

Turnkey Instruments Ltd



Simret-F Operating Instructions

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KEY-PRESS FUNCTION

[RESET]	to switch on to quit current function to see amount of memory left
[ENTER]	to select a function to select an instrument setting to enter a character and move on to the next to enter an edited value <u>press and hold</u> to switch between <i>Fleet Manager</i> displays
[ARM]	to arm for a brake test to start and stop the <i>Fleet Manager</i> to reset Driver & Vehicle ID to <u>all</u> dashes
[↑]	to <i>Scroll</i> the display to increase a value to fast increase <u>press and hold</u> to choose YES for a setting
[↓]	to <i>Scroll</i> the display to decrease a value to fast decrease <u>press and hold</u> to choose NO for a setting

GETTING STARTED

The **SIMRET-F** keypad has a tactile feel and the instrument beeps when a button is pressed. Holding a button for more than one second causes the instrument to beep rapidly. This is the **hold-mode** in which the buttons [**↑**], [**↓**] and [**ENTER**] behave differently as described below.

SWITCHING ON: The instrument will normally turn on automatically with the vehicle ignition. To turn on otherwise, press and release the switched marked [**RESET**]. After a short self test (see below) the display will show "**SIMRET ready**", together with the time and date.

DISPLAY CONTRAST: To adjust the contrast of the display press and hold [**RESET**] as the instrument is switched-on until the display goes its darkest after about 3 seconds. Then use the [**↑**] or [**↓**] buttons to darken or lighten the display respectively. Press [**ENTER**] when the required contrast is obtained. SIMRET will automatically remember this setting and use it each time it is switched-on. The contrast can only be adjusted as you switch the instrument on, and once set to suit you it should not normally need re-adjusting.

SELF TEST: As SIMRET is switched on it carries out certain self tests to make sure it is working correctly. At the end of the self test the display will show "**Calibration date**", this is the time and date when the instrument was last calibrated. If this is more than a year ago, the display will show "**PLEASE HAVE ME RE-CALIBRATED**" instead.

If the instrument detects a fault with its memory during the self test the display will show "**MEMORY ERROR**".

If the instrument has lost its calibration information the display will show "**POOR CALIBRATION**".

In both of the above cases, the instrument will automatically revert to a default calibration and is therefore still usable – albeit with reduced

accuracy. In this case, after the error message, the display will show "**PLEASE HAVE ME RE-CALIBRATED**". If the "**Memory Error**" warning appears always check that the Trimmable Parameters (see Appendix B) have not been corrupted before using the instrument.

MEMORY: If you press **[RESET]** while the display shows "**SIMRET ready**", the display will switch to indicating the percentage of brake test memory used and the next test number. Release **[RESET]** to revert to the normal display.

SIMRET-F has special *memory management* software which means that the instrument's memory should never get full. Whenever the memory is nearly full, the software will automatically delete the earliest previous test from memory. This frees up memory space for the next test and means you don't have to worry about making sure the memory has sufficient space left before doing a brake test. So that there can be no confusion, the test identification numbers keep on increasing up to 65000 – even if the memory is cleared.

SCROLLING: with the display indicating "**SIMRET ready**", you can use the **[↑]** and **[↓]** buttons to scroll through the different functions available on the instrument. Press **[ENTER]** to select the function, or **[RESET]** to return the display to "**SIMRET ready**".

SYSTEM EDITOR: The editor allows some of the instrument settings and parameters to be changed. Editing can be password protected. To select, scroll to "**System EDITOR**" and press **[ENTER]**. Then use **[↑]** or **[↓]** again followed by **[ENTER]** to choose what to edit from the following:

DRIVER ID: allows the user to change the name identification of the driver. Up to sixteen alphanumeric characters can be entered. Pressing **[↑]** or **[↓]** changes the flashing character, hold to increase the rate of change. Press **[ENTER]** to move on to the next character position. Press and hold **[ENTER]** to save the whole name. Pressing **[A]** resets the ID to all dashes.

VEHICLE ID: allows the user to change the vehicle identification. The characters are edited in the same fashion as Examiner ID.

Change Settings: your instrument has various settings which can be turned on or off by the user. The settings you can change are described in **Appendix A** of this manual. Press [**↑**] to select YES for a setting (i.e. to turn it on), [**↓**] to select NO (i.e. to turn it off). Then press [**ENTER**] to accept the choice and move on to the next.

