SERIAL NO. 3191

ONKYO SERVICE MANUAL

STEREO CASSETTE TAPE DECK

MODEL TA-2090

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO®
AUDIO COMPONENTS

SPECIFICATIONS

Track Format:	4 tracks, 2 channels
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec. (1-7/8 i.p.s)
Wow & Flutter:	0.02% (WRMS)
Frequency Response:	20–18,000Hz (25–17,000Hz ± 3dB) (normal position tape) 20–20,000Hz (25–19,000Hz ± 3dB) (high position tape) 20- 22,000Hz (25–21,000Hz ± 3dB) (metal position tape)
Signal-to-Noise Ratio:	60dB (metal position tape, Dolby NR out). A noise reduction of 10dB above 5kHz and 5dB at 1kHz is possible with Dolby B NR. A noise reduction of 20dB at 5kHz is possible with Dolby C NR. A noise reduction of 30dB is possible with dbx NR.
Input Jacks:	Mic jacks: 2 Input sensitivity: 0.3mV/600 ohms Input impedance: 5 kohms Line IN: 2 Input sensitivity: 60mV Input impedance: 50 kohms DIN In Jack: 1 Input sensitivity: 0.1mV/1 kohm Input impedance: 2.7 kohms

Outputs:	Line OUT: 2 Std output level: 1100mV (odB) Optimum load impedance: over 10 kohms Headphone Jack: 1 Optimum load impedance: 8--200 ohms DIN Out Jack: 1 Standard output level: 1100mV (at OdB) Opt load impedance:over 10 kohms
Motors:	Brushless DD motor: 1 DC motors: 2
Heads:	Rec/PB: Sendust combination Erase: Dual gap ferrite
Semiconductors:	TR:130 Diodes:68 IC:38 LED:33
Power Consumption:	47 watts
Dimensions:	450(W) x 100(H) x 392(D) mm (17-11/16" x 3-15/16" x 15-7/16")
Weight:	9 kg. (19.8 lbs.)

- Specifications and external appearance are subject to change without notice because of product improvements.

SERVICE PROCEDURES

1. Instulation resistance measurement

Connect the insulating-reistance tester between the plug of power supply cord and chassis.
Specifications;500 V more than 10 MΩ

2. Replacing the lamps

This unit used the lamps listed below.

Circuit No.	Parts No.	Description
Mechanism ⑥	24606173	50mA,14V.Lamp
PL701	210090	150mA,14V.Lamp

CAUTION:Before replacing the lamps, be sure to unplug the power supply cable.

FEATURES

3-Head Configuration

Having three heads is a must for all serious recordists because it allows monitoring the just-recorded signal while the recording is in progress. Another advantage is that the recording and playback head gap widths can be optimized for their respective tasks. To further enhance performance, the recording and playback heads are made of Sendust.

3 Motors with Direct-Drive Capstan Motor

Tape is driven by a brushless direct-drive motor. A second motor drives the reel tables and a third motor moves the head assembly up and down. This lowers wow and flutter to an insignificant 0.02% (WRMS).

Real Time Tape Counter

The electronic tape counter shows either the elapsed time during playback or recording or the time remaining until the end of the cassette in minutes and seconds.

Dolby B and C NR, dbx NR and Dolby HX Pro

This unit has all three of the most frequently used noise reduction systems, Dolby B NR, Dolby C NR and bdx NR, to meet all kinds of recording needs. This deck also has Dolby HX Pro to help prevent tape saturation and allow a tape to contain a wider dynamic range.

Fully Automatic ACCUBIAS

To fine tune the recording bias to the optimum point, simply put the deck in the rec/pause standby mode and press the ACCUBIAS button.

Multiple Mode Display for Six Deck Operating Modes

The head block position and tape speed are each shown in a graphic format by a total of six LEDs to permit quick confirmation of the current deck mode.

Auto Music Control System (A.M.C.S.)

The AMCS automatically locates the beginning of every song on a cassette in either the forward or the reverse direction. When the forward AMCS button is pressed during the play mode, the tape is rapidly wound to the beginning of the next song and the first 10 seconds (approximately) is played. Then the tape is rapidly wound forward to the beginning of the next song and about 10 seconds is played again. This process continues until the PLAY button is pressed to cancel AMCS operation and return to normal playback. When the reverse AMCS button is pressed during the play mode, this process is performed in the reverse direction.

Bright Fluorescent Peak Hold Level Meters

The colorful left and right peak hold level meters react instantaneously to changes in signal level and a peak-hold system maintains peak readings for a second to make sure you don't miss potentially harmful input signals when setting the recording level.

Single Song, Whole Side and Block Repeat Modes

With this deck, you have a choice of three ways to play a tape repeatedly: (1) Single repeat for one song: (2) Full repeat for an entire cassette side: (3) Block repeat for a section of the cassette between the [0:00] counter reading and any other counter reading.

Auto Space Rec Mute Button

This button lets you insert unrecorded sections five seconds in length with one touch simplicity.

Remote Control Unit Connector

With an optional remote control unit (such as the RC-5T), this unit can be controlled even while you are relaxing in your favorite chair. All transport modes are included: record, play, fast forward, rewind, stop and pause.

DESCRIPTION OF THE LM6402H-425 MICRO COMPUTER (DECK MECHANISM CONTROL)

1. ACCU BIAS operation

In more conventional optimum bias adjustment systems, ACCU BIAS operations were performed almost entirely by hardware. In the TA–2090, however, the major operations are handled by microcomputer. And in addition to the 5-bit D/A converter which enables greater accuracy in the adjustments, an operation which resembles successive comparisons is executed to further reduce the adjustment time. See Figure 1 for the block diagram.

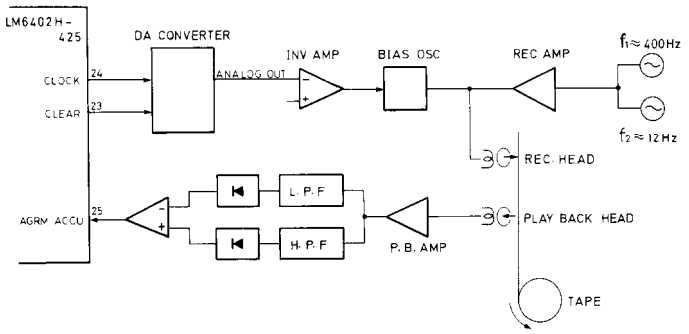


Fig. 1 ACCU BIAS block diagram

When the ACCU BIAS operation is started, a 400Hz/12kHz mixed signal is recorded, the bias current in this case being controlled by a signal from the microcomputer. The playback signal is separated by filter into the original 400Hz and 12kHz signals, and after being rectified these signals are passed to a comparator where a comparison check is made to see if one of the signals is greater than the other. A HIGH comparator output indicates that the 12kHz signal is greater than the 400Hz signal, and a LOW output indicates that the 400Hz is lower than the 12kHz.

Although the bias was changed one step at a time from greater bias levels to smaller levels in more conventional systems, this would involve twice the amount of time if a 5-bit D/A converter was used. For this reason, optimum bias is found by the following method in the TA–2090.

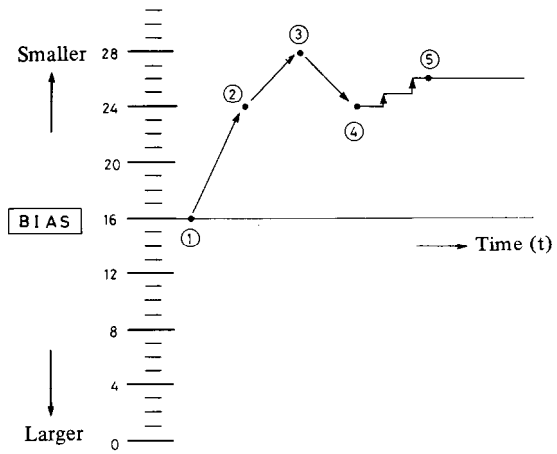


Fig. 2 Bias adjustment method

First the bias is set to step 16 which is in the center of the bias range shown in Figure 2. Then the 400Hz/12kHz mixed signal is subjected to a comparison operation to see which component is larger. If the 12kHz signal is larger, then the bias level is too small. If the 400Hz signal is larger, on the other hand, the bias level is too large. In the example shown in Figure 2, the bias level at step 16 is too large, so the bias is reduced by ¼ of the total range (8 steps) to position (2) where the 400Hz and 12kHz components are again compared. If the 400Hz signal is still larger than the 12kHz signal, the bias level is further reduced by ⅛ of the total (4 steps) (3) and the components then compared again. This procedure is used for rough adjustment of the optimum bias. If at this stage, the 12kHz signal is now found to be greater than the 400Hz signal, the optimum bias is known to exist between steps 24 and 28. The operation is now switched to fine adjustment – the bias is increased by ⅛ and then reduced one step at a time from step 24. The step where the component signal size relationship is switched from 400 > 12k to 12k > 400 is taken as the optimum bias (5), and the bias is set at this level. This fine adjustment operation proceeds only from greater to lower bias levels in order to avoid misoperation due to possible drop outs. The effects of a drop out on the bias adjustment when the bias is changed from a smaller to a larger level is indicated in Figure 3, while the reverse case is indicated in Figure 4.

