MTR-100A Design Concept

❑ Auto Alignment

Labor/Time Saving — Automated Audio Adjustment

- Full alignment in 4 minutes and 20 seconds
- Bias, Gain, Equalization alignment in 1 minute and 40 seconds

❑ Noise Reduction

Dynamic Range Expansion

When using Dolby SR Signal to Noise Ratio is 93 dB (@ 30 ips)
(Without SR: 70 dB)

❑ Fast Wind Mechanism

Fast Wind Speed is about 12 m/s (470 ips)
(MTR-90II: 7 m/s)

❑ Sound Quality Even Better Than Before

New cylindrical heads

❑ Full Professional Function Ability

Reverse Recording, etc.

❑ Strengthened Interface Ability

- RS-422-A
- RS-232-C
- Console interface
- Built-in Synchronizer

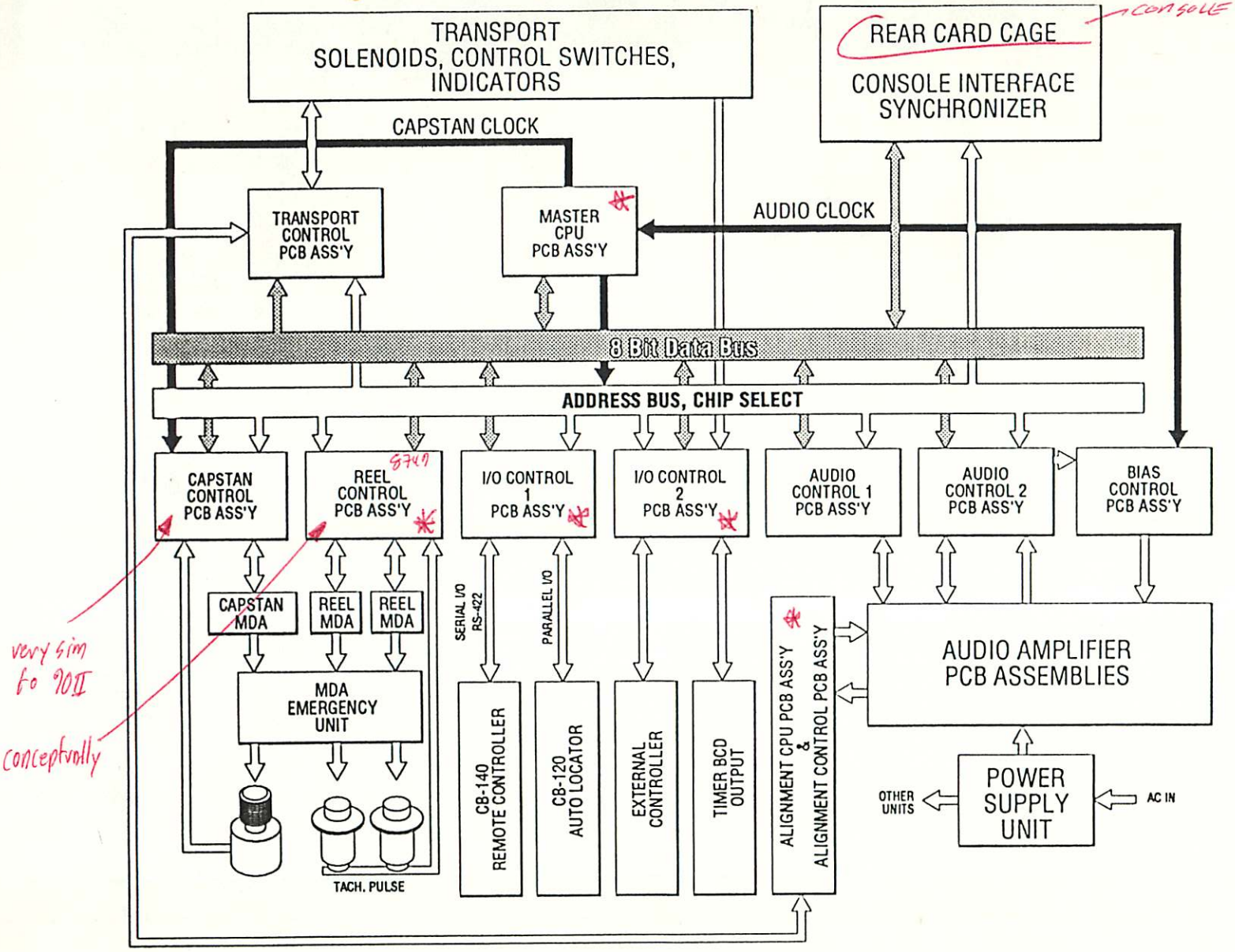
Requirements for Audio Auto Alignment of Professional Tape Recorder

1. The algorithm of alignment should be planned to lead the best performance of the machine.
2. Alignment parameters (bias depth, test signal frequency, reference fluxitivity, etc) should be selectable according to user preference and tape being used.
3. Alignment accuracy should be equal or better than that of usual method (potentiometers).
4. The results of alignment should be visually verified.

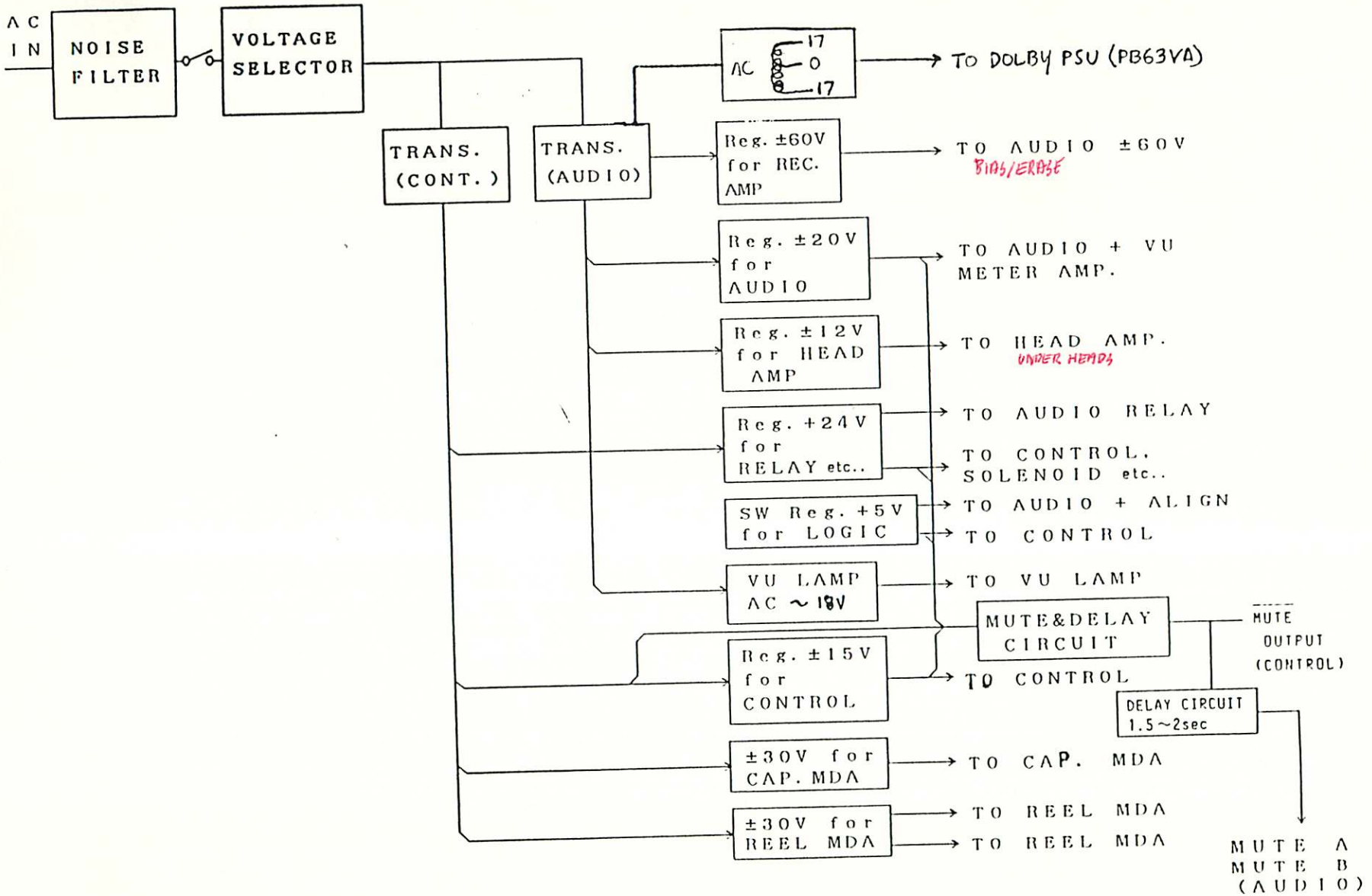
Advantages of Auto Alignment

1. Alignment can be done by a person who is not a trained maintenance personel.
2. Higher reliability attained by not using mechanical potentiometers.
3. Alignment conditions (tape type, EQ standard, test signal frequency, etc) and results can be stored in memory.

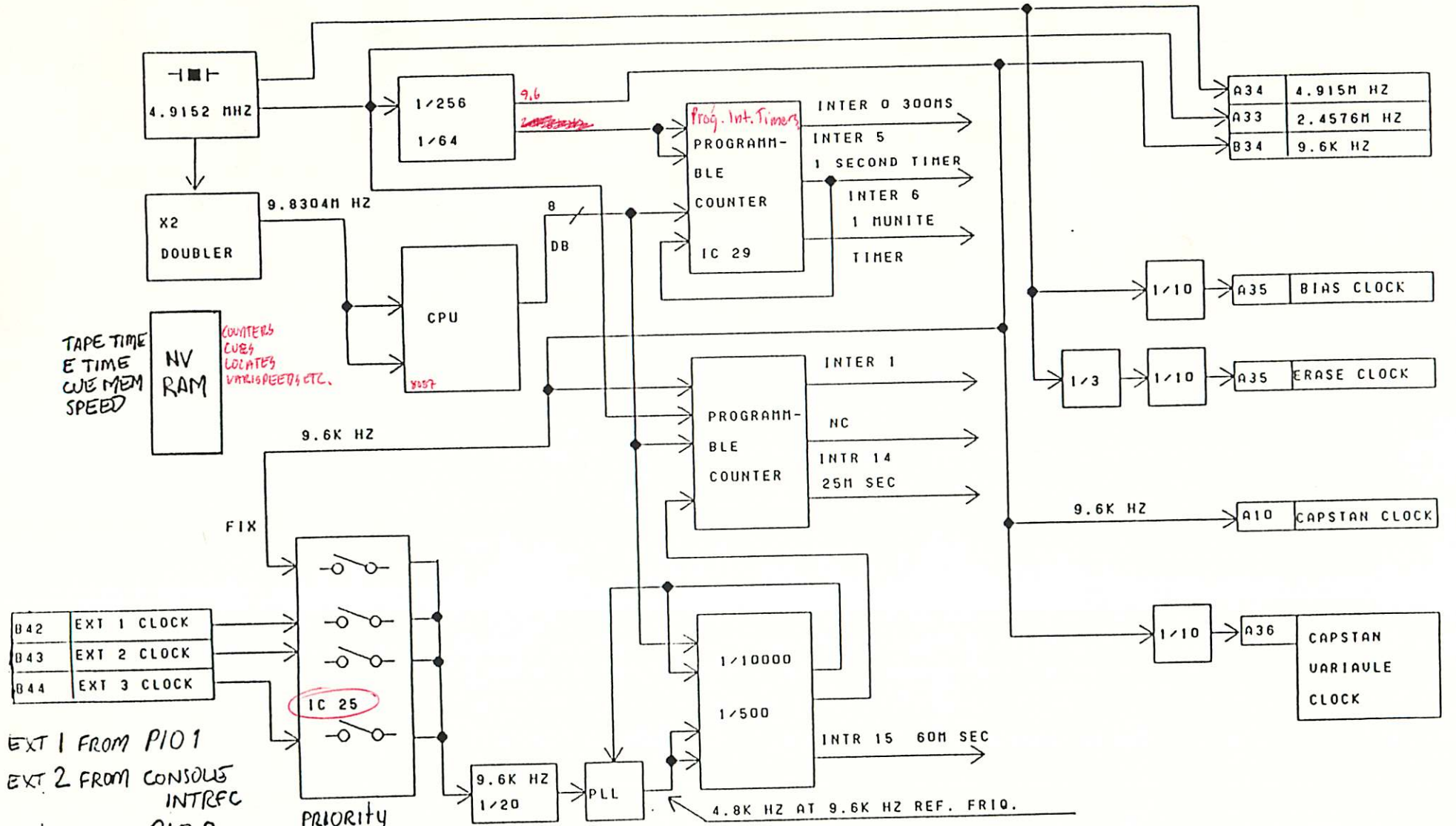
MTR-100A System Block Diagram



BLOCK DIAGRAM FOR POWER SUPPLY UNIT



MASTER CPU



EXT 1 FROM PIO 1

EXT 2 FROM CONSOLE INTREC

EXT 3 FROM PIO 2

PRIORITY ENCODER PRIORITY = PORT FROM WHICH LAST BUTTON PRESSED; IF ALL, EXT 1

MASTER CPU SET THE ADDRESS OF AMP CH.

