****^CONCENTRATION^= ^^^^5.09 *****
<CRLF>
<CRLF>
TESTS^USED=999                      (NOTE 24)
<CRLF>
<CRLF>
!!
```

---Special TDM/Special Chemistry---
T-UPTAKE WITH FTI option

```
!U                          (NOTE 15)
DATE:^MM/DD/YY              (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
ASSAY:^T-UPTAKE
<CRLF>
CAROUSEL:^99
<CRLF>
SPLVOL=^^^9.99
REPS=^9
GAIN=^99
CALIB.DATE:^MM/DD/YY    (NOTE 23)
CALIB.TIME:^99:99:99
<CRLF>
CONC=^T-UPTAKE^UNITS
<CRLF>
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
^1^^ID#^3
^^^^^^^^^0.48^LOW^^^91.75^^^^^^^164.43
^2^^ID#^5
^^^^^^^^^0.50^LOW^^^93.24^^^^^^^140.08
^3^^ID#^4
^^^^^^^^^0.98^^^^^^119.58^^^^^^^141.25
^4^^ID#^1
^^^^^^^^^1.04^^^^^^122.98^^^^^^^140.11
^5^^ID#^8
^^^^^^^^^1.48^HI^^^147.44^^^^^^^140.11
^6^^ID#^9
^^^^^^^^^1.51^HI^^^149.18^^^^^^^143.91     (NOTES 3, 6)
<CRLF>
<CRLF>
^^^^NORMAL^RANGE^^5.00^^TO^^^2.00
<CRLF>
LOC^^^^^T-UP^UNITS^^^^^CALC%^UPTAKE
<CRLF>
^1^^^^^^^^^0.48^^^^^^^^^^^^5.66
^2^^^^^^^^^0.50^^^^^^^^^^^^5.51
^3^^^^^^^^^0.98^^^^^^^^^^^^3.56
^4^^^^^^^^^1.04^^^^^^^^^^^^3.39
^5^^^^^^^^^1.48^^^^^^^^^^^^2.50
^6^^^^^^^^^1.51^^^^^^^^^^^^2.45
^^^^^^^^^^F.T.I.^CALCULATION
<CRLF>
LOC^^^^^T4^^^^^CALC%^^^^^F.T.I.
^1^^^^^4.21^^^^^^5.66^^^^^^0.24
^2^^^^^4.43^^^^^^5.51^^^^^^0.24
^3^^^^^8.21^^^^^^3.56^^^^^^0.29
^4^^^^^8.42^^^^^^3.39^^^^^^0.29
^5^^^^14.45^^^^^^2.50^^^^^^0.36
^6^^^^14.61^^^^^^2.45^^^^^^0.36
<CRLF>
TESTS^USED=999          (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

Message Content/Format

---Special TDM/Special Chemistry---
T-UPTAKE WITH FTI and FT4c options

```
!U                          (NOTE 15)
DATE:^MM/DD/YY              (NOTE 23)
TIME:^99:99:99
SERIAL^#:^99999
LOCK=^0
ASSAY:^T-UPTAKE
<CRLF>
CAROUSEL:^99
<CRLF>
SPLVOL=^^^9.99
REPS=^9
GAIN=^99
CALIB.DATE:^MM/DD/YY
CALIB.TIME:^99:99:99
<CRLF>
CONC=^T-UPTAKE^UNITS
<CRLF>                      (NOTE 11)
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
^1^^^^^^^0.46^LOW^^^90.74^^^^^^^175.05
^2^^^^^^^0.48^LOW^^^91.76^^^^^^^160.22
^3^^^^^^^0.96^^^^^^118.53^^^^^^^152.23
^4^^^^^^^0.96^^^^^^118.33^^^^^^^151.48
^5^^^^^^^1.47^HI^^^146.72^^^^^^^153.37
^6^^^^^^^1.47^HI^^^146.77^^^^^^^155.28
<CRLF>
<CRLF>
^^^^NORMAL^RANGE^^5.00^^TO^^^2.00       (NOTE 16)
<CRLF>
LOC^^^^^T-UP^UNITS^^^^^CALC%^UPTAKE
<CRLF>
^1^^^^^^^^^0.46^^^^^^^^^^^^5.76
^2^^^^^^^^^0.48^^^^^^^^^^^^5.66
^3^^^^^^^^^0.96^^^^^^^^^^^^3.61
^4^^^^^^^^^0.96^^^^^^^^^^^^3.62
^5^^^^^^^^^1.47^^^^^^^^^^^^2.52
^6^^^^^^^^^1.47^^^^^^^^^^^^2.52
^^^^^^^^^^F.T.I.^CALCULATION
<CRLF>
******^FT4^CALCULATION^******
FT4^CONC=NG/DL              (UNITS ARE LISTED IN THE APPENDIX)
<CRLF>
LOC^^^T4^^^^^^^^UPTAKE^^^^FT4^^^^^F.T.I.        (NOTE 19)
^1^^^^^4.35^^^^^^0.46^^^^^1.41^^^^^9.47
^2^^^^^4.34^^^^^^0.48^^^^^1.35^^^^^9.09
^3^^^^^7.98^^^^^^0.96^^^^^1.22^^^^^8.30
^4^^^^^8.00^^^^^^0.96^^^^^1.23^^^^^8.35
^5^^^^14.51^^^^^^1.47^^^^^1.48^^^^^9.87
^6^^^^14.57^^^^^^1.47^^^^^1.48^^^^^9.90
<CRLF>
TESTS^USED=999                                  (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

CALIBRATION SAMPLES

Type 1 Calibration

```
!C
DATE:^MM/DD/YY              (NOTE 23)
TIME:^99:99:99
<CRLF>
SERIAL^#:^99999
LOCK=^0
RGT^LOT^#:^999999999        (NOTE 2)
EXP^DATE:^MM/DD/YY          (NOTE 23)
ASSAY:^PHENYTOIN
<CRLF>                      (NOTE 12)
CALIBRATION
<CRLF>
VOL=^^^9.99
REPS=^9
GAIN=^^99
<CRLF>
CONC=^UG/ML                 (UNITS ARE LISTED IN THE APPENDIX)
I.D.^^^^^NET^^^^^^^NET^^^^^^^^^BLANK
^^^^^^^^^^P^^^^^^^^^I^^^^^^^^^^^^I
^1^^A^^^^257.71^^^^^6780.0^^^^^^117.4
^2^^A^^^^258.62^^^^^6950.6^^^^^^114.3
^3^^B^^^^231.85^^^^^7034.1^^^^^^117.4
^4^^B^^^^233.05^^^^^7010.8^^^^^^114.8
^5^^C^^^^205.90^^^^^7305.9^^^^^^112.1
^6^^C^^^^204.71^^^^^7240.1^^^^^^113.0
^7^^D^^^^167.80^^^^^7758.1^^^^^^114.3
^8^^D^^^^168.44^^^^^7721.0^^^^^^120.5
^9^^E^^^^134.80^^^^^8235.6^^^^^^116.6
10^^E^^^^135.19^^^^^8187.8^^^^^^117.0
11^^F^^^^104.95^^^^^8635.2^^^^^^118.3
12^^F^^^^105.25^^^^^8566.5^^^^^^115.2
<CRLF>
I.D.^^CONC^^^AVGP^^^^^^FITP^^^^^^PERR
A^^^^^0.00^^^258.17^^^^258.17^^^^^0.00
B^^^^^2.50^^^232.45^^^^231.26^^^^^1.19
C^^^^^5.00^^^205.31^^^^205.67^^^^-0.36
D^^^^10.00^^^168.12^^^^169.68^^^^-1.56
E^^^^20.00^^^135.00^^^^132.99^^^^^2.01
F^^^^40.00^^^105.10^^^^106.00^^^^-0.90
<CRLF>
RMSE=^^^1.05
<CRLF>
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
13^^^^^^29.16^^^^^^116.77^^^^^^^114.34
14^^^^^^14.69^^^^^^148.58^^^^^^^112.58
15^^^^^^^7.73^^^^^^183.84^^^^^^^113.90
<CRLF>                      (NOTES 6, 13)
TESTS^USED=999              (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

Type 2 Calibration

```
!C
DATE:^MM/DD/YY          (NOTE 23)
TIME:^99:99:99
<CRLF>
```

