RDER TECHNICAL DEVELOPMENTS & INVESTIGATIONS

MAINTENANCE GUIDELINES

¼" (6.3 mm) ANALOGUE TAPE MACHINES MECHANICAL PERFORMANCE

BBC

TEST	ACTION	SPECIFICATION	COMMENTS
1: INSPECTION	Clean and inspect tape path.		As you work round you will notice the condition of the fixed and moving parts in the tape path. Look out for: worn parts, especially guides; noisy rollers or sticking idlers; loose parts or excessive free play; foreign bodies or signs of spillage. Rectify any faults at this stage before proceeding. Noisy parts on the feed side of the tape path will affect performance.
2: HEAD WEAR	Check width of wear marks.	Studer m/cs: < 1/4" (6.3mm) wide wear patch.	All tape heads eventually show signs of wear; the width of the worn patch on the pole pieces indicates the amount of "life left". Replace the head assembly if the wear limit will be reached before next visit. Telefunken heads should last longer than Studer.
3: SPOOLING TENSIONS AND COUNTER	Using spare tape, lace up 2400 ft. reel, zero counter, mark tape and spool fast. Stop from full speed several times until just before the end. Rewind to the mark.	38 cm/s: ≤ ±5 secs counter error 19 cm/s: ≤ ±10 secs counter error	Listen to the bearings and motors, and check the tape tension during spooling. Look at the tape on the take up spool for signs of bad winding. Check the counter accuracy by the reading shown when the mark is back to its start point. NB: Do not use test tapes to perform this test. Correct tensions should give a smooth wind on the take-up spool. Fast spooling will risk stretching test tapes.
4: STARTING PERFORMANCE AND PLAY TENSIONS	Check tape handling during play start. Check tape tensions in play. Listen to output during starts.		Check with take up spool empty, half full, and full. Look for loops or signs of sluggishness. Listen for jumpy or sluggish starting or wow. Follow manufacturer's specific instructions where given.
5: TAPE STABILITY	Watch tape in front of heads.	Movement seen with the naked eye would constitute a fault.	Any signs of movement up or down on starting or during play will cause azimuth errors. A spare reel of tape is not guaranteed accurate for width - if in doubt, use Standard Bias Tape.
6: OPERATIONAL CONTROLS	Check for function and quiet operation.		Check faders etc. by recording station tone on the reel of spare tape.
7: MECHANICAL BRAKES	Check for editing ease and tape handling on power loss.		Move the tape by hand as if finding an edit; ensure the brakes do not bind or snag. Brakes should be quiet in operation. Noisy brakes make edit points harder to hear. Turn off the power to the machine during full speed spool and make sure no tape spill or stretch occurs.
8: DEMAGNETISE	Switch off tape machine & use an approved demagger to demagnetise heads and tape path.		Often it is easier to remove the head block. Take care not to affect any tape tension tape fitted. Switch demagger on and off well clear of all tapes and machines. It is not always necessary to demag. on every visit.
9: SPEED ACCURACY	Play Speed Check Tape; check speed and drift.	Absolute: 38cm/s : 3150Hz, ±6.3Hz 19cm/s : 1575Hz, ±3.1Hz Drift: 38cm/s : ≤ 3.1Hz 19cm/s : ≤ 1.5Hz	Play the tape with empty and full take up reel. Measure with frequency meter. Drift is the difference between full and empty feed spool performance (if any).
10: FLUTTER	Record 3150 Hz on the Standard Bias Tape. Check Flutter in replay mode.	38cm/s : ≤= ±0.10% (Peak Weighted) 19cm/s : ≤= ±0.15% (Peak Weighted)	If the overall (record - replay) performance is not within specification, use a pre-recorded Wow & Flutter Test Tape (if available). Measurement is taken by the peak needle excursions. (Weighted to IEC 386).
11: PHASE JITTER OR STABILITY	Record 10/12.5 kHz on the Standard Bias Tape. Measure the phase jitter	M15/A80/A810/A807 : ≤ ±10 deg Other machines : ≤ ±22 deg	It is preferable to measure the phase jitter directly using a Lindos or other appropriate test equipment. If not possible, check the M/S separation; the variation between min & max M/S separation indicates the phase jitter.

Enquiries to: Tel. LBH 5713. Post to Room 409 Yalding House. Technical Developments and Investigations, Resource Development and Engineering Radio.