EXAMPL:SET CH.3

A.CH. SEL 0 =1

A.CH. SEL 1 =1

A.CH. SEL 2 =0

A.CH. SEL 3 =0

A.CH. SEL 4 =0

→

SEND THE DATA FROM THE PORTE OF BELLOW

GOTO AUTO ALIGN PCB

B37	A.CH.SEL 0
A37	A.CH.SEL 1
A38	A.CH.SEL 2
B38	A.CH.SEL 3
B39	A.CH.SEL 4

→

THE CPU OF AUTO ALIGN. SEND THE TALLY TO THE PORTE OF BELLOW

TALLY FROM ALIGN

B34	REC TALLY
B35	READY TALLY
B36	INPUT TALLY
A36	REP TALLY

ROTARY DIP SWITCH

DIAL	FLUX LEVEL
0	185 nWb/M
1	200 nWb/M
2	250 nWb/M
3	320 nWb/M
4-9	510 nWb/M

SW NO.	ON/OFF	MODE
1	ON	15/30 IPS
	OFF	7.5/15 IPS
2	ON	IEC EQ
	OFF	NAB EQ
3	ON	HX PRO ON
	OFF	HX PRO OFF
4	ON	GAP LESS ON
	OFF	GAP LESS OFF

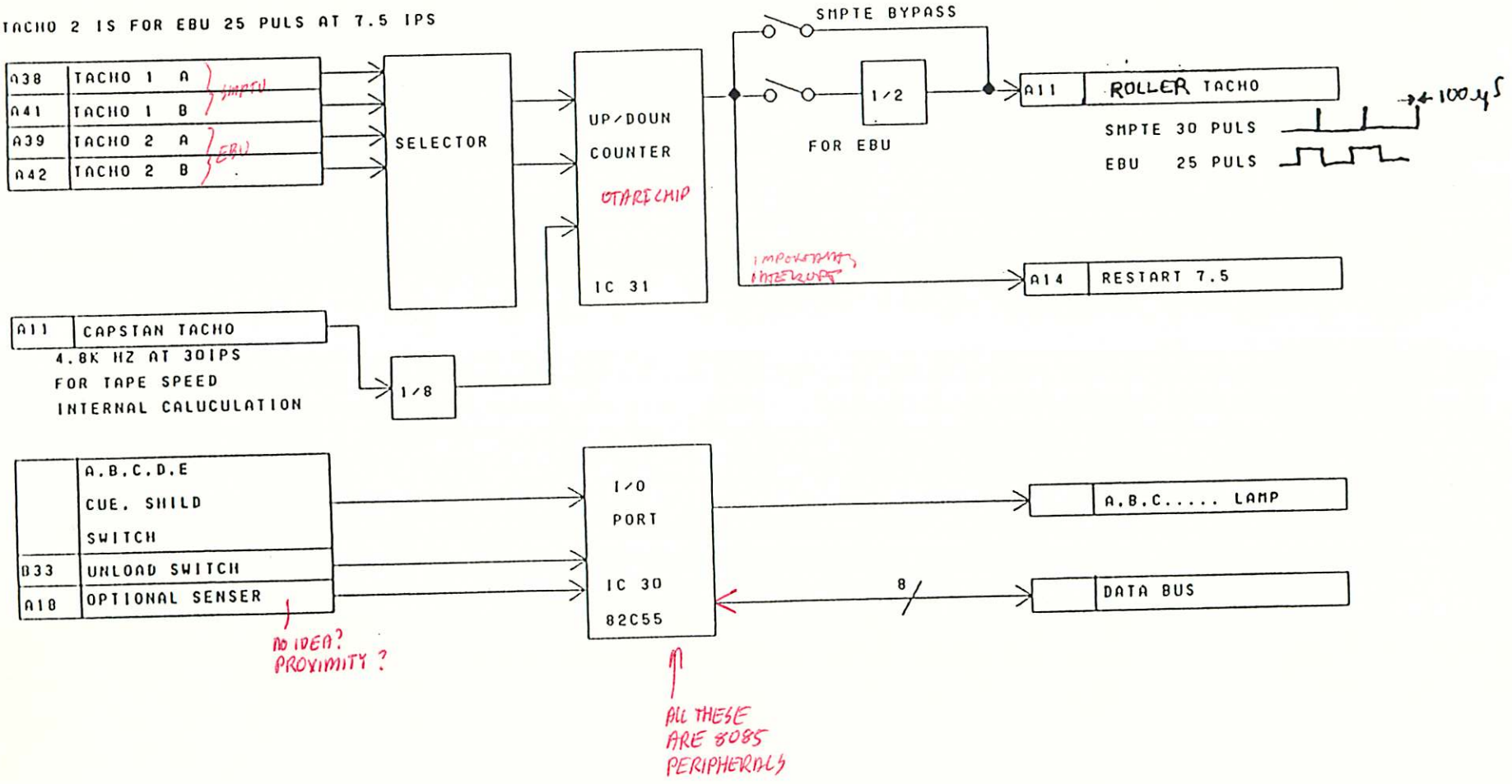
HEAD ID A	HEAD ID B	HEAD ID C	HEAD
ON	OFF	OFF	8 CH
OFF	ON	OFF	16 CH
ON	ON	OFF	24 CH