Trim Parameters: your instrument is programmed with some adjustable parameters whose values can be changed. They are described in **Appendix B** of this manual. This editing option allows you to change their value. Press [**↑**] or [**↓**] to increase or decrease the value of the flashing digit, hold to speed up. Press [**ENTER**] to move on to the next digit. Press and hold [**ENTER**] to save the whole parameter value and move on to the next.

Trim Zeros: allows the user to periodically check and trim the slope transducer zero level. Zeroing can be done more or less anywhere by following the prompts on the display. The vehicle must be stationary. Properly trimmed zeros allow the instrument to be used to make accurate measurements of ground slope. Make the first measurement then turn the vehicle through 180 degrees and make the second measurement. This compensates for the slope of the ground. If you are sure the ground is level, you don't have to turn the vehicle.

Adjust Clock: allows the time to be changed to compensate for daylight saving. On selection, the minutes value will flash to indicate it can be adjusted, use [**↑**] or [**↓**] to change then [**ENTER**] to save the new value, the hours value will then flash and can be adjusted likewise. The date can only be changed at the factory.

Re-calibrate: shows the latest calibration information and allows a field service engineer to re-calibrate the instrument.

Clear Memory: clears all brake tests from the instrument memory. This does not change the next brake test identification number. Fleet management information is not affected.

Because of the in-built memory management feature there should be no need to clear the instrument's memory. The instrument will always make sure there is sufficient memory space for the next brake test.

BRAKE TESTING WITH SIMRET

MEASURING SLOPE: To measure the slope gradient scroll to the slope measuring function as described above and press **[ENTER]**. The instrument will now continuously measure and display the slope gradient in percent. A negative number means a downward gradient. If a very accurate measurement is required, first trim the instrument zeros as described in **Trim Zeros**.

If the **line pressure** input option is switched-on, the second line of the display will show the brake line pressure in Bar applied to the pressure gauge). If not, the second line will show the gradient as **1 in n**.

ARMING FOR A TEST: Before brake performance can be measured the instrument must be armed. This is done by pressing the switch marked **[A]** while the vehicle is stationary.

The top line of the display will show "**ARM FOR TEST N**", where **N** is an identification number for the next brake test. This number, which will be between 1 and 65000, is used to identify the test results in the instrument memory. It automatically increases by 1 after each successful test.

Press **[ENTER]** to proceed. After a short pause the display will show "**ARMED TEST N**". You can now accelerate the vehicle up to its safe brake test speed. The second line will show the approximate speed increase since starting to accelerate.

To disarm the instrument without carrying out a brake test, press **[RESET]**.

BRAKE TESTING: Accelerate the vehicle up to its normal brake test speed and fully apply the brakes. Always observe safe working practices when accelerating and stopping the vehicle.

SIMRET will automatically starts to measure the deceleration experienced by the vehicle as the brakes are applied. The display will show

"AUTOMATIC STOP". Measurements continue until the instrument senses the vehicle has stopped decelerating, at which time the results are calculated and shown on the display.

At the end of a successful test the display will show the **average reading**, expressed as a **% of g** the acceleration due to gravity, $g = 9.81$ metres per second per second; the **Speed** at braking and the **Stopping Distance**.

If the test was not successful, the display will indicate the possible reason.

The instrument will continue measuring for 1.5 seconds after the vehicle comes to rest. This records the suspension bounce behaviour of the vehicle. The display shows **"Measuring Bounce"** while this is going on.

The display then shows **"Calculating..."** whilst the results are being calculated. Note that the calculated speed and distance assume the vehicle comes to rest and will be wrong if the vehicle is not brought to a halt during the brake test and the instrument will automatically measure the ground slope at this point.

Do not allow the vehicle to move off until the results appear on the display.

After a successful brake test, the results are automatically stored in memory. Each set of test results is identified by the test number shown when the instrument was armed for that test.

Press **[RESET]** when finished to return to **"SIMRET ready"**.

TERMINOLOGY and SET-UP: You may set your SIMRET to measure either average **Brake Effort** or average **Deceleration**. We call the average **Brake Effort** the **Brake Efficiency**. Which **average reading** appears depends on how the instrument is set-up.