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RDER TECHNICAL DEVELOPMENTS & INVESTIGATIONS

MAINTENANCE GUIDELINES

¼" (6.3 mm) ANALOGUE TAPE MACHINES REPLAY PERFORMANCE

BBC

TEST	ACTION	SPECIFICATION	COMMENTS
1: LEVEL	Set any front panel controls to normal positions. Monitor post-fader output.	Channel difference: ≤ 1 dB	At this stage priority is to get both legs equal as this makes the following tests easier. Take care not to double terminate m/c output. Do not adjust levels unless channel difference exceeds spec.
2: PHASE	Check outputs are in-phase with each other.	Channels must be in-phase at 1 kHz (500Hz at 19 cm/s)	At this stage just check for phase reversals (possibly due to wiring).
3: AZIMUTH(MEAN PHASE	Adjust at 19 cm/s (for best accuracy) & then check at 38 cm/s. Maximise HF output; reduce mean phase difference to minimum.	At 19 and 38 cm/s: < ±10 deg	Measure MEAN phase difference only: ignore phase jitter. Oscilloscope or Lindos method will show the mean phase directly. M/S method will display jitter (& dropout effects) as well. Substantial differences between speeds suggests there is a tape transport fault, e.g. scrape roller problem; refer to manufacturer's manual.
4: FREQUENCY RESPONSE	Check frequency response lies within limits; adjust if not.	63 Hz - 12.5 kHz: ±1.0dB 40 Hz - 16 kHz : +1.0, -2.5 dB Channel difference: ≤ 1dB (80 Hz - 16 kHz, both speeds)	The response (measured with respect to 1kHz) should lie within the limits at both speeds. If error large, re-check azimuth. Matching of A & B leg responses is more important than a flat response for individual legs.
5: LEVEL	Set both legs equal, at the correct level.	Each channel: ≤ ±0.5 dB Channel difference: ≤ 0.5 dB	Levels are with respect to the output level recommended for that machine (normally -4dBu per leg from 250nWb/m). Check that all front panel controls are restored before this test. Check that prefade level matches main output level.
6: NOISE	Measure noise on output in play mode, with no tape loaded.	38 cm/s: better than -54 dB4 19 cm/s: better than -52 dB4	Measure to IEC 468-3. Figure given in spec. is unweighted figure; weighted figure should not be more than 6dB better than the measured unweighted figure. Raise hum shield if fitted.

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RDER TECHNICAL DEVELOPMENTS & INVESTIGATIONS

MAINTENANCE GUIDELINES

¼" (6.3 mm) ANALOGUE TAPE MACHINES RECORD PERFORMANCE

BBC

TEST	Level/Freq	ACTION	SPECIFICATION	COMMENTS
1: LEVEL	0 dBu, 1 kHz	Set any front panel controls to their normal positions; monitor post-fader output.	Each channel: ±1 dB Difference: ≤ 1 dB	At this stage priority is to get both legs equal as this makes the following tests easier.
2: PHASE	0 dBu, 1 Khz	Check outputs are in-phase with each other.		At this stage just check for phase reversals (possibly due to wiring).
3: COARSE AZIMUTH	-10 dBu, 10 kHz (or lower)	Maximise HF output on one leg only.		Large level differences between stereo legs suggest bias errors so maximise HF output for one leg only.
4: BIAS	-10 dBu, 10 kHz	Reduce bias to minimum, then increase to find a peak in output level. Continue increasing bias until output falls by correct amount.	38 cm/s 19cm/s Studer A80/A810/B62: 3 dB 6 dB Studer A807: 4 dB 8 dB Telefunken M15A: 2 dB 4 dB	For best accuracy do not try to interpret between PPM scale marks. Tolerance on setting up should be ≤ ±0.5dB. Misaligned bias can affect the azimuth reading. Remember that Studer A807 has Dolby HX-PRO.
5: LEVEL	0 dBu, 1 kHz	Check (& reset) recording level.	Difference: ≤ 1 dB	Bias adjustment may have affected level; re-adjusting here makes following test easier.
6: FINE AZIMUTH (MEAN PHASE)	-10 dBu, 10 / 12.5 kHz	Maximise HF output; reduce mean phase difference to minimum.	At 19 & 38 cm/sec < ± 10 deg	See comments for Replay Azimuth (Mean Phase). Apparent azimuth is affected by bias setting. If large adjustment is necessary, check equalisation.
7: FREQUENCY RESPONSE	-10 dBu, 40 Hz - 16 kHz	Check frequency response lies within limits; adjust if not.	63 Hz - 12.5 kHz: ±1 dB 40 Hz - 16 kHz : +1, -2.5 dB Channel difference: ≤ 1dB (80 Hz - 16 kHz, both speeds)	Duplicate the shape of the measured replay response - the objective is to produce flat recordings on tape. Matching of A and B leg responses is more important than achieving a very flat response.
8: LEVEL	0 dBu, 1 kHz	Check recording level - reset if necessary.	Each channel: ≤ ±0.5 dB Channel difference: ≤ 0.5 dB	Check that all front panel controls are restored before this test.
9: DISTORTION	+8 dBu, 100 Hz / 1 kHz	Measure distortion on output.	≤ 3% (i.e. better than -30 dB)	If distortion high, suspect mis-aligned bias. Worn heads can also cause distortion.
10: NOISE	Term I/P in 600Ω	Measure noise on output in record mode with Std. Bias Tape.	38 cm/s: better than -52 dB4 19 cm/s: better than -50 dB4	Raise replay hum shield if fitted. Terminate input in 600 ohm. If necessary, demagnetise heads again & re-check bias. Measure to IEC 468-3. Figure given in spec. is unweighted figure; weighted figure should not be more than 6dB better than the measured unweighted figure.
11: CROSSTALK	+8 dBu, 1 kHz 0 dBu, 10kHz (each channel in turn)	Measure output of the unmodulated track. (Repeat for the other track.)	Less than the measured unweighted noise figure, or adjust for minimum if 3rd octave filter available.	Raise replay hum shield if fitted. Full test requires 3rd octave filter.
12: ERASURE	+8 dBu, 1 kHz	Record tone, erase, & then measure the output.	Less than the measured unweighted noise figure.	See comments above for Crosstalk.
13: SUBJECTIVE TEST	Suitable programme	Record some suitable programme and listen to output on quality loudspeakers.	Listen for transient effects and overall quality. There should be no undue differences when comparing input & output.	