DETERMINES ENABLE FOR TIME CODE CUE HEADS TELL CPU

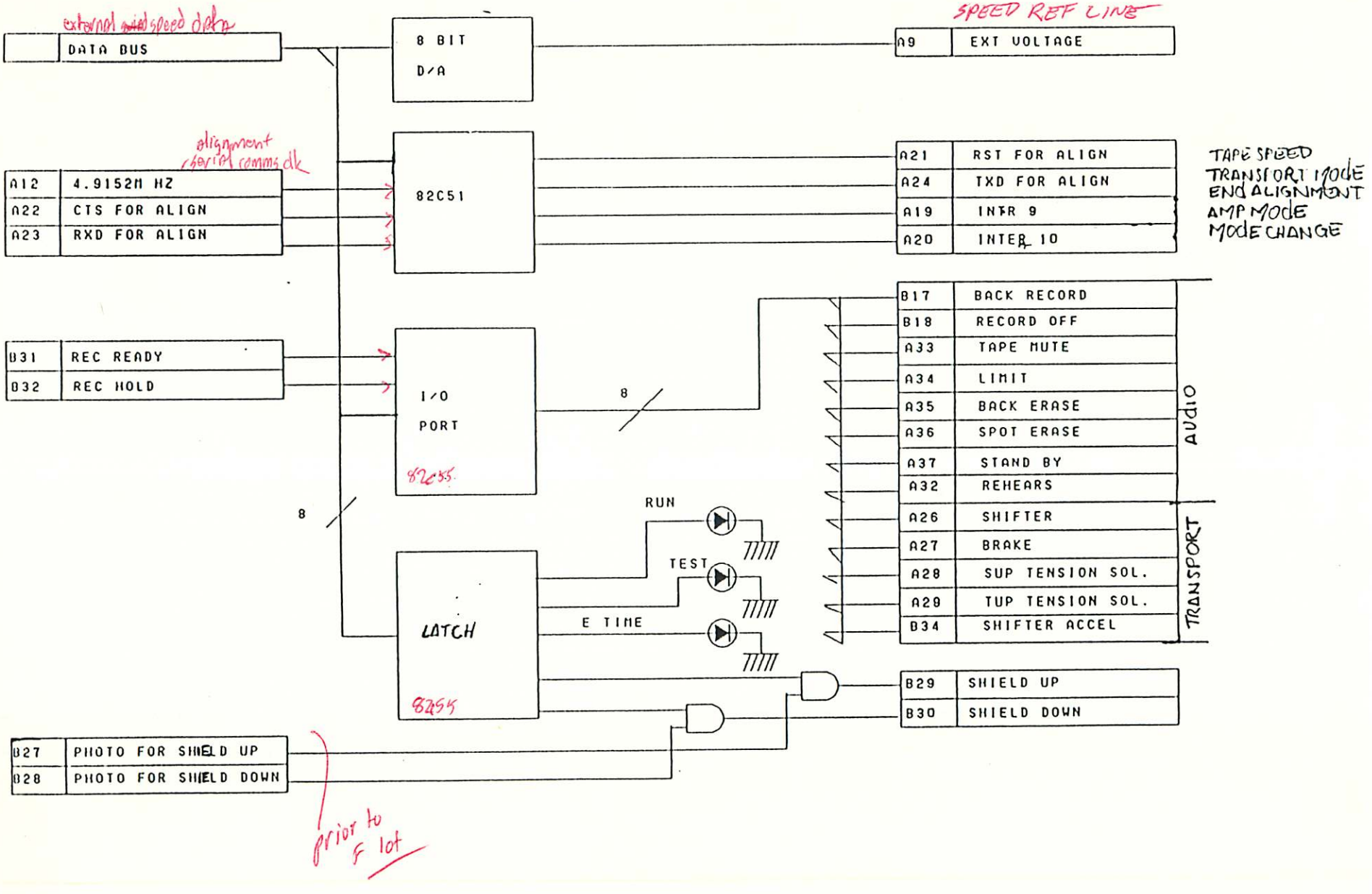
TRANSPORT CONT. PCA BLOCK DIAGRAM

TACHO 1 IS FOR SMPTE 15 PULS AT 3.75 IPS

TACHO 2 IS FOR EBU 25 PULS AT 7.5 IPS

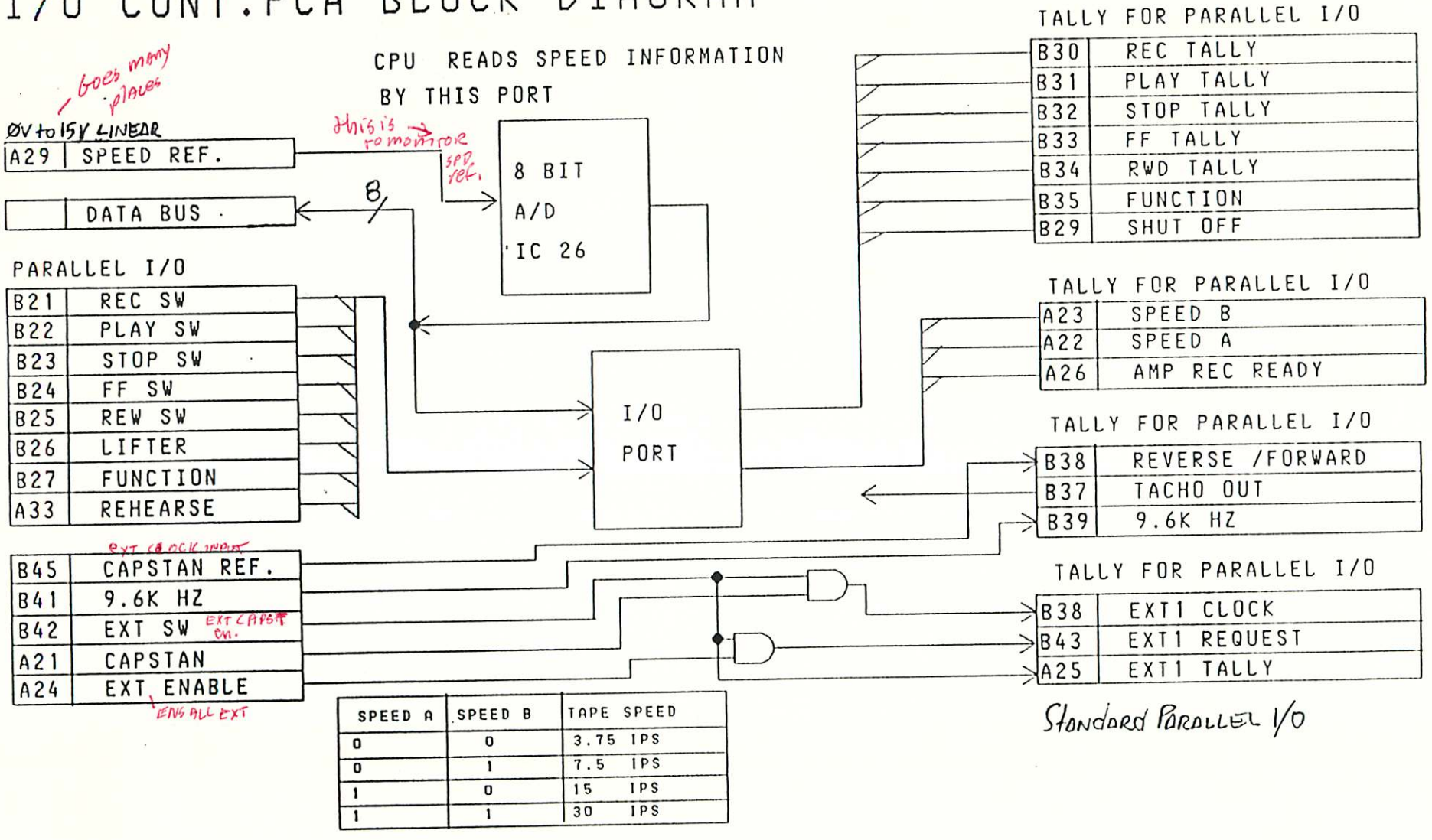


XPORT CONTROL CONT'D



I/O CONTROL 1

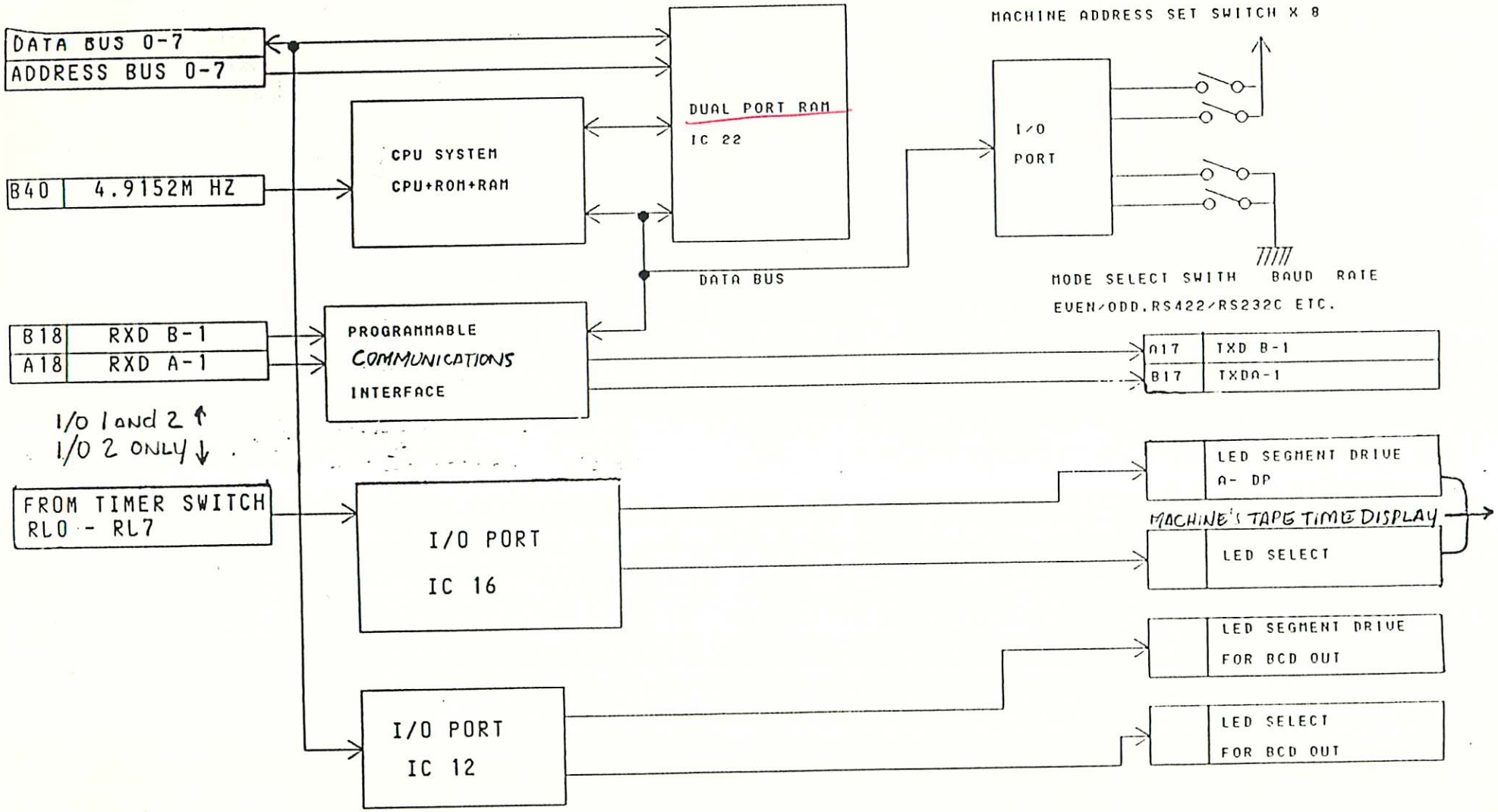
I/O CONT.PCA BLOCK DIAGRAM



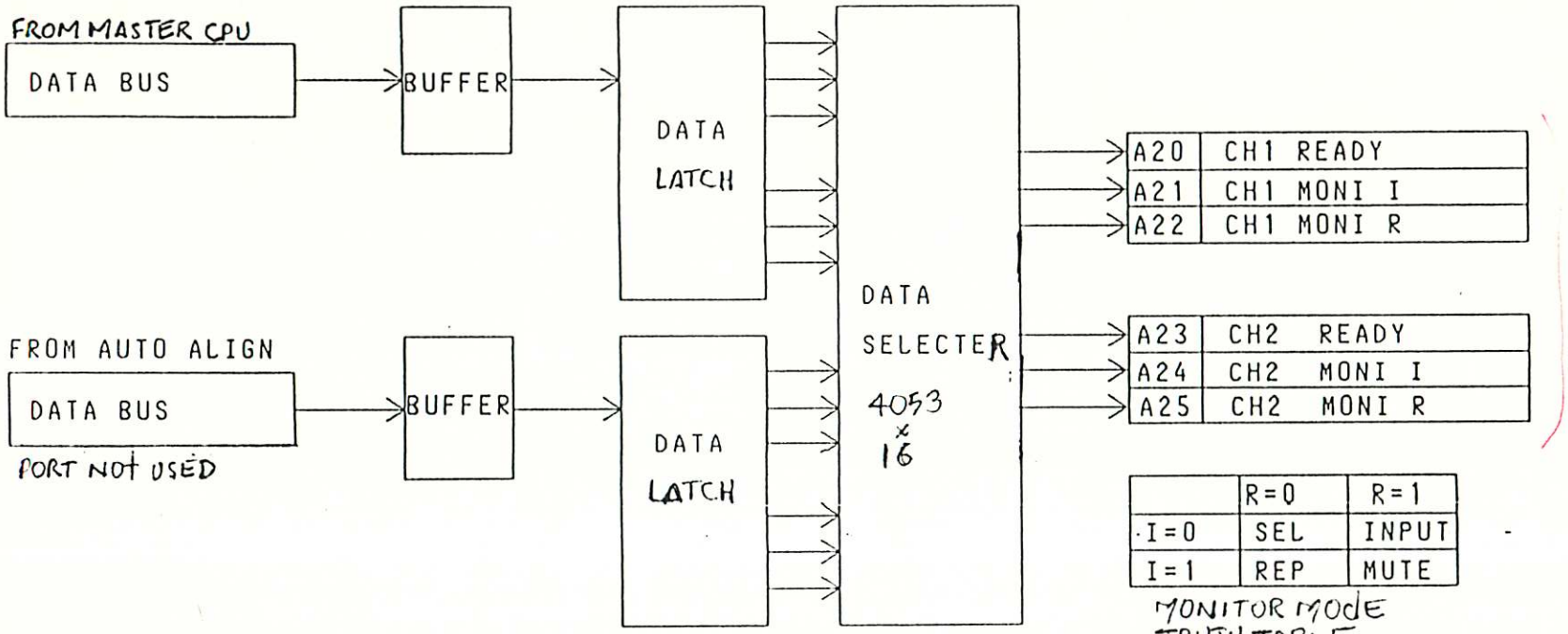
SPEED A	SPEED B	TAPE SPEED
0	0	3.75 IPS
0	1	7.5 IPS
1	0	15 IPS
1	1	30 IPS

I/O CONTROL 1 and 2

(shared)