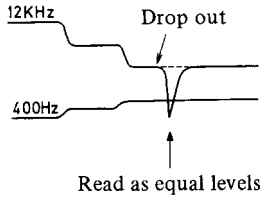


Fig. 3 Example of misoperation caused by drop out

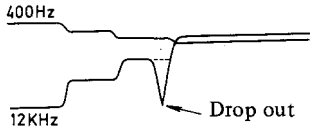


Fig. 4 Example where effect of drop out is avoided

2. DA Converter and Data Setting Method

The D/A converter circuitry is outlined in Figure 5, and the logic diagram of the 4024BP 7-stage binary counter in Figure 6. The 4024BP counter is counted up each time a negative input pulse is applied to the clock pin, the output data being obtained from Q1 thru Q7 (although only Q1 thru Q5 are actually used). This output is converted to an analog quantity when passed through the R–2R rudder resistance circuit.

If the power supply voltage is 5V, the voltage per step is approximately 0.156V with a total of about 4.84V. Since this 4024BP is only involved in up counting, setting to a value lower than the current value (that is, greater bias) results in an initial clearing and output of pulses until the set value is reached.

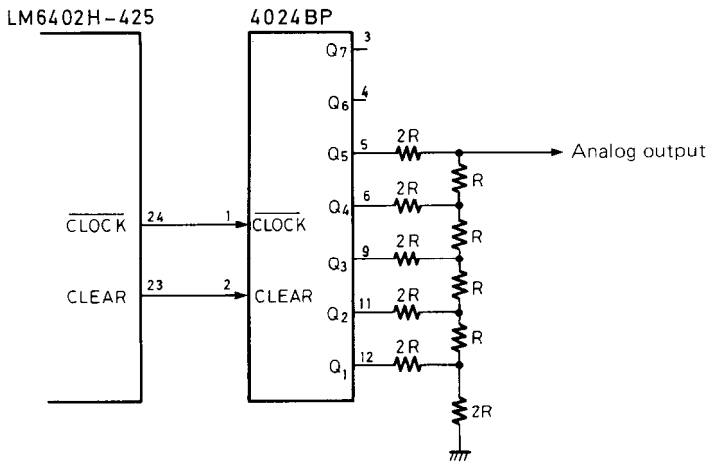


Fig. 5 DA converter circuitry

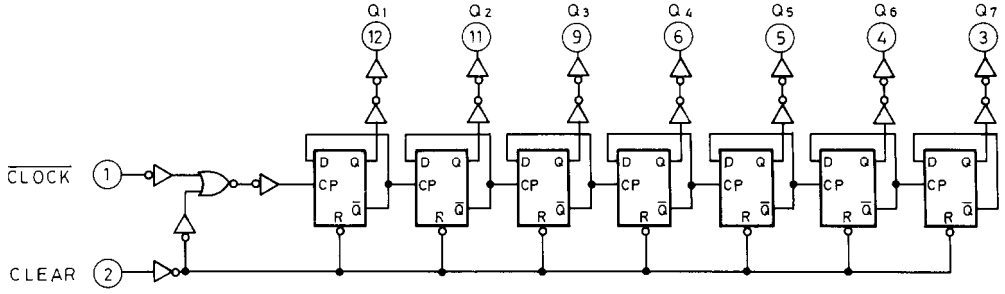


Fig.6 4024BP logic circuit

3. Input Port Expander IC

The equivalent circuit of the LC7800 used to expand input ports is shown in Figure 7. This IC includes four 4-bit input ports, one 4-bit output port, and one 4-bit selector input port. When BA of the selector input is set to LOW and the other bits to HIGH, the A0" A1" A2" A3 input port is connected to the D0" D1" D2" D3 output port. And if only the BB bit is set to LOW, the B0" B1" B2" B3 input is selected. Hence, a LOW level signal is applied to the selector port bits in cyclic order, and the operation indicator LEDs are switched on and off dynamically in combination with the #13, #14, and #15 LED output ports while input port data is being read out.

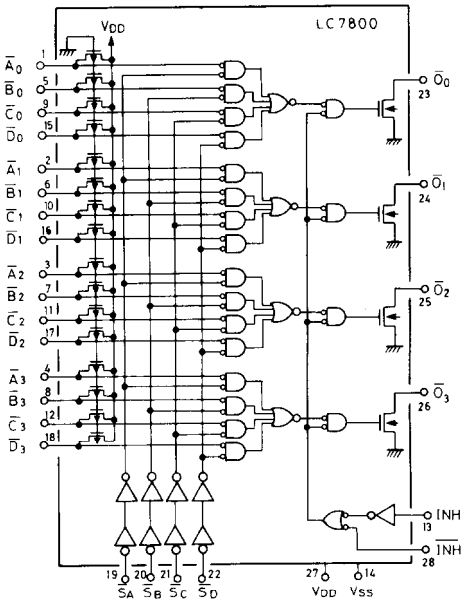
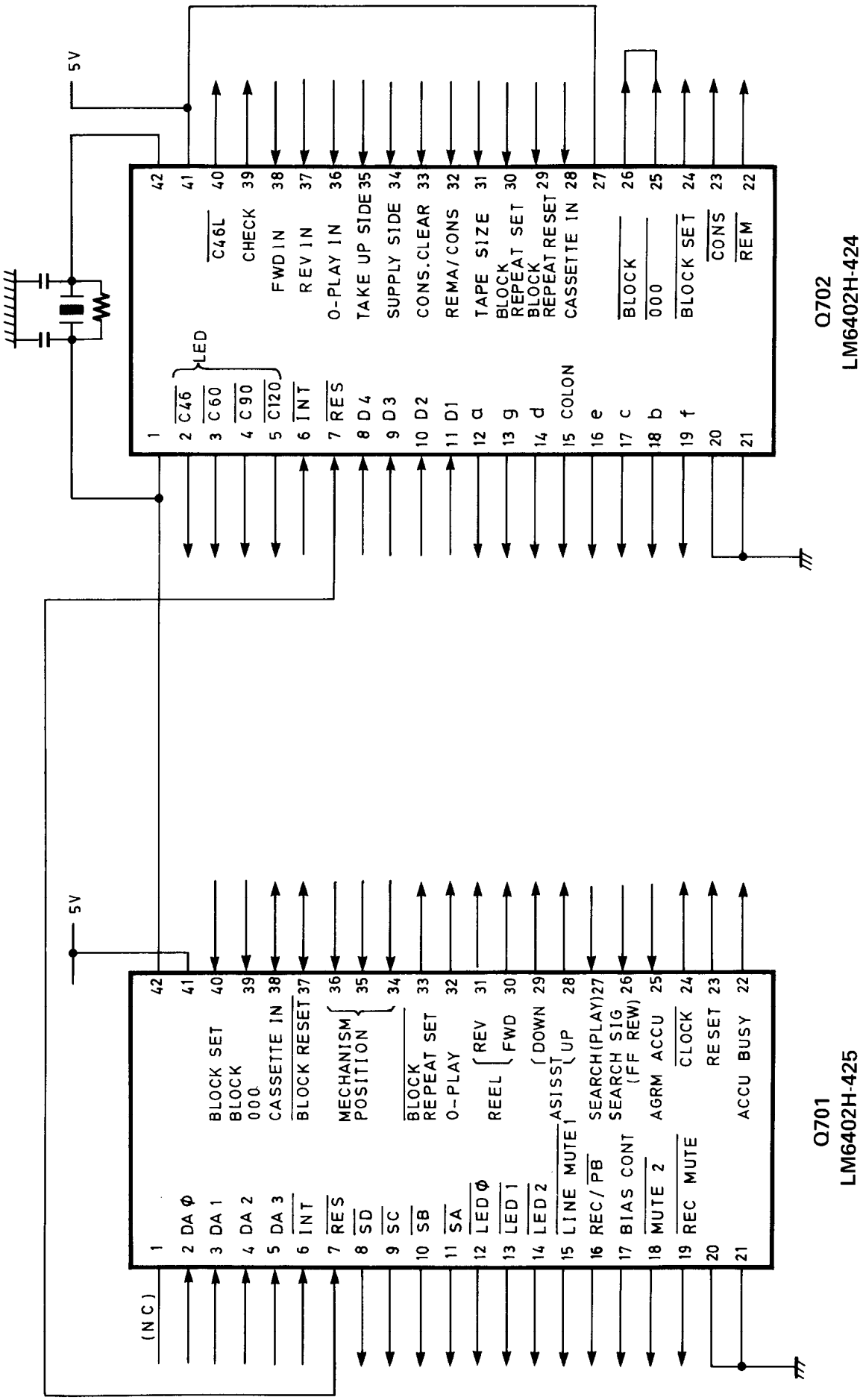