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MAINTENANCE GUIDELINES

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CASSETTE MACHINES MECHANICAL PERFORMANCE

TEST	ACTION	SPECIFICATION	COMMENTS
1. INSPECTION OF TAPE PATH	Check cleanliness of heads guides, capstan shafts and pinch roller.		Only make mechanical adjustments if absolutely necessary, if machine fails to meet spec. Look out for worn, noisy or loose parts. Heads, guides capstan & pinch wheel must be clean. Noisy parts on machine or cassette will affect performance.
2. CASSETTE LOADING	Check cassette loads & runs properly.		The cassette should locate firmly in the transport. If it doesn't & the cassette itself is O.K. follow the manufacturer's tape transport checks & adjustments.
3. HEAD & GUIDE ALIGNMENT	To check this use an alignment cassette e.g. the Philips 814 service mirror cassette or the Studer head alignment tool.		This should be done with reference to the service manual. The alignment of the erase head guide as well as rec/rep head should be carefully checked. The Studer alignment tool can also be used on the ASC AS2000.
4. CASSETTE TRANSPORT OPERATION	Check each function. Check cassette sensor switches work.		Most makes of machine should have at least one sensor to enable the record function. Some machines have additional sensors for auto EQ selection e.g. Studer A710 Revox B710. Transport mechanism & cassette should operate smoothly. Where fitted set m/c for auto EQ selection.
5. HEAD DEMAGNETISE	This is not usually necessary. If it is use a small demagger with care.		Make sure machine is off & only switch demagger on & off when well clear of the machine. If using a head demagnetiser cassette such as the TDK one, carefully follow the instructions.
6. SPEED ACCURACY	Play prerecorded reference wow & flutter test cassette. Check speed & drift.	Absolute: < or = ±0.5% (±15Hz) Drift: <0.5% (15Hz)	Drift is difference in speed from beginning to end of cassette. Quoted accuracy of BASF 3150Hz W&F tape is ±0.2% (±6.3Hz)
7. WOW & FLUTTER	Use above test cassette.	<0.15% overall record-play < or = 0.1% using BASF W&F ref. tape	Measure to DIN 45507/IEC 386
8. PHASE JITTER	Record 10kHz on a known good cassette tape. Measure the phase jitter on replay.	±40 deg at 10 kHz record-play. ±30 deg at 6.3kHz from BASF ref tape	Phase jitter is very dependent on individual cassettes, so use a known good one. Measure phase jitter direct using a Lindos or similar test equipment. Measure on replay (ie. rewind after recording & then replay).

