National Standards Commission

Certificate of Approval

No 6/10B/54

Issued under Regulation 9
of the
National Measurement (Patterns of Measuring Instruments) Regulations

This is to certify that an approval for use for trade has been granted in respect of the

Ramsey Model Micro Track Weighing-in-motion Weighing Instrument

submitted by Ramsey Technology
20-22 Box Road
TAREN POINT NSW 2229.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

CONDITIONS OF APPROVAL

This approval is subject to review on or after 1 June 1999.
This approval expires in respect of new instruments on 1 June 2000.

Instruments purporting to comply with this approval shall be marked NSC No 6/10B/54 and only by persons authorised by the submittor.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0/A.

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It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the Commission and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with the Commission's Document 106.

The values of the performance criteria (maximum number of scale intervals etc.) applicable to the instrument shall be within the limits specified herein and in any approval documentation for the components where they are approved separately.

The Commission reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

This approval shall NOT be used in conjunction with General Certificate No 6B/0.

Special: (for Variant 3)

The submittor shall notify the Commission in writing of each instrument purporting to comply with Variant 3 prior to it being submitted to a trade measurement authority/licensed certifier for initial verification/certification.

Trade measurement authorities/licensed certifiers should not verify/certify any instrument purporting to comply with Variant 3 until advised in writing by the Commission of the suitability of the instrument.

DESCRIPTIVE ADVICE

Pattern: approved 6 May 1994

- A Ramsey model Micro Track weighing-in-motion single platform weighing instrument.

Variants: approved 6 May 1994

1. With two weighing platforms.
2. With a Ramsey model Planar EL8358HR visual display terminal/keyboard.
3. With various components of the pattern replaced by certain other components.

Technical Schedule No 6/10B/54 describes the pattern and variants 1 to 3.

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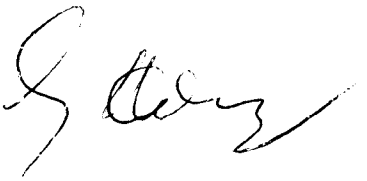
FILING ADVICE

The documentation for this approval comprises:

Certificate of Approval No 6/10B/54 dated 19 October 1994
Technical Schedule No 6/10B/54 dated 19 October 1994 (incl. Table 1 & Test Procedure)
Figures 1 to 6 dated 19 October 1994

Signed and sealed by a person authorised under Regulation 9 of the National Measurement (Patterns of Measuring Instruments) Regulations to exercise the powers and functions of the Commission under this Regulation.



National Standards Commission

TECHNICAL SCHEDULE No 6/10B/54

Pattern: Ramsey Model Micro Track Weighing-in-motion Weighing Instrument.

Submittor: Ramsey Technology
20-22 Box Road
TAREN POINT NSW 2229.

1. Description of Pattern

A Ramsey model Micro Track weighing instrument for the determination of individual bogie masses, and hence the mass of the wagons of a train, when weighed in motion.

The instrument shall be used up to a maximum speed of 5 km/h.

A typical system is shown in Figure 1.

1.1 Weighing Platform (Figure 2)

This supports a short section of rail track on four load cells. The platform is fitted with stays to restrict both longitudinal and transverse movement.

1.2 Load Cells

Four Revere model CSP-M-40 t-C3-SC load cells of 40 t maximum capacity are used (as described in the Documentation of NSC Approval No S258) and mounted as shown in Figures 2 and 3.

1.3 Signal Processing/Computing Unit (Figure 1)

A Ramsey model Micro Track signal processing/computing unit is used and is suitable for use with up to 1500 verification scale intervals. The instrument has special temperature limits of 0°C to 40°C.

The circuitry for this unit converts, processes and analyses signals from the load cells and track switches to determine the weight value and correct weighing sequence. Interfaces to the visual display terminal/keyboard are provided; interfaces to speed signals, a printer and a remote visual display terminal/keyboard may also be provided.

This circuitry is implemented on a number of circuit boards which may be incorporated within one or a number of housings.

The specifications of this unit are set out in Table 1.

