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To

All Holders of the
1900 Hardware Guide

From

L. Upstone
Manager
Publication Centre
TS,
SIH 01

1900 HARDWARE GUIDE AMENDMENT 1/6

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5.2 Characteristics

	2504	2505
Tape Width	0.5 ins.	0.5 ins.
No. of Tracks	9	9
Tape Speed ins./sec.	37.5	75
Recording Mode	Phase Encoded	Phase Encoded
Packing Density	1600	1600
Parity	Odd	Odd
Transfer Rates Kch/sec.	80	160
Interblock Gap	0.6 ins.	0.6 ins.
Interblock Gap Time	21.2 m/sec.	12.3 m/sec.
Rewind Time 2400 ft.	2.5 mins.	2.5 mins.

Note: The interblock gap times are inclusive of the preamble and postamble and are the sum of the start and stop times.

5.3 Control Unit

The control electronics, which are integral with each cluster will implement the following commands.

Write Data (Write Permit Ring Required)
 Read Data Forward
 Read Data Reverse
 Backspace one block
 Write a Tape Mark
 Skip forward to TM
 Skip backward to TM
 Rewind

Only one command at a time can be obeyed and all the commands listed with the exception of Rewind require the full use of the control.

Once Rewind commands have been initiated, the control is then free to action any other command. No other form of simultaneity is provided.

5.4 Media

The only magnetic tapes that are recommended for use on the 2504 and 2505 systems are the half inch Industry Compatible tapes supplied by Dataset for these systems and which bear the ICL label.

These tapes are guaranteed to be the most suitable for 2504/2505 systems and are certified for all packing densities up to 1600 rpi.

For further information on magnetic media see Section 3.8.

2506/2507 9 TRACK MT SYSTEMS1.0 INTRODUCTION

These two magnetic tape systems are supplied in clusters of two, three or four transports. Each cluster is assembled as a single unit with integral control electronics and is connected to the processor by a single Standard Interface cable.

Both systems record on 9 track tape in NRZI mode at 800 rows per inch.

1.1 Restrictions

2506 or 2507 systems cannot be attached to 1901, 1902 or 1903 processors.

2507 systems cannot be attached to 1901A processors.

The read reverse function cannot be implemented on 2506/2507 systems attached to 1901A, 1904, 1905 and 1909 processors because these four processors do not have the ability to decrement the Control Word Count.

Clusters of 2 transports cannot be field enhanced to clusters of 3 or clusters of 4. Also, 2506 systems cannot be converted to 2507 systems.

2.0 TYPE NUMBERS AND CONSTITUENT ITEMS2.1 Type Numbers

2506/01	Control	+ 2	Transports
2506/02	"	+ 3	"
2506/03	"	+ 4	"
2507/01	"	+ 2	"
2507/02	"	+ 3	"
2507/03	"	+ 4	"

2.2 Optional Features

None.

2.3 Conversions

None.

2.4 Accessories

A 50ft. interface cable is supplied with each cluster. See Section 6.7.

5.4.2. AUTOMATIC LOADING

Automatic tape loading requires the use of an automatic loading cartridge. This cartridge will only fit 10.5 in. diameter spools.

Loading reliability is subject to the following conditions:

- (1) The leading end of the tape must be free from dirt, wrinkles and folds, and the leading edge must be trimmed with the special trimming tool supplied.
- (2) The distance between the outer edge of the tape reel and the outer layer of tape must not exceed $\frac{5}{8}$ ". (This is approximately equivalent to 2000 ft. of tape).

5.4.3. SEMI-AUTOMATIC LOADING

For 6", 8.5", or 10.5" diameter spools not fitted with a cartridge, manual assistance is required to guide the leading end of the tape into the tape path. It will then be threaded automatically on to the take-up spool provided item (1) above is observed.

5.4.4. SLIM LINE CARTRIDGE FACILITY (F2001/00)

The basic 2508 or 2509 system can only use cartridges of the IBM Standard type or equivalent designs, e.g. Dataset Ref. 198810. For customers who wish to use the Slim Line Cartridge instead of, or in addition to the standard type;

F2001/00 - Slim-Line Cartridge Facility

must be ordered for each transport. This can be specified on orders for new systems, or for field alteration to existing systems.