Message Content/Format

```
SERIAL^#:^99999
LOCK=^0
OP^ID:^999999999        (NOTE 1)
ASSAY:^ETHANOL
<CRLF>
CALIBRATION
<CRLF>
VOL=^^^9.99
REPS=^9
GAIN=^^^9
<CRLF>
CONC=^MG/DL             (UNITS ARE LISTED IN THE APPENDIX)
I.D.^^^^^PERCENT^^^^FINAL^^^^^INITIAL
^^^^^^^^^^^^^^^^^^^^V^^^^^^^^^^V
^1^^A^^^^^99.93^^^^13080.0^^^^13089.4
^2^^A^^^^^99.29^^^^13404.2^^^^13500.3
^3^^B^^^^^89.32^^^^11925.0^^^^13351.5
^4^^B^^^^^90.18^^^^11944.4^^^^13245.7
^5^^C^^^^^83.87^^^^10914.8^^^^13013.3
^6^^C^^^^^83.65^^^^10827.4^^^^12943.4
^7^^D^^^^^68.09^^^^^9186.3^^^^13490.7
^8^^D^^^^^70.13^^^^^9203.7^^^^13123.6
^9^^E^^^^^52.00^^^^^6771.4^^^^13020.9
10^^E^^^^^50.08^^^^^6691.9^^^^13361.8
11^^F^^^^^38.20^^^^^5082.7^^^^13306.5
12^^F^^^^^38.43^^^^^5099.3^^^^13269.6
<CRLF>
I.D.^^CONC^^^AVG^^^^^^^FIT^^^^^^^ERR
A^^^^^0.00^^^^99.61^^^^^99.61^^^^^0.00
B^^^^25.00^^^^89.75^^^^^90.49^^^^-0.74
C^^^^50.00^^^^83.76^^^^^82.59^^^^^1.17
D^^^100.00^^^^69.11^^^^^69.57^^^^-0.46
E^^^200.00^^^^51.04^^^^^50.97^^^^^0.07
F^^^300.00^^^^38.31^^^^^38.32^^^^-0.01
<CRLF>
RMSE=^^^0.52
<CRLF>
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^PERCENT^^^^^FINAL^V
13^^^^^244.51^^^^^^^44.79^^^^^^5904.31
14^^^^^^99.83^^^^^^^69.61^^^^^^9172.16
15^^^^^^51.81^^^^^^^82.06^^^^^10846.85
<CRLF>                                  (NOTES 6, 13)
TESTS^USED=^15                          (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

Type 3 Calibration

```
!C
DATE:^MM/DD/YY              (NOTE 23)
TIME:^99:99:99
<CRLF>
SERIAL^#:^99999
LOCK=^0
EXP^DATE:^MM/DD/YY          (NOTE 23)
ASSAY:^AMPHET/METH^U
<CRLF>
CALIBRATION
<CRLF>
VOL=^^^9.99
REPS=^9
GAIN=^^99
```

```
<CRLF>
CONC=^UG/ML                    (UNITS ARE LISTED IN THE APPENDIX)
I.D.^^^^^NET^^^^^^^NET^^^^^^^^^BLANK
^^^^^^^^^^P^^^^^^^^^I^^^^^^^^^^^^I
^1^^A^^^^232.15^^^^^2183.4^^^^^^137.0
^2^^A^^^^231.54^^^^^2225.1^^^^^^137.9
^3^^B^^^^216.79^^^^^2276.5^^^^^^136.4
^4^^B^^^^216.91^^^^^2302.3^^^^^^136.4
^5^^C^^^^207.40^^^^^2359.5^^^^^^139.3
^6^^C^^^^207.28^^^^^2298.1^^^^^^136.8
^7^^D^^^^188.08^^^^^2385.4^^^^^^135.2
^8^^D^^^^187.57^^^^^2381.8^^^^^^138.7
^9^^E^^^^168.89^^^^^2491.8^^^^^^140.9
10^^E^^^^167.86^^^^^2465.7^^^^^^140.9
11^^F^^^^151.70^^^^^2527.4^^^^^^139.1
12^^F^^^^151.99^^^^^2556.9^^^^^^140.5
<CRLF>
I.D.^^CONC^^^AVGP^^^^^^FITP^^^^^^PERR
A^^^^^0.00^^^231.85^^^^231.85^^^^^0.00
B^^^^^0.15^^^216.85^^^^216.00^^^^^0.85
C^^^^^0.30^^^207.34^^^^207.92^^^^-0.58
D^^^^^1.00^^^187.83^^^^188.25^^^^-0.42
E^^^^^3.00^^^168.38^^^^167.70^^^^^0.68
F^^^^^8.00^^^151.85^^^^152.15^^^^-0.30
<CRLF>
RMSE=^^^0.47
<CRLF>
^^^^^^^^STORED^THRESHOLD^=^^^^^0.30
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
13^^^^^^^4.06^>=T^^162.45^^^^^^^192.73
14^^^^^^^3.94^>=T^^162.97^^^^^^^193.52
AVG:^^^^^4.00^>=T^^162.71^^^^^^^193.12
<CRLF>
15^^^^^^^1.59^>=T^^179.47^^^^^^^196.69
16^^^^^^^1.51^>=T^^180.43^^^^^^^198.26
AVG:^^^^^1.55^>=T^^179.95^^^^^^^197.47
<CRLF>
17^^^^^^^0.55^>=T^^198.71^^^^^^^193.32
18^^^^^^^0.52^>=T^^199.66^^^^^^^194.30
AVG:^^^^^0.54^>=T^^199.19^^^^^^^193.81
<CRLF>                                  (NOTES 6, 13)
<CRLF>
TESTS^USED=999                          (NOTE 24)
<CRLF>
<CRLF>
<CRLF>
!!
```

Type 4 Calibration

```
!C
<CRLF>
UNIT^DOSE^CALIBRATION
<CRLF>
DATE:^MM/DD/YY              (NOTE 23)
TIME:^99:99:99
<CRLF>
SERIAL^#:^99999
LOCK=^0
ASSAY:^GENTAMICIN
<CRLF>
CALIBRATION
<CRLF>
VOL=^^^9.99
```

```
REPS=^9
GAIN=^^99
<CRLF>
CONC=^UG/ML                (UNITS ARE LISTED IN THE APENDIX)
I.D.^^^^^NET^^^^^^^NET^^^^^^^^^BLANK
^^^^^^^^^^P^^^^^^^^^I^^^^^^^^^^^^I
^1^^A^^^^198.63^^^^^5572.1^^^^^^^79.2
^2^^A^^^^199.38^^^^^5674.8^^^^^^^77.9
^3^^B^^^^189.88^^^^^5724.2^^^^^^^73.8
^4^^B^^^^189.69^^^^^5737.0^^^^^^^69.8
^5^^C^^^^162.48^^^^^5823.9^^^^^^^72.0
^6^^C^^^^158.11^^^^^5781.4^^^^^^^75.6
^7^^D^^^^130.87^^^^^5848.2^^^^^^^80.1
^8^^D^^^^130.40^^^^^5906.2^^^^^^^78.8
^9^^E^^^^^97.84^^^^^6078.2^^^^^^^72.0
10^^E^^^^^97.76^^^^^6082.1^^^^^^^71.5
11^^F^^^^^82.34^^^^^6158.2^^^^^^^75.1
12^^F^^^^^83.98^^^^^6174.3^^^^^^^71.5
<CRLF>
I.D.^^CONC^^^AVGP^^^^^^FITP^^^^^^PERR
A^^^^^0.00^^^199.01^^^^199.01^^^^^0.00
B^^^^^0.50^^^189.79^^^^189.09^^^^^0.70
C^^^^^1.50^^^160.30^^^^161.26^^^^-0.96
D^^^^^3.00^^^130.63^^^^129.56^^^^^1.07
E^^^^^6.00^^^^97.80^^^^^98.58^^^^-0.78
F^^^^10.00^^^^83.16^^^^^82.89^^^^^0.27
<CRLF>
RMSE=^^^0.64
<CRLF>
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
13^^^^^^^7.76^^^^^^^89.79^^^^^^^^77.40
14^^^^^^^7.67^^^^^^^90.16^^^^^^^^74.71
15^^^^^^^3.97^^^^^^116.07^^^^^^^^80.10
16^^^^^^^3.88^^^^^^117.14^^^^^^^^75.14
17^^^^^^^0.88^^^^^^178.33^^^^^^^^76.05
18^^^^^^^0.86^^^^^^179.14^^^^^^^^87.74
<CRLF>                                    (NOTES 6, 13)
!!
```

Type 5 Calibration