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TABLE 1

Type: Ramsey Micro Track	
Maximum number of verification scale intervals	1500
Maximum sensitivity	4.6 x 10^{-3}mV/scale interval
Excitation voltage	15 V
Minimum load impedance	87.5 ohms
Maximum excitation current	171 mA

Computing Unit Specifications

1.4 Visual Display Terminal/Keyboard (Figures 1 and 4)

The indication to the operator and facilities for operational control of the instrument are provided by a visual display terminal/keyboard combination, being a Digital model VT300 computer terminal.

1.5 Uninterruptable Power Supply Unit

A Critec model DG12 or Pulsar model CSX 30 uninterruptable power supply unit is used.

1.6 Operation

The computer terminal displays a 'master menu' from which all operations are chosen using the keyboard, including 'static scale', 'coupled in-motion' and 'train summary'. Selecting any of these then causes further sub-menus to be displayed.

For example, if 'coupled in-motion' is selected, the system checks all the track switches (wheel sensors) and the 'live zero' of the weighing platform. If everything is in order, the 'ready' indicator will be displayed.

1.7 Track Switches (Figure 5)

Teifenbach model 2N 59-1R-200-45 track switches are used and these are operated by the wheel flanges of the rail vehicles. The operating sequence provides logic signals which initiate the system, prevent the locomotive mass from being printed, enable the instrument to determine the type and position of the wagon being weighed, detect any reversal of train movement, and monitor the speed of the wagons during weighing.

The mass of 'overspeed' vehicles will not be recorded by the printer.

1.8 Printer

The printer will print 'Totaliser Clear, Scale Zeroed' to indicate that the system had been set to zero before commencement of weighing. The wagon sequence number, individual bogie mass (optional), wagon mass and total train mass will also be printed, as will any overspeeding or other error messages. Additional information may also be printed; locomotive masses will not be printed.

1.9 Remote Visual Display Terminal/Keyboard

A remote visual display terminal/keyboard having some or all of the functions of the primary visual display terminal/keyboard may be provided. This unit is also a Digital model VT300 computer terminal. The unit may also be connected to a printer, however, the keyboard and/or various operational features may not be present at the remote location.

1.10 Markings

Instruments are marked with the following data, on one or more permanently attached nameplates:

Manufacturer's name or mark		
Serial number		
NSC approval numbers	- instrument	NSC No 6/10B/54
	- load cells	NSC No S...
Accuracy class		(III)
Maximum capacity		Max ..... *
Minimum capacity		Min ..... *
Verification scale interval		e = ... *
Maximum wagon weight		.....
Speed range		..... to ..... km/h
Special temperature limits (computing unit)		0°C / 40°C

* Repeated adjacent to each reading face, if not already in that vicinity.

2. Description of Variants

2.1 Variant 1

With two weighing platforms connected to the one signal processing/computing unit.

2.2 Variant 2

With a Ramsey model Planar EL8358HR visual display terminal/keyboard (and remote visual display terminal/keyboard) running software which emulates a Digital model VT100 computer terminal. Such a unit is shown in Figure 6.

2.3 Variant 3

With various components of the pattern as listed below replaced by certain other compatible components.

NOTE: Agreement in writing to the substitution of components shall be obtained from the National Standards Commission. Refer to the Special Conditions of Approval.

- With alternative bogie weighing platforms.
- With alternative Commission-approved load cells.
- With the signal processing/computing unit in alternative housings, which may include components of the visual display terminal/keyboard. Where the housings vary significantly from those shown in the Figures in this Technical Schedule, the written agreement of the National Standards Commission must be obtained.
- With alternative visual display terminal/keyboard units. In the pattern, this unit communicates with the signal processing/computing unit using the protocol of a Digital model VT100 computer terminal. Compatible computer terminals or computers operating with suitable terminal emulation software may be used provided written agreement of the National Standards Commission has been obtained.
- With alternative uninterruptable power supply units.
- With alternative track switches.

TEST PROCEDURE

Instruments shall be tested in accordance with any relevant tests specified in the Inspector's Handbook.