Fig. 7 LC7800 equivalent circuit

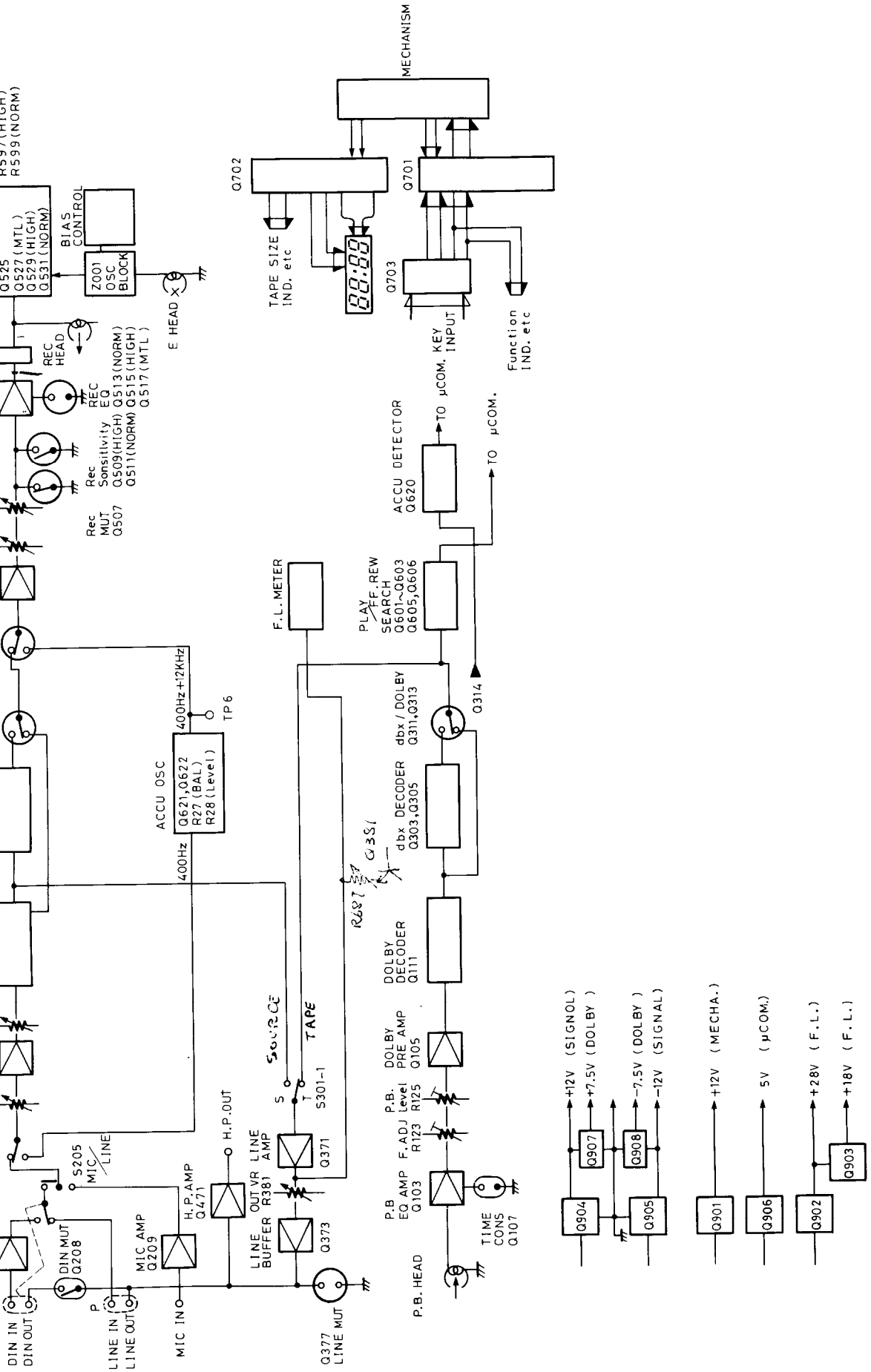
LM6402H-425 PIN ALLOCATION

Pin no.	Name	Function	Classification
2~5	DA0~DA3	Reading of data from the inport port expander IC	IN
6	$\overline{INT}$	Rotation signal input (for auto-stop operation)	IN
8~11	$\overline{SA}$.~$\overline{SD}$	Input port expander IC and dynamic LED selector IC	OUT
12~14	$\overline{LED0}$~$\overline{LED3}$	Operation display dynamic LED data output	OUT
15	$\overline{LINE\ MUTE\ 1}$	Line muting output signal generated when the power is switched on, and during ACCU BIAS operation.	OUT
16	REC/PB	Output signal for muting DIN outputs when recording	OUT
17	BIAS CONT.	Output signal for control of bias oscillator	OUT
18	$\overline{MUTE2}$	Signal for switching muting off during playback	OUT
19	$\overline{REC.\ MUTE}$	Signal for muting the recording amplifier output	OUT
22	ACCU BUSY	Output signal generated during ACCU BIAS operation	OUT
23	RESET	Signal for resetting the D/A converter	OUT
24	CLOCK	Signal for setting data in the D/A converter	OUT
25	AGRM ACCU	ACCU BIAS matching input	OUT
26	SEARCH SIG (HIGH)	Input signal from high-speed travel tune-selector.	IN
27	SEARCH SIG (LOW)	Input signal from low-speed travel tune-selector amplifier	IN
28	UP	Output signal for driving the assist motor towards the PLAY position.	OUT
29	DOWN	Output signal for driving the assist motor towards the FF/REW position.	OUT
30	FWD	Output signal for driving the reel motor towards the FF position.	OUT
31	REW	Output signal for driving the reel motor towards the REV position.	OUT
32	O-PLAY	Reel motor torgue switching output	OUT
33	$\overline{BLOCK\ SET}$	Output which informs the counter IC that the BLOCK SET key has been pressed.	OUT
34~36	a.b.c	Input ports for signal from the mechanism position switches	IN
37	BLOCK RESET	Output which informs the counter IC that the BLOCK RESET key, or any other key apart from the BLOCK SET key has been pressed.	OUT
38	CASSETTE IN	Input involved in detection of cassette half. and output which stops the capstan motor when an abnormal mechanism status is detected.	I/O
39	$\overline{BLOCK\ MATCHING\ \&\ 000\ INPUT}$	Input of 000 input signal and BLOCK matching signal from the counter IC.	IN
40	$\overline{BLOCK\ SET}$	Input which accepts signals from the counter IC during BLOCK SET.	IN

MICRO COMPUTER

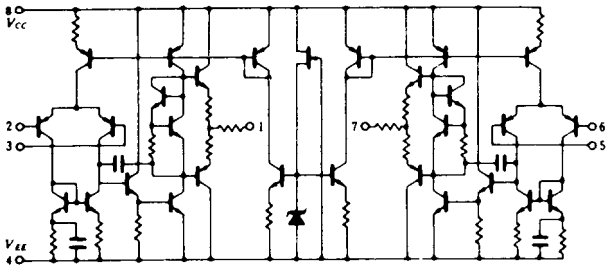


BLOCK DIAGRAM

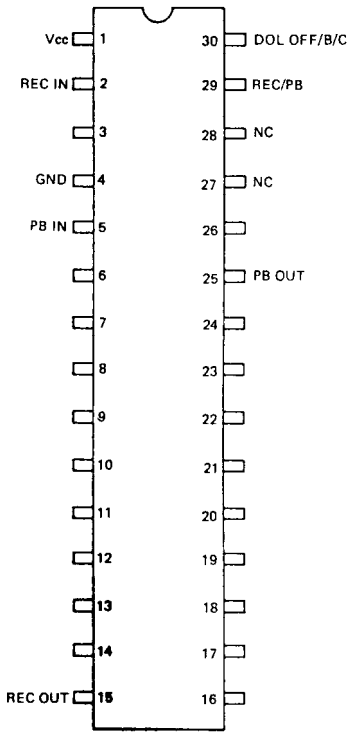


BLOCK DIAGRAM OF IC

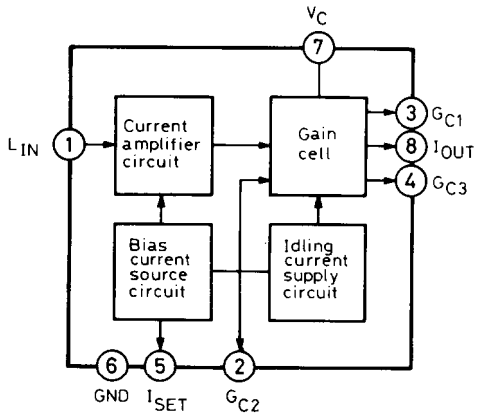
NJM4558, 4559, 4560 (Operation amplifier)



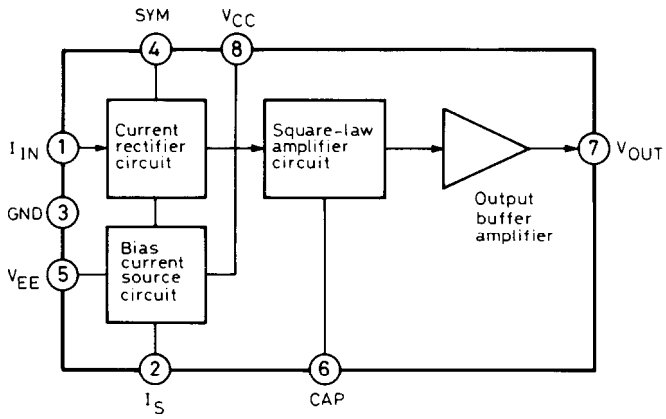
HA-12058 NT
(DOLBY B & C TYPE NOISE REDUCTION SYSTEM)



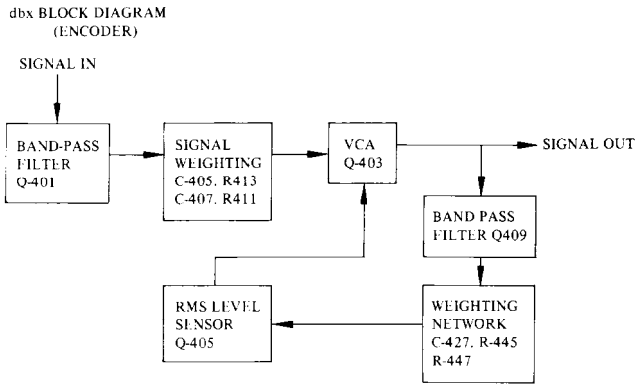
μPC1252H2 (DBX)

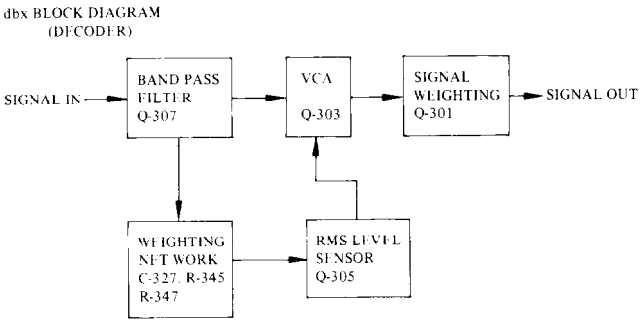


μPC1253H2



BLOCK DIAGRAM OF DBX





SIGNAL WEIGHTING

Encoder side: Pre-emphasis Decoder side: De-emphasis Pre-emphasis raises the high frequencies of the input signal and de-emphasis returns the high frequencies to their original levels during playback. In addition to reducing overall noise, the effect of this process is to provide even more powerful high end noise reduction.

