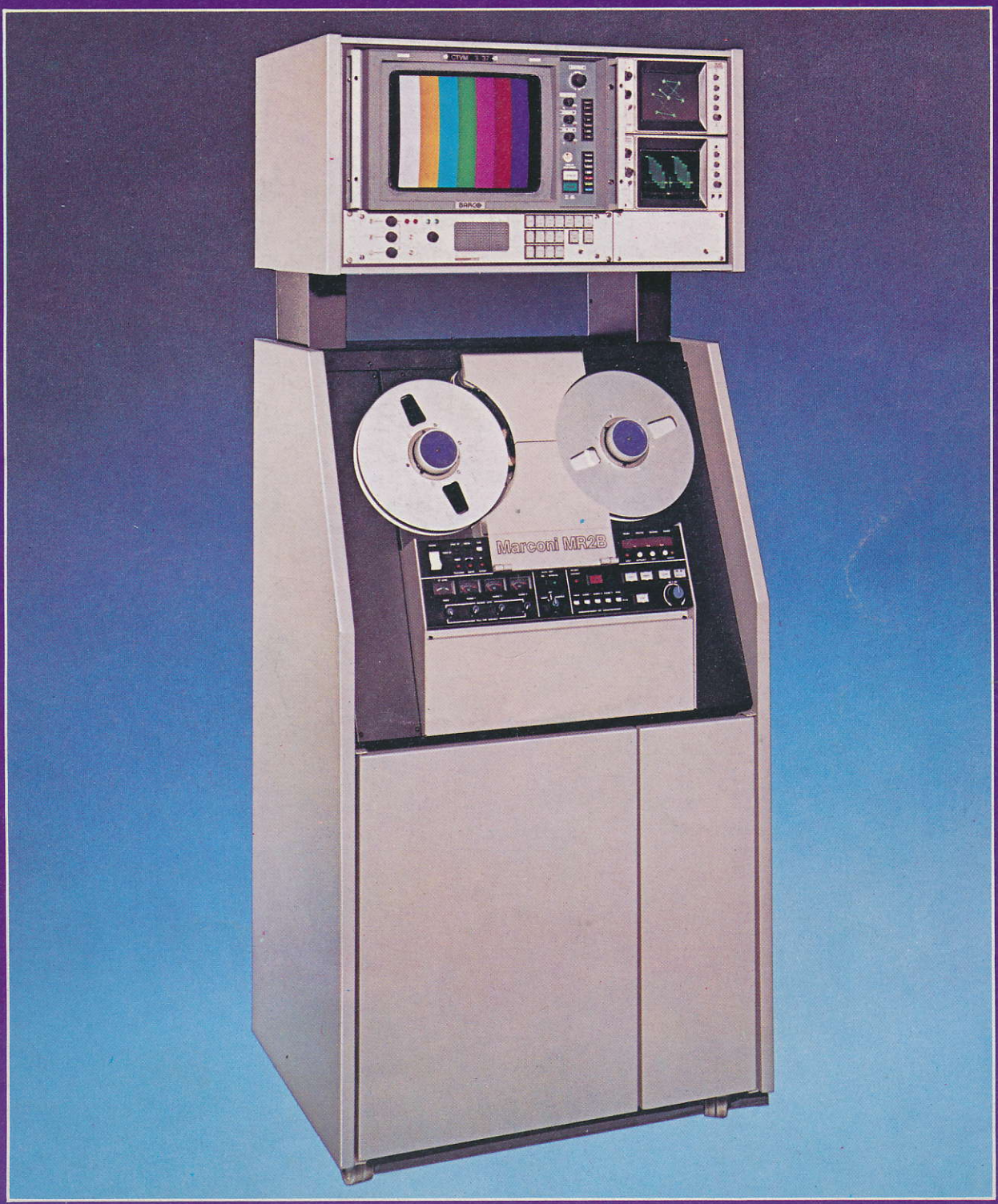
Marconi
Communication Systems

Video Recording Equipment



Features:

Marconi Video Recording Equipment

SMPTE/EBU Type C Format

The most widely accepted 1-inch helical format provides:
- **continuous-field, non-segmented recording**
- **no-compromise interchange**
- **optional sync track**
- **optional 4th audio track (EBU)**

MR2B in Table Top Case.