ENQUIRIES TO LBH 5713

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RDER TECHNICAL DEVELOPMENTS & INVESTIGATIONS

MAINTENANCE GUIDELINES

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CASSETTE MACHINES REPLAY PERFORMANCE

TEST	ACTION	SPECIFICATION	COMMENTS
1. DOLBY CALIBRATION & LINE OUTPUT LEVEL	Check correct calibration voltage at relevant test point on Dolby encoder. Then set Line O/P level. Where applicable set input/output level controls to CALIBRATE, & Balance controls midway, & Dolby OFF.	Set Dolby calibration level at relevant test point to within 10mV of specified level (730mV rms for A710/B710, 755mV on AS2000.	Refer to manufacturer's information. Dolby level on a cassette is at 200 nWb/m, which is 2dB below peak level. Use peak level 315Hz tone & monitor source (A710) or play 315Hz 250nWb/m LU section of reference tape (AS2000).
2. REPLAY LEVEL	Set peak output level to within ±0.5dB of correct setting. Set any Input/Output level controls to CALIBRATE, & Balance controls midway.	Channel difference < or = 1dB @ 315Hz. Set level to within ±0.5dB of correct setting.	Use 315Hz 250nWb/m L.U. section of reference tape. Note that some machines may not give output levels as high as + 8dBu.
3. METER CALIBRATION	Check the machine's meters read correctly using the 250 nWb/m peak level Line Up tone.		250 n Wb/m L.U. tone should read +2 on A710 & ASC AS2000 machines. Check meter reads correctly for Dolby level & peak level.
4. REPLAY AZIMUTH (MEAN PHASE)	Check using an azimuth reference tape. Reduce mean phase difference to minimum.	±20° mean phase error or 15dB M & S separation at 6.3kHz. Ignore phase jitter.	Do not use the azimuth band on the frequency calibration tape as this is not a true absolute azimuth. Use BASF 6.3kHz Azimuth Test Cassette. Ensure equal levels on both channels if measuring M and S separation.
5. FREQUENCY RESPONSE	Select correct EQ and check response with frequency calibration tape. Adjust H.F. controls if fitted, so response is within limits.	100Hz - 8kHz: ±2dB 40 - 100Hz : +2, -3dB 8 - 16kHz :+ 2, -3dB (All relative to level at 315Hz)	A few cassette m/cs have replay h.f. adjustment e.g. AS2000. Ensure matching of A & B channel responses. Ensure Dolby off. Response should be within limits shown using the BASF frequency calibration tape. Channel matching should be within 1dB from 100Hz - 8kHz. Incorrect HF response may also be caused by head wear.

RDGR TECHNICAL DEVELOPMENTS & INVESTIGATIONS

MAINTENANCE GUIDELINES

BBC

CASSETTE MACHINES — RECORD PERFORMANCE

TEST	LEVEL & FREQ.	ACTION	SPECIFICATIONS	COMMENTS
1. LEVEL INPUT GAIN.	+ 8dBu or at level of peak i/p signal. 315Hz	Monitor source & adjust m/c i/p gain for same o/p level.	Channel Difference < or = 1dB @ 315Hz	Adjusting the levels at this stage makes following tests easier.
2. BIAS.	Approx-20dB ref 250nWb/m 10kHz.	Set bias for Fe (IECI) & Cr (IECII) tapes	Overbias (dB): TDK AR TDK SA Studer A710 Sony heads: 4 3 Cannon Siamese heads: 6 6 ASC AS 2000 (Cannon Siamese heads): set bias for level response at 10kHz	Set bias to ±0.5dB accuracy at 10kHz. Set carefully as bias affects phase. Note: there are no separate record EQ presets on the AS2000
3. RECORD LEVEL	OdBu 315Hz	Set record gain for correct record level for each tape type, IEC I & II	Channel Difference < or = 1dB Set level to within ±0.5dB	Monitor tape & set record level for unity gain, input to output.
4. AZIMUTH RECORD/ REPLAY (MEAN PHASE)	-10dBu(approx) 10kHz.	Check phase shift. Adjust record head if m/c has separate non-siamese heads	±40° at 10kHz mean phase or 8dB M & S separation. Ignore phase jitter.	Since azimuth is so dependent on cassette shell use metal bodied cassette or a known good cassette. N.B. A710 & AS2000 machines have Cannon Siamese heads. Mean phase measurement.
5. FREQUENCY RESPONSE	Approx -20dB w.r.t. 250nWb/m	Adjust record EQ presets (if fitted). Dolby off.	100Hz - 8kHz : ±2dB 40 - 100Hz) 8 - 16kHz) : +2,-3dB All relative to level at 315Hz	Record/replay response should match the replay response. Response with Dolby B or C should not deviate from non Dolby response curve by more than ±2dB.
6. DISTORTION	+ 8dBu peak level at 100 Hz & 1kHz.	Measure distortion on output.	< 3% or - 30dB separation from peak level	THD + noise. If high recheck bias.
7. NOISE		Measure record/replay noise off tape.	Nr off Dolby B Dolby C IEC I <-30dB4W <-40dB4W <-50dB4W IEC II <-32dB4W <-42dB4W <-52dB4W	Measure noise to IEC 468 - 3.
8. CROSSTALK	OdBu at 100Hz, 1kHz, 10kHz		100 Hz 1kHz 10kHz <-40dB <-40dB <-30dB	Use 1/3 octave filter or instrument using bandpass filter. eg. Lindos.
9. DOLBY B & DOLBY C		Check response distortion noise & crosstalk		The peak weighted noise should be approx 10dB better with Dolby B, and 20dB better with Dolby C.
10. SUBJECTIVE TEST		Record & reproduce programme		