```
!C
<CRLF>
TURBO^CALIBRATION
<CRLF>
<CRLF>
DATE:^MM/DD/YY          (NOTE 23)
TIME:^99:99:99
<CRLF>
SERIAL^#:^99999
LOCK=^0^
ASSAY:^IGG
<CRLF>
CALIBRATION
<CRLF>
VOL=^^^9.99
REPS=^9
GAIN=^^9
<CRLF>
CONC=^MG/DL             (UNITS ARE LISTED IN THE APPENDIX)
TURBO^REF^1^=^^1024.00
TURBO^REF^2^=^^^997.00
<CRLF>
^L^^^^^^^^^^^^^^^^^^^FINAL^^^^^INITIAL
```

```
^^^^^^^^^^RSIU^^^^^^^^^H^^^^^^^^^^H
^1^^A^^^^^^1.08^^^^^110.00^^^^^^102.0
^2^^B^^^^^^7.93^^^^^167.00^^^^^^103.0
^3^^C^^^^^19.15^^^^^266.00^^^^^^117.0
^4^^D^^^^^31.57^^^^^351.00^^^^^^^89.0
^5^^E^^^^^64.86^^^^^522.00^^^^^^^86.0
^6^^F^^^^^67.23^^^^^647.00^^^^^^120.0
<CRLF>
I.D.^^CONC^^^AVG^RSIU^^CRVFIT^RSIU^^ERR
A^^^^^0.00^^^^^1.08^^^^^^1.08^^^^^0.00
B^^^221.00^^^^^7.93^^^^^^6.95^^^^-0.98
C^^^553.40^^^^19.15^^^^^18.70^^^^-0.45
D^^1104.00^^^^31.57^^^^^35.80^^^^^4.23
E^^2210.00^^^^64.86^^^^^57.26^^^^-7.60
F^^3314.00^^^^67.23^^^^^68.55^^^^^1.32
<CRLF>                                  (NOTES 6, 13)
RMSE=^^^3.13
<CRLF>
!!
```

T-Uptake Calibration

```
!C
DATE:^MM/DD/YY              (NOTE 23)
TIME:^99:99:99
<CRLF>
SERIAL^#:^99999
LOCK=^0
RGT^LOT^#:^999999999        (NOTE 2)
EXP^DATE:^MM/DD/YY          (NOTE 23)
ASSAY:^T-UPTAKE
<CRLF>
CALIBRATION
<CRLF>
VOL=^^^9.99
REPS=^9
GAIN=^^99
<CRLF>
CONC=^T-UPTAKE^UNITS
I.D.^^^^^NET^^^^^^^NET^^^^^^^^^BLANK
^^^^^^^^^^P^^^^^^^^^I^^^^^^^^^^^^I
^1^^A^^^^^64.64^^^^^5912.4^^^^^^116.7
^2^^B^^^^^88.01^^^^^6680.1^^^^^^142.6
^3^^C^^^^107.22^^^^^7600.8^^^^^^140.2
^4^^D^^^^131.57^^^^^9015.4^^^^^^143.5
^5^^E^^^^157.16^^^^11195.7^^^^^^143.1
^6^^F^^^^179.67^^^^14591.3^^^^^^141.9
<CRLF>
I.D.^^CONC^^^AVGP^^^^^^FITP^^^^^^PERR
A^^^^^0.00^^^^64.64^^^^^63.74^^^^^0.90
B^^^^^0.40^^^^88.01^^^^^86.79^^^^^1.22
C^^^^^0.80^^^107.22^^^^109.85^^^^-2.63
D^^^^^1.20^^^131.57^^^^132.91^^^^-1.34
E^^^^^1.60^^^157.16^^^^155.96^^^^^1.20
F^^^^^2.00^^^179.67^^^^179.02^^^^^0.65
<CRLF>
RMSE=^^^9.99
<CRLF>
^^^^^^SAMPLES
LOC^^^^^CONC^^^^^^^NET^P^^^^^^^^^BLK^I
^7^^^^^^^1.54^HI^^^152.27^^^^^^^143.08
^8^^^^^^^1.04^^^^^^123.74^^^^^^^144.70
^9^^^^^^^0.53^LOW^^^94.04^^^^^^^141.45
<CRLF>
TESTS^USED=999                          (NOTE 24)
```

Message Content/Format

```
<CRLF>
<CRLF>
<CRLF>
!!
```

NOTES:

1=Optional, may be left off. If so, line not transmitted.

2=Optional, may be left off. If so, puts blank line here.

3=Run may be any quantity from 1 through 20 locations

4=List of UNIT DOSE assays in appendix.

5=List of Turbo®/Specific Protein assays in appendix.

6=Any assay may be run in replicates of 1 to 20. For replicates >1 an average line is printed.

7=If running replicates, and there is an error message on one replicate, there will be no average line.

8=Some Unit Dose runs have a header starting with UNIT DOSE SAMPLES instead of SAMPLES.

9=System 6.7, an operator controllable parameter, affects the printout for Abused Drugs. It has two states, 0 or 1. If System 6.7 =0, a result is printed under SAMPLES CONC and a flag, such as HI or LOW may follow it or replace it. Concentrations greater than the stored threshold are flagged >=T. If System 6.7 =1, no result is printed under Samples CONC, a flag such as >=THRESHOLD or NONE DETECTED is printed.

In this case the Operator **may** edit System 6.7 to 0, select SYSTEM 4.1 and RUN and get a reprint of the last assay as if it had been run initially with 6.7=0.

10=The basic Unit Dose output is a single line. An example using NAPA is shown below.

```
^1^^NAPA^^^^^^^^^^^^^^^^^3.09^^^^^UG/ML
```

A variation of the basic output occurs when a flag is set during an assay. An example using Ethosuximide is shown below. The resulting flag, in this case “LOW”, is printed on the first line. A value may or may not be printed after the flag. A second line of related information is also printed in the general format shown.

```
^3^^ETHOSUXIMIDE^^^^^^^^LOW^^^^^^^UG/ML
^^^^NET^P:^^231.77^^BLK^I:^^207.99
```

An exception to the basic Unit Dose printout occurs with the FLM assay. FLM generates three lines as its standard output. An example of a typical FLM result is shown below.

```
^1 ^^FLM^^^^^^^^^^^^^^^^^44.37^^^^^MG/G
^^^^NET^P:^^250.18
^^^^NET^I:^12543.93^BLK^I:^^^99.85
```

11=As an instrument operator option, there may be a message line added after the <CRLF> following CONC= such as DILUTION PROTOCOL or STORED THRESHOLD = 300.00 or MTX DILUTION PROTOCOL.

12=If, following the line which has the assay name, i.e., AMIKACIN, there is a <CRLF> followed by a line with the word CALIBRATION, then there will be calibration data printed out followed by the LOC line and headings for sample results as shown for that type of assay. In a calibration run no carousel number will be generated.

Depending on Operator preference, there may be calibration runs with no sample results at the end.

13=Maximum number of locations is 20.

14=If not used in this assay, this line is not transmitted.

15=When performing a T-Uptake assay, the following user selectable parameters will change the basic T-Uptake format.

7.1 Sets the lower limit of the normal range.

7.2 Sets the upper limit of the normal range.

7.3 Enables calculation of transformed %Uptake equivalence of T-Uptake values. Both T-Uptake and %Uptake are printed.

7.4 Enables the FTI calculation

Option 1: FTI as a function of %Uptake divided by 100.

Option 2: FTI as a function of %Uptake.

Option 3: FTI as a function of T-Uptake.

7.5 Enables the FT4c calculation

Option 1: FT4c calculation results reported in NG/DL.

Option 2: FT4c calculation results reported in PMOL/L.

In order to enable 7.3, values must be entered for 7.1 and 7.2.

In order to enable 7.4 option 1 or option 2, values must be entered for 7.1 and 7.2.

In order to enable 7.5, 7.4 must be enabled.

Entering values for 7.1 and 7.2 without enabling 7.3, 7.4 or 7.5 will not alter the basic T-Uptake printout.

16=This line is printed when option 7.3 is enabled.

17=Unit Dose assays can only be run with replicates = 1.

19=On T-Uptake with FTI calculation, the column labeled CALC% may be changed by the operator to print UPTAKE.

20=On UNIT DOSE or RANDOM ACCESS assays, if assay is reprinted, in addition to the reprint header example shown, one line and a <CRLF>is added before the header like this:

```
TURBO^SPLS
<CRLF>
REPRINT^DATE:^MM/DD/YY
REPRINT^TIME:^99:99:99
*****^^REPRINTED^DATA^*****
```

UNIT DOSE SPLS prints for unit dose runs. TDXFLX SPLS prints for random access runs. For reprints of calibration runs, SPLS is replaced with CALIB.

21= The Reagent Carousel Loadlist may contain from 1 to 8 (A through H) reagents.

22=Any assay run except UNIT DOSE, Turbo®, and TDxFLx can have (patient) ID # printed or omitted. However, on all types except UNIT DOSE, if replicates > 1 are run in an assay with ID # used, the ID # will be printed only once, on a line just after last replicate and before average line like this (shown for Type-2):