The brake efficiency is virtually independent of ground slope and is the best measure of brake performance. The deceleration on the other hand will vary with ground slope. For example, when going down hill the deceleration will be less because the brakes also have to overcome the force of gravity trying to accelerate the vehicle down the hill. The Brake Efficiency though remains the same. Both are expressed as a percentage or fraction of g , the acceleration due to gravity, $g = 9.81$ metres/sec/sec.

Generally speaking **Brake Effort** equals **Deceleration minus Slope**. On level ground the two are identical.

The **average reading** is normally calculated from when the brakes start to stop the vehicle until it comes to rest. The point when the brakes start to stop the vehicle is determined when the deceleration is sustained above the **braking threshold**. However, if you choose to include the brake delay in the average it will be calculated from when the brakes control was actually operated. This will give a slightly lower result. The default braking threshold is 10% g , refer to Appendix B for more information.

The **Time to Stop** is the time from pressing the brake control until the vehicle comes to rest. The **Brake Delay Time** is the time from pressing the brake control until the deceleration is sustained over the **braking threshold** and the brakes are stopping the vehicle.

The **speed** at braking and **stopping distance** are calculated from the measured deceleration of the vehicle. The deceleration is equal to the brake effort plus the slope on which the brake test was carried out. For example, for upward slopes the force of gravity helps to stop the vehicle, giving a deceleration greater than that due to the brake effort alone. Downward slopes decrease the effective deceleration.

To calculate the speed and stopping distance, SIMRET needs to know the **ground slope** on which the test was carried out. It makes an accurate measurement of this slope three seconds after the brake test. This time delay allows the suspension system of the vehicle to settle down after the

Simret-F

test. During this time the SIMRET display shows "**Calculating - DON'T MOVE YET**". Do not allow the driver to move off while the display shows this, otherwise the slope will be measured incorrectly giving errors in the speed and stopping distance.

Note that the Brake Efficiency reading is not affected by any errors in the measurement of the slope of the test course but the speed and stopping distance will be affected.

Note also that the calculation of speed and distance assume an end point speed equal to zero. The calculation will be in error if the vehicle is not brought to a halt during the brake test. If your instrument supplied with a distance pulse (odometer) signal for fleet management it can use this to measure the speed and stopping distance directly instead of calculating them from the deceleration. Do this by selecting YES for the Odometer Input in **Change Settings**.

You may set-up you instrument to display results in kph and metres, or mph and yards.

The recommended instrument set-up for heavy quarry vehicle brake testing is:

Miles per hour?	YES/NO
Delay in Average?	NO
Measure Effort?	YES
Tilt	5.0 degrees/g
Braking Threshold	10.0% g
Start window	0.5 seconds
Stop window	0.1 seconds

REVIEWING RESULTS: You can review the results of up to the last 50 tests on the SIMRET-F display. To do this scroll to "**Review Results**" using the arrow buttons and then press **[ENTER]**.

The display will automatically scan and display the results of any brake stored in memory. For each test it will indicate:

Test number and time and date

Average reading in % g

Peak reading in % g

Ground slope during the test

Speed and stopping distance

Delay time and time to stop

Press **[↑]** to see the next test, **[↓]** to see the previous one. The review also shows whether brake efficiency or deceleration was measured and whether readings during the brake delay time were included in the average.

FLEET MANAGER

The SIMRET-F Fleet Manager is a versatile device that lets you know exactly what your plant is doing literally every minute of the day, every day of the month. It works by making a *Continuous Recording* of vehicle usage and events in a large memory. It also keeps a summary or *Day Report* of the usage during each day of the last month. Note the Fleet Manager memory is independent of the SIMRET Brake Tester memory. Clearing one will not affect the other.

The status of the vehicle for fleet management purposes is defined by automatic switches on the vehicle. These are normally a body-up switch, and a loaded/empty switch. The current status of the vehicle is therefore one of the following:

EMPTY
LOADED
BODY-UP

The current status plus speed, distance and engine revolutions are then monitored on a minute-by minute basis throughout the month. The Fleet Manager automatically decides what operations have been carried out (e.g. loading, tipping, etc) as the status changes.

See Appendix D for the alternative display of the *mini* Fleet Manager.