WEIGHTING NETWORK

This lowers the amount of VCA amplification for signals having a high degree of high frequency components in order to prevent distortion that would otherwise result if these high frequencies were recorded in the raised level set during pre-emphasis.

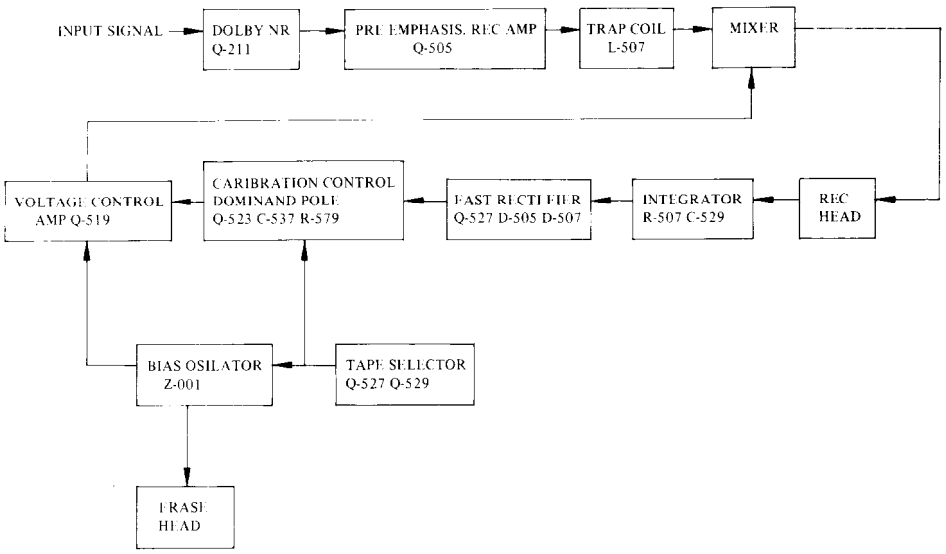
VCA (Voltage Controlled Amplifier)

An amp in which the amount of amplification is changed in a linear, logarithmic manner by the control DC voltage received from an external source. Serves to compress and expand the dynamic range of the input signal.

RMS LEVEL SENSOR

Detects the effective value (root mean square value) of the input signal and converts it into a DC voltage proportional to the logarithm of that level.

BLOCK DIAGRAM OF HX PRO

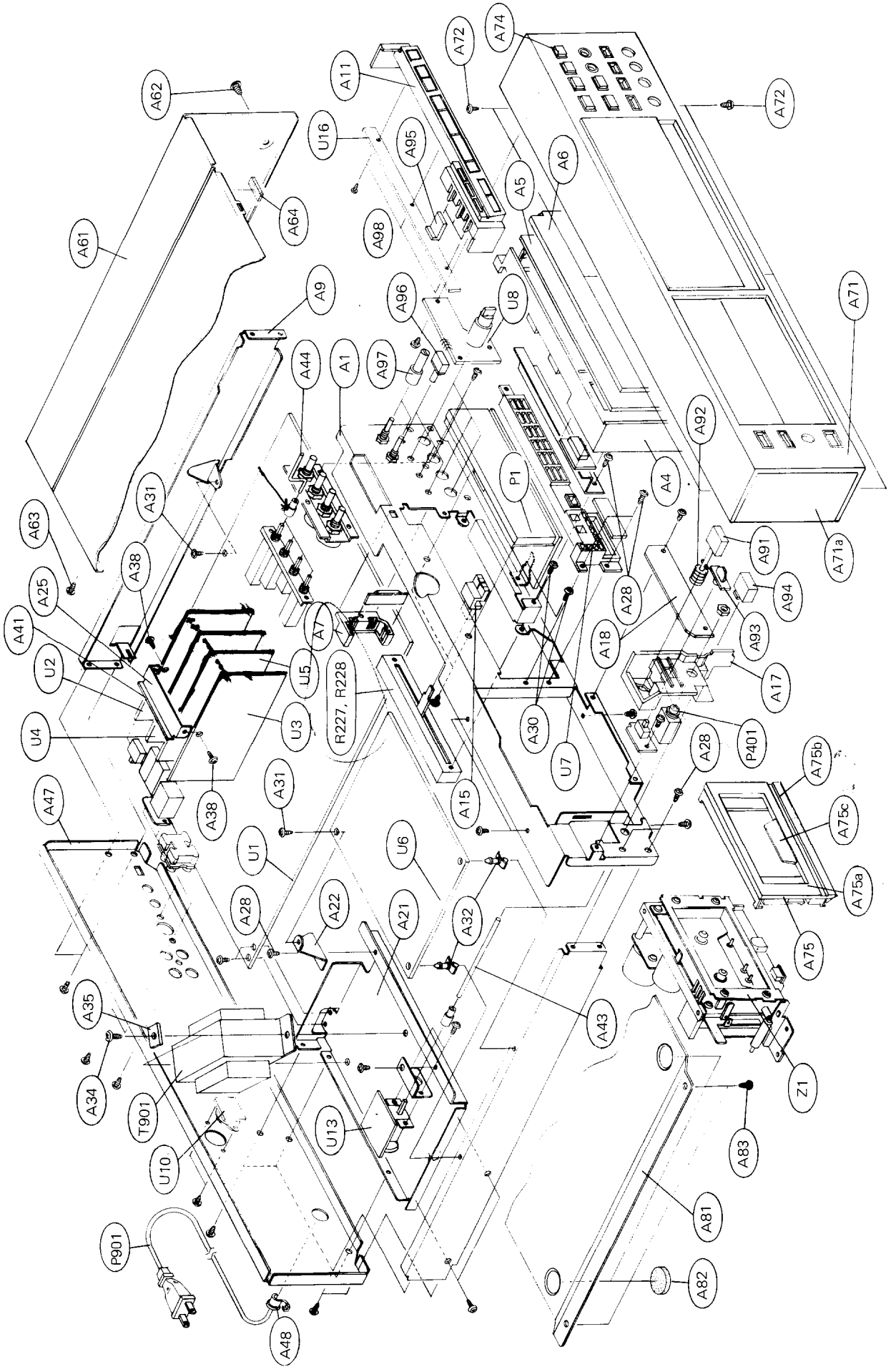


Dolby HX Pro

*** Principle**

Prevents disruption of flat frequency response caused by the biassing effect of high frequencies by continuously adjusting the bias current in response to the amount of frequencies over 10kHz in the signal being recorded.

CHASSIS-EXPLODED VIEW



CHASSIS-EXPLODED VIEW PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
A1	27110224A	Front bracket
A4	27190293	Holder
A5	28133106A	Back plate
A5a	28199126A	Film
A6	28191263A	Clear plate, edge
A7	27190295	Holder, lamp
A9	27115164A	Side bracket
A11	28321625	Knob ass'y
A12	27262300	Plate
A14	27300702	Plate, slide volume
A15	28321640A	Knob, slide volume
A16	27180218	Spring, ground
A17	27190296A	Holder H
A18	28175093	Insulator plate
A19	27150186	Shielded plate
A20	87643008	W3x8F (BC), Flat washer
A21	27130362A	Bracket, power transformer
A22	27140917	Bracket S
A24	27140918	Bracket D
A25	27140919	Bracket U
A26	27140577	Bracket DIN
A27	833420068	2TTP+6B (BC), Tapping screw
A28	834430068	3TTS+6B (BC), Tapping screw
A29	834426068	2.6TTS+6B (BC), Tapping screw
A30	82143006	3P+6FN (BC), Pan head screw
A31	831430088	3TTW+8B (BC), Tapping screw
A32	27190009	Holder
A34	830440109	4TTC+10C (BC), Tapping screw
A35	870065	Special washer
A36	86414010	FWN4x10FN, Flange nut
A38	880009	Rivert
A39	262011	Tape, silver
A40	28140555	10x36x3mm, Cushion
A41	28140559	10x55x10mm, Cushion
A43	27260148	Shaft
A44	27260150A	Shaft P
A47	27120624	Back panel D
	27120625	Back panel G
	27120626	Back panel W
⚠ A48	270025	SR-3P-4, Strainrelief D SR-4K-4, Strainrelief G/W
A50	801230	3STS+8BQ (BC), Tapping screw
A51	834430108	3TTS+10B (BC), Tapping screw
A52	82142604	2.6P+4F (BC), Pan head screw
A61	28184237	Top cover
A62	838440089	4TTB+8C (BC), Tapping screw
A63	838430088	3TTB+8B (BC), Tapping screw
A64	28140408	3x10x36, Cushion
A71	11388121	Front panel ass'y
A71a	28125149	End cap L
A71b	28125150	End cap R
A71c	27267347	Guide E
A71d	27267279	Guide, power
A71e	28191264A	Clear plate
A74	28321674	Knob ass'y, repeat
A72	838430068	3TTB+6B (BC), Tapping screw
A73	838430088	3TTB+8B (BC), Tapping screw
A75	28400190	Casette lid ass'y
A75a	28400191	Window
A75b	27262301	Plate C
A75c	2191265	Clear plate C
A76	880009	Rivert