```
             SAMPLES
LOC           CONC        PERCENT      FINAL V
 1            253.29       40.02       3623.70
 2            258.47       39.35       3608.76
             ID# 1234567890
AVG:          255.88       39.68       3616.23
```

Note that UNIT DOSE assay runs cannot accommodate ID#.

On Turbo®, with ID#'s and replicates >1, the handling of IDs is as shown in this sample (replicates =2):

Message Content/Format

```
                SAMPLES
LOC             CONC          RSIU          INITIAL H
 1 IGA
                414.00        31.99         1629.00
 2 IGA
                468.62        36.37         1194.00
                ID# 123456789 CONC= MG/DL
AVG:            441.31        34.37         1411.50
 3 IGA
                476.16        36.98         1242.00
 4 IGA
                476.98        37.05         1244.00
                ID# 123456781 CONC= MG/DL
AVG:            476.57        37.01         1243.00
```

23=Date formats are operator selectable. The default format is MM/DD/YY. The optional formats are DD/MM/YY and YY/MM/DD.

24=Test count is operator selectable. Count can be reported as TESTS USED or as TESTS LEFT.

25=On all assays, if 6.9=0, the message EXP DATE: MM/YY is omitted and line or column (on TDxFLx) is not transmitted. If 6.9 =1, the message EXP DATE: MM/YY is transmitted. Note, Turbo®, and UNIT DOSE don't have EXP DATE: MM/YY in their output.

26=For TDxFLx assay runs, assays run with a dilution protocol are indicated by an asterisk, *. The asterisk will be printed before the assay name in both the sample loadlist and the assay result.

27=The manner in which assay results are grouped is operator selectable. The default setting is group by location. This setting is presented in the Type 6 samples. If an optional grouping method is selected, the header information will change as shown below. The result data fields are not affected by the grouping method selection.

System 6.10

Grouped by Location = 0

Grouped by Patient ID: = 1 (added before the results header)

PATIENT-ID FORMAT
RESULTS GROUPED BY PATIENT-ID
<CRLF>

Grouped by Assay: = 2 (added before the results header)

ASSAY FORMAT
RESULTS GROUPED BY ASSAY
<CRLF>

28=Interactive dilution protocol can evaluate as many as five groups of samples. Each group is comprised of four positions representing 1:1, 1:10, 1:100 and 1:1000 dilution. The all dilutes option will print NET P and BLK I in all positions. The other four dilutions will print NET P and BLK I in positions 1, 2, 3 and 4 respectively, for each group of four.

29=There can be multiple transmissions of the Reagent Carousel Loadlist or the Sample Loadlist sections of the data. Multiple transmissions will occur when the operator edits either of the Loadlist sections during an assay run. The latest data transmitted should be used.

Message Content/Format

The following fields appear on TDxFLx® Software revision 2.0/2.1 printouts.

ASSAY

A variable length field. A unique assay name.

BLK I

A variable length field of raw data. The blank intensity.

CALIB.DATE

Eight bytes. The date that an assay was last calibrated.

CALIB.TIME

Eight bytes. The time of day for the CALIB.DATE.

CAROUSEL

Two bytes. An identification number of the carousel during an assay run. This barcode is read by an internal barcode reader or entered manually by the operator.

CONC

A variable length field. The unit of measure for the value printed.

DATE

Eight bytes. The date on which an assay was run.

EXP DATE

Five bytes. The expiration date of a specific reagent pack. This data is encoded in the reagent pack barcode.

FINAL V

A variable length field of raw data. An intermediate value used in REA® assays.

GAIN

A variable length field. The relative value indicating the voltage on the photo multiplier tube.

LN %

A variable length field of raw data. An intermediate value used in REA® assays.

LOC

Two bytes that indicate the location of a sample in a carousel.

LOCK

One byte. Indicates the status of parameter 2.2. If LOCK is enabled, the parameter is set to 1. If LOCK is disabled, the parameter is set to 0.

NET P

A variable length field of raw data. An intermediate value used to determine concentration.

OP ID

Nine bytes. A unique operator identification number.

PERCENT

A variable length field of raw data. An intermediate value used in REA® assays.

REPS

Two bytes. A number from 1 to 20 which indicates the replicates of patient samples for a specific assay. When the replicates are greater than 1, the result for each unique sample and the averaged value are both reported.

RGT LOT

Nine bytes. A unique identification number of the chemical reagent lot. This number is assigned during the manufacture of the reagent pack.

RGTA

Three bytes, right justified, indicating the number of tests that have been run from a reagent pack.

RMSE

Root mean square error. A measurement of the standard deviation of the PERRs. Used only on CAL runs.

SAMPLES CONC

Variable length field. The result field of the sample.

SERIAL

Five bytes. The unique identification number of an instrument.

SPLVOL

Six bytes. A number stored in the instrument protocol for a specific assay. Also, the final sample volume in a cuvette, reported in microliters.

STORED THRESHOLD

Six bytes. A parameter used in Abused Drug assay printouts. The threshold of concentration used in the result column of the printout. This threshold is printed at the start of an assay printout, prior to the printing of results.

TIME

Eight bytes. The time of day that an assay was run.

MAXIMUM RECORD LENGTH

Record lengths are variable within the assays. Additionally, record length is a function of the mode of transmission. For example, in MODE D interface operation, a record comprises one line, while in other MODES the record length is a complete assay, from the start indicator (!U or !C) to the end indicator (!!). A good estimate of maximum record length can be made by checking the various types of records in the MESSAGE CONTENT section. Using a type 6 assay as an example, a maximum record length of 3000 bytes would be a good approximation.

Data Dictionary

Section 7 Troubleshooting

If communication between the instrument and the host computer cannot be established, perform the following procedures.

1. Verify that the baud rates of both the instrument and the host computer are the same.

   The instrument baud rate can be changed as required. Baud rates of 110, 300, 600, 1200, 2400 and 4800 are supported. The default baud rate is 4800.

   To set the baud rate:

   - Press the “SYSTEM” key.
   - Enter “2.4”.
   - Press the “EDIT” key. The current baud rate is displayed.
   - Enter the new baud rate.
   - Press the “STORE” key.
   - Press the “STOP” key. This returns the instrument to the ready state.

2. Verify that the following parameters are set on the host computer. These settings cannot be modified on the instrument.
   - 7 bit ASCII code in an 8 bit word; bit 8 is always 0.
   - Start bit = 1.
   - Stop bit = 1.
   - Parity = none.

3. Verify that the instrument is transmitting data. The following procedure can be performed to verify the operation of the instrument’s communication port.

   ## Loopback Test:

   - Verify that power is applied to the analyzer and that it is not performing any function.
   - Jumper pin 2 to pin 3 of the DB25 connector.
   - Press the “TEST” key.
   - Enter “5.5.1”.
   - Press the “DISPLAY” key. UART TEST is displayed.
   - Press the “RUN” key. The instrument tests the communication port and displays PASS or FAIL UART 31.
   - Press the “STOP” key. This returns the instrument to the ready state.
   - Remove the jumper from pins 2 and 3.

4. Verify the integrity of the communications cable.

   Perform the loopback test with the communications cable connected to the instrument. Jumper pins 2 and 3 at the host end.

Troubleshooting

Further assistance is available from the X SYSTEMS™ Customer Support Center at 1-800-527-1869. Please have the following information available when you call:

TDxFLx® Analyzer serial number.

TDxFLx® Analyzer software revision number (see section 3).

Make, model and configuration of the host computer.

Title and revision number of the LIS software.

RS232c Interface Specification for the current software revision.

TDxFLx® System Operations manual for the current software revision.

ASSAYS FOR TDxFLx® SYSTEM VERSION 2.0/2.1 (Assay numbers are constant)

#	1 –	GENTAMICIN
#	2 –	TOBRAMYCIN
#	3 –	AMIKACIN
#	4 –	PHENYTOIN
#	5 –	PHENOBARBITAL
#	6 –	PRIMIDONE
	7 –	NETILMICIN
#	8 –	VALPROIC ACID
#	9 –	CARBAMAZEPINE
	10–	DIGOXIN
#	11–	QUINIDINE
#	12–	PROCAINAMIDE
#	13–	NAPA
#	14–	LIDOCAINE
#	15–	THEOPHYLLINE
#	16–	VANCOMYCIN
	17–	FREE VALPROATE
	18–	CY A/METAB(WB)
*	19–	DIBEKACIN
**	20–	STREPTOMYCIN
**	21–	KANAMYCIN
	22–	METHOTREXATE
	23–	CY A/METAB(P/S)
#	24–	ETHOSUXIMIDE
	25–	DISOPYRAMIDE
	26–	FREE PHENYTOIN
	27–	DIGITOXIN
**	28–	FLUOXETINE
	29–	T–UPTAKE
#	30–	ACETAMINOPHEN
	31–	SALICYLATE
	32–	FREE CARB
	33–	TOTAL T3
	34–	GLUCOSE
	35–	BUN
	36–	CHOLESTEROL
**	37–	URIC ACID
	38–	AMYLASE
	39–	CREATININE
	40–	ETHANOL
**	41–	IRON/TIBC
	42–	HDL CHOLESTEROL
	43–	LACTIC ACID
	44–	TOTAL ESTRIOL
	45–	AMPHET–CLASS U
	46–	CORTISOL
**	47–	LDH
	48–	METHADONE U
##	49–	COTININE
	50–	CY A (WB)
	51–	FLECAINIDE
**	52–	NORCLOMIPRAMINE
	53–	CRP
**	54–	5–HIAA (URINE)
**	55–	CLOMIPRAMINE
	56–	TRICYCLICS S
	57–	AMPHET/METH U
	58–	BARBITURATES U
	59–	COCAINE METAB U
	60–	CANNABINOIDS U
	61–	PCP U
	62–	OPIATES U
	63–	BENZODIAZEPINE U
	64–	BARBITURATES S
	65–	BENZODIAZEPINE S
	66–	FREE ESTRIOL
**	67–	DIGOXIN NXT
**	68–	HALOPERIDOL
**	69–	THC S
	70–	IGA

Appendix

	71–	IGG
	72–	IGM
	73–	TRANSFERRIN
**	74–	TOTAL DOXEPINS
*	75–	ISEPAMICIN
*	76–	APRINDINE
**	77–	MAO ACTIVITY
***	78–	MEGX
	79–	T4
**	80–	NORFLUOXETINE
	81–	PROPOXYPHENE U
**	82–	AMITRIPTYLINE
**	83–	NORTRIPTYLINE
**	84–	DESIPRAMINE
**	85–	IMIPRAMINE
**	86–	CY A (P/S)
*	87–	ARBEKACIN
#	88–	FLM

* INTERNATIONAL USE ONLY
** NOT COMMERCIALLY AVAILABLE
*** INVESTIGATIONAL USE ONLY
# UNIT DOSE ASSAY AVAILABLE
NOT FOR MEDICAL DIAGNOSTIC USE

TDxFLx® SYSTEM REVISION 2.0/2.1 ASSAYS LISTED BY BASIC PRINTOUT FORMAT

There are 6 basic printout types:

Type 1: TDM Format (Therapeutic Drug Monitoring/Special Chemistry): 61 Assays

** 5–HIAA
# ACETAMINOPHEN
# AMIKACIN
**AMITRIPTYLINE
AMYLASE
* APRINDINE
* ARBEKACIN
BARBITURATES S
BENZODIAZEPINE S
CARBAMAZEPINE
** CLOMIPRAMINE
CORTISOL
CRP
** CY A (P/S)
CY A (W/B)
CY A/METAB (P/S)
CY A/METAB (WB)
** DESIPRAMINE
* DIBEKACIN
DIGITOXIN
DIGOXIN
DISOPYRAMIDE
ETHOSUXIMIDE
FLECAINIDE
FLM
** FLUOXETINE
FREE CARB
FREE ESTRIOL
FREE PHENYTOIN
FREE VALPROATE
GENTAMICIN
** HALOPERIDOL
** IMIPRAMINE
ISEPAMICIN
** KANAMYCIN
# LIDOCAINE
** MAO ACTIVITY
METHOTREXATE
NAPA
NETILMICIN
** NORCLOMIPRAMINE
** NORFLUOXETINE
** NORTRIPTYLINE
# PHENOBARBITAL
# PHENYTOIN
# PRIMIDONE
# PROCAINAMIDE
# QUINIDINE
SALICYLATE
** STREPTOMYCIN
T4
** THC S
T UPTAKE
THEOPHYLLINE
TOBRAMYCIN
** TOTAL DOXEPINS
TOTAL ESTRIOL
TOTAL T3
TRICYCLICS S
VALPROIC ACID
VANCOMYCIN

Appendix

Type 2: CLINICAL CHEMISTRY: 10 Assays

BUN	GLUCOSE	** LDH
CHOLESTEROL	HDL CHOLESTEROL	** URIC ACID
CREATININE	** IRON/TIBC	
ETHANOL	LACTIC ACID	

Type 3: ABUSED DRUGS: 12 Assays

AMPHET–CLASS U	CANNABINOIDS U	METHADONE U
AMPHET/METH U	COCAIN METAB U	OPIATES U
BARBITURATES U	##COTININE	PCP U
BENZODIAZEPINE	***MEGX	PROPOXYPHENE U

Type 4: UNIT DOSE: 17 Assays

Unit Dose assays, indicated by a pound symbol (#), are listed on page X-X and are also listed in the TDM category on page X-X.

Type 5: Turbo®/SPECIFIC PROTEINS: 4 Assays

IGA	IGM
IGG	TRANSFERRIN

Type 6: RANDOM ACCESS: 16 Assays

These assays can also be run in batch mode. The results are printed in the TDM/Special Chemistry format.

# AMIKACIN	NETILMICIN	# THEOPHYLLINE
# CARBAMAZEPINE	# PHENOBARBITAL	# TOBRAMYCIN
# GENTAMICIN	# PHENYTOIN	# VALPROIC ACID
** KANAMYCIN	# PRIMIDONE	# VANCOMYCIN
# LIDOCAINE	# PROCAINAMIDE	
# NAPA	# QUINIDINE	

* INTERNATIONAL USE ONLY
** NOT COMMERCIALLY AVAILABLE
*** INVESTIGATIONAL USE ONLY
# UNIT DOSE ASSAY AVAILABLE
NOT FOR MEDICAL DIAGNOSTIC USE

Appendix

PRINTED AND TRANSMITTED ERROR MESSAGES

The following error messages can be printed and transmitted at any point during an assay or calibration run. Error messages can occupy more than one data field.