To configure the SIMRET-F instrument as a Fleet Manager, select YES for the "**Fleet Manager?**" option in **Change Settings**. Only SIMRET-F instruments with the Fleet Manager option can be so configured.

The Fleet Manager will normally switch on automatically when power is applied to the vehicle and start recording right away. If it does not switch on press the **[RESET]** button as described in **Getting Started**.

Once started, only intervention with a special password will stop the recording. This allows the recording to be transferred to PrintMan, the memory to be cleared, or the instrument configuration to be changed.

We recommend you transfer the recording and clear the memory every month. If not, the instrument will clear and restart the memory automatically when it gets full and the *Continuous Record* to that point will be lost.

FLEET MANAGER DISPLAY. While the instrument is recording one of two display modes can be selected, *either* the **Instant Display** or the **Day Report Display**. Press [ENTER] to switch between the two displays.

Instant Display. This indicates the present time and date, the ground speed averaged over the last one second and the engine revolutions averaged over the last one second. Also shown is the present plant status, namely EMPTY, LOADED, or BODY UP.

Press [↑] to display the engine revolutions in RPM, press [↓] to display the ground speed in mph or kph.

Day Report Display. For each of the last 31 days this indicates the totalised:

Power-on time

Engine running time

Engine revolutions

Distance travelled

Productive time and distance when loaded

Productive time and distance when empty

Idle Time

Loading time

Tipping time

The instrument display will automatically scan through each of these 12 values while showing the day to which they refer on its top line.

For the vehicle to be considered to be **productive** it must be *moving* (either loaded or empty) otherwise it is classified as **idle**. Idle time is whenever the vehicle is stationary with the engine running. The average

time per load is the engine running time divided by the number of loads. Note that Loading and Tipping Times are included in the Idle Time as determined by the Fleet Manager.

Press [↓] to display the report for an earlier day, [↑] for a later day. Any of the last 31 days may be viewed without affecting the recording. Press [RESET] to return the display to the present day.

STOPPING FLEET MANAGER. To stop FleetMan recording and go to standby press [ARM]. If the Password Protection is on, you will be prompted for a password. The recording will continue until the correct password is given.

Once at standby the display will indicate "**Fleet Manager OK**", and you can gain access to the System Editor, Download Results or select the SIMRET brake testing mode. The Fleet Manager recording is not affected by brake testing and will carry on from where it left off when you return to the Fleet Manager.

SYSTEM EDITOR: The editor allows some of the instrument settings and parameters to be changed. Editing can be password protected. To select, scroll to "**System EDITOR**" using the arrows and press [ENTER] Then use [↑] or [↓] again followed by [ENTER] to choose what to edit from the following:

DRIVER ID: allows the user to change the name identification of the driver. Up to sixteen alphanumeric characters can be entered. Pressing [↑] or [↓] changes the flashing character, hold to increase the rate of change. Press [ENTER] to move on to the next character position. Press and hold [ENTER] to save the whole name. Pressing [A] resets the ID to all dashes.

VEHICLE ID: allows the user to change the vehicle identification. The characters are edited in the same fashion as Examiner ID.

Change Settings: your instrument has various settings which can be turned on or off by the user. The settings you can change are described

in **Appendix A** of this manual. Press [**↑**] to select YES for a setting (i.e. to turn it on), [**↓**] to select NO (i.e. to turn it off). Then press [**ENTER**] to accept the choice and move on to the next.

Trim Parameters: your instrument is programmed with some adjustable parameters whose values can be changed. They are described in **Appendix B** of this manual. This editing option allows you to change their value. Press [**↑**] or [**↓**] to increase or decrease the value of the flashing digit, hold to speed up. Press [**ENTER**] to move on to the next digit. Press and hold [**ENTER**] to save the whole parameter value and move on to the next.

Adjust Clock: allows the time to be changed to compensate for daylight saving. On selection, the minutes value will flash to indicate it can be adjusted, use [**↑**] or [**↓**] to change then [**ENTER**] to save the new value, the hours value will then flash and can be adjusted likewise. The date can only be changed at the factory.

Clear Memory: clears the present Fleet Manager recording from the instrument memory. Both the *Continuous Recording* and all the *Day Reports* are cleared and restarted.