MR2B Video Tape Recorder

New features

Full electrical control of capstan motor provides:
- controlled tape acceleration
- trouble-free electrical capstan braking
- rapid response to slow motion speed changes

Auto stop in shuttle in both directions prevents tape unwinding

Dependable tape transport:

- proven reliability
- easy adjustment
- ready accessibility
- individually replaceable scanner heads

Accessible electronics:

- plug-in functional modules
- built-in diagnostics
- industry-standard components

Integral frame counter and editor:

- frame-accurate editing in Assemble and Insert modes
- search to cue
- optional time code reader/generator module

Full remote control facilities:

- remote transport and mode control
- remote frame count indication
- tape speed override
- editor interface

Automatic Scan Tracking (AST*) provides:

broadcast-quality playback in:
- variable forward speed (to x1.25)
- reverse slow motion (to x0.25)
- still frame

*Trademark of the Ampex Corporation.

MTBC2B Digital Time Base Corrector

- wide correction window
- automatic window centring
- drop out corrector
- velocity compensator

MR20 Portable Video Tape Recorder

- lightweight
- format-compatible
- automatic back space assemble editing
- 60 minutes recording

VTR Monitoring Unit B4624

- time base corrector and monitoring controls in one compact unit

MR2B Video Tape Recorder

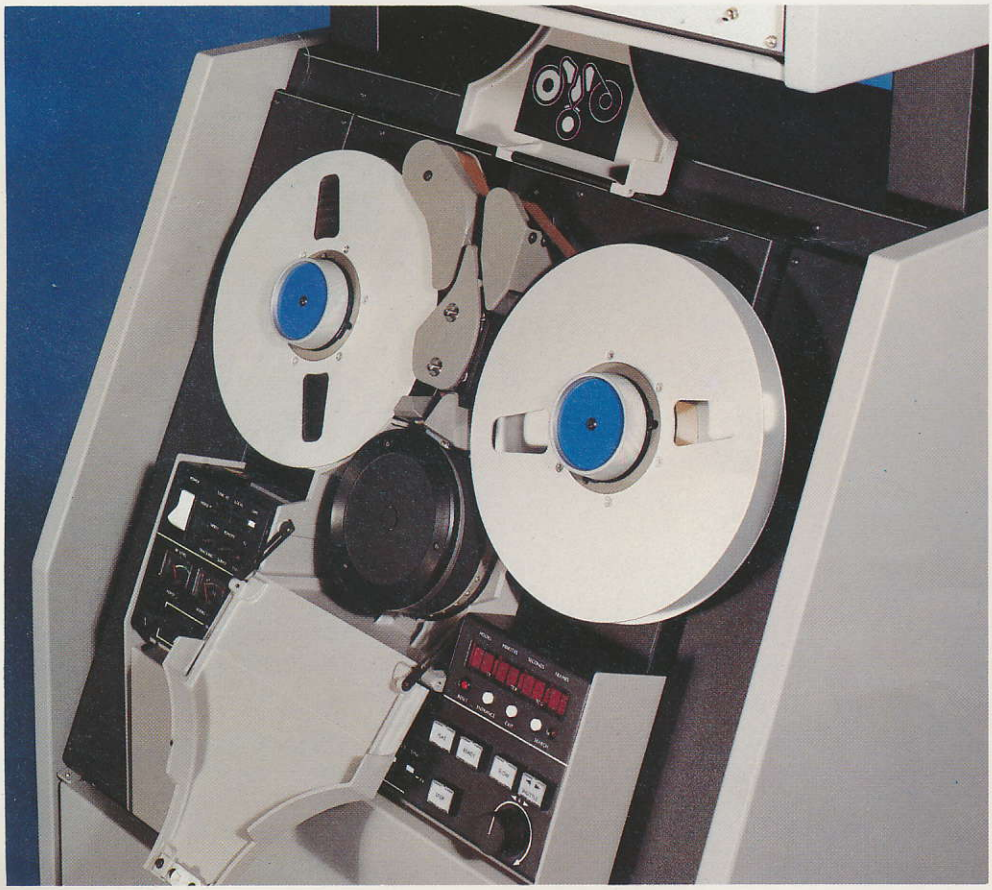
Introduction

The Marconi range of 1 in helical video recording equipment includes the MR2B recorder, designed for the standard SMPTE/EBU/CCIR Type C format, and the MTBC2B Digital Time Base Corrector, both British made and both incorporating further developments of the successful MR2 and MTBC2 equipments. The range also includes the MR20 portable recorder, employing the same format, and the Marconi VTR Monitoring Unit. A variety of optional accessories are available.