AUDIO CONT 1 PCA BLOCK DIAGRM



	R=0	R=1
I=0	SEL	INPUT
I=1	REP	MUTE

MONITOR MODE TRUTH TABLE

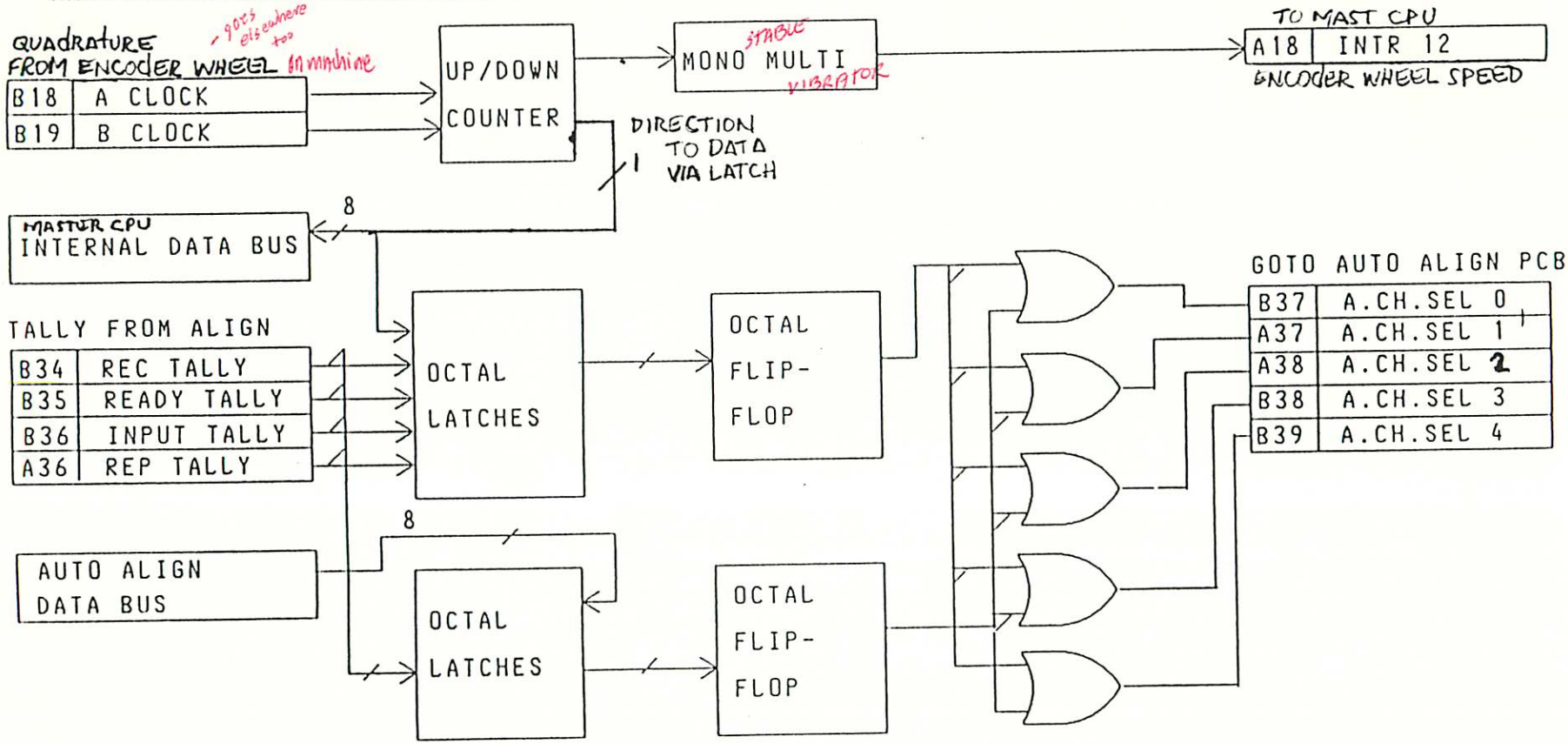
1 CH TO 16 CHANNELS

FROM 17 CH TO 24 CH ARE LOCATED ON AUDIO CONT 2 PCA

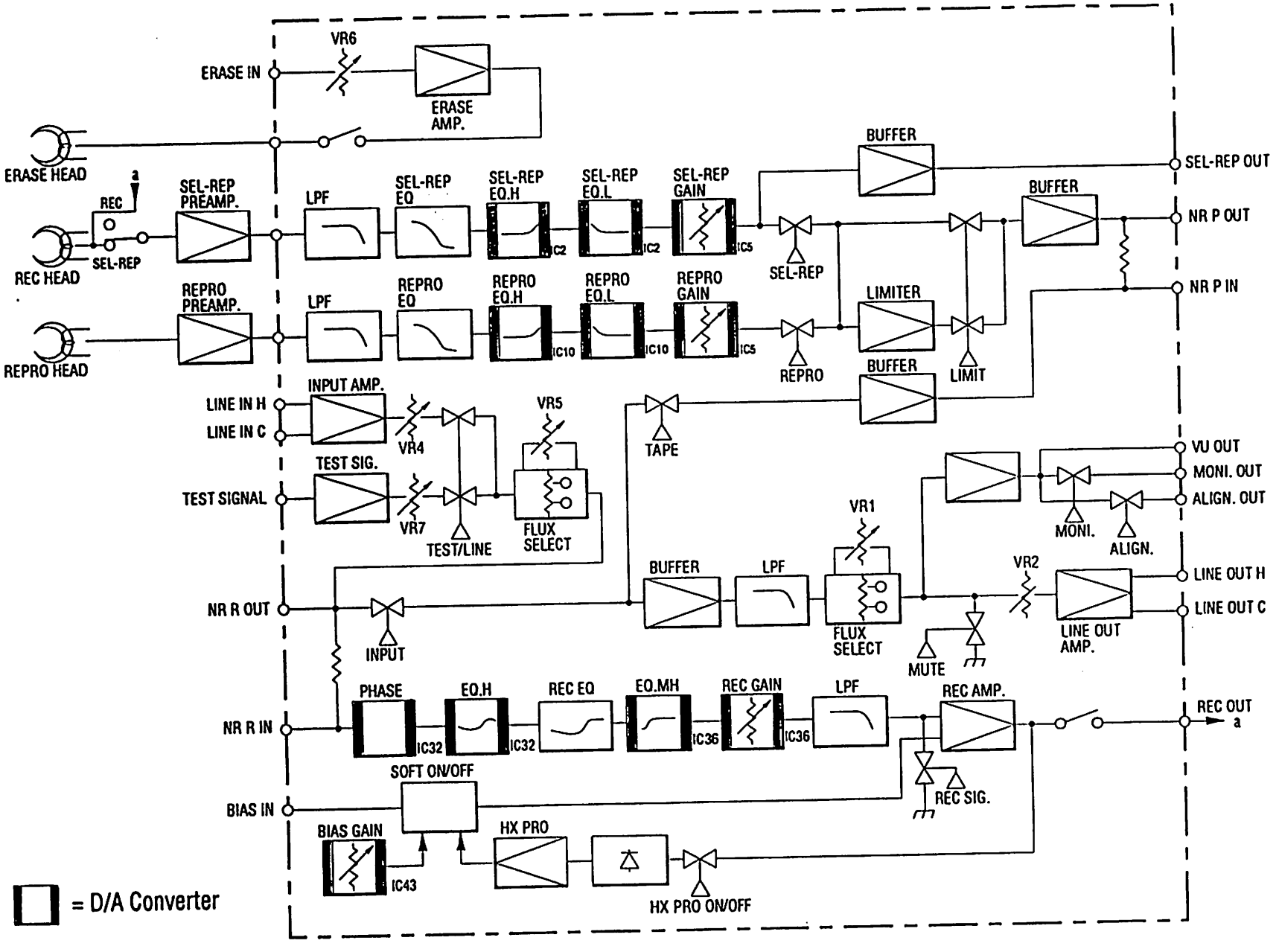
AUDIO CONTROL 2

17 CH TO 24 CH DATA(READY,MONI I,MONI R)

THE CIRCUIT IS SAME CIRCUIT AS AUDIO CONT. 1 PCA

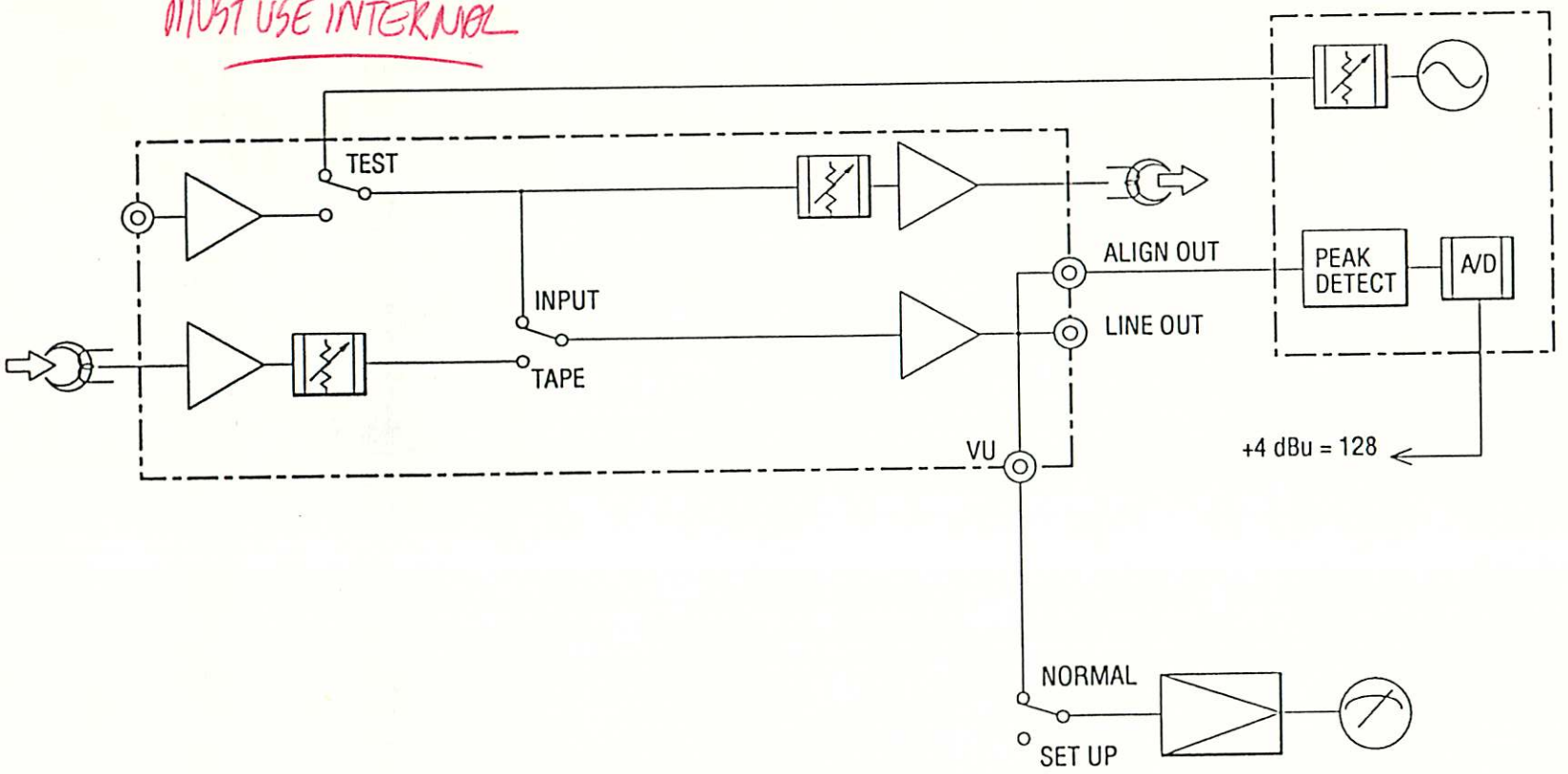


MTR-100A Audio Amplifier Block Diagram



VU Alignment - like MTR20

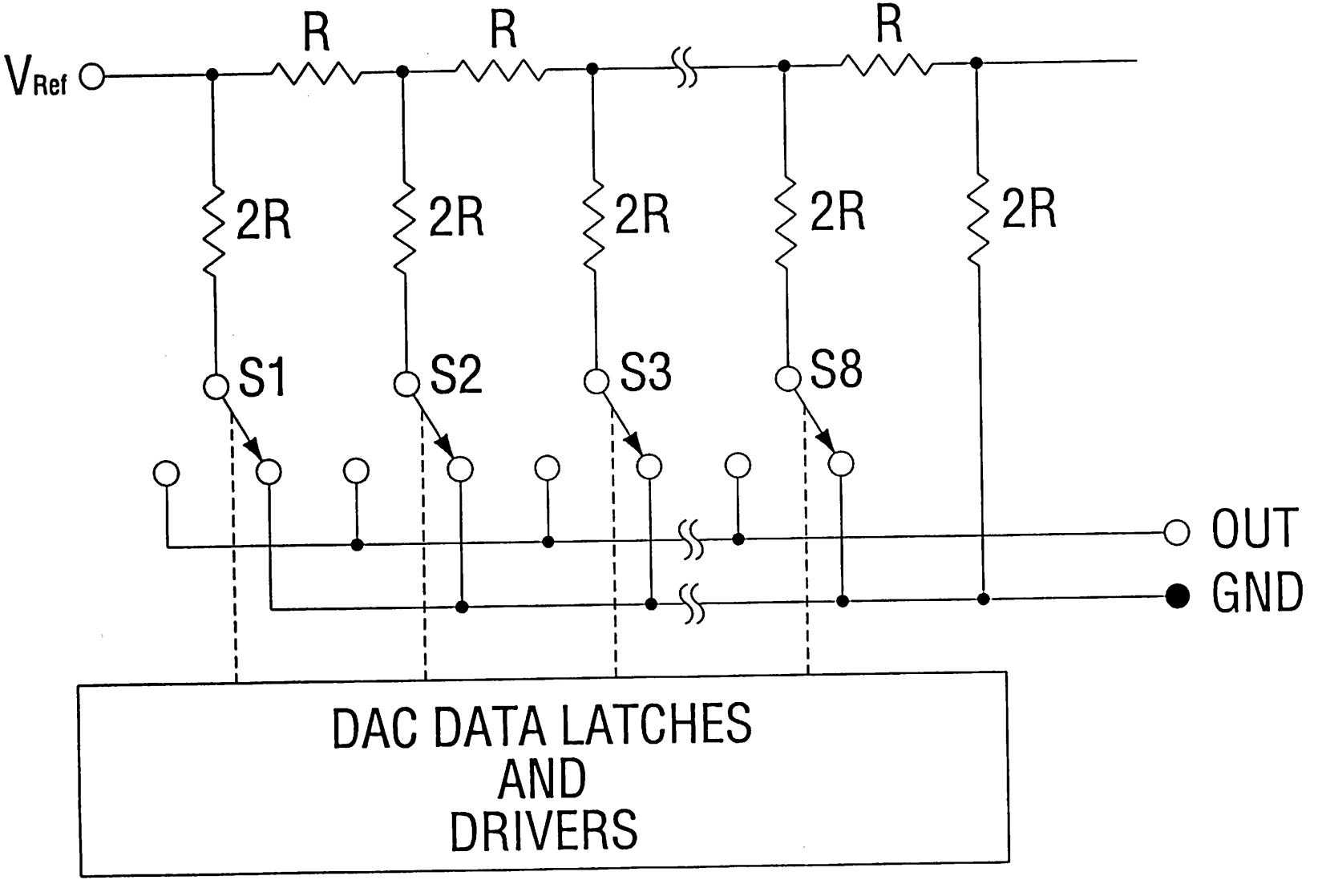
MUST USE INTERNAL

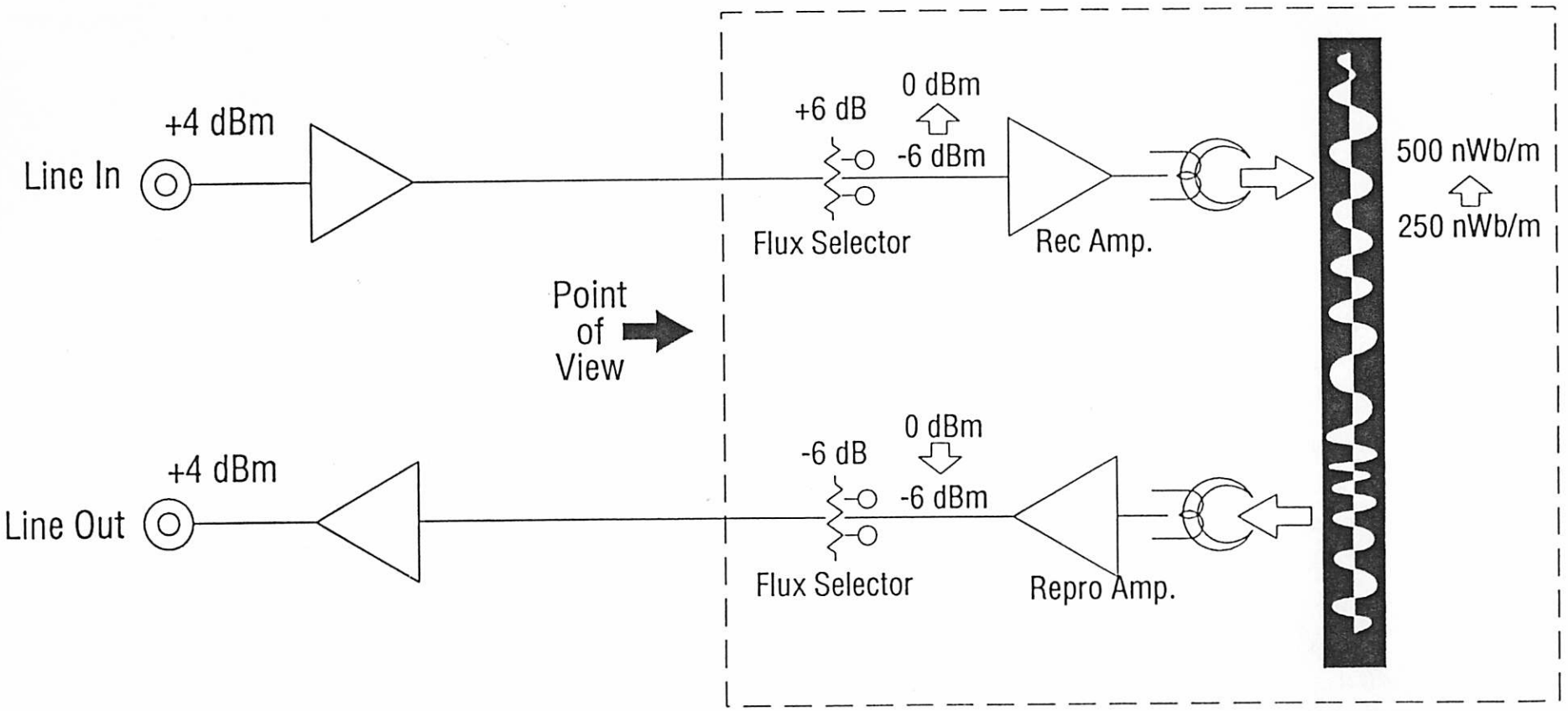


0 VU Calibration Mode

very impotent

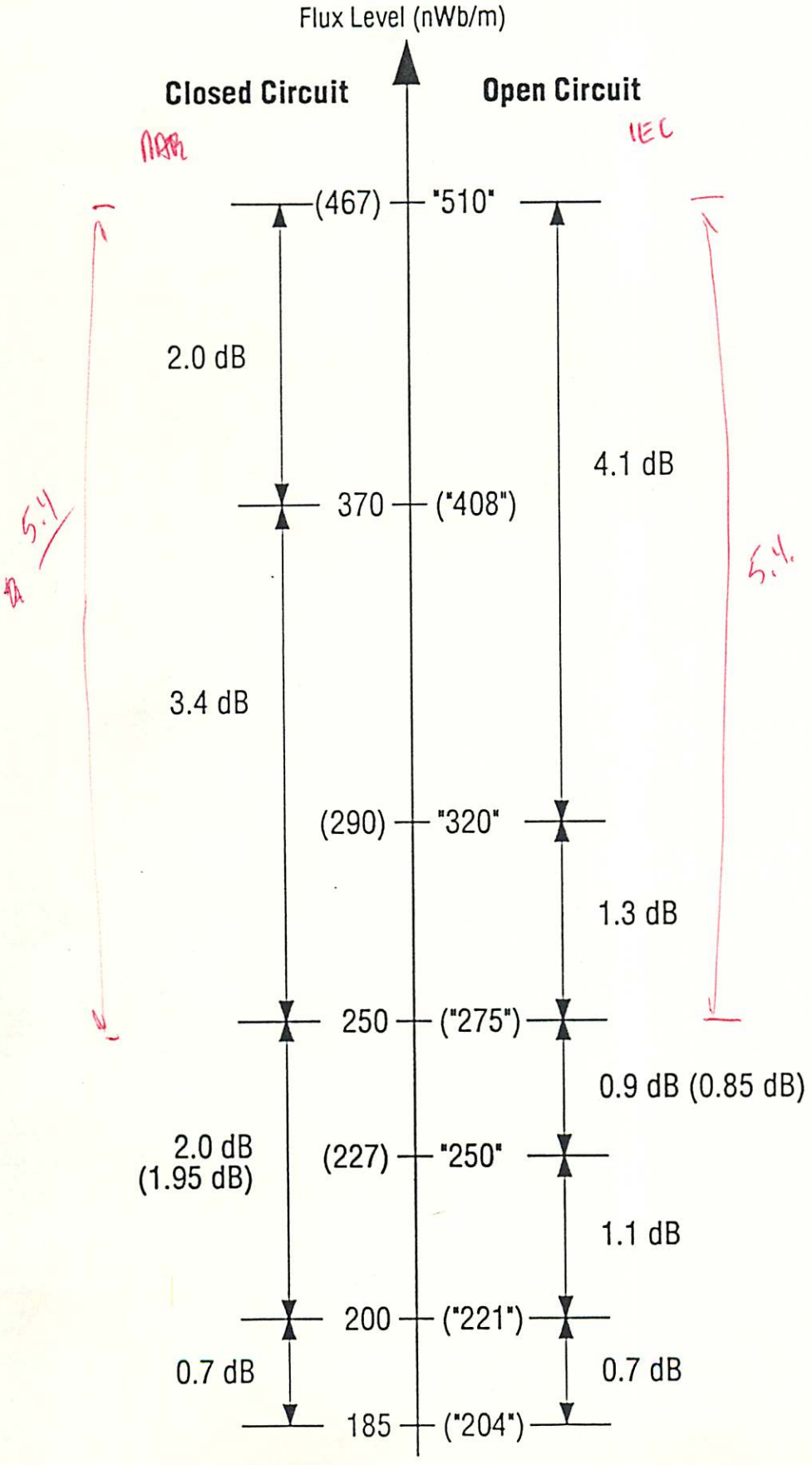
General Idea of D/A Converters

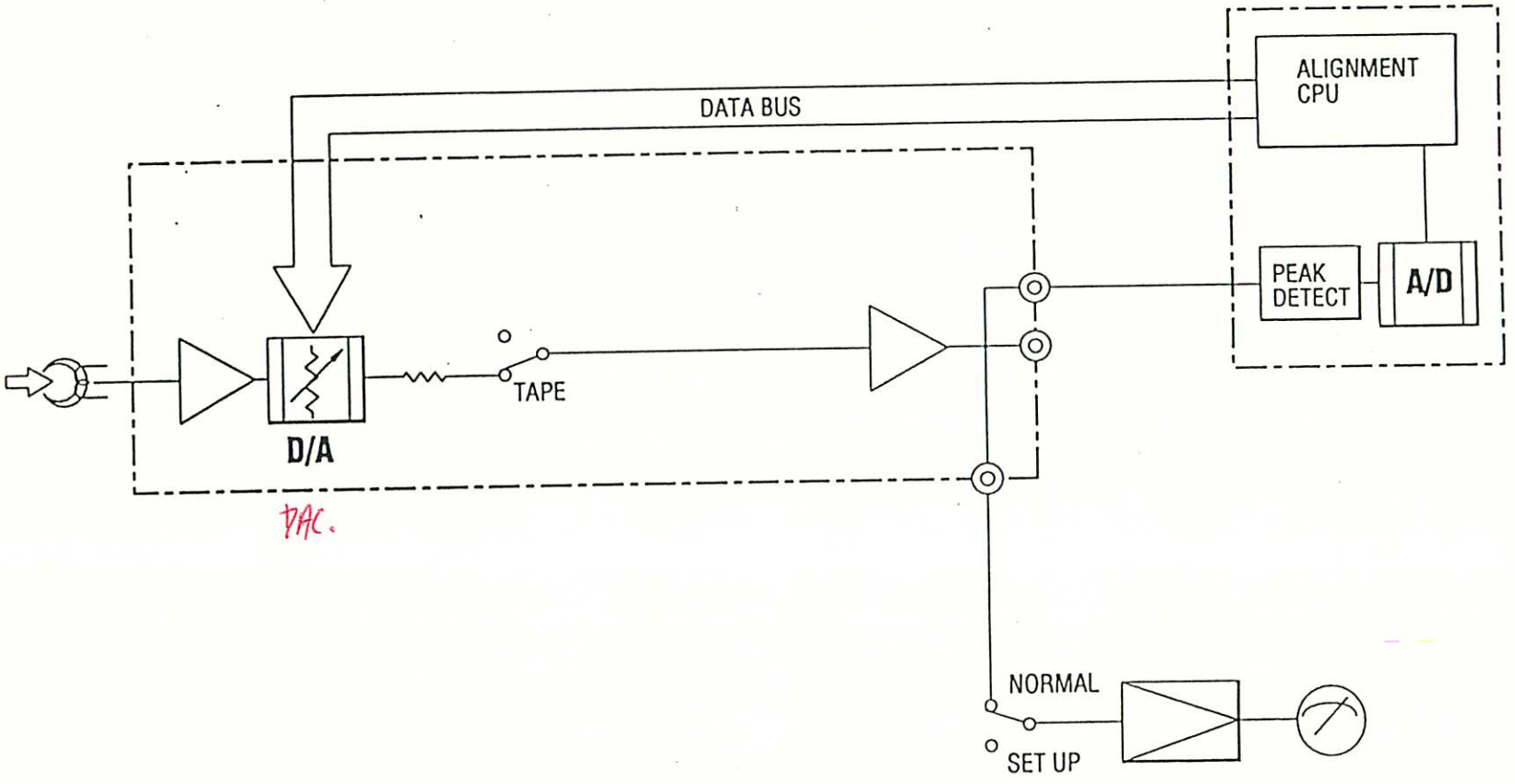




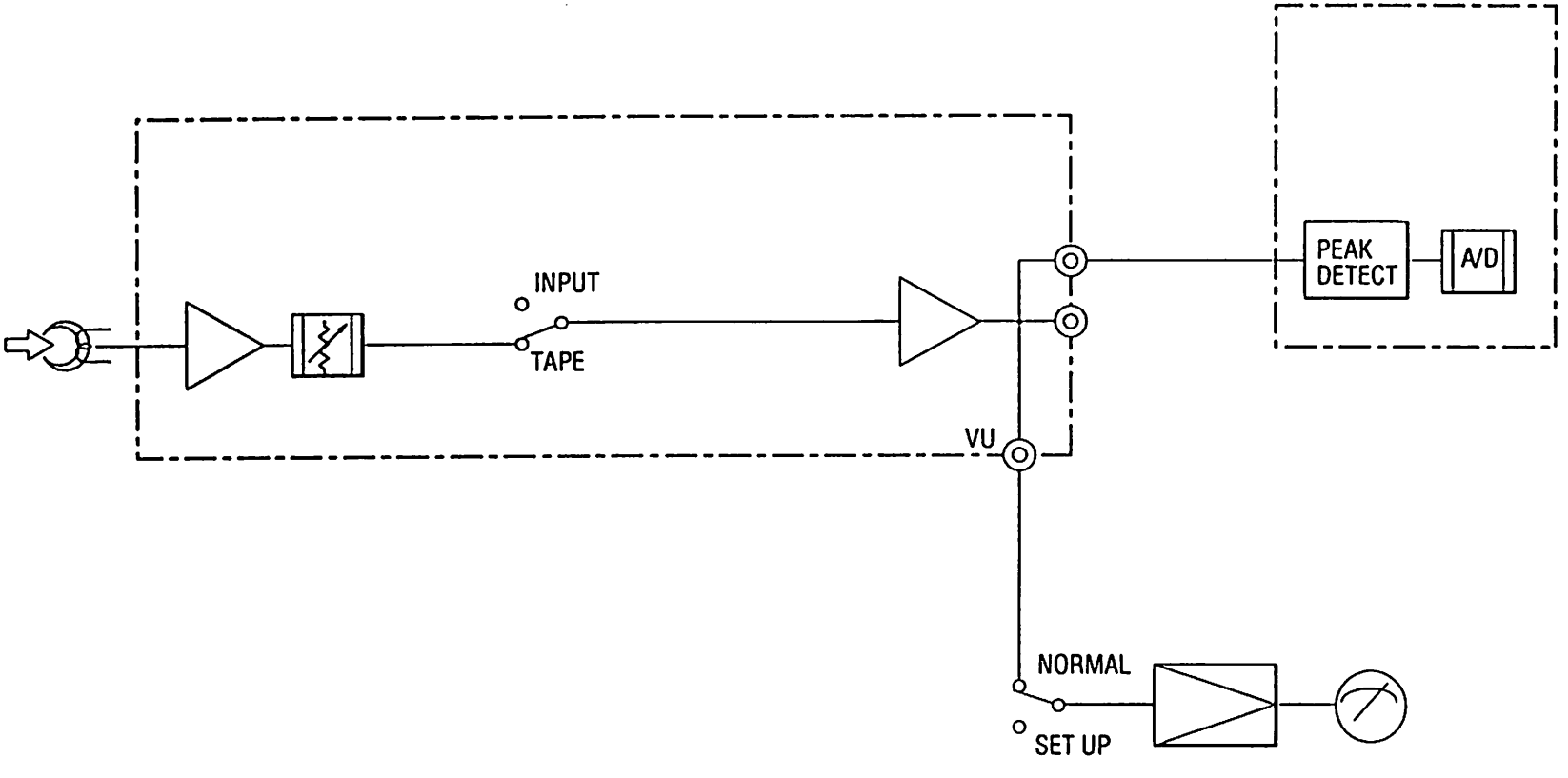