Note if the instrument cleared the memory itself automatically due to it being full, only the *Continuous Recording* would be restarted and the *Day Reports* would be unaffected.

STARTING FLEET MANAGER. To start the Fleet Manager simply press [**ARM**] while the display shows "**Fleet Manager OK**".

Note you can view the amount of Fleet Manager memory left by pressing and holding [**RESET**] while the recording. The memory will be full (100% used) after about 33 days of continuous recording 24 hours per day.

PC-LINK

Brake test results and fleet management information recorded by your **SIMRET-F** can be downloaded to an IBM compatible computer for more detailed analysis and archive purposes. Thus a full database can be automatically maintained.

A PC-Link interface and software disk are required to download from the instrument. The operation of the PC Link software is described in a separate instruction booklet.

EXTERNAL INPUTS

With the appropriate pressure transducer you can also use your Simret-F to measure and record brake line hydraulic/air pressure during a brake test. Consult Turnkey Instruments for suitable pressure transducers to measure line pressure.

PRINTMAN

PrintMan is the quickest and easiest way to produce hard copy printout of your SIMRET-F brake test results and Fleet Manager information. Connect PrintMan to your SIMRET-F while its display indicates **SIMRET-F ready** or **Fleet Manager OK** and press the **[S]** button on the PrintMan keypad. All results and recordings in the SIMRET-F will now be transferred to your PrintMan's memory. You can then printout the results and recordings on the built-in printer, either there and then or later on. You can also transfer information from PrintMan into a PC computer.

Once information has been uploaded from a SIMRET-F there can be two operating modes for the PrintMan. The original PrintMan mode which is used to printout brake tests results, and the FleetMan mode which is used to printout fleet management information. Note the FleetMan mode is only available after you have uploaded from a SIMRET-F which has fleet management software installed.

SWITCHING ON: To switch Printman on, press the **[RESET]** button. Press and hold **[RESET]** at switch-on to adjust the display contrast using the arrow keys. Press **[ENTER]** at switch-on to adjust the internal clock using the arrow keys.

UPLOADING STORED RESULTS. Press **[S]** to upload stored results from the SIMRET-F. First connect the instruments together with the lead provided. The display shows the number of data blocks transferred. Brake test information will be upload as blocks 1 to 64, fleet manager information as blocks 66 to 255. To terminate uploading press **[RESET]** at any time.

OTHER FEATURES. Press **[↑]** or **[↓]** to switch between the FleetMan and PrintMan modes respectively. Note the FleetMan mode is only available when results have been uploaded from a SIMRET-F equipped with Fleet Manager.

Press **[ENTER]** to switch the display illumination on or off. Press and hold **[ENTER]** as you switch-on the instrument to adjust the time and date shown on the display.

Press **[A]** to print out the latest calibration report from the SIMRET-F you most recently uploaded from.

To print SIMRET brake test Result Tables and Graphs make sure the display shows "*PrintMan ready*" by pressing the **[↓] button.**

PRINTING SIMRET-F RESULTS: PrintMan will upload and store up to 50 sets of brake test results, each identified by the respective test number given to it by SIMRET-F. On completion of each successful brake test, the test number will automatically increase by one.

The results store remains valid even when the instrument is switched off.

To print a *Results Table*, press **[PRINT]** while the display shows "***PrintMan ready***". The display will show "***Print Test N?***" (where N is a test number between 1 and 50) and, on the second line, the Vehicle ID for that test.

Use **[↑]** or **[↓]** to change the test number if required, then press **[ENTER]** to start printing. Hold **[ENTER]** to just feed paper.

You can also print all the stored results from the last test number printed up to the last test carried out. Do this by pressing **[A]** instead of **[ENTER]** while the display shows "***Print Test N***".

The *Results Table* for the test will be printed. This will show the **Mean Brake Effort**, the **Time to Stop**, **Brake Delay Time**, **Speed** at braking and **Stopping Distance**, the peak **Line Pressure** in Bar, the time and date of the test, the test number, the date the next instrument calibration is due, and the instrument serial number. Also printed are the Driver and Plant identifications.

The **Time to Stop** is the time from operating the brake control until the vehicle stops. It is the sum of the **Brake Delay Time** and the **Braking Time** (see *Printing Graphs* below).