The Type C Format

The Type C 1in helical-scan recording format, standardized by the SMPTE and EBU and endorsed by the CCIR, has been adopted widely by broadcasting organizations and production houses. The format permits the design of small and compact video tape recorders, such as the MR2B, of broadcast quality but economical in tape consumption and offering long head life. Being non-segmented – each field being recorded in an unbroken scan – the format enables excellent editing facilities, variable speed replay and still frame modes to be provided at modest cost.

MR2B Studio Console with VTR Monitoring Unit and Monitor Bridge.



MR2B Video Tape Recorder.

Description

Good mechanical design ensuring precision and stability in tape and scanner drum motion is a key factor in achieving the necessary high standard of v.t.r. performance. Here, with further refinements, the MR2B follows the successful constructional principles established in its predecessors the MR1 and MR2.

A substantial and precisely-machined aluminium transport deck casting ensures accurate mechanical alignment and provides a rigid and stable mounting for the transport components. The tape path employs fixed guides and embodies the concept of natural tape flow with minimal differential stress.

Electronic control of tape tension ensures constant tension at the heads at all times. A feature of the MR2B is extended electrical control of the capstan motor, ensuring controlled tape acceleration and preventing undue tape stress or scuffing during start up. It also provides trouble-free electrical capstan braking, eliminating brake-shoe problems, and gives a rapid response to slow motion speed changes in both rewind and forward modes, sensing circuits slow down the reels as the end of the tape approaches and thus prevent damage to the tape. In addition, an end-of-tape auto-stop facility can be selected, effective at all speeds, forward or reverse. In shuttle mode, the very rapid acceleration of the tape to 30 times normal speed ensures that any desired point is quickly reached.

Video Optimization

Three active video heads are fitted, including separate record and replay heads, thus enabling the video record to be checked during recording. This allows the recording conditions to be optimized rapidly and efficiently.

Audio Channels

The MR2B has three high-quality audio channels (four with EBU Option II), with a track-to-track dubbing capability. Audio 3 may be switched to time code operation, increased bandwidth permitting time code recovery at shuttle speeds. Audio input and output circuits are designed for balanced lines.

Control Panel

The control panel on the machine is logically laid out for convenience in operation. It provides facilities for play and record, forward or reverse motion using the slow motion and shuttle control, stop, tape timing and search to cue. Remote control is also available.

An integral back-space editor ensures accurate pre-roll calculation for precise edits. Meter indications are provided for audio and video levels and record optimization.

MR2B controls.

MR2B Video Tape Recorder

Automatic Scan Tracking (AST*)

The optional AST system for the MR2B employs a special video head which moves under control of a micropositioning servo system. This technique allows the head to be deflected during playback to follow automatically any deviation from the recorded track. The AST system enables the following features to be provided:

Variable Speed Playback

With the AST system the MR2B can replay the recorded video at any speed from ¼ of normal speed in reverse, through still frame and to 1¼ times normal speed forward, at high quality.

When the tape speed is varied the track angle changes so that the normal fixed head is unable to follow the recorded track properly, and the result is a 'noise bar' moving through the picture. This defect is eliminated by AST, and when the MTBC2B Time Base Corrector is in use, a signal of full broadcast quality is obtained.

Jogging

The ability of the MR2B to reproduce clear pictures in slow motion and still frame with AST, and recognisable pictures at maximum shuttle speed, greatly facilitates editing operations. Forward or reverse tape movement, manual jogging, using the variable slow-motion and shuttle motion control, allows the operator to examine any number of adjacent fields, one at a time, in selecting the desired editing point.

Video Record Confidence

AST provides full bandwidth colour reproduction off tape during recording for video optimization and record verification.