ENQUIRIES TO LBH 5713

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MAINTENANCE GUIDELINES

BBC

CARTRIDGE MACHINES MECHANICAL PERFORMANCE

TEST	ACTION	SPECIFICATIONS	COMMENTS
1. INSPECTION	Clean and inspect tape path, heads, guides, capstan and pinch wheel.		Any adjustments should be done with reference to manufacturers' manual.
2. HEAD WEAR	Check width of wear marks. Look for signs of uneven or excessive wear.		Compare heads with known good one if possible.
3. HEAD ALIGNMENT	Check that head penetration is within NAB limits marked on Test Cartridge body.		Use correct gauges & follow manufacturers' instructions
4. HEAD DEMAGNETISE	Not necessary at each inspection (do each routine)		Make sure m/c is off and switch demagger on and off well clear of machine.
5. PINCH WHEEL AND SOLENOID OPERATION	Check speed and smoothness of pinch wheel engagement and clamping when it disengages.		Excessively noisy operation means that adjustment is required. Follow manufacturers' instructions. Use correct gauges for adjusting alignment & setting pinch wheel pressure.
6. CARTRIDGE SEATING	Check loading and unloading of cartridges. Check appropriate indicator lamps come on and that capstan runs when cartridge loaded.	Right hand guide must be set for accurate square alignment of cartridge with reference to heads.	Check cartridge guide alignment as per manufacturers' instructions. Cartridges should fit firmly in the aperture and sit squarely on the end stops of the machine.
7. OPERATIONAL CONTROLS	Check all operational functions		
8. SPEED ACCURACY	Play a 3150 Hz Speed Check or Wow/ Flutter test cartridge.	3150 Hz ± 6.3 Hz (± 0.2%) @ 19 cms/sec.	
9. WOW & FLUTTER	Play Wow & Flutter test cartridge.	<0.15% Peak Wtd	Measure to IEC 386
10. START-UP TIME	Check for minimum start-up Wow.		This can be checked with the 3150 Hz tape. Start up wow should be negligible.
11. PHASE JITTER	Record 10 kHz on the Standard Bias Tape.	<±40°	Phase jitter can be measured using a Lindos. Measure the PEAK phase jitter.
12. SPLICE DETECTION	If fitted, adjust in accordance with manufacturer's service manual.		It is important that the mechanics have been correctly adjusted first. Check reliability with several typical cartridges.

Enquiries to: LBH 5713 Issued : May 1993

MW/AHM/Feb 93 - DTP(GLCARMEC.PM4)CJC

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MAINTENANCE GUIDELINES

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CARTRIDGE MACHINES REPLAY PERFORMANCE

TEST	ACTION	SPECIFICATIONS	COMMENTS
1. LEVEL	Set line-up level	Get absolute level to ±0.5dB accuracy	Use 161 nWb/m Line-up Test Cart. Measure into a high impedance input. (Setting level now makes following tests easier.)
2. AZIMUTH	Check for maximum HF output and adjust replay head for minimum phase difference.	<± 40° or >9dB maximum M & S seperation	Use 10kHz Azimuth test cart. (Do not use the frequency calibration tape for this test). Spec. value is mean phase difference, ignoring phase jitter. A & B levels must be matched for M & S reading.
3. FREQUENCY RESPONSE	Check frequency response lies within limits. Adjust if necessary.	100 Hz to 10 kHz: ± 1dB 63 Hz to 16 kHz : +1, -3dB	Use frequency calibration test cart. Cartridge m/cs use NAB EQ (50µs) standard. Response should be within limits shown. Incorrect HF response may also be caused by head wear.
4. NOISE	Measure noise on output in Replay mode without tape but with capstan running and pinch wheel engaged.	Better than -47dB4	Weighted figure should not be more than 6dB better than the measured unweighted figure. If it is, suspect hum.
5. METERS	Where meters are fitted to a machine (usually VU), check they read correctly for OdBu line-up.		VU meters normally read - 4 VU for OdBm at Line Out.
6. CUE DETECTION	Check machine responds correctly to primary 1 kHz cue tone. Also secondary (150 Hz) and tertiary (8 kHz) tones if applicable.	NAB Primary Cue 1kHz, 0dBu ±1dB NAB Secondary Cue 150Hz, + 6dBu ±1dB NAB Tertiary Cue 8kHz, -10dBu ±1dB For Primary Cue the operating threshold sensitivity is set so the detector just functions in the presence of 1kHz tone at -7dBu and of 10 sec duration. For Secondary Cue the operating threshold sensitivity is set so the detector just functions in the presence of 150Hz tone at -1dBu and of 10 sec duration. For Tertiary Cue the operating threshold sensitivity is set so the detector just functions in the presence of 8kHz tone at -17dBu and of 10 sec duration.	Use Cue Track Line-up Cart. & also a programme tape if possible. (See Record procedures for Cue line-up)