REF. NO.	PART NO.	DESCRIPTION
A81	27170180	Bottom board
A82	27175028	Leg
A83	834430068	3TTS+6B (BC), Tapping screw
A91	28321636A	Knob, eject
A92	27180179	Spring
A93	28321681	Knob, switch
A94	28321394	Knob, power
A95	28321673	Knob, tape
A96	28321637A	Knob, push
A97	28321638A	Knob S
A98	28321639A	Knob, output
P1	212024	LB135-L16XMC2T34, Level meter
P401	25045124	HLJ-4608-01-020, Stereo headphone terminal
⚠ P901	253097B	AS-UC-3, Power supply cord D
	253099B	AS-CEE, Power supply cord G/W
R227, R228	6142035	N100LG50KA25F, Resistor, variable, input level
⚠ S902	25065123	NSS-1258P, Voltage selector switch W
⚠ T901	230823	NPT-846D, power transformer D
	230824	NPT-846G, power transformer G
	230825	NPT-846D/G, power transformer W
U1	1138572	NAAF-2072, Main circuit pc board ass'y
U2	1138573	NADOL-2073, Dolby decoder pc board ass'y
U3	1138574	NADOL-2074, Dolby encoder pc board ass'y
U4	1138575	NADBX-2075, DBX decoder pc board ass'y
U5	1138576	NADBX-2076, DBX encoder pc board ass'y
U6	1138577	NACOC-2077, Control circuit pc board ass'y
U7	1138578	NADIS-2078, Display circuit pc board ass'y
U8	1138579	NASW-2079, Switch pc board ass'y
U9	1138580	NADIS-2080, Display circuit pc board ass'y
U10	1138581	NARM-2081, Remote control terminal pc board ass'y
U11	1138582	NASW-2082, Switch pc board ass'y
U12	1138583	NASW-2083, Switch pc board ass'y
U13	1138584	NASW-2084, Power switch pc board ass'y
U14	1138585	NAPL-2085, Edge light pc board ass'y
U15	1138586	NAVR-2086, Record caribration volume pc board ass'y
U16	1138587	NASW-2087, Switch pc board ass'y
Z1	244066	NDM-58, Tape mechanism ass'y

NOTE
D : 120V AC,60Hz
G : 220V AC,50Hz
W : 120 or 220V AC,50/60Hz

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CIRTICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

ADJUSTMENT PROCEDURES

PRECAUTIONS

1. Before adjustment, clean the following parts with an alcohol moinstend swab.
   - * record/playback head
   - * erase head
   - * pinch roller
   - * capstan
2. Do not use magnetized screwdriver for adjustments.
3. Demagnetize record/playback head with a head demagnetizer.

TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator
Digital frequency counter
Oscilloscope
Attenuator
AC voltmer DC volmeter voltmeter

Blank tapes (completely erased)

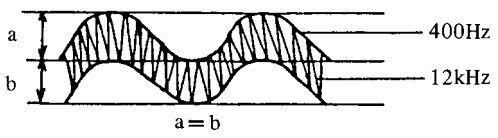
NORMAL ..... NEW UD 90
HIGH ..... NEW XL-II 90
METAL ..... NEW MX 60

Test tapes

VTT-658 : 10 kHz, —15 dB
MTT-111 : 3 kHz, —10 dB
MTT-150 : Dolby level calibration 400 Hz tone 200 nWb/m

	Item	Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1	Playback torque			TW-2111	PB	TW-2111	R761	35 to 55gcm	
2	Tape speed	Frequency counter to LINE output terminal		MTT-111	PB	Frequency counter	Semi-fixed on the moter	3,000 to 3,010Hz	
3	Head azimuth	AC voltmeter and oscilloscope to LINE output terminal		VTT-658	PB	AC voltmeter	Head azimuth screws	Maximum and same phase at channels L and R.	See fig. 1 Set the semi-fixed resistors R123 and R124 to center position.
4	Playback level	AC voltmeter terminals TP-3 and TP-4		MTT-150	PB	AC voltmeter	R125 (Ch. L) R126 (Ch. R)	580mV	
5	Meter			MTT-150	PB	Level meter	R687 R688	OdB indicator lights on	
6	Bias current	Fig. 2	400Hz, −20dB and 12kHz, −20dB	MAXELL UD-IC90	REC/PB	AC voltmeter	R599 (Ch. L) R600 (Ch. R)	Same level at REC/PB AND SAME LEVEL AT HX PRO ON/OFF	INPUT VOLUME ..... maximum HX PRO ..... ON NORMAL TAPE
		R563 & R564 MUST BE ADJUSTED TO COMPENSATE FOR 5 OR 6DB INCREASE BETWEEN HX PRO ON & OFF TOGETHER WITH R599 R600					R563 R564	~~Same level at HXPRO ON/OFF~~ +5 OR +6 dB	HX PRO ..... OFF NORMAL TAPE
				HIGH XL-IC90 METAL MXC-60			R597 R598 HIGH R595 R596 METAL	Same level at REC/PB	HXPRO ..... ON HIGH, METAL TAPE
7	Record level	Fig. 2	1kHz		REC PAUSE	AC voltmeter AC voltmeter	Attenuotor or AF OSC output R511 R512	775mV Same level at source and tape position of MONITOR switch	INPUT VOLUME ..... maximum ACCUBIAS ON/OFF ..... OFF

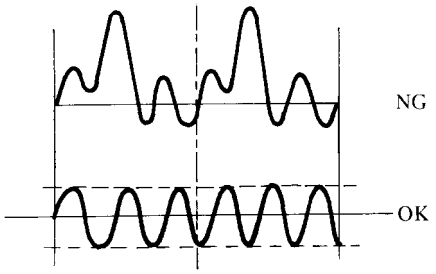
ACCUBIAS oscillator adjustment
Connect the oscilloscope and AC voltmeter to the terminal TP-6.
Set Rec. Cal. switch to on.
Adjust the semi-fixed resistor R27 so that the 400Hz and 12.5kHz mixing signals become same level (a=b) as shown below.
Adjust R29 so that the AC voltmeter indicator becomes 70mV.



DBX Adjustment

*** Encoder**

Receive a 1kHz signal through LINE and, when the LINE OUT output is 775mV, adjust R419 (Left) and R420 (Right) so that distortion is minimized as shown on a distortion meter connected to the output of TP (Left: J7 Right: J8) of NADBX-2076. At the same time, adjust so that the distortion waveform is as shown below (not more than 0.5%)
Then, lower the input level at TP by 10dB and confirm that the TP output goes down by 5dB (1/2 compression).



*** Decoder**

Input a 1kHz signal from the P.B. head input (p101) and adjust the input so at TP of NADBX-2075 (Left: J11 Right: J12) the level is between 500mV and 1V (R301 and R302 are centered). Then, as in the encoder section, adjust R319 (Left) and R320 (Right) so that distortion and the waveform are both minimized.
Then, lower the input level at TP by 10dB and confirm that the TP output goes down by 20dB (2X expansion).

*** Overall performance**

Input a 1kHz signal through LINE IN and, while recording that signal, adjust R301 (Left) and R302 (Right) of NADBX-2075 so that the level is the same for when dbx is in and out.

Operation Checks for Special Circuits

1. HX Pro

Record a 12.5kHz signal and, while playing it back, confirm that the level is raised by the following values when HX Pro is switched on compared with when HX Pro is left off:

Normal tape: 5 -- 6dB
High tape: 5 -- 6dB
Metal tape: 0 -- 1dB

2. dbx

Decode

With dbx out, record 1kHz at 0dBm and --10dBm, rewind the tape and play the tape with dbx in. At this time, the 0dBm should now be +7dBm and the --10dBm should be --13dBm (using normal tape).

Encode

With dbx in, record 1kHz at 0dBm and --10dBm, rewind the tape and play the tape with dbx out. At this time, the 0dBm should now be --3.5dBm and the --10dBm should be about --8.5dBm (using normal tape).

3. Accubias

Confirm that Accubias is set when using a standard tape, then record 15kHz at 20dBm and play it back. If the level when Accubias was set is within ±1.5dB of the level when Accubias was reset, the Accubias circuit is functioning properly.

4. Recording Calibration Adjustment Range

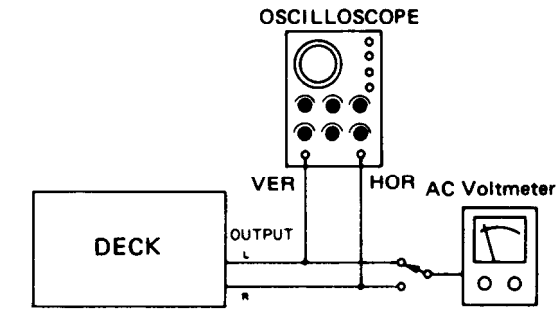
(Master VR Max, Preset Center)

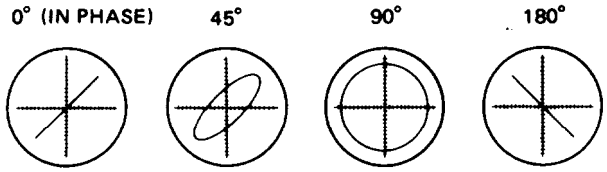
With the recording calibration on and the deck in the source mode, confirm that the meter is reading 0 to +1dB and make a recording. Then confirm that the meters fluctuate between +3dB and --3dB when the calibration VR is rotated back and forth while the recording is played back with the deck in the tape mode.