Note that the instrument will not allow you to print results if the low battery warning is on, or if the battery starts to fail during printing. However, since the results are automatically stored in memory, they can be printed out later on (or duplicate prints obtained) if this happens.

If at any time you wish to terminate a printout press **[RESET]**.

The printout will show "***I NEED CALIBRATING***" if your SIMRET instrument is due for re-calibration.

PRINTING SIMRET GRAPHS: the instrument can also print graphs of the brake effort as a function of time. After printing a results table, the display will show "**PRINT GRAPH N ?**". If a graph is required press **[ENTER]**, if not press **[RESET]**.

The printer will feed paper as before until **[ENTER]** is released. The graph will be automatically scaled to suit the results. The graph axis is scaled to give either 0.125 g, 0.25 g, 0.5 g, 1.0 g or 1.5 g full scale, and the time axis scaled to match the time between the brakes being applied and the vehicle coming to a stop. At the end of the graph, the time axis scale will be printed.

Three solid lines appear on the graph. The first line is at the *external trigger time* when the brake control was operated. The other two are at the points in time when the deceleration first and last crosses the **Braking Threshold** (for the required start and stop window time respectively - see Appendix B). These are the *brake start* and *brake end times* respectively. The time between these latter two lines is the **Braking Time**. The time between the *external trigger time* and the *brake start time* is the brake **Delay Time**. Some pre-braking measurements will be plotted on the graph prior to the *external trigger time*.

Beyond the *brake end time* the graph records the suspension bounce for a further 1.5 seconds. In this portion of the graph negative values are plotted as shaded.

The average reading in % g or **Brake Efficiency** is calculated over the **Braking Time** unless you set the instrument to include the readings taken during the brake **Delay Time** in the average. The **Time to Stop** is the **Braking Time** plus the brake **Delay Time**.

If at any time you wish to terminate a graph printout press **[RESET]**.

If you have recorded line pressure during a brake test this will also be plotted on the graph as the thick line.

To print Fleet Manager Day Reports and Fleet Charts first make sure the display shows "*FleetMan ready*" by pressing the [↑] button.

PRINTING FLEETMAN DAY REPORTS: Press [PRINT] to print the fleet manager *Day Report* for each of the last 31 days. The printout will show the vehicle to which it refers and its last driver. Each report is identified by the date and gives the totalized: **power-on time, engine running time, engine revolutions, distance travelled, productive time and distance when loaded, productive time and distance when empty, idle time, number of loads, loading time and tipping time** for that day. Days for which no report is available will be skipped.

If at any time you wish to terminate the report printout press [RESET].

PRINTING FLEET CHARTS: When all available reports have been printed the display will prompt you to "*Print Fleet Chart*", press [ENTER] to proceed. A series of charts representing the vehicle usage will be printed. A new chart is started each time the vehicle is powered-up.

Each chart is identified by a time and date the vehicle was powered-up and plots the distance travelled over each minute (thin line), and what the vehicle was doing for that minute (thick line). The thick line has only four positions corresponding to EMPTY, BODY-UP, BODY UP and LOADED states respectively. These positions are clearly marked on axis of the chart. Each point on the chart corresponds to 1 minute in time with divisions every 60 points or 1 hour.

The cycle time can be quickly determined from the charts.

Over 33 days worth of usage charts can be stored and printed from the FleetMan 96kByte memory.

If at any time you wish to terminate the chart printout press [RESET].

TRANSFERRING TO PC COMPUTER: Test results and records uploaded to your PrintMan can be downloaded to an IBM compatible computer for more detailed analysis and archive purposes. Thus a full fleet database can be maintained.

A PC-Link interface and software disk are required to download from the instrument. The operation of the PC Link software is described in a separate instruction booklet.

MAINTENANCE

There are no user serviceable parts inside the **SIMRET-F** or **PrintMan** instrument cases. The manufacturer's warranty is invalidated if the case seal is broken.

CHARGING THE PrintMan BATTERY: To re-charge the **PrintMan** battery, connect the charger supplied with the instrument to the DIN connector on the rear panel. Switch on the mains power to the charger. A full charge takes about 12 hours.

With a fully charged battery, **PrintMan** can be operated for up to 20 hours, depending on how much the printer is used.