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MW/AHM/Feb 93 - DTP(GLCARREP.PM4)CJC

RDER TECHNICAL DEVELOPMENTS & INVESTIGATIONS

MAINTENANCE GUIDELINES

BBC

CARTRIDGE MACHINES RECORD PERFORMANCE

TEST	LEVEL & FREQUENCY	ACTION	SPECIFICATIONS	COMMENTS
1. LEVEL	0dBu 1kHz	Set record level input gain	Difference < or = 1dB	Adjust for equal level both channels.
2. BIAS	-10dBu 10kHz	Set bias for specified amount of overbias for machine under test.	ITC 99 3dB overbias at 10kHz ITC Delta 3dB overbias at 10kHz Sonifex Micro HS 3dB overbias at 10kHz	Use a Std. Bias/Record cart for all these tests. Bulk erase as required.
3. AZIMUTH	-10dBu (approx) 1k -10kHz	Maximise HF output & minimise phase difference.	<±40° or >9dB M & S Separation at 10 kHz	Mean phase difference - ignore phase jitter.
4. LEVEL	0dBu 1kHz	Check and adjust recording level.	Absolute level ± 0.5dB	Bias may have altered it.
5. FREQUENCY RESPONSE	-10dBu 40-16kHz	Check frequency response lies within limits and adjust EQ as necessary	100Hz to 10kHz: ± 1dB 63Hz to 16kHz : +1, -3dB	Duplicate the replay response and match each channel. Response should be within the limits. Note this is the record response tolerance.
6. DISTORTION	+8dBu 100Hz, 1kHz	Measure distortion on line output using Std. Bias Cart.	≤ - 30dB	This figure is for THD + noise. If high, bias is likely cause.
7. NOISE		Measure noise on output in record mode, with a Std. Bias Cart.	< - 40dB4	Terminate line inputs with 600R. Ensure Bias Cart. is bulk erased properly. Weighted figure should not be more than 6dB worse than this.
8. CROSSTALK (PROG TRACKS)	0dBu 100Hz, 1kHz, 10kHz	Measure Crosstalk between A & B channels.	< - 40dB @ 1kHz < - 30dB @ 10kHz & 100Hz	Use a bandpass or 3rd octave filter or a Lindos.
9. CUE BIAS	8kHz Tertiary cue tone	Swap the left programme playback head cable (Top Track) with the cue playback head cable (Bottom Track). Adjust cue bias trimmer for maximum o/p level.	Set cue bias for maximum o/p of 8 kHz tertiary tone.	Monitor the A leg replay o/p with high impedance meter.
10. CUE LEVEL (PRIMARY)	1kHz Primary cue tone	Adjust cue level control to give same output level as from the 161nWb/m L.U. cart.	1kHz 0dBu +1dB, -2dB	
11. CUE LEVEL (SECONDARY)	150Hz Secondary Cue tone	Check level relative to the primary cue tone level.	150Hz +6dBu +1dB, -2dB	
12. CUE LEVEL (TERTIARY)	8kHz Tertiary Cue Tone	Check level relative to that of primary cue.	8kHz -10dBu +1dB, -2dB	
13. CUE CROSSTALK		Restore head connections to normal. Measure Crosstalk of cue tones from cue track to A & B programme tracks.	< - 50dB for 1 kHz Primary Cue	Crosstalk from cue tracks will measure worse on right channel as the cue track is next to it.
14. ERASURE	1kHz + 8dBu	If fitted use the machine's erase facility to erase the cartridge.	< - 50dB	Measure using a 1kHz bandpass filter.