5. Preset VR Adjustment Range

(Master VR Max, Rec Cal Center)

Using the method described in section four, confirm that the meters fluctuate between +2dB and --2dB when the calibration VR is rotated back and forth.





Confirming phase relationship

fig-1

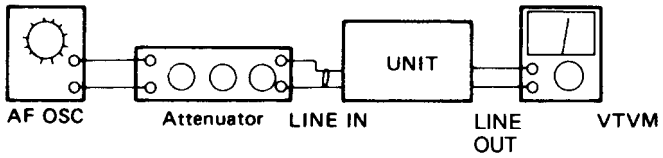
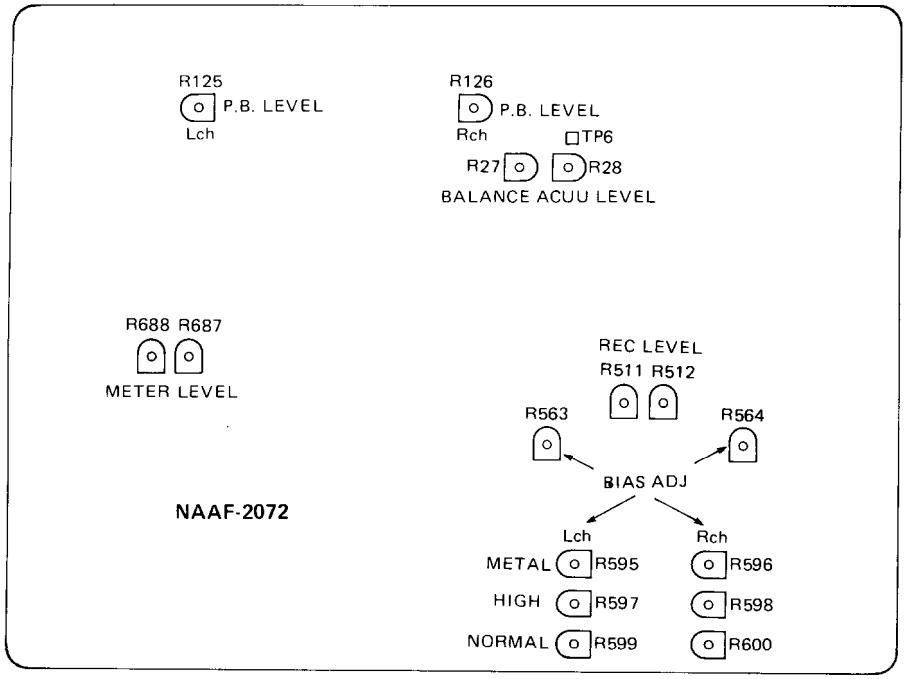
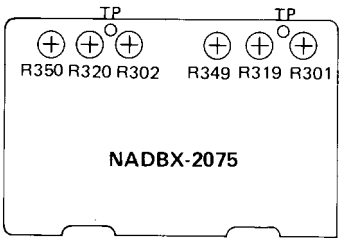
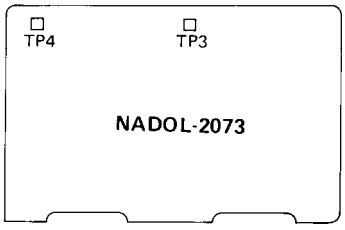
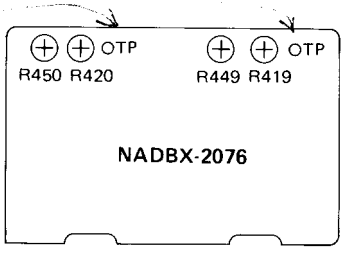