Always recharge the battery as soon as possible after the "**Charge Battery**" warning appears on the display.

To get the best performance and battery life out of your **PrintMan** it is important that the battery is kept in good condition.

To keep the battery in optimum condition and the instrument ready for use we recommend the following charging schedules:

- 1 *If **PrintMan** is in regular use, re-connect the battery charger after every session and leave the instrument permanently on charge.*
- 2 *If **PrintMan** is not to be used for a month or so, fully recharge the battery and then disconnect the charger. Then at monthly intervals give **PrintMan** a 24 hour top up charge. In this way, the instrument will always be ready for use.*
- 3 *If the battery has gone into deep discharge through neglect or miss-use, it may take up to 72 hours of re-charging to fully recover its capacity.*

CHANGING PrintMan PAPER AND RIBBON: Remove the printer cover. This is held in place by the two Allen key screws on the top of the instrument. Lift out the paper roll and carrier and tear through the remaining paper strip to leave a short length feeding into the printer.

Remove this strip of paper by carefully pulling it upwards through the printer.

Remove the printer ribbon by pressing on the right hand side near the PUSH marker.

Fit a new roll of paper onto the roll carrier so that the paper will feed upwards into the printer mechanism from the bottom of the roll. Make sure the leading edge of the paper strip is square.

Replace the paper carrier. Feed the leading edge of the paper strip into the bottom of the printer and wind through by turning the knurled plastic screw on the left hand side of the mechanism. Once the paper appears out of the top of the printer, pull through a short length to align it properly.

Pass the ribbon over the leading edge of the paper and then gently press it down onto the printer mechanism until it clicks into position. Tension the ribbon by turning the adjuster on the left hand side in the direction of the arrow.

Replace the printer cover.

CALIBRATION: The **SIMRET-F** instrument is supplied with a printed **Calibration Report** with the instrument identified by its serial number. Additional copies of the Calibration Report can be printed using PrintMan

It is recommended that your SIMRET-F be re-calibrated once per year or earlier if the instrument self test warns of a calibration fault.

Turnkey Instruments Ltd and its distributors can offer a full Re-calibration and Maintenance Contract for your SIMRET and PrintMan.

NOTES

For help and information please contact:

Turnkey Instruments Ltd

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Issue 1, 15 April 1996.

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APPENDIX A - CHANGING SETTINGS

Use [↑] to choose YES to turn a setting on, or [↓] to choose NO to turn it off. Then press [ENTER] to select and save the setting choice and move on to the next one.

PASSWORD PROTECT? Choose YES to protect the settings and parameters with the password ***. The password must be entered via the keypad before the **Editing Mode** can be used.

LCD BACKLIGHTING? Choose YES to illuminate the LCD for use at night. The extra current drain will shorten time between battery re-charges.

MILES PER HOUR? Choose YES to show, print and download results in mph and feet, NO for kilometres per hour and metres.

FLEET MANAGER? Choose YES for the Fleet Manager mode, NO for the SIMRET Brake Tester.

The following settings apply to brake testing only and will only appear in the SIMRET Brake Testing mode. The odometer input and line pressure are special features.

Auto. Switch off? Choose YES for the instrument to switch off automatically (providing not armed for a test) 4 minutes after the last button was pressed.

Odometer Input? Choose YES for the brake test speed and stopping distance to be measured from the odometer input, NO for them to be calculated from the deceleration profile. Odometer pulses must be generated externally.

Line Pressure? Choose YES to record the brake line air or hydraulic pressure during the brake test. An external pressure transducer must be connected to the instrument. This should give an output of 0.4 volt at 0 bar pressure and 2.0 volt at 100 bar.

Brake Light Trigger? Select YES to trigger the instrument when the brake lights

come on.

Delay in Average? Choose YES to include the measurements during **Brake Delay Time** period in the average g result (tends to give a lower average reading), NO to start the average after the brake delay at the *brake start time*.

Measure Effort? Choose YES to measure **Brake Effort**, NO to measure *Deceleration*. The Brake Effort measurement is virtually independent of the ground slope so you obtain consistent results wherever you do the brake tests. Brake Effort equals Deceleration *minus* Slope.

Complete Review? Choose YES to give complete information in the results review, NO to give just the average g reading and time stamp.