```
1)BACKGROUND TOO LARGE
2)BARCODE FAIL
3)BELOW 1
4)BLK I HI ALERT
5)CAL REPS INCORRECT FOR CALIBRATION
6)CALIBRATION ABORTED
7)CHECK DATA
8)CHECK WASTE CUP
9)CONCENTRATION LOW
10)CRV FIT ERR ### (### is a 3 digit number)
11)HI (after BLK I, RESULT, or FINAL V
or instead of concentration)
12)ILLEGAL MODE MIX
13)ILLEGAL SAMPLE
14)INSUFFICIENT SAMPLE
15)INSUFFIC RGT
16)INVALID ASSAY
17)INVALID BARCODE
18)LIQ SENSE ERROR
19)LIQ LEVEL HI
20)LIQ LEVEL L0
21)LIQUID XTAL FAILURE
22)LLS FAIL
23)LOW (instead of concentration)
24)>MX BKG
25)NET I LARGE
26)NET I TOO SMALL
27)NET I SMALL
28)NO AIR SPACE
29)NO AVG AVAILABLE
30)NO FOIL FOUND
31)NO RGT LOADED
32)NO SAMPLES PIPETTED
33)NO VALID ANSWER
34)NOT CALIBRATED (printed in header during UNIT DOSE)
35)PIPETTE ERROR
36)PO TOO SMALL
37)PREDIL LEVEL HI
38)PREDIL LEVEL LO
39)RANGE TOO LARGE
40)REAGENT LEVEL LO
41)RGNT TOO FULL
42)SAMPLE LEVEL HI
43)SAMPLE LEVEL LO
44)SPAN LESS THAN MIN SPAN
45)SPL CRTRDGE MISS
46)SPLS NOT MONOTONIC
47)SPL VOL ILLEGAL
48)***** (printed instead of a value for BLK I)
49)TOO LITTLE RGT
```

LIST OF UNITS FOR ASSAYS

UG/ML
MG/DL
MM/L
UG/DL
NG/ML
MG/G
U/L
UM/L
G/DL
NG/ML FLECAINIDE ACETATE
T-UPTAKE UNITS
g/L
mEQ/L
munits/uL
umol/L
nmol/L
mmol/L
mol/L
I Units/L
%
mg/L
mP
mg/g

Appendix

BARCODE LABELS

The barcode scanner on the TDxFLx can be used to enter patient identification numbers.

The hand-held barcode scanner reads Code 3 of 9, Code 128, Interleaved 2 of 5 and Codabar symbologies. The scanner accepts alpha-numerics characters for Patient ID and Operator ID even though the keypad does not have alpha keys.

Labels must conform to the AMERICAN NATIONAL STANDARD FOR MATERIALS HANDLING.

The barcode scanner is also used to input 13 digit reagent labels during barcode override.

SAMPLE PRINTOUTS

Type 1 Unknown