5.4.5. 4 PIN HUB FOR TYPE 8 MTU (F2067/00)

The 4 pin hub for holding the tape spool is only supplied with F2001/00 Slimline Cartridge Facility. This ensures speedy accurate alignment and positive location of the file spool on the file spool hub which is an essential condition when Slimline cartridges are used.

With the normally supplied single pin hub, operators have to be more precise and diligent when loading spools of tape to ensure correct alignment and location of the spool.

For users who have no requirement for the full Slimline cartridge facility.

F2067/00-4 Pin Hub for Type 8 MTU

can now be specified separately, and enables tape loading efficiency and reliability to be improved, or at least maintained, with less emphasis on operator responsibility.

2510/2511 9 TRACK MT SYSTEM

1.0 INTRODUCTION

The 2510/2511 is a 9 Track Phase Encoded MT system with full automatic loading facilities plus an optional NRZI facility.

The 2510/01 or Master Unit is the MT Control with an integrated transport in the same cabinet. Up to 5 additional single transports, Type 2511/01, or Slaves, may be connected to the master unit making a maximum of a control and 6 transports for any one system.

1.1 Restrictions

Attachment of the 2510/01 control is limited to certain processors in the 1900 range, and full Executive support is confined to particular Executives (See 3.0 and 4.0)

For 2903 attachment see 9.0

2.0 TYPE NUMBERS AND CONSTITUENT ITEMS

2.1 Type Numbers

Long Description

Short Description

2510/01 Magnetic Tape Control and Integrated Transport

MT CONT+MTU 9TR PE 80 KCH

2511/01 Magnetic Tape Transport

MTU 9TR PE 37.5IPS 80 KCH

The minimum system is a control and one transport, i.e. a 2510/01 on its own.

The maximum system is a control and six transports, i.e. a 2510/01 plus 5 x 2511/01.

2.2 Optional Features (See also 5.1).

Long Description

Short Description

F2009/00 NRZI Facility (2510 Control Unit)

NRZI FACILITY (2510)

2.3 Conversions

None. (but see 7.0, Field Enhancements).

Once Rewind commands have been initiated, the control is then free to action any other command. No other form of simultaneity is provided.

The F2009/00 NRZI facility is an option applied to the 2510 control. When fitted, the whole system is able to operate in 1600 rpi PE mode or 800 rpi NRZI mode according to the setting of the manual mode switch on the 2510 control unit.

When set to PE mode the whole system will appear to the software as a 2504 or 2508 system. When set to NRZI mode, the whole system will appear to the software as a 2506 system.

See also Systems Considerations 10.0.

5.2 Transports

The first transport is integrated with the control in the 2510 cabinet known as the Master Unit. Additional 2511 single transports, or Slave Units, are contained in cabinets which are identical in shape and size to the Master Cabinet.

The transport decks are fitted with long-life read/write heads and tape is driven at 37.5ins/sec.

Tape movement is controlled by a single capstan and vacuum chambers provide the tape tension.

Tape loading is fully automatic when a Standard type or Slimline cartridge is used. Without a cartridge, manual assistance is required, See also 5.4.1.

Operator controls are situated on a front facing panel above each transport deck.

5.3 Characteristics

	<u>2510 and 2511</u>
Tape Width	0.5 ins
No. of Tracks	9
Tape Speed	37.5 ins/sec
Recording Mode	Phase/Encoded/Optional NRZI
Packing Density	1600 rpi 800 rpi
Transfer Rates	80 Kch/s 40 Kch/s
Parity	Odd
Interblock Gap	0.6 ins
Interblock Gap Time	26 m.sec
Rewind Speed	150 ins/sec
Automatic Loading	10.5 in. Spools Only.
Read/Write Head	Long Life
Tape Drive	Single Capstan

The tape marks recorded by the 2510 are:-

1. PE mode. 80 rows of ones recorded in tracks 2, 5 and 8 with all other tracks DC erased.
2. NRZI mode. A single row with ones recorded in tracks 2, 3, and 8 only.