Maximum Permissible Errors:

1. Wagon Weighing

The maximum permissible error for dynamic weighing of a coupled wagon during initial verification/certification shall be:

(a) ±1% of the wagon weight, rounded to the nearest scale interval;

(b) ±1%, rounded to the nearest scale interval, of the weight of a single wagon equal to 35% of the maximum wagon weight as inscribed on the descriptive markings; or

(c) ± one scale interval,

whichever is the greatest.

Errors of not more than 10% of the weighing results, taken from one or more passes of the test train, may exceed ±1% but shall not exceed ±2% of the wagon weight.

2. Train Weighing

The maximum permissible error for dynamic weighing of a train of coupled wagons during initial verification/certification shall be:

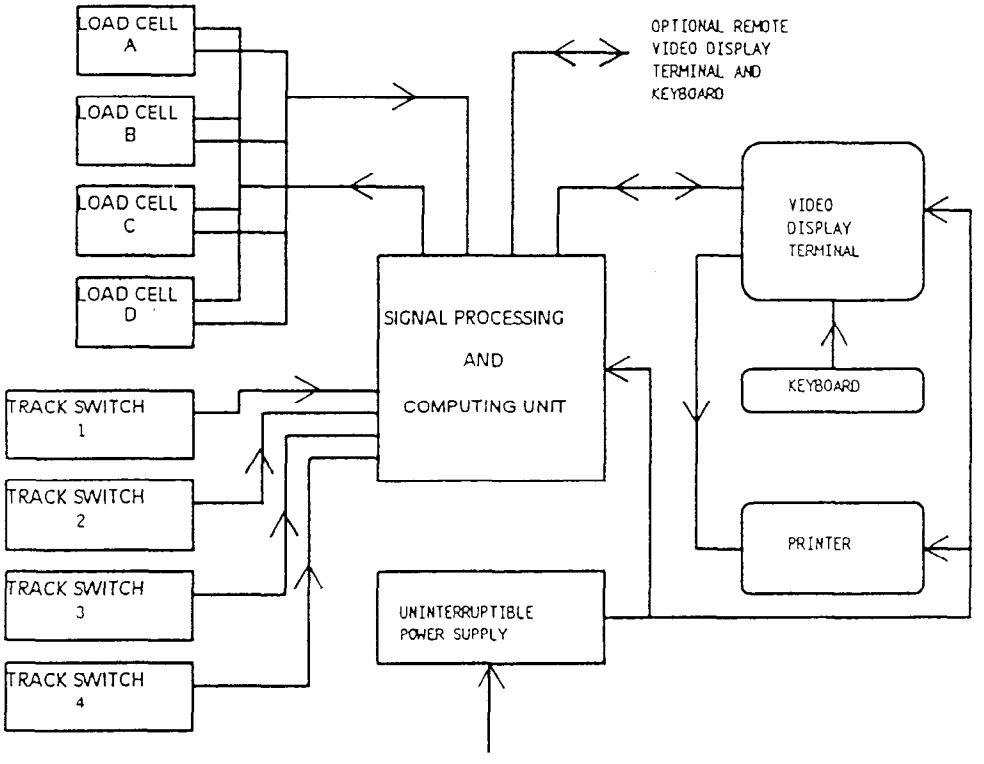
(a) ±0.5% of the total train weight, rounded to the nearest scale interval;

(b) ±0.5%, rounded to the nearest scale interval, of the weight of a single wagon equal to 35% of the maximum wagon weight as inscribed on the descriptive markings, times the number of wagons in the train but not exceeding 10 wagons; or

(c) ± one scale interval for each wagon in the train, but not exceeding 10 scale intervals,