Selecting Recorder's Flux Level

Open & Closed Circuit Flux Levels



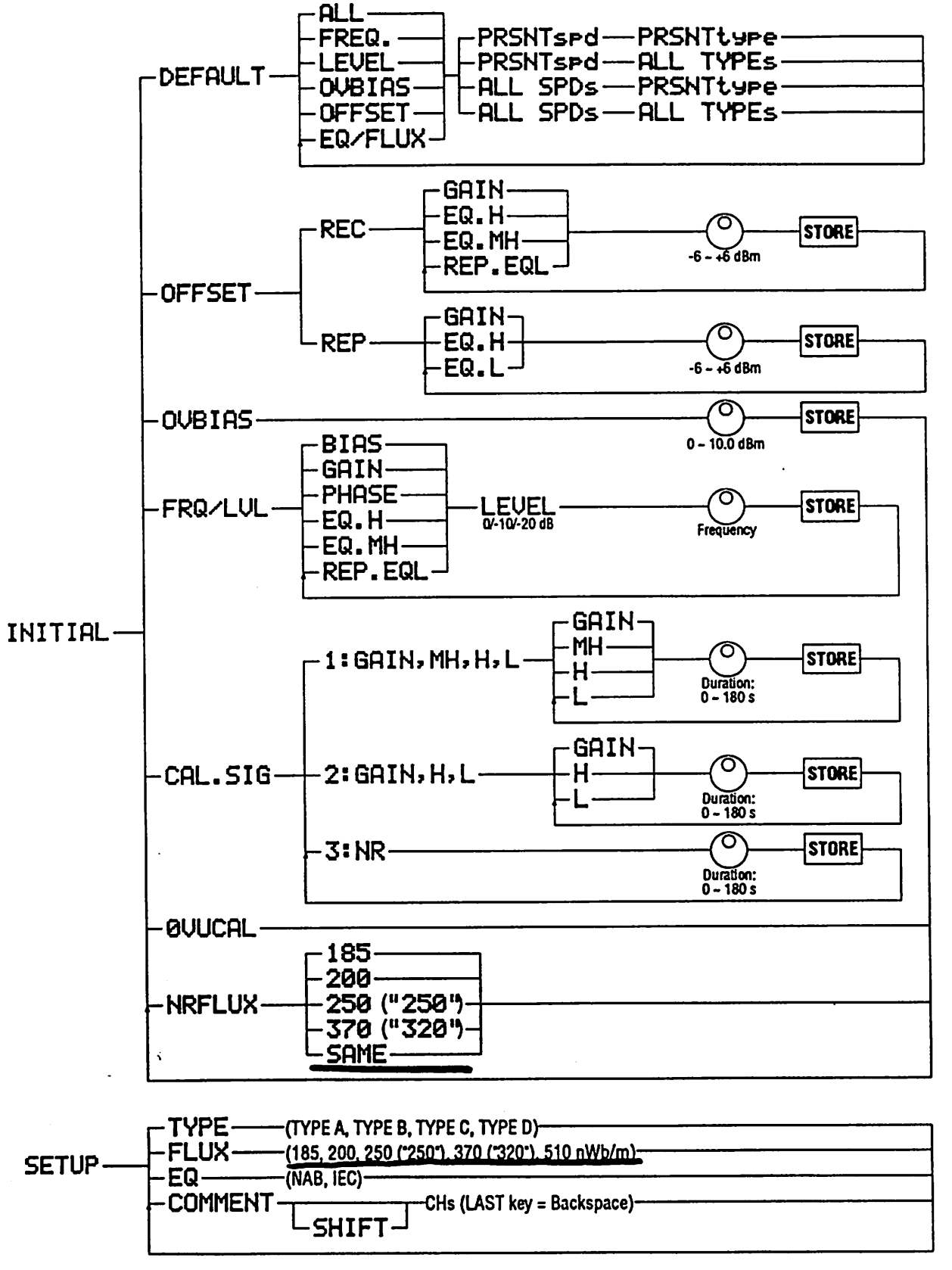


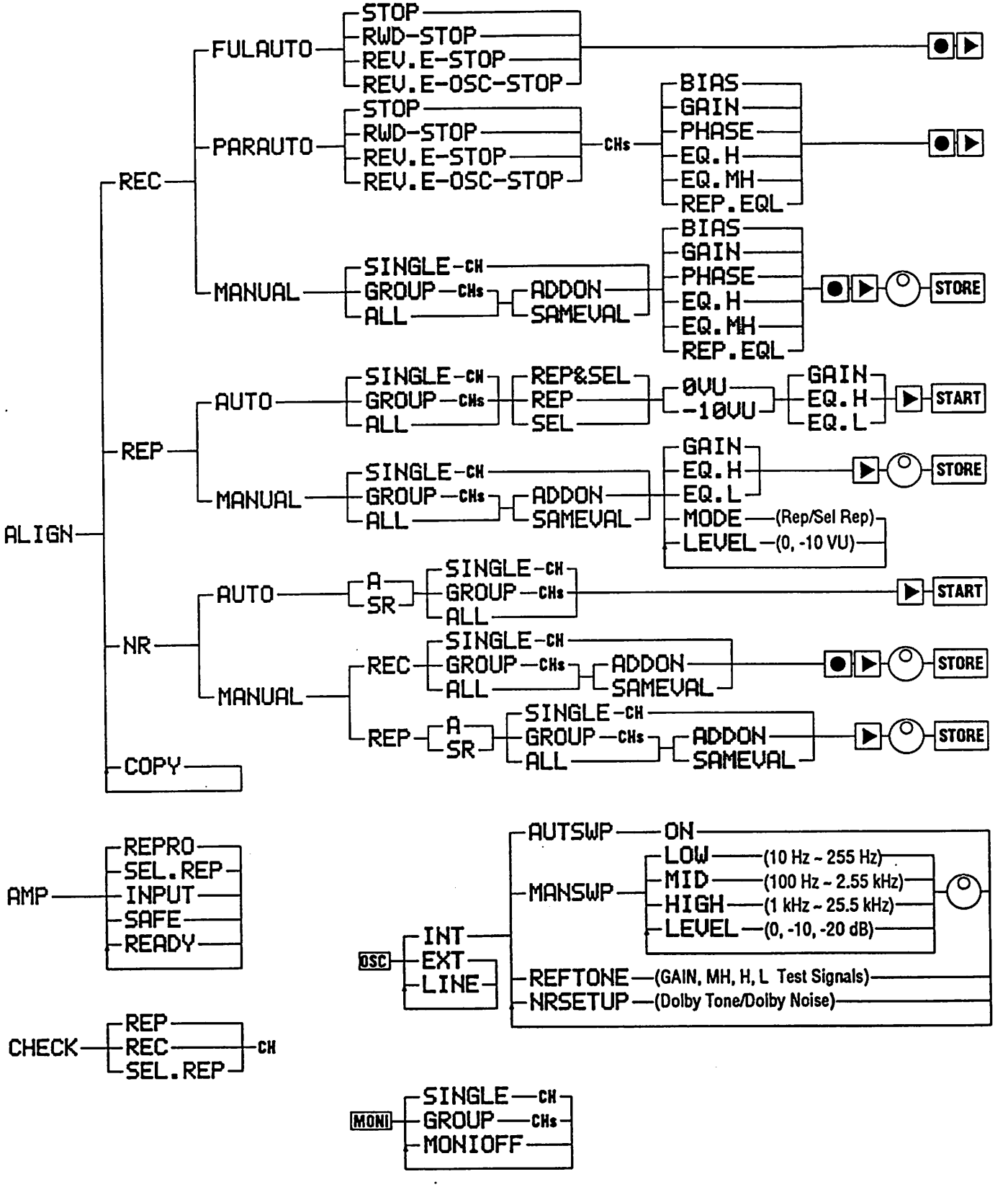
Auto Alignment Mode

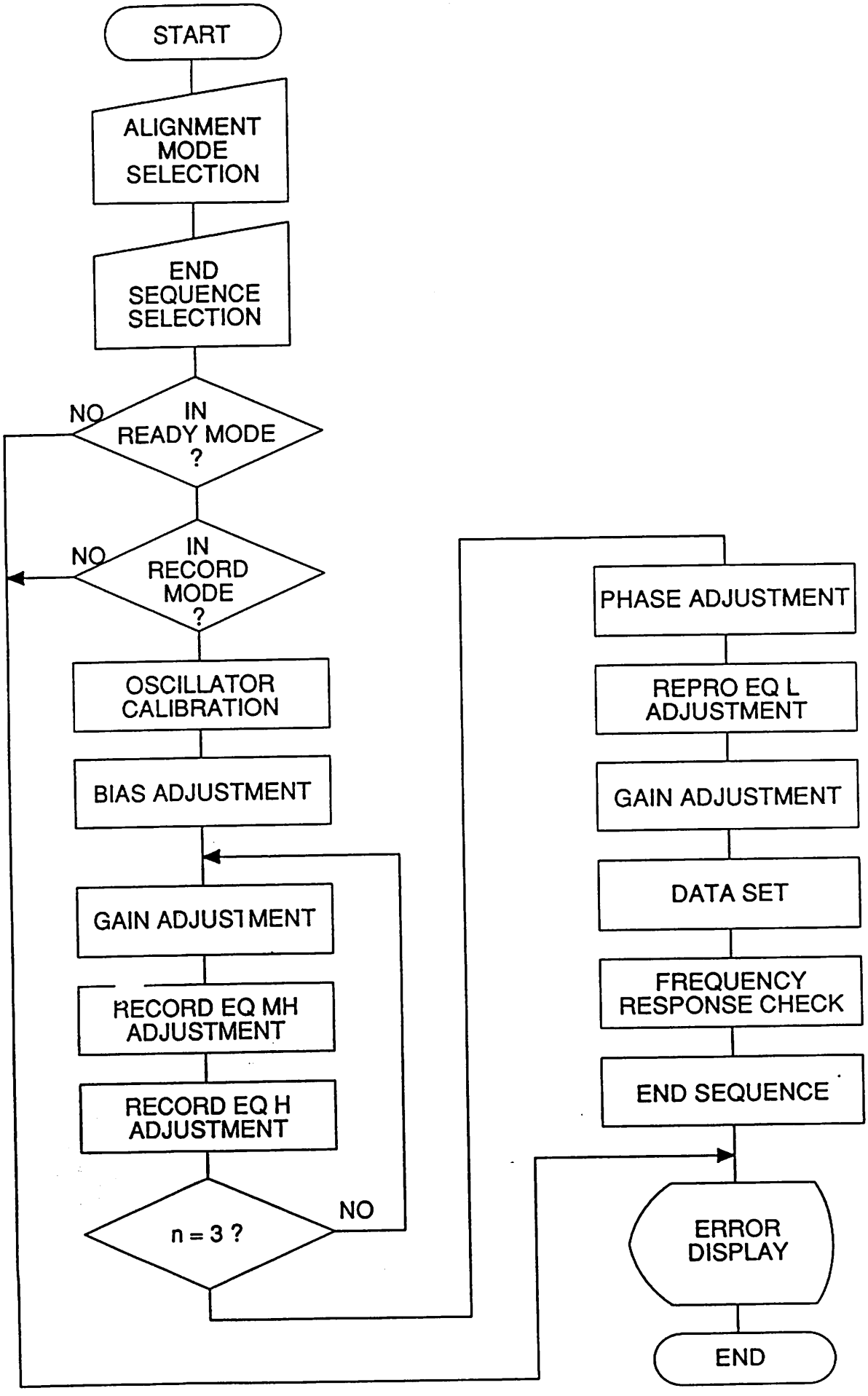


Reproduce Mode

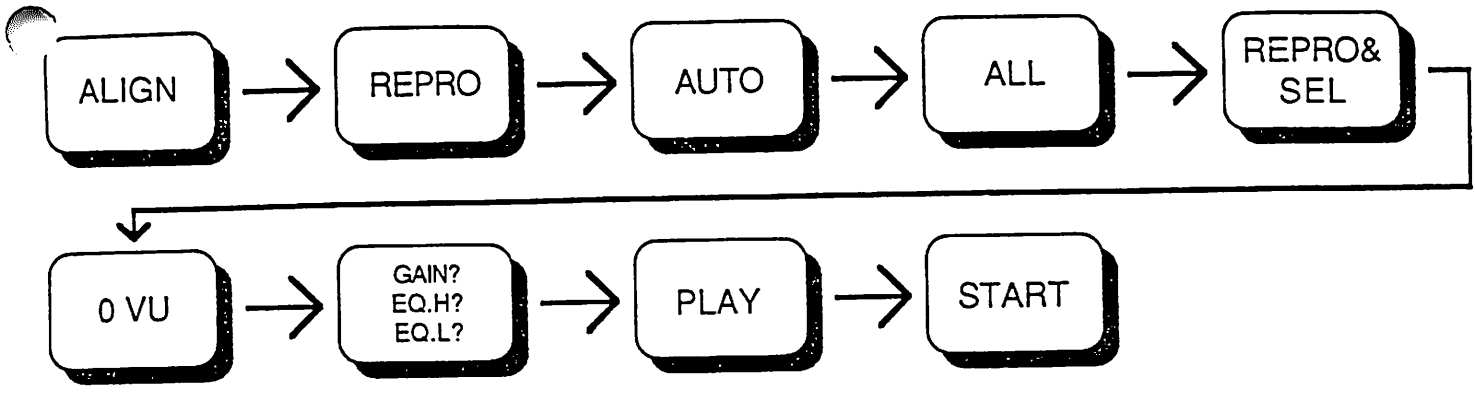
MTR-100A Auto Alignment Operation Guide



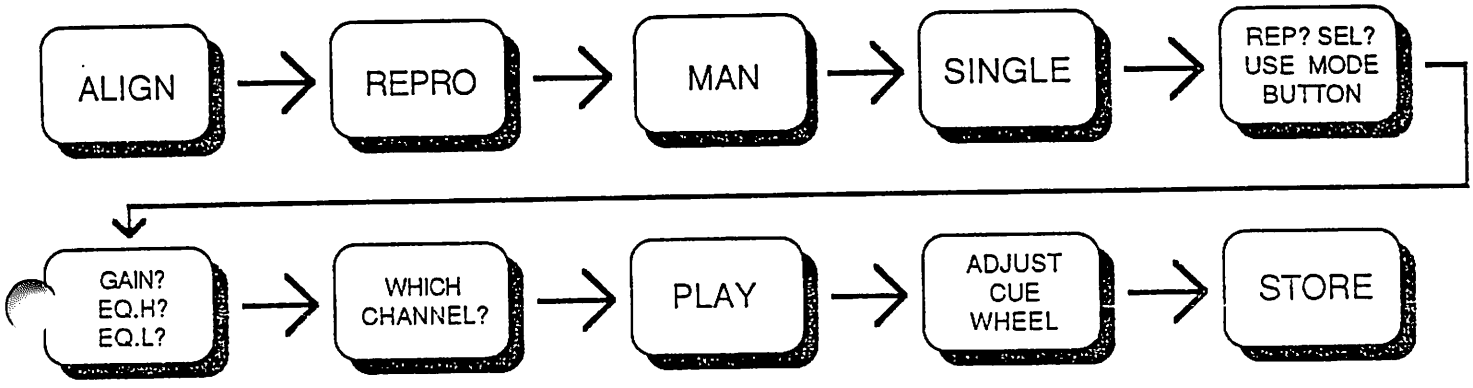

ALIGN
REC
FULAUTO
STOP
RWD-STOP
REV.E-STOP
REV.E-OSC-STOP
PARAUTO
STOP
RWD-STOP
REV.E-STOP
REV.E-OSC-STOP
CHs
BIAS
GAIN
PHASE
EQ.H
EQ.MH
REP.EQL
MANUAL
SINGLE-CH
GROUP-CHs
ALL
ADDON
SAMEVAL
BIAS
GAIN
PHASE
EQ.H
EQ.MH
REP.EQL
STORE
REP
AUTO
SINGLE-CH
GROUP-CHs
ALL
REP&SEL
REP
SEL
0VU
-10VU
GAIN
EQ.H
EQ.L
START
MANUAL
SINGLE-CH
GROUP-CHs
ALL
ADDON
SAMEVAL
GAIN
EQ.H
EQ.L
MODE
(Rep/Sel Rep)
LEVEL
(0, -10 VU)
STORE