```
!U
DATE: 02/03/93
TIME: 12:57:25
SERIAL #: 60184
LOCK= 0
RGT LOT #:
EXP DATE:
ASSAY: PHENYTOIN

CAROUSEL:  1

SPLVOL=   1.00
REPS= 1
GAIN= 20
CALIB.DATE: 02/03/93
CALIB.TIME: 10:33:41

CONC= UG/ML

      SAMPLES
LOC     CONC       NET P         BLK I
 1       28.75      117.31        97.04
 2       29.38      116.48        94.40
 3       29.19      116.73        96.17
 4       29.28      116.61        94.40
 5       28.50      117.65        94.85
 6       14.75      148.38        89.98
 7       14.57      149.04        90.86
 8       14.35      149.85        91.31
 9       14.74      148.42        91.31
10       14.62      148.83        92.18
11        7.70      184.03        94.41
12        7.62      184.59        92.63
13        7.67      184.25        93.51
14        7.77      183.52        93.96
15        7.58      184.85        92.64

TESTS USED= 30


!!
```

Appendix

Type 2 Unknown

```
!U
DATE: 02/12/93
TIME: 09:06:04
SERIAL #: 60008
LOCK= 0
ASSAY: GLUCOSE

CAROUSEL:  4

SPLVOL=   3.00
REPS= 5
GAIN=  5
CALIB.DATE: 01/29/93
CALIB.TIME: 07:41:34

CONC= MG/DL

      SAMPLES
LOC     CONC       PERCENT     FINAL V
 1     252.44       36.89      3258.32
 2     255.70       36.47      3290.39
 3     252.33       36.90      3271.82
 4     250.39       37.15      3279.73
 5     257.64       36.23      3244.96
AVG:   253.70       36.73      3269.04

 6     103.77       63.22      5517.49
 7     103.12       63.37      5545.35
 8      99.16       64.34      5550.95
 9     107.57       62.31      5612.66
10     101.23       63.83      5583.49
AVG:   102.97       63.41      5561.99

11      71.75       71.52      6387.29
12      68.19       72.52      6392.73
13      71.02       71.72      6363.03
14      67.52       72.71      6415.46
15      68.31       72.49      6367.08
AVG:    69.36       72.19      6385.12


TESTS USED= 51


!!
```

Type 3 Unknown System 6.7 = 0

```
!U
DATE: 02/15/93
TIME: 15:56:17
SERIAL #: 60007
LOCK= 0
EXP DATE:
ASSAY: AMPHET/METH U

CAROUSEL:  6

SPLVOL=   8.00
REPS= 5
GAIN= 20
CALIB.DATE: 01/30/93
CALIB.TIME: 08:29:17

CONC= NG/ML

        STORED THRESHOLD =     0.30
      SAMPLES
LOC     CONC        NET P          BLK I
 1       3.79 >=T  163.62        185.88
 2       4.24 >=T  161.70        182.13
 3       4.11 >=T  162.23        186.67
 4       4.22 >=T  161.78        181.71
 5       4.08 >=T  162.34        182.13
AVG:     4.09 >=T  162.34        183.70

 6       1.61 >=T  179.29        183.91
 7       1.71 >=T  178.13        186.08
 8       1.57 >=T  179.69        184.49
 9       1.63 >=T  179.03        187.84
10       1.81 >=T  177.07        186.66
AVG:     1.67 >=T  178.64        185.79

11       0.55 >=T  198.93        187.25
12       0.59 >=T  197.61        187.42
13       0.56 >=T  198.37        188.44
14       0.60 >=T  197.43        188.42
15       0.58 >=T  197.95        189.80
AVG:     0.58 >=T  198.06        188.26


TESTS USED= 15



!!
```

Appendix

Type 3 Unknown System 6.7 = 1

```
!U
DATE: 02/06/93
TIME: 15:12:52
SERIAL #: 60179
LOCK= 0
ASSAY: AMPHET/METH U

CAROUSEL:  1

SPLVOL=   8.00
REPS= 1
GAIN= 20
CALIB.DATE: 02/01/93
CALIB.TIME: 11:15:21

CONC= UG/ML

        STORED THRESHOLD =     0.30
      SAMPLES
LOC     CONC                      BLK I
 1  NONE DETECTED
 2  NONE DETECTED
 3  >= THRESHOLD
 4  >= THRESHOLD
 5  NONE DETECTED
 6  NONE DETECTED
 7 NET I SMALL
 8  >= THRESHOLD
 9  >= THRESHOLD
10 INSUFFICIENT SAMPLE
11  NONE DETECTED
12  NONE DETECTED
13  NONE DETECTED
14  NONE DETECTED
15  NONE DETECTED
16  NONE DETECTED
17  NONE DETECTED
18  NONE DETECTED
19  >= THRESHOLD
20  NONE DETECTED

TESTS USED= 20


!!
```

Type 4 Unknown

```
!U

UNIT DOSE SAMPLES
DATE: 03/30/93
TIME: 15:18:21
SERIAL #: 31664
LOCK= 0
OP ID: 123

          ASSAY KEY

LOC  1   VALPROIC ACID   CDATE: 03/30/93
LOC  2   CARBAMAZEPINE   CDATE: 03/30/93
LOC  3   VALPROIC ACID   CDATE: 03/30/93
LOC  4   CARBAMAZEPINE   CDATE: 03/30/93
LOC  5   VALPROIC ACID   CDATE: 03/30/93
LOC  6   CARBAMAZEPINE   CDATE: 03/30/93



 1  VALPROIC ACID      132.00     UG/ML

 2  CARBAMAZEPINE       14.98     UG/ML

 3  VALPROIC ACID       76.93     UG/ML

 4  CARBAMAZEPINE       ^HI^      UG/ML
     NET P:   95.38  BLK I:   95.90

 5  VALPROIC ACID       39.94     UG/ML

 6  CARBAMAZEPINE        2.93     UG/ML


!!
```

Appendix

Type 5 Unknown

```
!U

TURBO SAMPLES

DATE: 02/13/93
TIME: 07:06:02
SERIAL #: 62196
LOCK= 0
          ASSAY KEY
LOC  1** IGM             CDATE: 02/12/93
LOC  2** IGA             CDATE: 02/12/93
LOC  3***IGG             CDATE: 02/12/93
LOC  4** TRANSFERRIN     CDATE: 02/12/93

**  ELEVATED SAMPLE VOLUME

*** CSF PROTOCOL

TURBO REF 1 =  1037.00
TURBO REF 2 =  1000.00

      SAMPLES
LOC     CONC          RSIU     INITIAL H
 1**  IGM            MG/DL
         HI         106.00       126.00
 2**  IGA            MG/DL
         HI         113.80       136.00
 3*** IGG            MG/DL
       25.96         60.57        89.00
 4**  TRANSFERRIN    MG/DL
         HI         131.25        85.00


!!
```

Type 6 Unknown

```
!U

 **TDXFLX REAGENT CAROUSEL LOADLIST**
RGT                              EXP
LOC    REAGENT       RGT LOT#   DATE
-- ---------------- ---------- -----
C  THEOPHYLLINE
      CAL DATE: 12/13/92
E  GENTAMICIN
      CAL DATE: 12/11/92

TDXFLX RUN

DATE: 01/02/93
TIME: 06:53:36
SERIAL #: 31422
LOCK= 0
OP ID: 348619043
RGT LOT #:562391082
CAROUSEL: 21
          SAMPLE LOADLIST

LOC  1*GENTAMICIN
LOC  2 THEOPHYLLINE
LOC  3*GENTAMICIN
LOC  4 THEOPHYLLINE
LOC  5*GENTAMICIN
LOC  6 THEOPHYLLINE
*  DILUTION PROTOCOL

LOC ASSAY                CONC
--- -----                ----
 1* GENT                 10.05^HI^ UG/ML
     NET P:  111.20
     BLK I:   96.14