fig-2

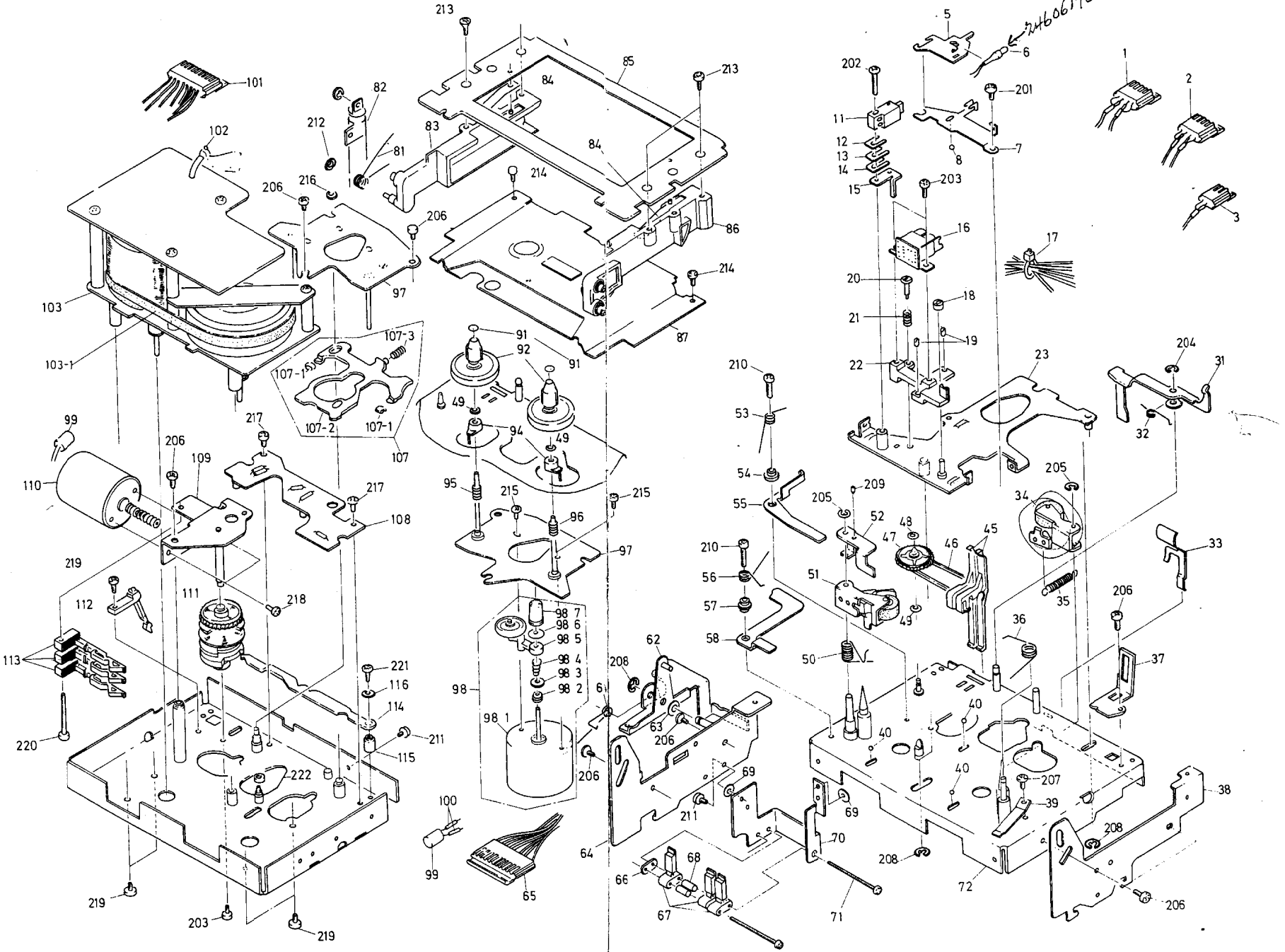








TAPE MECHANISM-EXPLODED VIEW

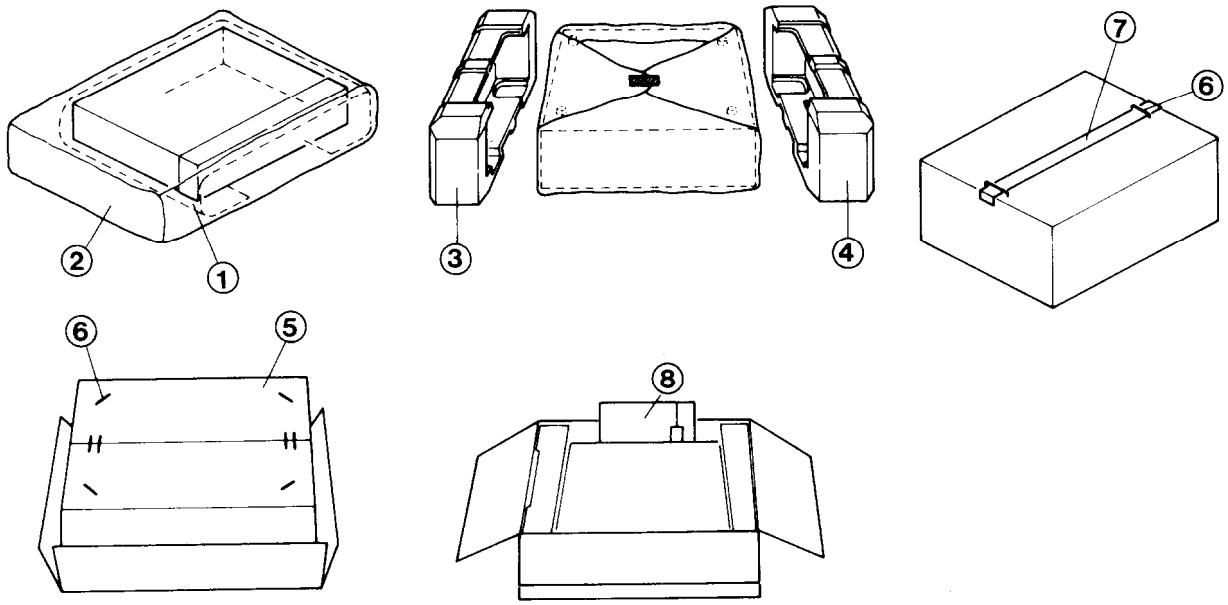


TAPE MECHANISM-PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
5	24610498	Holder, lamp
6	24606173	50mA, 14V, Lamp
7	24610669	Plate, holding, head
8	24610943	3mm, Steelball
11	24600047	Erase head
12	24611060	t0.06, Spacer
13	24611061	t0.03, Spacer
14	24611062	0.1t, Spacer
15	24610653	Plate, erase head
16	24600030A	Rec/pb head
18	24610495	Adjusting nut
19	801251	2x4mm, Screw
20	24610652	Shaft
21	24605502	Spring
22	24611063	Head block
23	24611064	Head base ass'y
31	24603284	Lever, reader
32	24605506	Spring
33	24605507	Spring, holding, cassette
34	24602270	Pinch roller ass'y
35	24605244	Spring
36	24605508	Spring
37	24610659A	Protector
38	24610846	Bracket R
39	24605188	Spring, cassette
40	24610351	Steelball
45	24603205	Lever, rec.
46	24602271	Belt
47	24601167	Pulley ass'y
48	24611003	1.8x3.8x0.5mm, Washer
49	24611047	2.1x4.5x0.1mm, Washer
50	24605509	Spring
51	24602272	Pinch roller ass'y
52	24611065	Lever, adjusting
53	24605510	Spring
54	24604065	Collar
55	24603286	Lever, selector
56	24605511	Spring
57	24610344	Collar
58	24611066	Lock plate
61	24605504	Spring
62	24603285	Lever, cancel
63	8771441005	Washer
64	24611067	Side bracket L
66	24611057	Washer
67	24606205	Leafswitch
68	24604063	Collar
69	87712705	2.7x5x0.5mm, Washer
70	24611068	Bracket, switch
71	82112030	Pan head screw
72	24611069	Chassis
81	24605456	Spring
82	24611051	Damper unit
83	24611070	Holder L
84	24605463	Spring
REF. NO.	**PART NO.**	**DESCRIPTION**
91	**24610349**	**Washer**
92	**24602299**	**Reel stand ass'y**

REF. NO.	PART NO.	DESCRIPTION
85	24610949	Frame
86	24611071	Holder R
87	24611019	Panel, cassette
94	24611072	Holder, spring
95	24605505	Spring
96	24605501	Spring
97	24611073	Bracket, motor
98	24601171	Reel motor ass'y
98-1	24601169	Reel motor
98-2	24611048	Holder, spring
98-3	24610374	Washer
98-4	246-5512	Spring
98-5	24602274	Lever, idler
98-6	24610970	Felt
98-7	24602273	Motor pulley
99	352942206	22μF, 16V, Non-polar elect. capacitor
100	24604066	Tube
102	24601152	Binder
103	24601172	DD motor ass'y
103-1	24602275	Belt
107	24611043	Brake plate ass'y
107-1	24610999	Brake rubber
107-2	24611053	Brake plate
107-3	24605472	Spring
108	24606206	Sensor pc board ass'y
109	24611074	Bracket ass'y
110	24601103	Assist motor
111	24602133	Cam gear
112	24606104	Leafswitch
113	24606119	Leafswitch
114	24611075	Connector plate
115	24604064	Collar
116	87712808	2.8x8x1mm, Washer
201	833130049	3x4mm, Pan head screw
202	82512012	2x12mm, Binding screw
203	801250	...4mm, Pan head screw
204	8930251	E washer
205	8930201	E washer
206	833125059	2.5x5mm, Tapping screw
207	801292	2x3.2mm, Tapping screw
208	893030	3mm, E washer
209	801263	2x3mm, Screw
210	833125069	2.5x6mm, Pan head screw
211	801325	2x5mm, Pan head screw
212	891024	Circlip
213	835426082	2.6x8mm, Tapping screw
214	801326	2.5x3.5mm, Pan head screw
215	82512603	6x3mm, Binding screw
216	863720	N-2BN, Nut
217	833125049	2.5x4mm, Tapping screw
218	801259	2x3mm, Screw
219	833126067	2.6x6mm, Tapping screw
220	833125209	2.5x20mm, Tapping screw
221	833126127	2.6TTP+12S, Tapping screw
222	863126	N-2.6F, Nut

PACKING VIEW



D Model

REF. NO.	PARTS NO.	DESCRIPTION
1	29095012-1	500x800, Protection sheet
2	290311A	620x550, Poly bag
3	29090922	Pad (L)
4	29090923	Pad (R)
5	29050983	Master carton box
6	282301	Sealing hook
7	260012	Damplon tape
8	Accessary bag ass'y	
	29340802	Instruction manual
	2010095	Connection cable
	29365006-5	Warranty card (N)
	29358002A	Service station list (N)
	29100005	220x330, Poly bag

G/W Model

REF. NO.	PARTS NO.	DESCRIPTION
1	29095012-1	500x800, Protection sheet
2	290311A	500x750, Poly bag
3	29090922	Pad (L)
4	29090923	Pad (R)
5	29050983	Master carton box
6	282301	Sealing hook
7	260012	Damplon tape
8	Accessary bag ass'y	
	29340803	Instruction manual
	2010095	Connection cable
	25055040	Conversion plug CV-K-2 (W)
	29100005	220x330, Poly bag

NOTE

(N): Only U.S.A. Model
(W): Only 120/220V Model

PRINTED CIRCUIT BOARD PARTS LIST

Main circuit pc board (NAAF–2072)

REF. NO.	PART NO.	DESCRIPTION
	ICs	
Q105	222811 or	NJM4558DD or
	222502	NJM4558DX
Q207, Q209	222811	NJM4558DD,
	222502 or	NJM4558DX or
	222534	NJM4559DX
Q371	222736 or	NJM4558S or
	222652	M5218L
Q373, Q471	222652	M5218L
Q505, Q506	222652	M5218L
Q521	222735	NJM072D
Q523, Q524	222681 or	IR3702 or
Q603, Q620	222695	LA6324
Q904	222780120	7812, Const. voltage, +12V
Q905	222790120	7912, Const. voltage, −12V
Q906	222780050	7805, Const. voltage, +5V
	Transistors	
Q101–Q104	2211406,	2SC2240 (BL),
Q201, Q202	2211896 or	2SC1815L (BL) or
	2212256	2SC2458 (LL)
Q107, Q108	2211255,	2SC1815 (GR),
Q203, Q204	2212115,	2SC2458 (GR),
	2210746 or	2SC945A (P) or
	2212485	JC501 (Q)
Q205, Q206	2212303,	2SK381 (C),
	2212304,	2SK381 (D),
	2210746 or	2SK246 (Y) or
	2211945	2SK246 (GR)
Q311–Q314	2212304,	2SK381 (D),
	2212305,	2SK381 (E),
	2211945 or	2SK246 (GR) or
	2211946	2SK246 (BL)
Q377, Q378	2211705 or	2SD655 (E) or
	2211706	2SD655 (F)
Q381, Q382	2211255,	2SC1815 (GR),
Q507–Q518	2212115,	2SC2458 (GR),
Q527–Q532	2210746 or	2SC945A (P) or
Q601, Q602	2212485	JC501 (Q)
Q411–Q414	2212304,	2SK381 (D),
Q501–Q504	2212305,	2SK381 (E),
	2211945 or	2SK246 (GR) or
	2211946	2SK246 (BL)
Q519, Q520	2211255	2SC1815 (GR)
Q533	2211554	2SA562TM (Y)
Q534, Q623	2211454,	2SA1015 (Y),
Q605, Q606	2212124,	2SA1048 (Y),
	2210804 or	2SA733A (Q) or
	2212494	JA101 (P)
Q535, Q537	2211254,	2SC1815 (Y),
Q538, Q607	2212114,	2SC2458 (Y),
Q624	2210747 or	2SC945A (Q) or
	2212484	JC501 (P)
Q536	2211683 or	2SD468 (C) or
	2211612	2SD471 (L)
Q608, Q617	2211255,	2SC1815 (GR),
Q610–Q613	2212115,	2SC2458 (GR),
Q619, Q621	2210746 or	2SC945A (P) or
Q622, Q625	2212485	JC501 (Q)
Q609, Q614	2211455,	2SA1015 (GR),
Q615, Q616	2212125,	2SA1048 (GR),
Q618,	2210803 or	2SA733A (P) or
	2212495	JA101 (Q)
Q901	2201340 or	2SD1128 or
	2201350	2SD687
Q902, Q903	2211612 or	2SD471 (L) or
	2211683	2SD468 (C)
Q907	2201285 or	2SD882 (Q) or
	2201286	2SD882 (P)
Q908	2201275 or	2SB772 (Q) or
	2201276	2SB772 (P)
Q909	2211612 or	2SD471 (L) or
	2211683	2SD468 (C)
	Diodes	
D201, D202	223155	1SS138
D301–D304	223145,	1S2076TD,
D520, D619	223150,	US1040,
	223105 or	1S1555 or
	223133	DS442X
D401–D404	223155	1SS138
D501–D516	223155	1SS138
D517	2239673,	RD15EB3,
D603–D606	2243253 or	MTZ15C or
	2242922	EQA02–14B
D519	223155	1SS138
D601, D602	223155	1SS138
D607, D608	223155	1SS138
D611–D614	223132	1K60
D616	2239451,	RD5.1EB1,
	2243141 or	MTZ5.1A or
	2242836	EQA–02–05C
D617, D618	223155	1SS138
D620	223155	1SS138
D621	223145,	1S2076TD,
	223150,	US1040,
	223105 or	1S1555 or
	223133	DS442X
D622, D623	223155	1SS138
D624	2239513,	RD6.8EB3,
	2243173	MTZ6.8C or
	2242855	EQA02–07B
D901, D902	223868	2W02
D903, D904	223848	GP–08B
D905	223842	GP–15B
D906	2239653,	RD13EB3,
	2243243 or	MTZ13C or
	2242911	EQA02–18B
D907	2239794,	RD27EB4,
	2239811,	RD30EB1,
	2243021 or	EQA02–28A or
	2243022	EQA02–28B
D908	2239732,	RD20EB2,
	2243282 or	MTZ20B or
	2242962	EQA02–18B
D910, D911	2239551,	RD8.2EB1,
	2243191 or	MTZ8.2A or
	2242865	EQA02–08B
D912, D913	223155	1SS138
D914	2239673,	RD15EB3,
	2243253 or	MTZ15C or
	2242922	EQA02–14B
	Coils	
L501, L502	231041 or	NCH–2081 or
	24606070	NCH–1008
L503, L504	231038 or	NCH–2078 or
	24606080	NCH–1022
L505, L506	231057	NCH–4102
L507, L508	233329	NCH–6101
L509, L510	231058	NCH–4103
L511, L512	231025	NCH–1064
	Osc. block	