NR
AUTO
A
SR
SINGLE-CH
GROUP-CHs
ALL
START
MANUAL
REC
SINGLE-CH
GROUP-CHs
ALL
ADDON
SAMEVAL
STORE
REP
A
SR
SINGLE-CH
GROUP-CHs
ALL
ADDON
SAMEVAL
STORE
COPY
AMP
REPRO
SEL.REP
INPUT
SAFE
READY
OSC
INT
EXT
LINE
AUTSWP
ON
MANSWP
LOW
(10 Hz ~ 255 Hz)
MID
(100 Hz ~ 2.55 kHz)
HIGH
(1 kHz ~ 25.5 kHz)
LEVEL
(0, -10, -20 dB)
REFTONE
(GAIN, MH, H, L Test Signals)
NRSETUP
(Dolby Tone/Dolby Noise)
CHECK
REP
REC
SEL.REP
CH
MONI
SINGLE
CH
GROUP
CHs
MONIOFF


START
ALIGNMENT MODE SELECTION
END SEQUENCE SELECTION
NO
IN READY MODE ?
NO
IN RECORD MODE ?
OSCILLATOR CALIBRATION
BIAS ADJUSTMENT
GAIN ADJUSTMENT
RECORD EQ MH ADJUSTMENT
RECORD EQ H ADJUSTMENT
n = 3 ?
NO
PHASE ADJUSTMENT
REPRO EQ L ADJUSTMENT
GAIN ADJUSTMENT
DATA SET
FREQUENCY RESPONSE CHECK
END SEQUENCE
ERROR DISPLAY
END