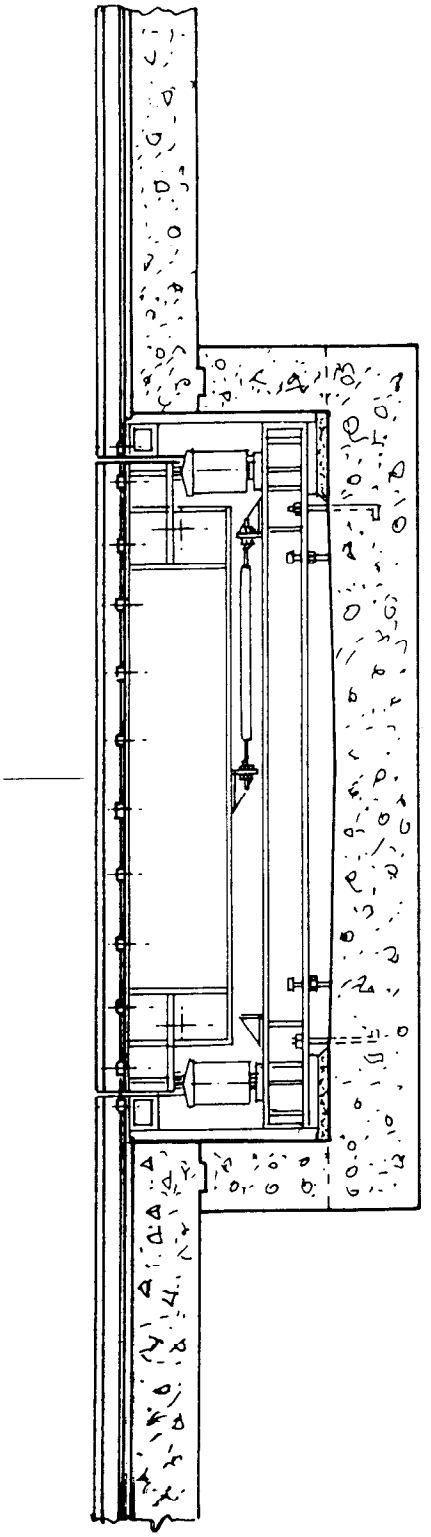
whichever is the greatest.

FIGURE 6/10B/54 - 1



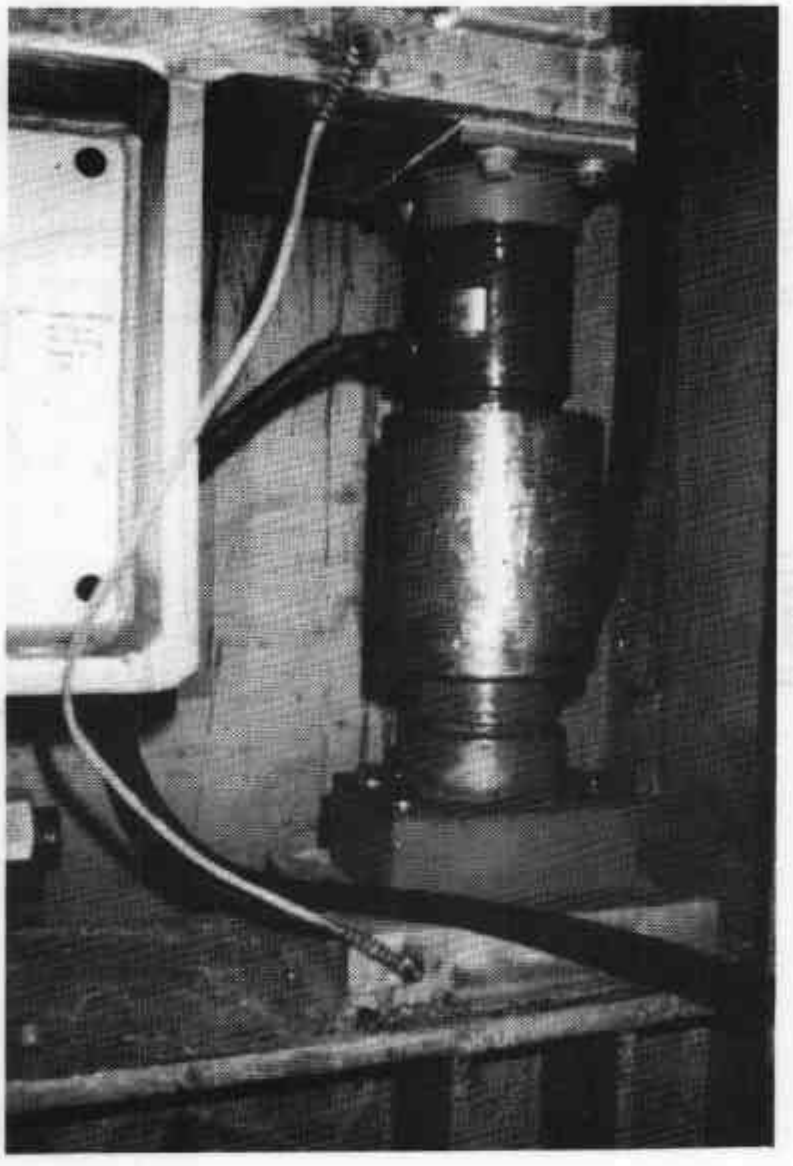
Typical Ramsey Model Micro Track Weighing System