Fine Slope? Choose YES to display the slope gradient to 0.1% in the SLOPE MEASURING mode. Otherwise measures to 1%

APPENDIX B - TRIMMABLE PARAMETERS

Tilt 05.00 degrees/g - this compensates for the tilt of the vehicle, caused by the movement of its suspension, as it decelerates. The default value of 5.0 degrees per g is suitable for typical heavy dump trucks. Other types of vehicle may need different compensation.

Brake at 10.00% - this is the deceleration in %g of the **Braking Threshold** which determines the start and end of braking. It is also the threshold for the end of the **Brake Delay Time** period. It can be adjusted between 00.00% and 99.99% g. The default value is 10.00% g.

Starting 00.50 secs - the time window the deceleration must be sustained at more than **braking threshold** for the braking to be determined to have started and the Brake Delay to have ended. The *brake start time* is then taken as the beginning of this time window. The time from the **External Trigger** to the *brake start time* is the **Brake Delay Time**. The Starting Time Window can be adjusted between 00.00 sec and 02.55 sec, the default value is

Simret-F

00.50 secs.

Stopping 00.10 secs - the time window (after a valid start) the deceleration must be sustained at less than **braking threshold** for the braking to be determined to have ended (and the vehicle to have stopped). The *brake end time* is then taken as the beginning of this time window. The time between the *brake start* and *brake end times* is the **Braking Time**. The average reading will be calculated over this interval unless you have specifically included in the average the deceleration during the Brake Delay Time as well. The Stopping Time Window can be adjusted between 00.00 sec and 02.55 sec, the default value is 00.10 secs.

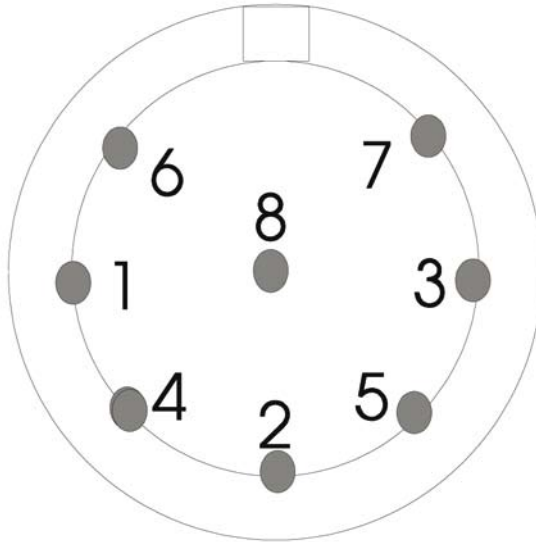
Pulse @ 10.00 cm - this is the calibration factor for the distance pulse counter (odometer). The default is one pulse every 10.00 cm travelled. Used by the Fleet Manager and by SIMRET Brake Tester if the Odometer Input is enabled.

RPM scale 01.00 - this is the calibration factor for the engine rev counter. The default of 01.00 is correct for two pulse per engine revolution. Used by the Fleet Manager only.

Note parameters relevant to brake testing will not appear when Fleet Manager is active and vice-versa.

APPENDIX C - PRINTMAN DIN CONNECTOR

Pin Connections Viewed onto DIN Plug Mating Face



- Pin 1 serial data out
- Pin 2 battery charger -ve and case
- Pin 3 serial data input
- Pin 4
- Pin 5 signal common
- Pin 6 voltage output (5.5 volt approx.)
- Pin 7
- Pin 8 battery charger +ve

APPENDIX D - ADDENDUM FOR MINI FLEET MANAGER

The *mini* Fleet Manager is a simpler version of the instrument which is designed to measure locomotive usage times. Distance travelled, speed and engine rpm are not measured.

The instrument and its controls function in the same way as the full Fleet Manager except that the operational state of the locomotive is simply defined as either

Power On

Engine Running

LOCO Moving

The **Instant Display** shows which of the three possible conditions the locomotive is currently in. The **Day Report Display** shows the time spent each day of the last month (for which results are available) in the above states.

Press **[ENTER]** to switch between the **Instant Display** and the **Day Report Display**. Press **[↑]** or **[↓]** while in the **Day Report Display** to change the date the report refers to, press **[RESET]** to return to the current day's report.

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