For data interchange purposes when working in PE mode, the 2510 will treat any control block as a tape mark that has the following format.

Recordings in track 1, 4 or 7 or any combination of all three these tracks together with recordings in tracks 2, 5 and 8 and with tracks 3, 6 and 9 DC erased.

The block may also be any length from 32 to 128 rows.

When reading or writing non-1900 tapes, user programs will need to handle labels and code conversion. See Appendix 1 1900 Magnetic Tape Manual.

5.6 Resilience

Operation of the controller within the master cubicle is independent of the power supplies for the tape transport in that same cubicle. A controller may therefore be operated with its own transport powered off.

A read after write check is automatically performed which ensures that all recorded data conforms to standards. If an error is detected the block will be re-written.

When reading in PE mode, single track errors will be automatically corrected in flight.

When reading in NRZI mode single track errors will be corrected during a subsequent read which can be in the forward or reverse direction.

If more than one track is in error, whether in PE mode or NRZI mode, error recovery is confined to multi re reading of the block, in the forward or reverse directions.

All repeat writes and repeat reads will automatically be initiated by Executive unless inhibited by own monitoring modes.



TITLE 1900 HARDWARE GUIDE

SECTION No 3.5 TITLE 2510/2511 Magnetic Tape

10.0 SYSTEMS CONSIDERATIONS.

10.1 Recording Modes

The manner in which the recording modes are controlled, dictates to some extent how the system is used.

- a) Without NRZI option, in PE mode only.
- b) With NRZI fitted. Individual transports cannot be switched to different modes. All transports operate in the same mode according to the mode switch setting on the 2510.
- c) The mode switch is only effective when the 2510 control is in the off-line state.

The system can be used in various ways.

- 1) Always in PE mode. (F2009/00 not fitted).

With F2009/00 fitted.

- 2) Always in NRZI.
- 3) Sometimes in PE and sometimes in NRZI.
- 4) On some 1900 systems where it is feasible to attach more than one cluster, then possibly one cluster in PE mode and another in NRZI mode. This would allow the transcription of tapes recorded in one mode to be written in the other mode.

10.2 Executive Support

Executives F3RM, E3NG, E6RM, EWG3 and EWG4 for 1900 and Executives 1, 1S, 2, 2S, 3, 3S for 2903 fully support the 2510/2511 MT system.

All these Executives cope with dual mode recognition such that when a 2510 cluster comes on line, Executive senses the mode in which the cluster is set to operate and:

- 1) Adjusts itself to cope with that mode.
- 2) Adjusts the property bits so that the properties as seen by user programs will be correct.

All those Executives not listed in 10.2 will not be modified for dual mode recognition.

10.2 Software Issue

Standard software is only issued on magnetic tape or small EDS disc packs (2801/2802).

One of these MT or small EDS devices should therefore exist on all systems that have EDS 30.

All 1903T to 1906S systems will automatically include a mag. tape device, also any system running under GEORGE 3 or 4.

However on 1901T to 1903S processors not running under GEORGE 3 or 4, EDS 30 is allowed to be the only backing store on the system, and under these circumstances the following should be carefully noted.

Software will be issued to the customer on magnetic tape, but arrangements must be made by the customer and at the customer's expense for the library data to be copied on to an EDS 30 disc pack at a suitable nearby 1900 installation that is equipped with the necessary type of EDS 30 and magnetic tape units.

10.3 System Resilience

The majority of 1900 systems are now disc based systems with Executive and system software overlaid on discs, therefore system resilience depends upon EDS resilience, and as such the following points should be considered:

- a) Although it is permissible to have only one transport on a system running under E3WS, system resilience under these conditions is considerably reduced. Also each time the disc pack is removed and whenever schedule maintenance is being done on the transport, all system activity will cease.

Also, one of the reasons for introducing a large EDS system was to increase efficiency by reducing the number of pack changes required in given situations.

Therefore when an EDS 30 system is being proposed, a sufficient number of transports should always be specified such that:

- a) the users work load involves the minimum number of pack changes per shift.
- b) schedule maintenance will not unduly disrupt the system.
- c) there is a reasonable measure of resilience.