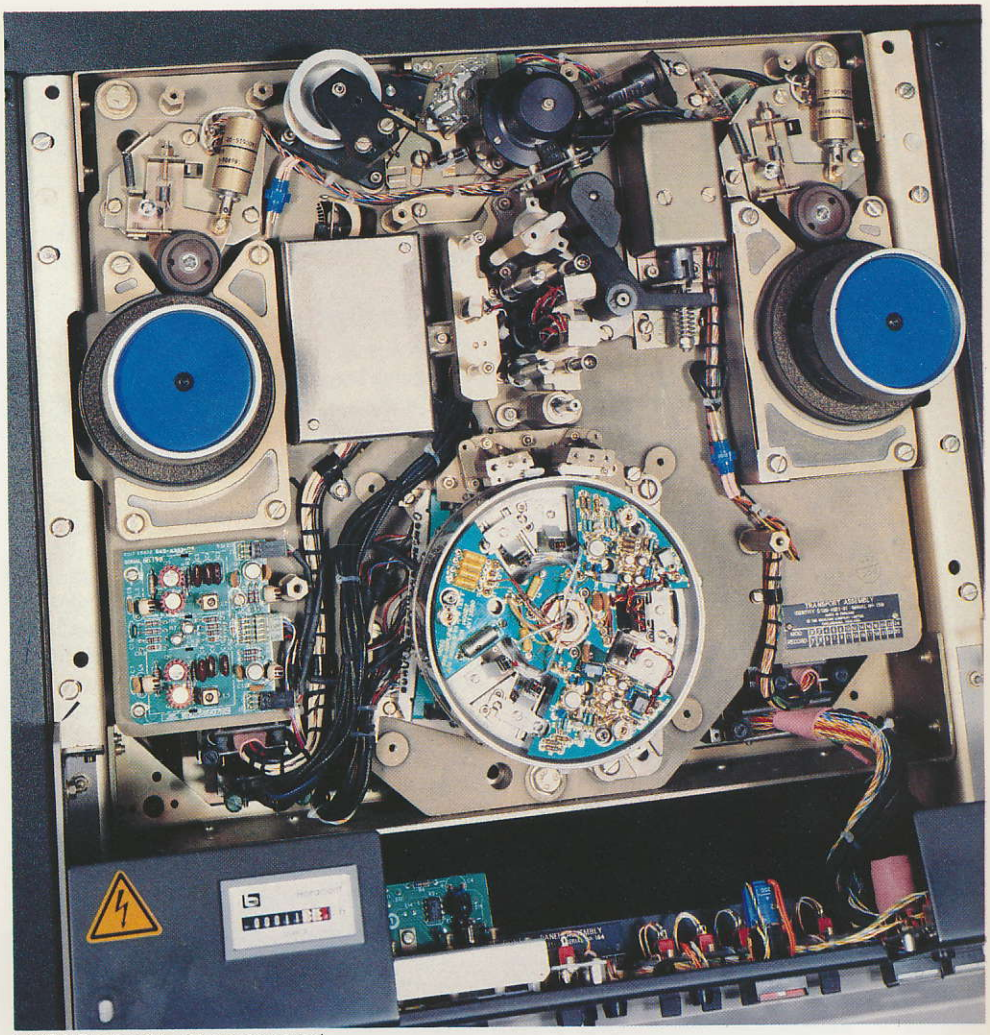
Remote Controls

All transport and editing operational controls can be extended for remote control.