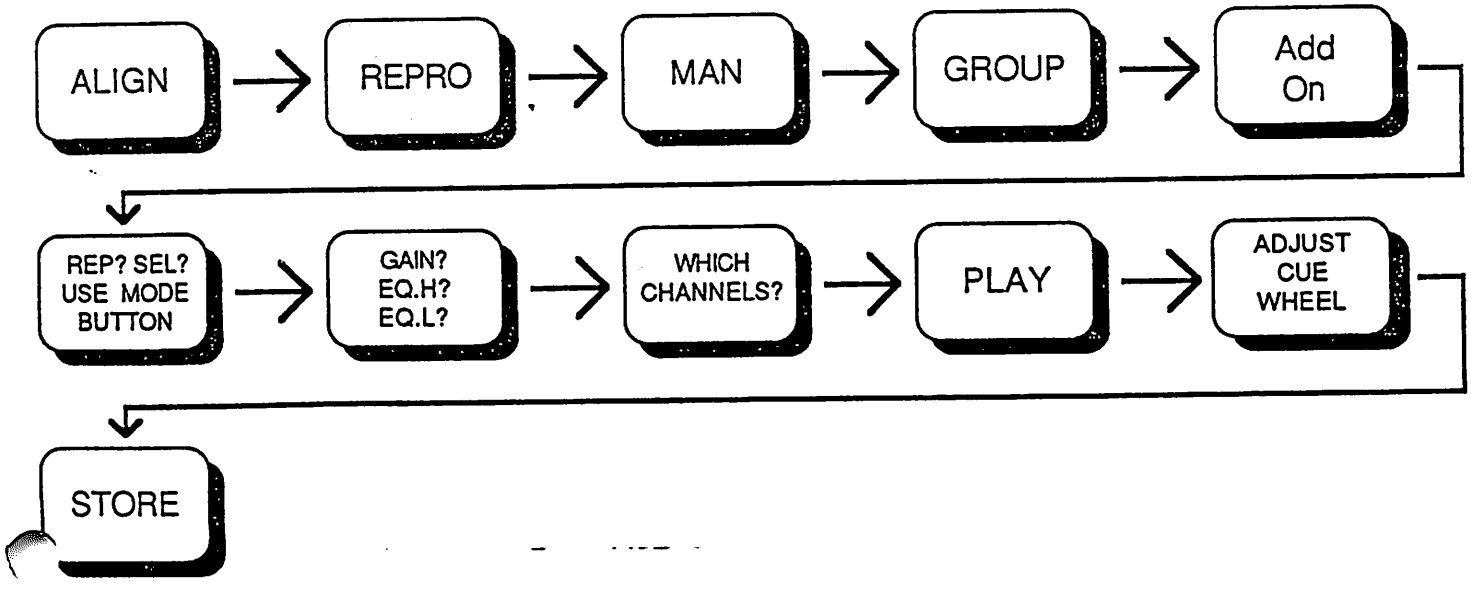
FULL AUTO REPRO



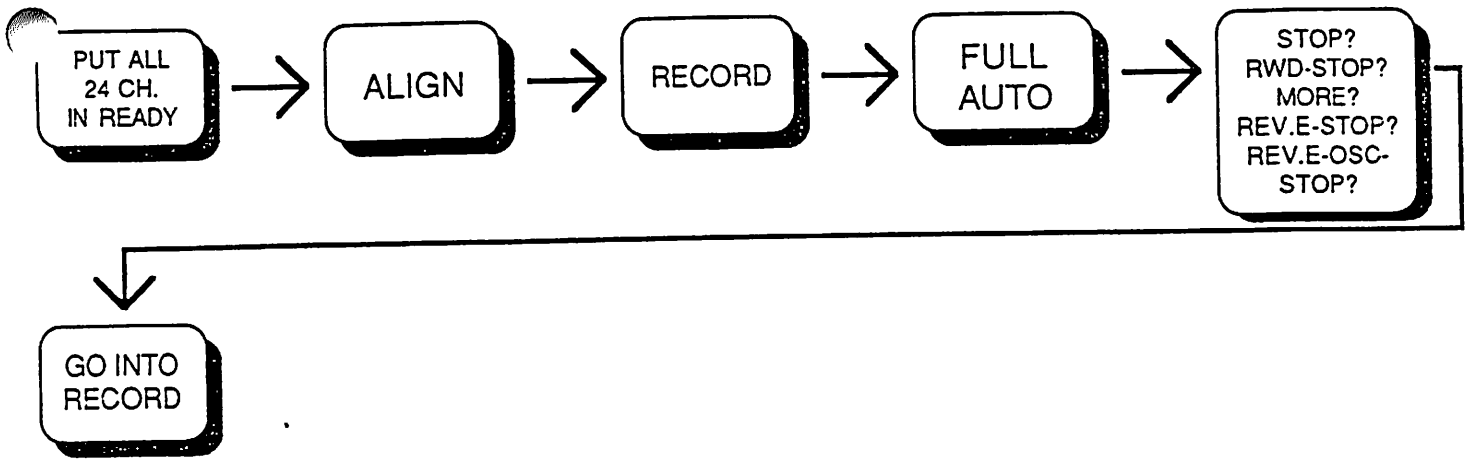
MANUAL REPRO OF SINGLE CHANNEL



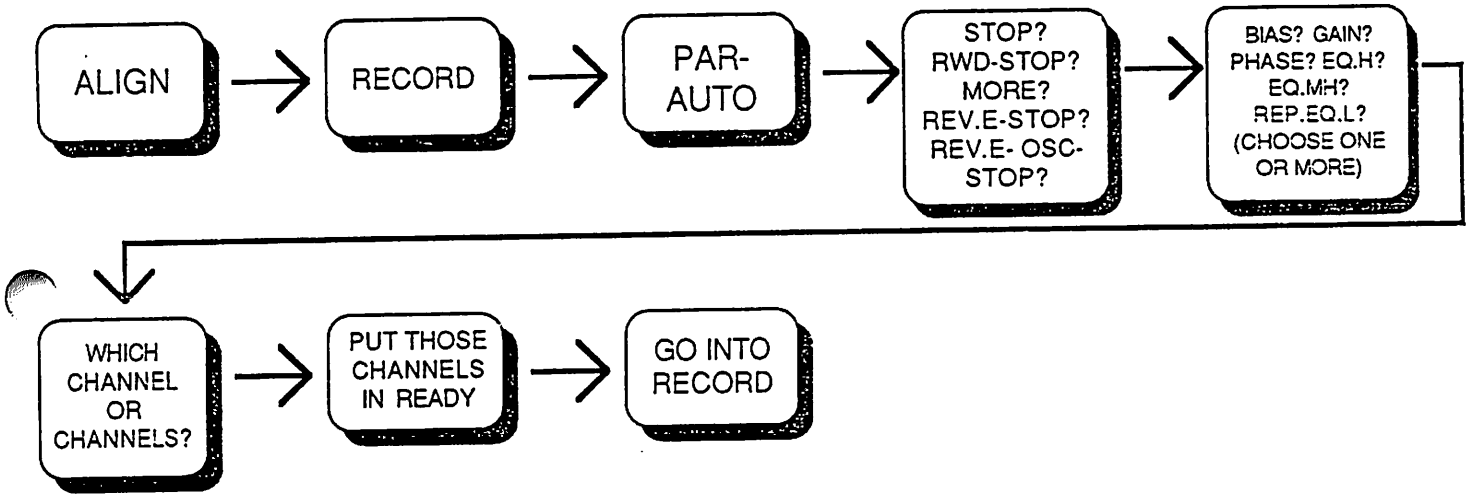
MANUAL REPRO FOR GROUP OF CHANNELS



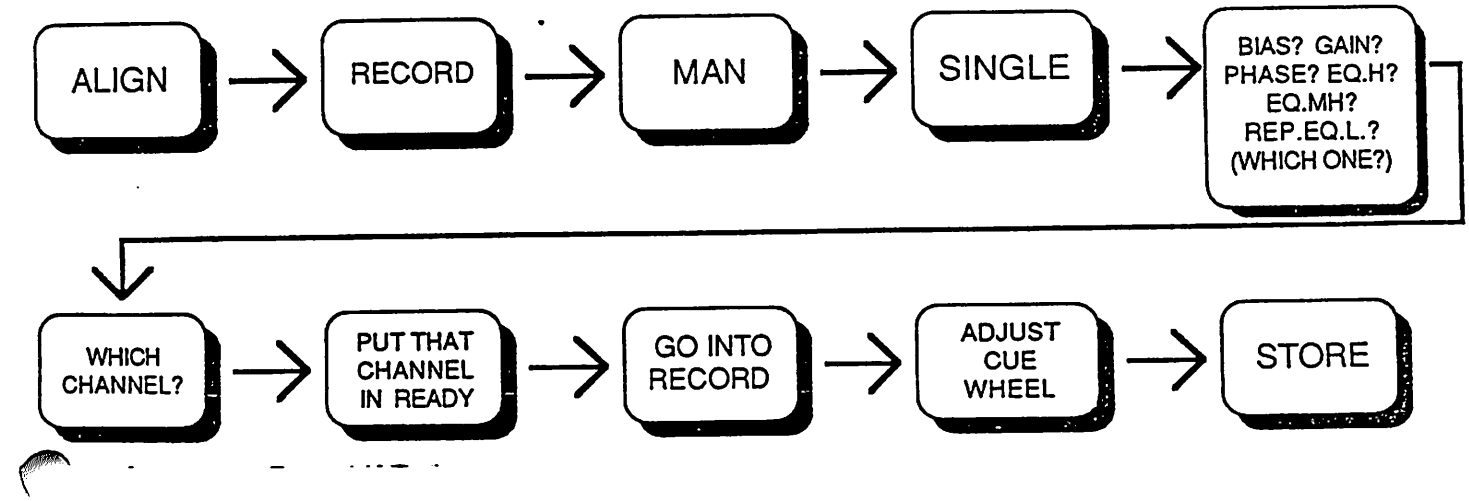
FULL AUTO RECORD



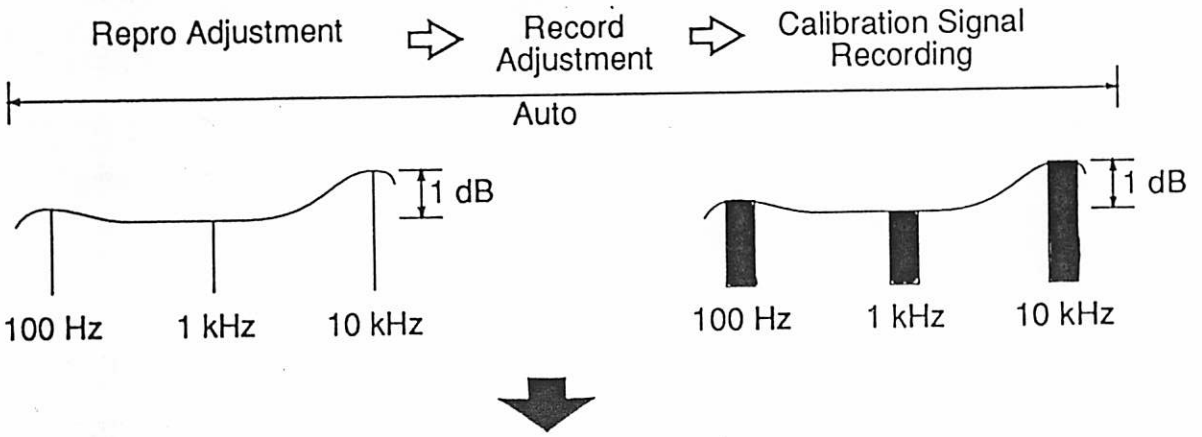
PARTIAL AUTO RECORD



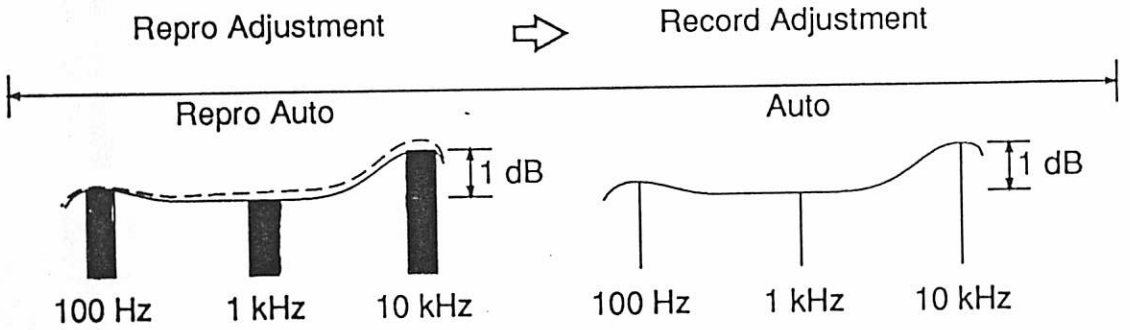
MANUAL RECORD OF SINGLE CHANNEL



STUDIO A



STUDIO B



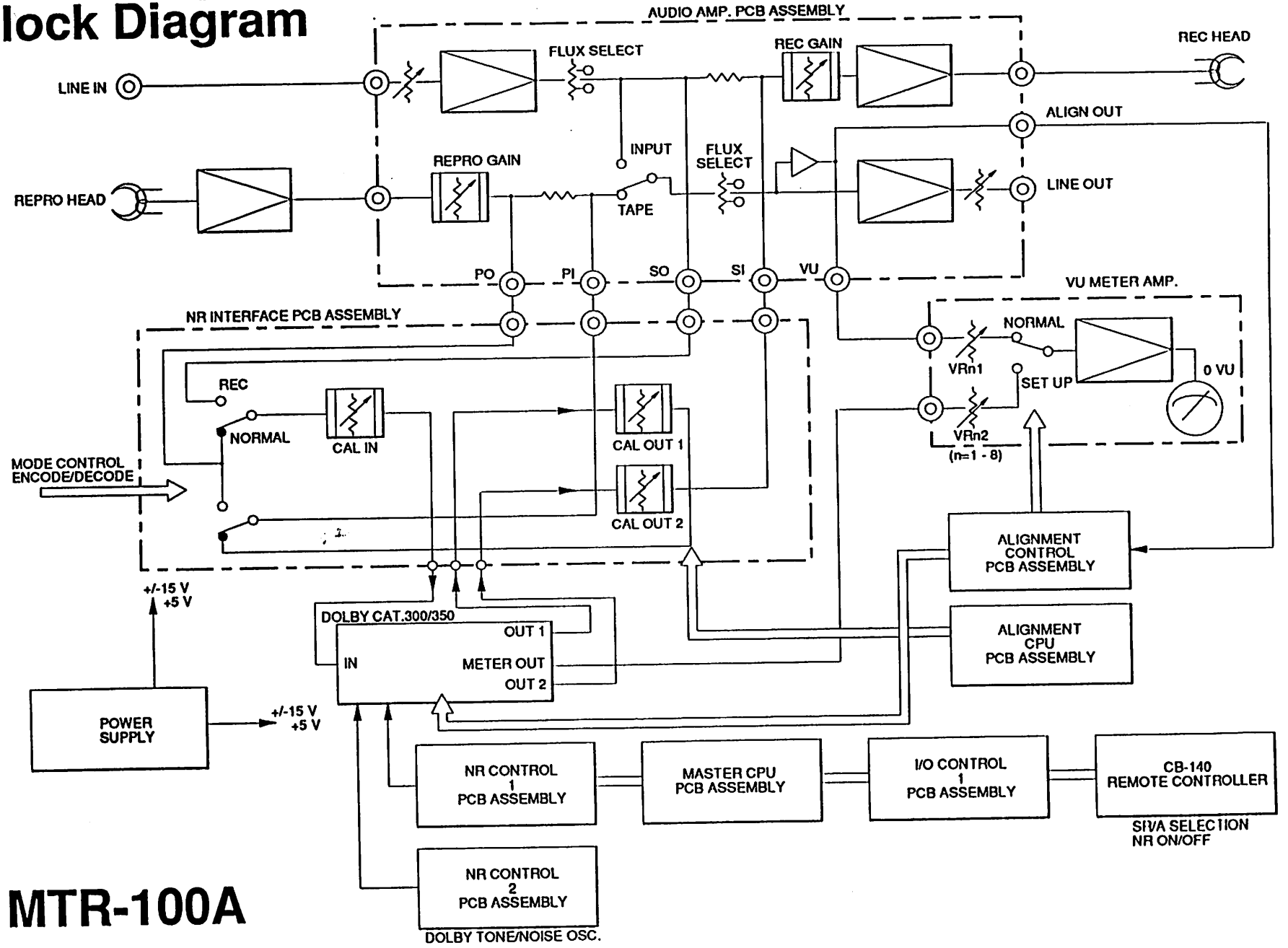
Incorporating Noise Reduction Unit into Tape Recorder

Advantages

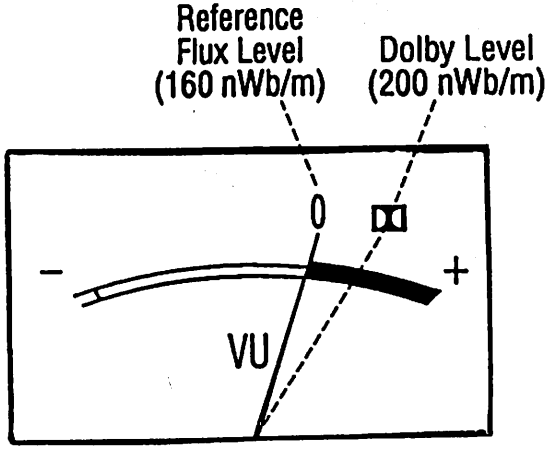
Built-in NR System

* does not reqire additional Input/Output stages that may deteriorate sound quality.
* minimizes cable loss.
* does not require space outside the machine.
* attains higher reliability due to direct controlling.

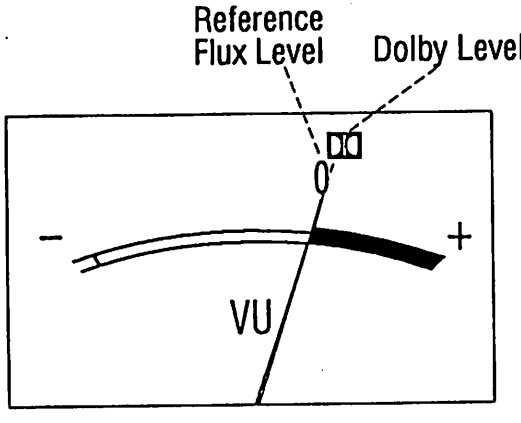
Audio Amplifier with Noise Reduction System Block Diagram