 2  THEO                 25.76     UG/ML
     NET P:  111.67
     BLK I:  531.15

 3* GENT                 10.00^HI^ UG/ML
     NET P:  111.44
     BLK I:  100.65

 4  THEO                 25.10     UG/ML
     NET P:  113.20
     BLK I:  530.38

 5* GENT                 10.13^HI^ UG/ML
     NET P:  110.84
     BLK I:   96.28

 6  THEO                 24.87     UG/ML
     NET P:  113.72
     BLK I:  521.57

          TESTS USED PER WEDGE
RGTA=     RGTB=     RGTC= 39  RGTD=
RGTE=  3  RGTF=     RGTG=     RGTH=


!!
```

Appendix

Type 6 Unknown with Patient ID On

```
!U

 **TDXFLX REAGENT CAROUSEL LOADLIST**
RGT                              EXP
LOC    REAGENT       RGT LOT#   DATE
-- ---------------- --------- -----
A  PHENYTOIN        TOO LITTLE RGT
      CAL DATE: 02/03/93
B  PHENOBARBITAL
      CAL DATE: 02/07/93

TDXFLX RUN

DATE: 02/16/93
TIME: 14:11:35
SERIAL #: 43976
LOCK= 0
CAROUSEL: 11
          SAMPLE LOADLIST

LOC ASSAY             PATIENT ID
--- -----             ----------
 1  PHENYTOIN         123456789
             *TOO LITTLE RGT*
 2  PHENYTOIN         987654321
             *TOO LITTLE RGT*
 3  PHENYTOIN         246802468
             *TOO LITTLE RGT*
 4  PHENYTOIN         086420864
             *TOO LITTLE RGT*
 5  PHENOBARBITAL     123456789
 6  PHENOBARBITAL     987654321
 7  PHENOBARBITAL     246802468
 8  PHENOBARBITAL     086420864

LOC ASSAY             PATIENT ID    CONC
--- -----             ----------    ----
 1  TOO LITTLE RGNT

 2  TOO LITTLE RGNT

 3  TOO LITTLE RGNT

 4  TOO LITTLE RGNT

 5  PHNOB  12                       6.25     UG/ML
     NET P:   323.53
     BLK I:    17.81

 6  PHNOB  12                       7.98     UG/ML
     NET P:    10.94
     BLK I:    16.57

 7  PHNOB  12                       5.76     UG/ML
     NET P:    12.24
     BLK I:    17.81

 8  PHNOB  12                       7.02     UG/ML
     N35 P:    11.73
     BLK I:    19.05

        TESTS LEFT PER WEDGE
RGTA= 91   RGTB= 91   RGTC=      RGTD=
```

```
RGTE=       RGTF=       RGTG=       RGTH=


!!
```

Appendix

Methotrextate Mode 11 or Mode 43

```
!U
DATE: 02/11/93
TIME: 13:08:55
SERIAL #: 60019
LOCK= 0
ASSAY: METHOTREXATE

CAROUSEL:  4

SPLVOL=  10.00
REPS= 5
GAIN= 40
CALIB.DATE: 01/28/93
CALIB.TIME: 10:02:19

CONC= UM/L

      SAMPLES
LOC     CONC       NET P        BLK I
 1       0.72       73.27       655.15
 2       0.72       73.14       657.36
 3       0.61       78.84       602.46
 4       0.72       73.27       650.48
 5       0.71       73.67       650.95
AVG:     0.69       74.44       643.28

 6       0.71       73.35       646.16
 7       0.73       72.74       650.55
 8       0.61       78.36       611.54
 9       0.72       72.89       658.03
10       0.70       73.77       651.71
AVG:     0.70       74.22       643.60

11       0.73       72.61       647.36
12       0.72       73.00       664.36
13       0.71       73.34       643.21
14       0.72       72.88       653.48
15       0.73       72.84       653.70
AVG:     0.72       72.93       652.42

16       0.73       72.84       656.95
17       0.71       73.71       643.01
18       0.72       72.98       656.37
19       0.72       73.14       653.07
20       0.72       72.97       634.97
AVG:     0.72       73.13       648.87


TESTS USED= 53


!!
```

Methotrexate Auto Dilution – Mode 3 or Mode 42

```
!U
DATE: 02/16/93
TIME: 10:22:19
SERIAL #: 60019
LOCK= 0
ASSAY: METHOTREXATE

CAROUSEL:  3

SPLVOL=  20.00
REPS= 1
GAIN= 20
CALIB.DATE: 01/14/93
CALIB.TIME: 09:03:12

CONC= UM/L

         MTX DILUTION PROTOCOL

      SAMPLES
LOC     CONC       NET P         BLK I
 1                  40.88        646.79
 2       5.07       88.04        361.96
 3                 170.93        341.03
 4                 181.35        343.26
***** CONCENTRATION =     5.07 *****

 5                  34.08        624.38
 6       5.15       41.34        355.68
 7                  89.09        335.54
 8                 171.90        342.07
***** CONCENTRATION =     5.15 *****

 9                  32.89        542.16
10                  34.51        348.58
11                  41.46        338.42
12                  86.99        349.20
***** CONCENTRATION LOW *****

13                 168.57        667.02
14                 181.29        373.41
15                 183.13        340.89
16                 182.76        350.83
***** CONCENTRATION LOW *****

17                 100.02        646.86
18       5.09      174.96        374.01
19                 181.95        337.03
20                 182.33        338.25
***** CONCENTRATION =     5.09 *****

TESTS USED= 32

!!
```

Appendix

T-Uptake with F.T.I. Unknown

```
!U
DATE: 02/22/93
TIME: 08:29:29
SERIAL #: 62196
LOCK= 0
ASSAY: T-UPTAKE

CAROUSEL:  1

SPLVOL=   2.00
REPS= 1
GAIN= 50
CALIB.DATE: 02/22/93
CALIB.TIME: 07:34:36

CONC= T-UPTAKE UNITS

      SAMPLES
LOC      CONC        NET P          BLK I
 1  ID# 3
          0.48 LOW    91.75        164.43
 2  ID# 5
          0.50 LOW    93.24        140.08
 3  ID# 4
          0.98       119.58        141.25
 4  ID# 1
          1.04       122.98        140.11
 5  ID# 8
          1.48 HI    147.44        140.11
 6  ID# 9
          1.51 HI    149.18        143.91

    NORMAL RANGE  5.00  TO   2.00

LOC      T-UP UNITS      CALC% UPTAKE

 1          0.48             5.66
 2          0.50             5.51
 3          0.98             3.56
 4          1.04             3.39
 5          1.48             2.50
 6          1.51             2.45
          F.T.I. CALCULATION

LOC      T4      CALC%      F.T.I.
 1     4.21       5.66       0.24
 2     4.43       5.51       0.24
 3     8.21       3.56       0.29
 4     8.42       3.39       0.29
 5    14.45       2.50       0.36
 6    14.61       2.45       0.36

TESTS USED= 22

!!
```

T-Uptake with F.T.I. and FT4 Unknown

```
!U
DATE: 02/22/93
TIME: 12:35:45
SERIAL #: 62196
LOCK= 0
ASSAY: T-UPTAKE

CAROUSEL:  1

SPLVOL=   2.00
REPS= 1
GAIN= 50
CALIB.DATE: 02/22/93
CALIB.TIME: 07:34:36

CONC= T-UPTAKE UNITS

      SAMPLES
LOC     CONC       NET P         BLK I
 1       0.46 LOW   90.74        175.05
 2       0.48 LOW   91.76        160.22
 3       0.96      118.53        152.23
 4       0.96      118.33        151.48
 5       1.47 HI   146.72        153.37
 6       1.47 HI   146.77        155.28


    NORMAL RANGE  5.00  TO   2.00

LOC     T-UP UNITS     CALC% UPTAKE

 1         0.46            5.76
 2         0.48            5.66
 3         0.96            3.61
 4         0.96            3.62
 5         1.47            2.52
 6         1.47            2.52
          F.T.I. CALCULATION

****** FT4 CALCULATION ******
FT4 CONC=NG/DL

LOC   T4        UPTAKE    FT4     F.T.I.
 1     4.35      0.46     1.41     9.47
 2     4.34      0.48     1.35     9.09
 3     7.98      0.96     1.22     8.30
 4     8.00      0.96     1.23     8.35
 5    14.51      1.47     1.48     9.87
 6    14.57      1.47     1.48     9.90