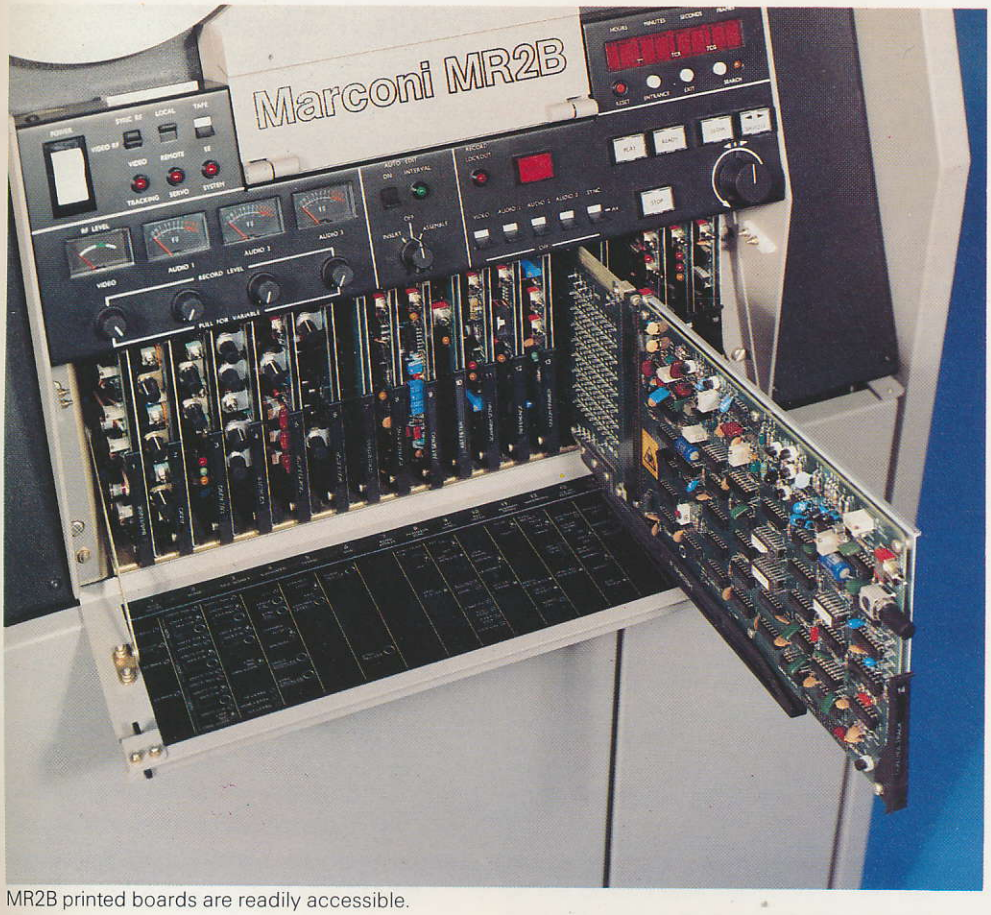
Configurations

The MR2B is available in three configurations, (1) in Table Top case, (2) in a Studio Console with Monitor Bridge (as illustrated) or (3) for rack mounting.

*Trademark of the Ampex Corporation.



MR2B Deck with cover removed.



MR2B printed boards are readily accessible.

Maintenance

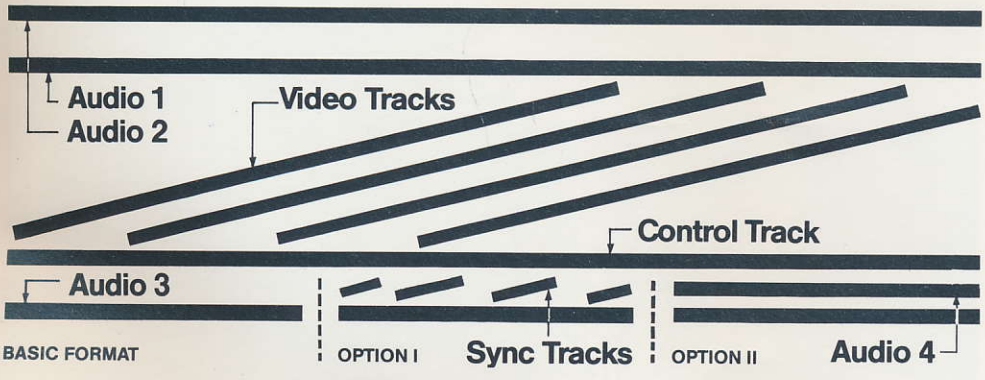
Maintenance of the MR2B is very simple and straightforward. On the deck virtually all the major mechanical assemblies such as the tape guides, scanner etc. can be removed from the front. Access is simply obtained by removing two covers.

The audio heads are precisely fixed on diecast head blocks. The ceramic tape guides are pre-aligned to the heads for tracking accuracy and no adjustment is necessary.

The same basic MR2B is used in all configurations and it can be readily removed from the studio console, rack or cabinet to facilitate maintenance. The main printed boards are accessible from the front and an extender board is provided for maintenance.

The printed boards plug into a printed mother board thus eliminating a complicated cableform.