FIGURE 6/10B/54 - 2



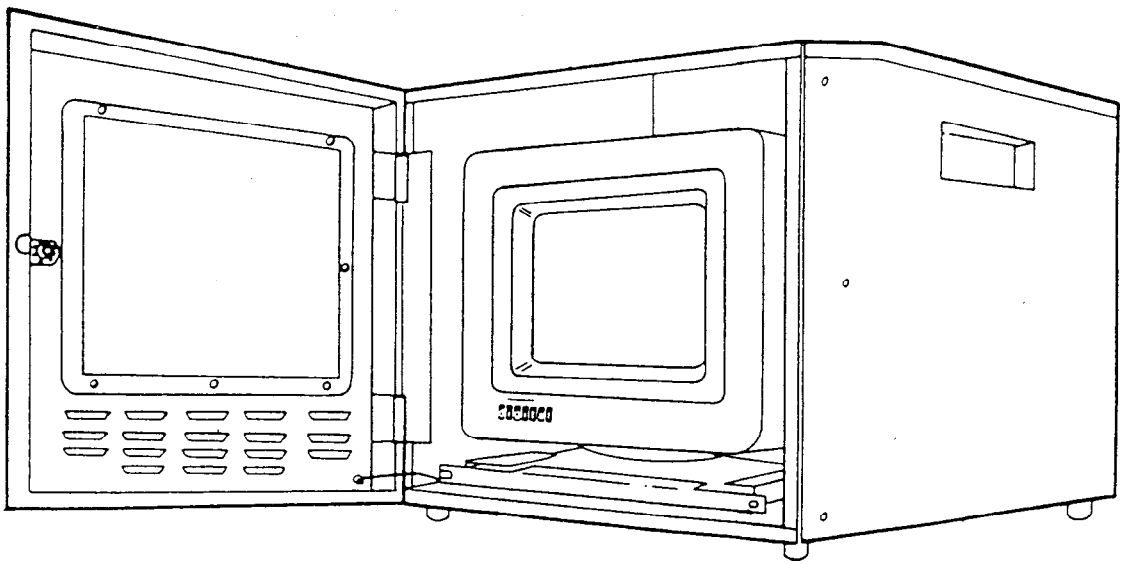
Ramsey Model Micro Track Weighing Platform