TESTS USED= 40


!!
```

Appendix

Type 1 Calibration

```
!C
DATE: 02/03/93
TIME: 10:33:41

SERIAL #: 60184
LOCK= 0
RGT LOT #:
EXP DATE:
ASSAY: PHENYTOIN

CALIBRATION

VOL=   1.00
REPS= 2
GAIN=  20

CONC= UG/ML
I.D.      NET        NET          BLANK
            P          I            I
 1   A     257.71      6780.0       117.4
 2   A     258.62      6950.6       114.3
 3   B     231.85      7034.1       117.4
 4   B     233.05      7010.8       114.8
 5   C     205.90      7305.9       112.1
 6   C     204.71      7240.1       113.0
 7   D     167.80      7758.1       114.3
 8   D     168.44      7721.0       120.5
 9   E     134.80      8235.6       116.6
10   E     135.19      8187.8       117.0
11   F     104.95      8635.2       118.3
12   F     105.25      8566.5       115.2

I.D.  CONC    AVGP       FITP       PERR
A     0.00    258.17     258.17      0.00
B     2.50    232.45     231.26      1.19
C     5.00    205.31     205.67     -0.36
D    10.00    168.12     169.68     -1.56
E    20.00    135.00     132.99      2.01
F    40.00    105.10     106.00     -0.90

RMSE=   1.05

      SAMPLES
LOC     CONC        NET P          BLK I
13      29.16       116.77         114.34
14      14.69       148.58         112.58
15       7.73       183.84         113.90

TESTS USED= 15


!!
```

Type 2 Calibration

```
!C
DATE: 03/31/93
TIME: 10:34:07

SERIAL #: 31664
LOCK= 0
OP ID: 311
ASSAY: ETHANOL

CALIBRATION

VOL=   2.00
REPS= 2
GAIN=   5

CONC= MG/DL
I.D.      PERCENT     FINAL      INITIAL
                        V          V
 1   A      99.93    13080.0    13089.4
 2   A      99.29    13404.2    13500.3
 3   B      89.32    11925.0    13351.5
 4   B      90.18    11944.4    13245.7
 5   C      83.87    10914.8    13013.3
 6   C      83.65    10827.4    12943.4
 7   D      68.09     9186.3    13490.7
 8   D      70.13     9203.7    13123.6
 9   E      52.00     6771.4    13020.9
10   E      50.08     6691.9    13361.8
11   F      38.20     5082.7    13306.5
12   F      38.43     5099.3    13269.6

I.D.  CONC    AVG        FIT        ERR
A      0.00    99.61      99.61      0.00
B     25.00    89.75      90.49     -0.74
C     50.00    83.76      82.59      1.17
D    100.00    69.11      69.57     -0.46
E    200.00    51.04      50.97      0.07
F    300.00    38.31      38.32     -0.01

RMSE=   0.52

       SAMPLES
LOC      CONC        PERCENT      FINAL V
 3      244.51        44.79       5904.31
14       99.83        69.61       9172.16
15       51.81        82.06      10846.85

TESTS USED= 15


!!
```

Appendix

Type 3 Calibration

```
!C
DATE: 01/30/93
TIME: 08:29:17

SERIAL #: 60007
LOCK= 0
EXP DATE:
ASSAY: AMPHET/METH U

CALIBRATION

VOL=   8.00
REPS= 2
GAIN=  20

CONC= UG/ML
I.D.      NET        NET          BLANK
            P          I            I
 1   A     232.15      2183.4       137.0
 2   A     231.54      2225.1       137.9
 3   B     216.79      2276.5       136.4
 4   B     216.91      2302.3       136.4
 5   C     207.40      2359.5       139.3
 6   C     207.28      2298.1       136.8
 7   D     188.08      2385.4       135.2
 8   D     187.57      2381.8       138.7
 9   E     168.89      2491.8       140.9
10   E     167.86      2465.7       140.9
11   F     151.70      2527.4       139.1
12   F     151.99      2556.9       140.5

I.D.  CONC    AVGP       FITP       PERR
A     0.00    231.85     231.85      0.00
B     0.15    216.85     216.00      0.85
C     0.30    207.34     207.92     -0.58
D     1.00    187.83     188.25     -0.42
E     3.00    168.38     167.70      0.68
F     8.00    151.85     152.15     -0.30

RMSE=   0.47

        STORED THRESHOLD =     0.30
      SAMPLES
LOC     CONC        NET P          BLK I
13       4.06 >=T   162.45        192.73
14       3.94 >=T   162.97        193.52
AVG:     4.00 >=T   162.71        193.12

15       1.59 >=T   179.47        196.69
16       1.51 >=T   180.43        198.26
AVG:     1.55 >=T   179.95        197.47

17       0.55 >=T   198.71        193.32
18       0.52 >=T   199.66        194.30
AVG:     0.54 >=T   199.19        193.81


TESTS USED= 18



!!
```

Type 4 Calibration

```
!C

UNIT DOSE CALIBRATION


DATE: 01/29/93
TIME: 08:37:27

SERIAL #: 31660
LOCK= 0
ASSAY: GENTAMICIN

CALIBRATION

VOL=   1.00
REPS= 2
GAIN=  20

CONC= UG/ML
I.D.      NET        NET          BLANK
            P          I              I
 1   A     198.63      5572.1         79.2
 2   A     199.38      5674.8         77.9
 3   B     189.88      5724.2         73.8
 4   B     189.69      5737.0         69.8
 5   C     162.48      5823.9         72.0
 6   C     158.11      5781.4         75.6
 7   D     130.87      5848.2         80.1
 8   D     130.40      5906.2         78.8
 9   E      97.84      6078.2         72.0
10   E      97.76      6082.1         71.5
11   F      82.34      6158.2         75.1
12   F      83.98      6174.3         71.5

I.D.   CONC    AVGP       FITP       PERR
A      0.00    199.01     199.01      0.00
B      0.50    189.79     189.09      0.70
C      1.50    160.30     161.26     -0.96
D      3.00    130.63     129.56      1.07
E      6.00     97.80      98.58     -0.78
F     10.00     83.16      82.89      0.27

RMSE=   0.64

      SAMPLES
LOC     CONC        NET P          BLK I
13       7.76        89.79         77.40
14       7.67        90.16         74.71
15       3.97       116.07         80.10
16       3.88       117.14         75.14
17       0.88       178.33         76.05
18       0.86       179.14         87.74



!!
```

Appendix

Type 5 Calibration

```
!C

TURBO CALIBRATION


DATE: 02/13/93
TIME: 09:42:45

SERIAL #: 62196
LOCK= 0
ASSAY: IGG

CALIBRATION

VOL=   1.00
REPS= 1
GAIN=   1

CONC= MG/DL
TURBO REF 1 =  1024.00
TURBO REF 2 =   997.00

 L                   FINAL     INITIAL
          RSIU         H          H
 1  A      1.08     110.00      102.0
 2  B      7.93     167.00      103.0
 3  C     19.15     266.00      117.0
 4  D     31.57     351.00       89.0
 5  E     64.86     522.00       86.0
 6  F     67.23     647.00      120.0

I.D.  CONC    AVG RSIU  CRVFIT RSIU  ERR
A      0.00      1.08      1.08      0.00
B    221.00      7.93      6.95     -0.98
C    553.40     19.15     18.70     -0.45
D   1104.00     31.57     35.80      4.23
E   2210.00     64.86     57.26     -7.60
F   3314.00     67.23     68.55      1.32

RMSE=   3.13

!!
```

T-Uptake Calibration

```
!C
DATE: 02/10/93
TIME: 12:19:50

SERIAL #: 31918
LOCK= 0
RGT LOT #:
EXP DATE:
ASSAY: T-UPTAKE

CALIBRATION

VOL=   2.00
REPS= 1
GAIN=  50

CONC= T-UPTAKE UNITS
I.D.      NET        NET          BLANK
            P          I            I
 1   A     64.64     5912.4       116.7
 2   B     88.01     6680.1       142.6
 3   C    107.22     7600.8       140.2
 4   D    131.57     9015.4       143.5
 5   E    157.16    11195.7       143.1
 6   F    179.67    14591.3       141.9

I.D.  CONC    AVGP       FITP       PERR
A     0.00     64.64      63.74      0.90
B     0.40     88.01      86.79      1.22
C     0.80    107.22     109.85     -2.63
D     1.20    131.57     132.91     -1.34
E     1.60    157.16     155.96      1.20
F     2.00    179.67     179.02      0.65

RMSE=   1.27

      SAMPLES
LOC      CONC        NET P          BLK I
 7        1.54 HI    152.27        143.08
 8        1.04       123.74        144.70
 9        0.53 LOW    94.04        141.45

TESTS USED= 29


!!
```

Appendix