At the rear by removing a simple panel, access is obtained to the motor drive, amplifiers, power supplies etc. Head life is guaranteed for a minimum of 1,000 hours and each head can be changed in a few seconds. Heads are supplied pre-aligned for tip projection, so that no tip projection adjustment is necessary.



Recording Formats

The MR2B and MR20 are designed for the SMPTE and EBU Type C track formats illustrated.

The SMPTE format for the 525-line NTSC television standard, provides, in addition to the video, for three high quality audio channels and a control channel. Recording of the sync tracks is an optional feature of the format. The basic EBU format, for the 625-line PAL and SECAM television standards is essentially the same. There are two options, one providing sync tracks and the other, as an alternative, a fourth audio channel. Both options can be fitted, the one required being selected by a front panel switch.

Whilst the video channel is able to carry VITS, VIRS and teletext signals transmitted on lines 16 to 22 (and 329 to 335), the sync tracks enable the earlier ten lines (approximately) to be recorded and reproduced where this is necessary.

MR20 Portable Recorder

The MR20 is a lightweight, rugged portable recorder intended for electronic news gathering and electronic field production. It employs the same Type C format as the MR2B, so that recordings may be played back on the MR2B without the need for intermediate dubbing and consequent loss of picture quality. Recordings can be played back directly on the MR20 at broadcast quality via the MTBC2B.

A full hour of recording is available, and the recorder may be operated from internal or external batteries, or from the mains by means of an a.c. adaptor which plugs-in in place of the internal batteries.

The MR20 is designed on the same principles as the MR2B, having a rigid transport and high performance servo control of tape tension combining gentle handling with precise tape control. The MR20 can be operated in any position and also in motion, and is of weather and dust proof construction.

Facilities of the MR20 include simultaneous confidence playback during recording and automatic back-space assemble editing. Two switchable meters provide for monitoring of video amplitude, r.f., battery and audio channels.

Operational control of shuttle, record, playback and stop is by logically placed illuminated pushbuttons. Other features are tape timer display and provision for time code or real time indication.

Additional options include an internal r.f. modulator providing either of two television channels for playback of picture and audio through a domestic receiver. There is also a heterodyne type colour corrector enabling simple full colour playback via video or r.f. outputs.

MR20 Portable Video Tape Recorder.

MTBC2B Digital Time Base Corrector

The role of the time base corrector in the recording system is to establish the very high video signal timing accuracy and stability necessary to meet broadcast standards. The MTBC2B is a digital time base corrector, self-contained, with power supplies and may be mounted either within the studio console, or separately in a standard 19 in rack or cabinet. The MTBC2B offers a wide correction window greater than ten lines on the 525-line standard and greater than 14 lines on the 625-line standard. This enables it to handle severe timing overloads resulting from mechanical shock or imperfect tapes without distortion of the output picture.

The MTBC2B is suitable for use with most non-segmented helical recorders, including those used in electronic news gathering or field production.

Standard facilities included are a line-by-line velocity compensator to improve performance in multigeneration dubbing, and a dropout compensator. This is a superior design in which only the individual dropout is replaced, rather than the whole line, using information from the previous correctly phased line.