Enquiries to: LBH 5713

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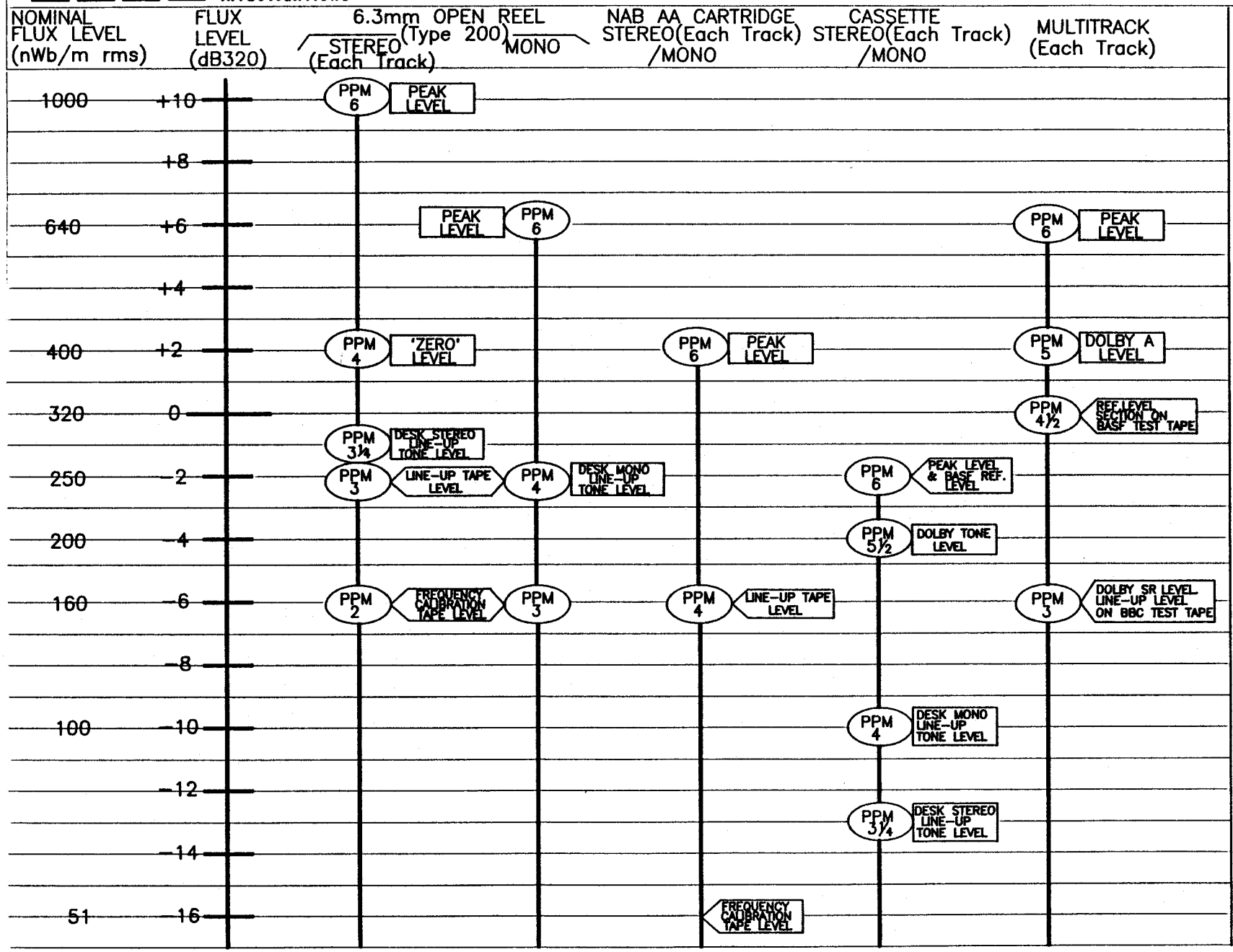
MW/AHM/Feb 93 - DTP(GLCARREC.PM4)CJC

RDER TECHNICAL DEVELOPMENTS & INVESTIGATIONS

MAINTENANCE GUIDELINES
ANALOGUE RECORDING LEVELS

BBC



NOTES:−

1) RECORDED FLUX LEVELS ARE NORMALLY QUOTED WITH RESPECT TO THE INTERNATIONAL REFERENCE LEVEL OF 320nWb/m. THE ABBREVIATION dB320 CAN BE USED, e.g. −6dB320 IS A FLUX LEVEL 6dB BELOW 320nWb/m.

2) RECORDED FLUX LEVELS ARE ALSO SOMETIMES GIVEN A NOMINAL VALUE, e.g. −2dB320 IS NOMINALLY 250nWb/m (ACTUALLY 254nWb/m).