11.0 Not Applicable.

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- b) schedule maintenance will not unduly disrupt the system.
- c) there is a reasonable measure of resilience.

11.0 Not Applicable

9.0 ORDER VETTING

- 1) A 2812/02 or a F1497 control unit must be ordered with each group of 2814 transports.
- 2) A single transport system, 2814/01, is only permitted if:-
 - a) there is another type of EDS on the system.
 - b) the system is going to be run under E3WS executive.

In all other cases at least two transports must be specified.

10.0 SYSTEMS CONSIDERATIONS

10.1 Data Capacity

All EDS 30 systems are governed by standards that require a Systems Control Area (SCA) to be set up on all packs. The size of this area on EDS 30 is a minimum of 160 blocks and will generally be the first 160 blocks of cylinder 0. (It may be extended to 184 blocks).

Also there is the question of Executive overlays.

For system resilience, space for these should exist on the majority of packs on the system.

Unless otherwise specified when setting up a disc pack 256 blocks will be allocated for the overlays, and these will follow the initial SCA to make a possible total of 440 blocks.

In general, the total capacity available to user is approx. 30.7 million characters.

10.2 Software Issue

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Software will be issued to the customer on magnetic tape, but arrangements must be made by the customer and at the customer's expense for the library data to be copied on to an EDS 30 disc pack at a suitable nearby 1900 installation that is equipped with the necessary type of EDS 30 and magnetic tape units.



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SECTION No 3.5 TITLE 2814 Exchangeable Disc Store

It should be noted, however, that RPS is not effective on disc packs formatted to 1900 standards that contain 1900 files.

Note B: Disc Packs formatted to 2900 Standards cannot be used for data interchange on EDS 30 attached to 1900 Systems.

Note C: The interface cable connections within the DFCl for 2814 EDS 30 differ from those in 1900 and 2903 EDS Controllers. Where 2814 drives are being retained for use on a DFCl or a 2900 DCU new cables will be required, and these must be ordered by Customer Engineering via the Non Preferred Length (NPL) cable ordering Procedure.

TITLE 1900 HARDWARE GUIDE

SECTION No 3.6 TITLE 2815/2816 Exchangeable Disc Store

The restriction of not being able to field fit dual access hardware to 2815 transports may cause problems for prospective customers, especially overseas. Therefore they should be advised to order 2816 transports for a single access environment prior to, and in preparation for, a planned enhancement to dual access. A second control unit and IPB can be ordered as and when required.

See also page 705 2812 Control Units.

12.0 ATTACHMENT TO 2903 AND 2900 SERIES PROCESSORS

EDS 60 transports can be attached to 2903/2900 systems via other controllers. The transports are identical to those used for 1900 attachment with the same type and conversion numbers. The General Description in 5.0 and Physical Characteristics in 6.0 also apply to 2900 attachment with the exception that data format can be variable when used as disc stores for 2900 Series.

12.1 2903

Attachment to 2903 is via the F1556/06 Integrated Coupler within the 2903. No dual access facilities are available on the 2903 so if 2816 units are attached they will be regarded by the Coupler as 2815 units. See 2903 Hardware Guide for further information.

12.2 2900 Series

Attachment to 2900 processors is via a File Peripheral Controller (FPC1) or a Disc File Controller (DFC1). These controllers are able to control other disc stores, therefore it is necessary to specify certain attachment features for the EDS 60. See 2900 Hardware Guides.

Note A. Dual access facilities are not available on 2900 systems, therefore 2816 disc stores will be regarded by the FPC1 and DFC1 as 2815 disc stores.

Note B. The DFC1 uses Rotational Position Sensing (RPS) to optimise on access times. Facilities exist within the DFC1 for RPS on EDS 30/60, but in addition to these for 2815/2816 requirements

F1994/00 RPS for 2814/2815 on 2900
or F1995/00 RPS for 2816 on 2900
must be ordered for each EDS 60 attached to a DFC1.

It should be noted however that RPS is not effective on disc packs formatted to 1900 standards that contain 1900 files.

Note C. Disc Packs formatted to 2900 Standards cannot be used for data interchange on EDs 60 attached to 1900 Systems.