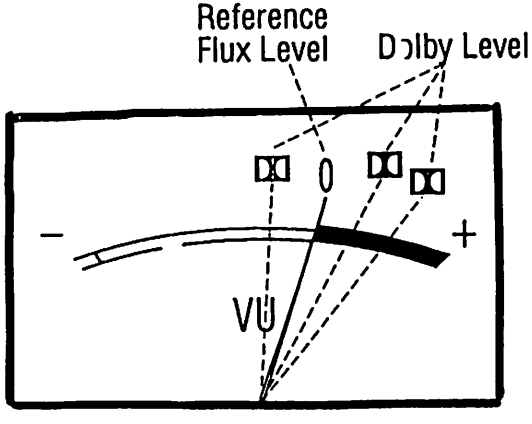
MTR-100A



Cassette Tape Recorder

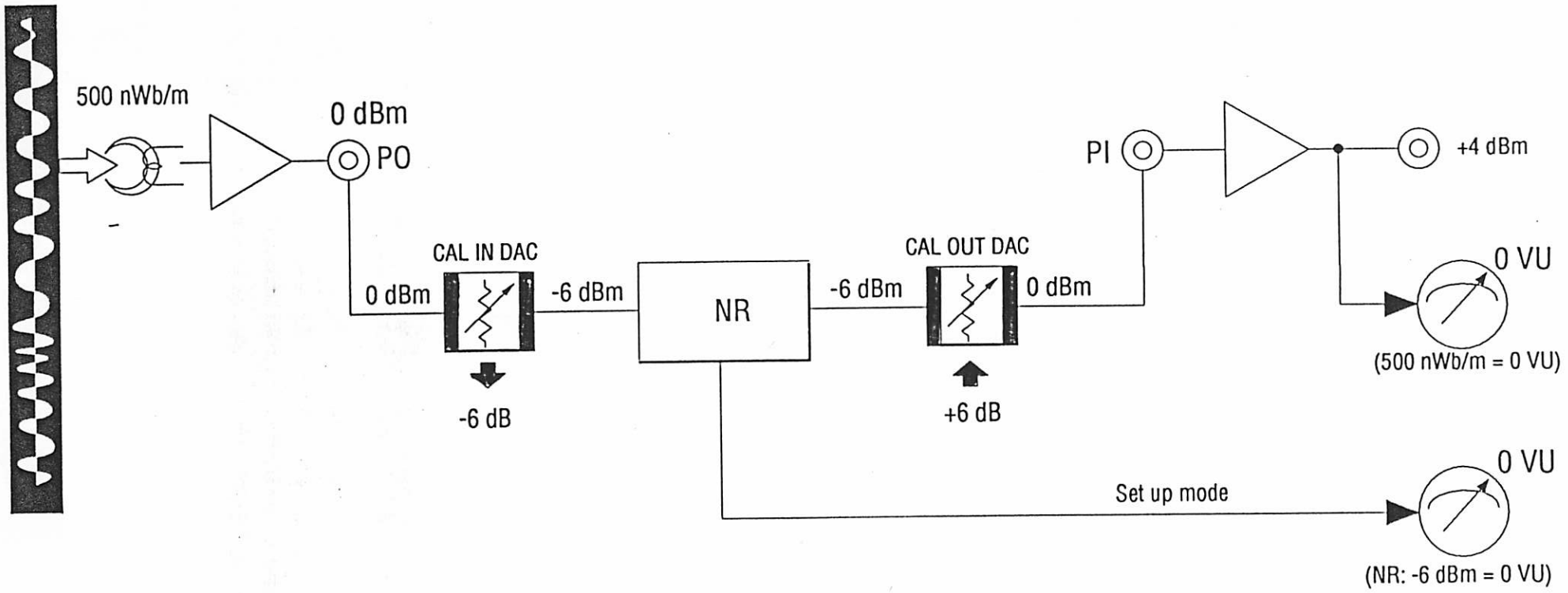


MTR-100A
SAME mode

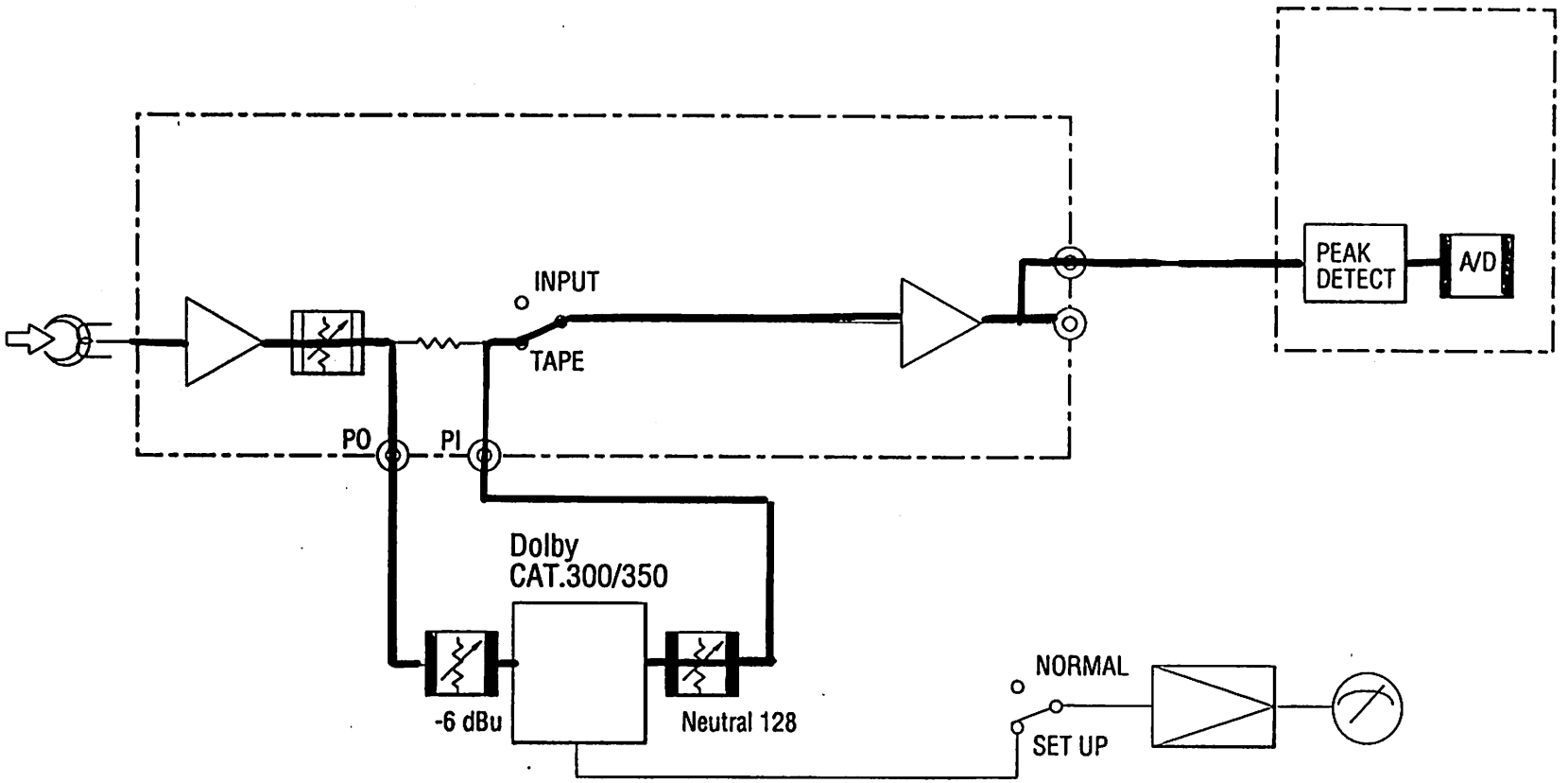


MTR-100A
Independent NR Flux Level
Selection (185, 200, 250,
250,"250","320", or 370)

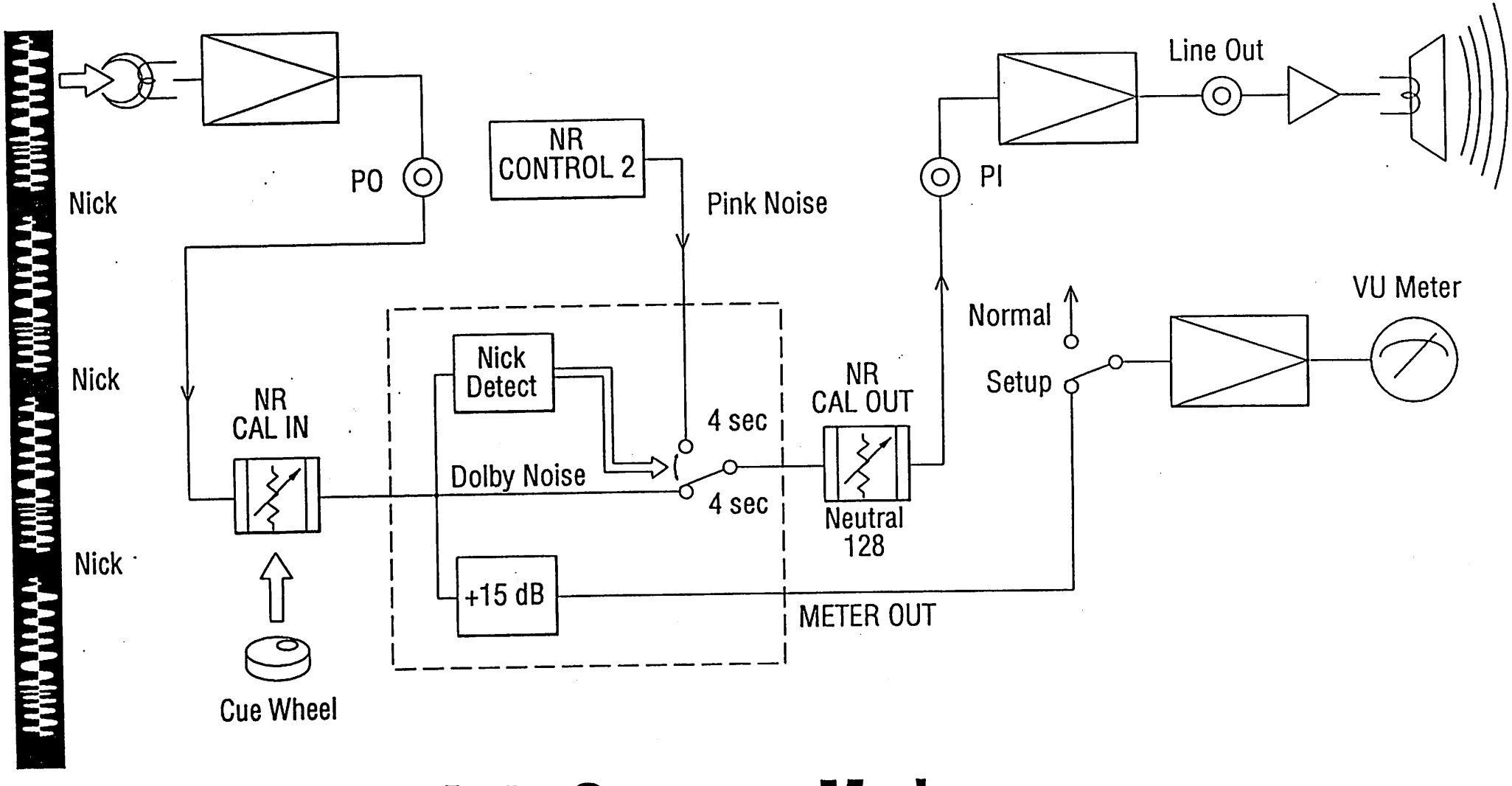
Dolby Level & Reference Flux Level



NR Flux Selection

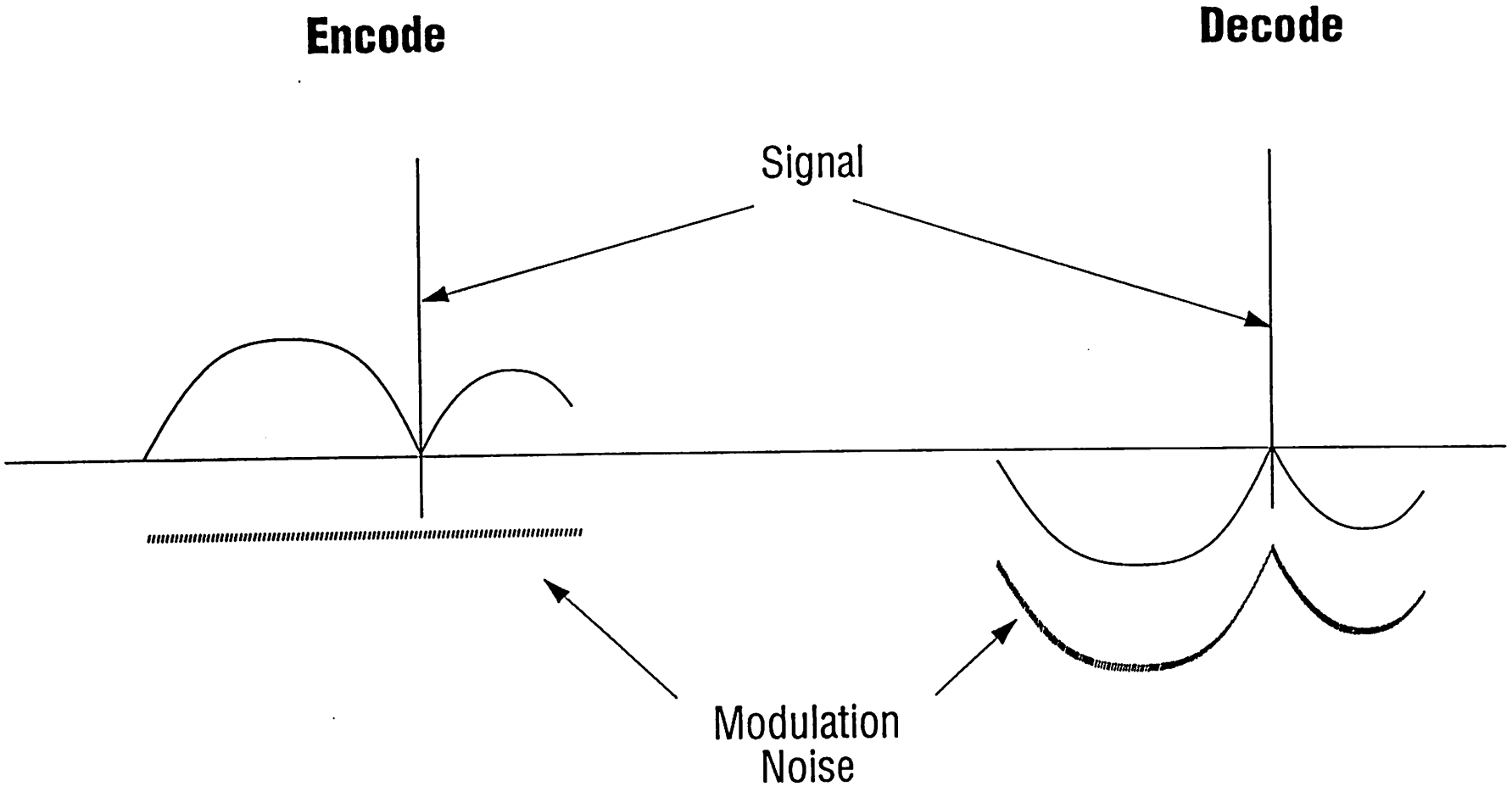


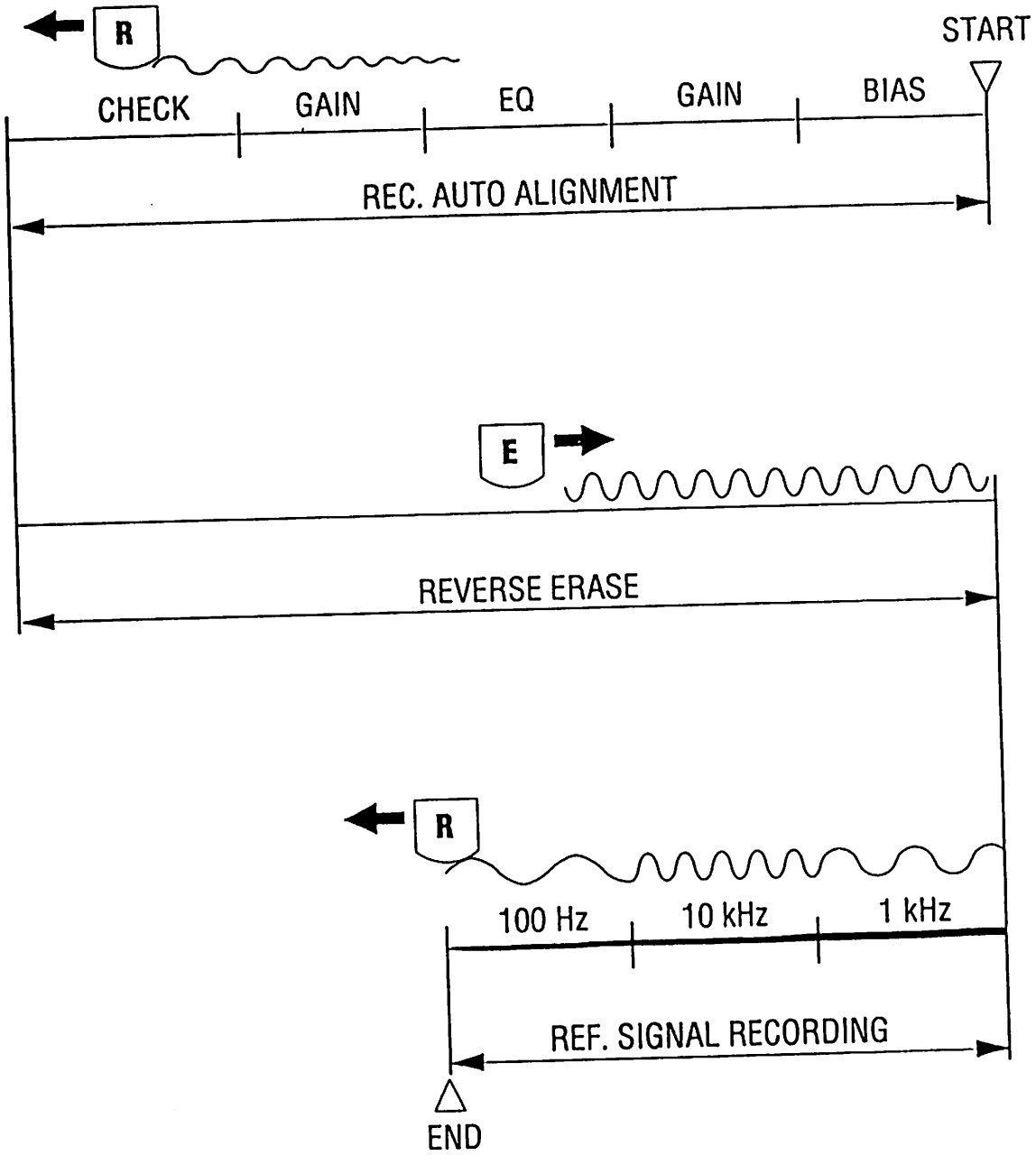
NR Alignment Mode



Auto Compare Mode

SR Filtering




R
START
CHECK
GAIN
EQ
GAIN
BIAS
REC. AUTO ALIGNMENT
E
REVERSE ERASE
R
100 Hz
10 kHz
1 kHz
REF. SIGNAL RECORDING
END