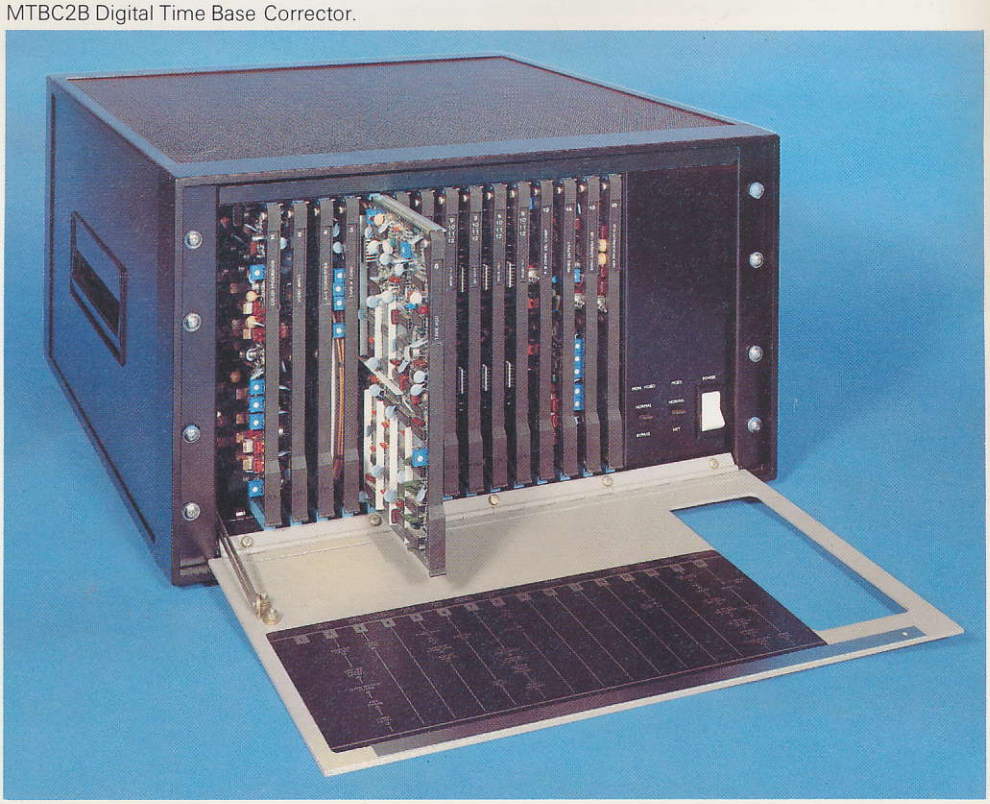
Picture in Shuttle

The MTBC2B enables recognizable black and white pictures to be obtained from the MR2B at all shuttle speeds, and colour pictures in variable-speed playback. Thus in editing or cueing the desired sequence can be quickly identified.

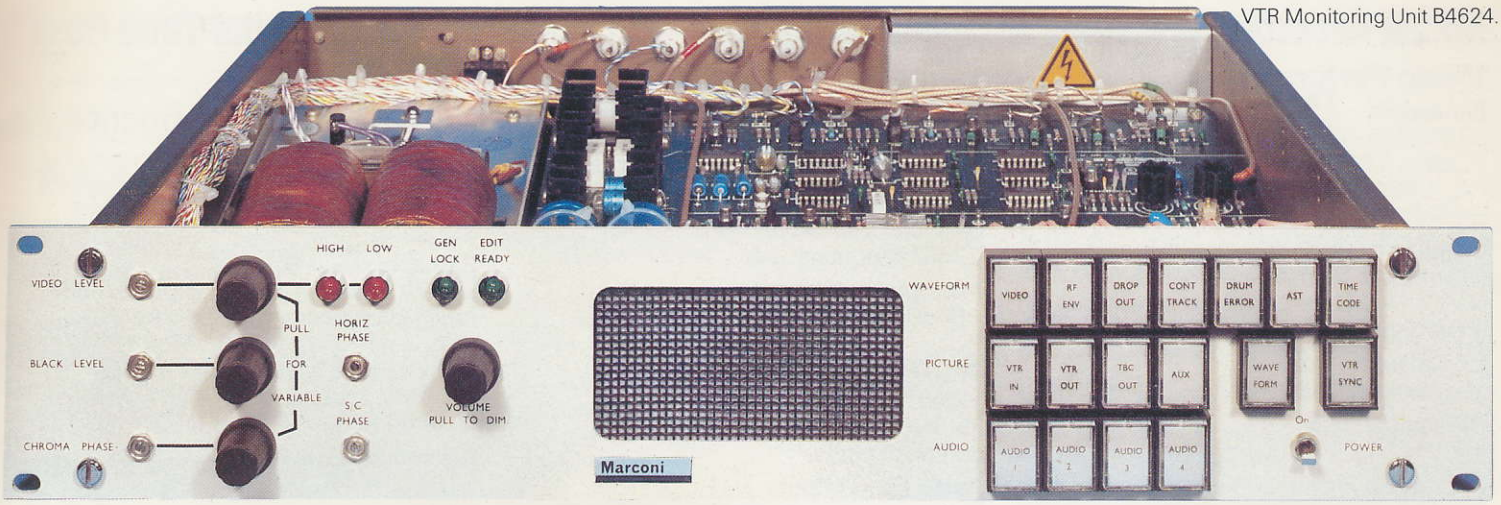
Controls

The MTBC2B is normally fitted with a simple control panel (anticipating the use of the TBC control facilities of the VTR Monitoring Unit). A full control panel can, however, be supplied if required.