3) SYMBOLS USED:−

REFERENCE FLUX LEVEL (ABSOLUTE)

OPERATIONAL FLUX LEVEL (DEPENDENT ON MACHINE LINE-UP

PPM READING RELATED TO FLUX LEVEL (DEPENDENT ON MACHINE LINE-UP)

ENQUIRIES TO : LBH5713 (DDI 071−927 5713)

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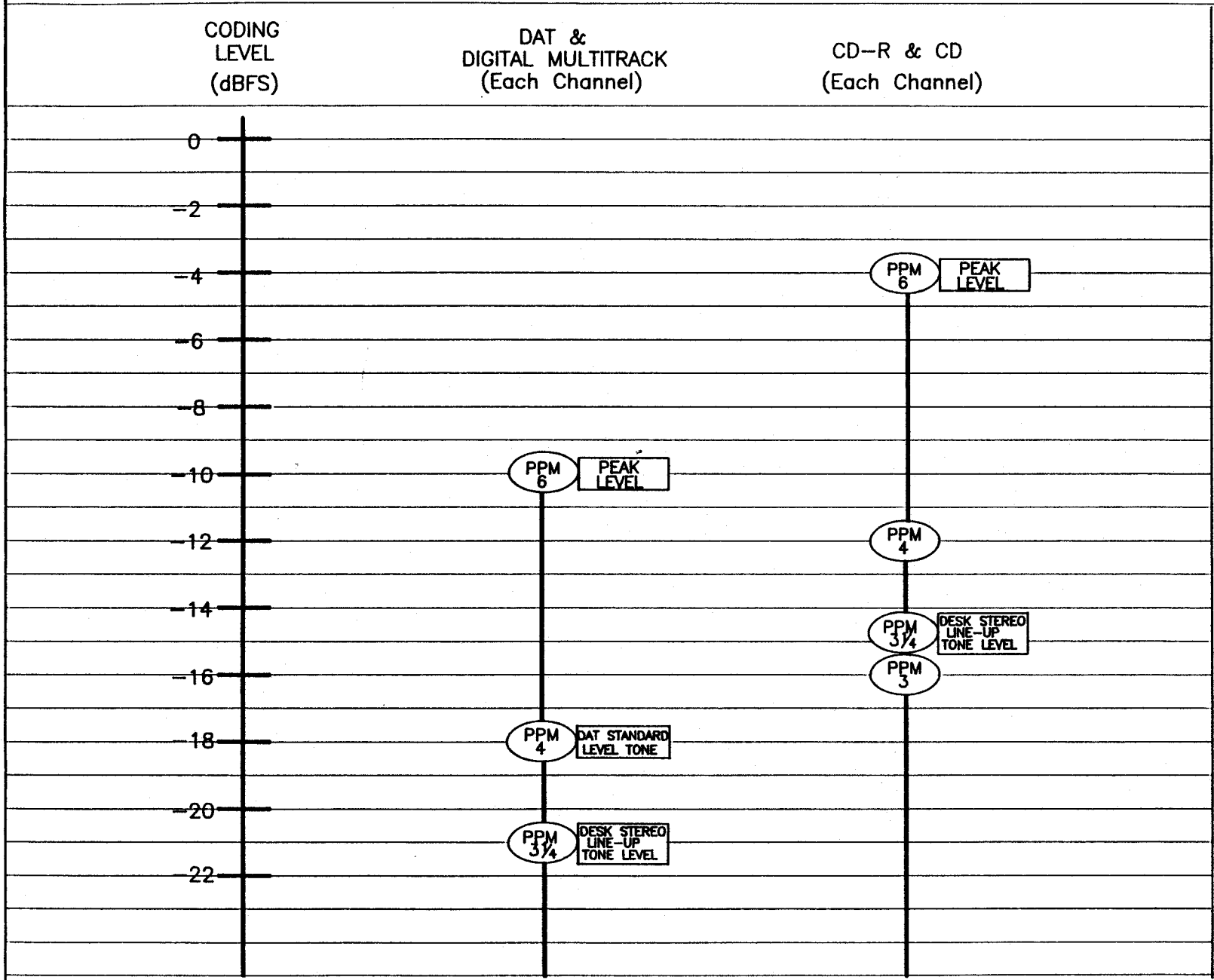
RDER TECHNICAL DEVELOPMENTS & INVESTIGATIONS

MAINTENANCE GUIDELINES
DIGITAL RECORDING LEVELS

BBC



NOTES:–

1) dBFS IS dB WITH RESPECT TO FULL SCALE (i.e.MAXIMUM CODING LEVEL)
2) THE BBC DAT STANDARD LEVEL TAPE HAS BOTH STANDARD LEVEL TONE(PPM4) AND PEAK LEVEL TONE(PPM6) RECORDED ON IT.

ENQUIRIES TO : LBH5713 (DDI 071–927 5713)

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