FIGURE 6/10B/54 - 3



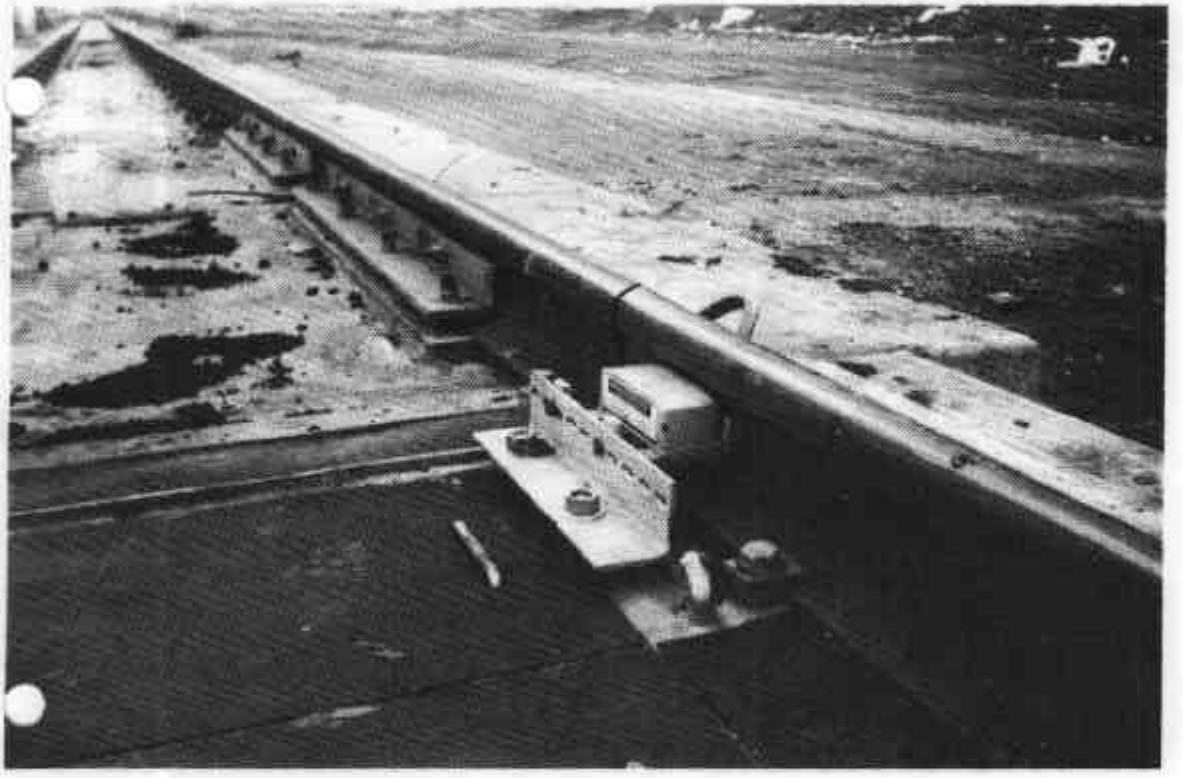
Mounting of Load Cell

FIGURE 6/10B/54 - 4



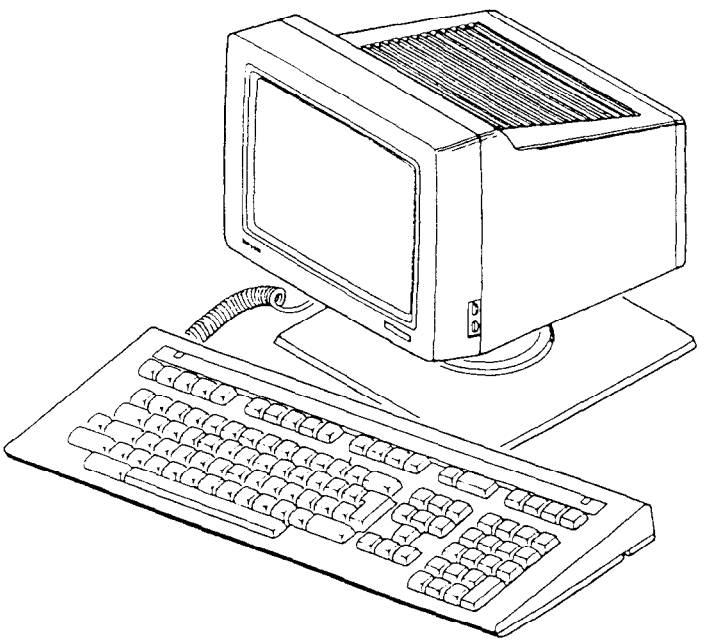
Digital Model VT300 Visual Display Terminal

FIGURE 6/10B/54 - 5



Teifenbach Track Switch

FIGURE 6/10B/54 - 6



Ramsey Model Planar Visual Display Terminal/Keyboard