MTBC2B Digital Time Base Corrector.



VTR Monitoring Unit B4624



VTR Monitoring Unit B4624.

Features:

Monitoring and TBC controls on one panel.

Waveform monitoring selection.

Picture monitoring selection.

Waveform-on-picture superimposition.

Audio monitoring including EBU 4th audio.

Suitable for NTSC, PAL and SECAM.

Compatible with MR1, MR2, MR2B, VPR1 and VPR2 machines.

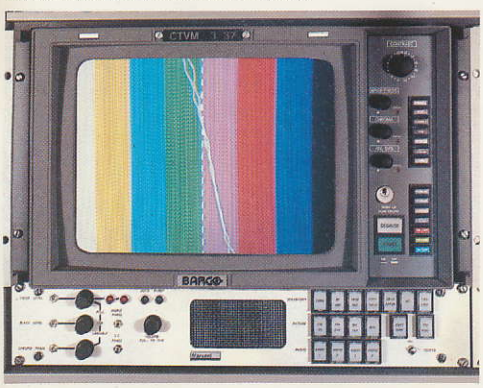
Self-contained 3.5in height 19in rack mounting unit.

A.C. powered 117/234V, 11W (plus 24W for threading lamp in console housing).

Simple interconnections to recorder.

Three A.C. utility power outlets for monitors.

VTR Monitoring Unit with picture monitor showing superimposed waveform display.



Description

The Marconi VTR Monitoring Unit combines Time Base Corrector (TBC) controls and monitoring selection in a single ergonomically designed unit.

A new 'waveform-on-picture' facility shows field rate waveforms superimposed on the picture (see illustration). This not only provides a convenient single view display, but with the picture monitor displaced field facility, gives an accurate assessment of waveform to picture relationship. Some users may consider this feature eliminates the need for a separate waveform monitor.

A choice of either of two sets of inter-connection cables can be supplied for operation with either 'A' or 'C' format machines.

No machine modification is necessary; once plugged in, the unit is ready for use.

Audio Monitoring

Four push button switches enable the selection of the three standard audio channels and the optional EBU 4th audio channel. Stereo or mixed audio can be monitored by operating two or more buttons together.

An internal loudspeaker which can be driven up to 3 watts is fitted centrally in the front panel. It is controlled by a volume control including a pull switch providing a 20dB loudspeaker dim facility. When the knob is pushed in normal listening level is restored.

An external loudspeaker or loudspeaker amplifier may be connected via a break-jack which disconnects the internal loudspeaker.

Picture/Vector Monitoring

A four-way selector switch permits monitoring VTR video input and output and TBC output, the fourth position being available to a bridged auxiliary connection at the rear panel as a user option. A pair of BNC outlets provide video and sync to the picture/vector monitoring arrangement of the user's choice. Sync is normally stripped from the selected video source. A binary-action front panel switch allows the alternative selection of 'VTR Sync' i.e. that being used as a reference in the VTR.

An X-Y display monitor in conjunction with a colour picture monitor having a decoded vector monitor output may be used.

Alternatively, a picture monitor and conventional vectorscope can be utilized.

Waveform Monitoring

A seven-way selector switch selects, Video, RF envelope, Drop out, Control Track, Drum Error, AST and Time Code for display on a conventional TV waveform monitor. A separate output of VTR composite sync is also provided to synchronize the waveform monitor. A timed pulse modulator is included in the monitoring unit and by operation of the 'waveform to picture' switch the selected waveform is displayed as a bright line superimposed on the picture. This offers three benefits, (a) relative timings to the field pattern can be judged by comparison with the picture, (b) greater magnification of the larger picture monitor display gives better accuracy and (c) in more restricted environments, the waveform monitor may be eliminated.

For additional details see Data Sheet TD-B4624.

This document gives only a general description of the product(s) and shall not form part of any contract.
From time to time changes may be made in the product(s) or in the conditions of supply.

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