REF. NO.	PART NO.	DESCRIPTION
Z001	24606199	NOB-030
	Capacitors	
C103, C104	392880337	3.3μF, 50V, LL
C109-C112	352741009	10μF, 16V, Elect.
C201, C202	392880107	1μF, 50V, LL
C203, C204	352780109	1μF, 50V, Elect.
C211, C212	392883397	0.33μF, 50V, LL
C213, C214	352783399	0.33μF, 50V, Elect.
C371-C374	352750479	4.7μF, 25V, Elect.
C471, C472	352744709	47μF, 16V, Elect.
C501, C502	352750479	4.7μF, 25V, Elect.
C503, C504	352783399	0.33μF, 50V, Elect.
C521, C522	352780479	4.7μF, 50V, Elect.
C539	352722219	220μF, 6.3V, Elect.
C540	352751019	100μF, 25V, Elect.
C543	352780479	4.7μF, 50V, Elect.
C605	352782299	2.2μF, 50V, Elect.
C609, C610	352780109	1μF, 50V, Elect.
C611, C613	352750479	4.7μF, 25V, Elect.
C612	352780109	1μF, 50V, Elect.
C615	352741009	10μF, 16V, Elect.
C620	352750479	4.7μF, 25V, Elect.
C621	352780109	1μF, 50V, Elect.
C622	352750479	4.7μF, 25V, Elect.
C623	352751009	10μF, 25V, Elect.
C631	352784799	0.47μF, 50V, Elect.
C632	352750479	4.7μF, 25V, Elect.
C633	352741009	10μF, 16V, Elect.
C634	352732209	22μF, 10V, Elect.
C640	352741009	10μF, 16V, Elect.
C641	352742209	22μF, 16V, Elect.
C644, C646	352750479	4.7μF, 25V, Elect.
C645	352741009	10μF, 16V, Elect.
C905	352752229	2,200μF, 25V, Elect.
C906, C907	352784719	470μF, 50V, Elect.
C908	352742219	220μF, 16V, Elect.
C909	352741019	100μF, 16V, Elect.
C910	352764709	47μF, 35V, Elect.
C911	352751009	10μF, 25V, Elect.
C913, C914	352752229	2,200μF, 25V, Elect.
C915	352783399	0.33μF, 50V, Elect.
C916	352780229	2.2μF, 50V, Elect.
C917	352781099	0.1μF, 50V, Elect.
C918	352780109	1μF, 50V, Elect.
C919	3504168	13,000μF, 25V, Elect.
C920	352783399	0.33μF, 50V, Elect.
C921	352781099	0.1μF, 50V, Elect.
C922, C923	352731019	100μF, 10V, Elect.
C924, C925	352734709	47μF, 16V, Elect.
C926	352741009	100μF, 16V, Elect.
C951, C952	352731019	100μF, 10V, Elect.
C953-C955	352744709	47μF, 16V, Elect.
C970	352741009	10μF, 16V, Elect.
C14	352750479	4.7μF, 25V, Elect.
C15, C19, C20	352741009	10μF, 16V, Elect.
C21	352780229	2.2μF, 50V, Elect.
	Resistors	
R123-R126	5215022 or 5215003	N08HR20KBC, Semi-fixed
R219, R220	5104148	N12RL10KB25, Variable, preset level
R381, R382	5104149	N12RGL10KB25M, Variable, output level
R511, R512	5225019	N10HR4.7KBD, Semi-fixed
R563, R564	5225078	N10HR47KBDM, Semi-fixed
R585, R586	442524704	47Ω, 1/2W, Metal oxide film
R595-R600	5225078	N10HR47KBDM, Semi-fixed
R687, R688	5225015	N10HR10KBD, Semi-fixed
R901	441522294	0.22Ω, 1/2W, Metal oxide film
R903	442523304	33Ω, 1/2W, Metal oxide film
R906, R907	441520104	1Ω, 1/2W, Metal oxide film
R908	441721804	18Ω, 2W, Metal oxide film
R916	441621514	150Ω, 1W, Metal oxide film
R27	5225016	N10HR100KBD, Semi-fixed
R28	5225034	N10HR47KBD, Semi-fixed
R49	442525604	56Ω, 1/2W, Metal oxide film
	Plugs	
P101, P501	25055045	NPLG-4P-33
P103, P104	25055051	NPLG-8P-39
P105, P106	25055065	NPLG-5P-51
P205, P206	25055051	NPLG-8P-39
P207, P208	25055065	NPLG-5P-51
P502	25055038	NPLG-2P-29
P720	25055137	NPLG-7P-121
P721, P722	25055133	NPLG-3P-117
	Terminals	
P202	25045142	NPJ-4PDBL55, Input/output
P203	25045158	HLJ-4336-3020, Mic.
P201	25050064	NSCT-5P-18, DIN
	Switches	
S205	25065242	NSS-22104, Mic./Line
S101	25035434	NPS-162-242-122-L398, Push
S601	25030248	NRS-144-255BU, NR selector
	Sockets	
J3	2000329	NSAS-12P-288
J6, J7	2000330	NSAS-6P-289
P603	2000341A	NSAS-14P-300
P709a	2000342A	NSAS-6P-301
P707a	2000332	NSAS-6P-291
P708a	2000334	NSAS-4P-293
P706a	2000333	NSAS-6P-292
P505a	2000343A	NSAS-6P-302
P506a	2000306A	NSAS-6P-265
	Radiators	
	27160075A	
	27160156	
	27160011A	
	Spacers	
	223019	AC-229, Transistor
	Bushes	
	223017	AC-310
	Bracket	
	27140915	Volume
	Connectors	
	28320135	For push switch

Dolby decoder circuit (NADOL-2073)

REF. NO.	PART NO.	DESCRIPTION
	ICs	
Q111, Q112	222813, 222814 or 222815	HA12058NT-01 (Violet), (Green) (Red)

Note: When replace IC HA12058NT-01, use the same color IC for decoder and encoder.

	Coils	
L101, L102	233327	NCH-6100
L103, L104	233245	NMC-2029
	Capacitors	
C151, C152	352780109	1μF, 50V, Elect.
C157, C158	392850477	4.7μF, 25V, LL
C161, C162	352783399	0.33μF, 50V, Elect.
C163, C164	352781599	0.15μF, 50V, Elect.
C165, C166	352784799	0.47μF, 50V, Elect.
C167, C168	352786899	0.68μF, 50V, Elect.

C175, C176	392850477	4.7μF, 25V, LL
C181, C182	352781599	0.15μF, 50V, Elect.
C183, C184	352784799	0.47μF, 50V, Elect.
C185, C186	352741009	10μF, 16V, Elect.
	Sockets	
P103A, P104A	25050133	NSCT-8P-35
	Bracket	
	27140916	Pc board
	Screws	
	82143006	3P+6FN (BC), Pan head

Dolby encoder pc board (NADOL-2074)

REF. NO.	PART NO.	DESCRIPTION
	ICs	
Q111, Q112	222813,	HA12058NT-01 (Violet),
	222814 or	(Green)
	222815	(Red)
Note: When replace IC HA12058NT-01, use the same color IC for decoder and encoder.		
	Transistors	
Q213-Q216	2211255,	2SC1815 (GR),
	2212115,	2SC2458 (GR),
	2210746 or	2SC945A (P) or
	2212485	JC501 (Q)
	Coils	
L201, L202	233328	NMC-6051
L203, L204	233245	NMC-2029
	Capacitors	
C251, C252	352741009	10μF, 16V, Elect.
C257, C258	392850477	4.7μF, 25V, LL
C261, C262	352783399	0.33μF, 50V, Elect.
C263, C264	352781599	0.15μF, 50V, Elect.
C265, C266	352784799	0.47μF, 50V, Elect.
C267, C268	352786899	0.68μF, 50V, Elect.
C275, C276	392850477	4.7μF, 25V, LL
C281, C282	352781599	0.15μF, 50V, Elect.
C283, C284	352784799	0.47μF, 50V, Elect.
C285-C288	352741009	10μF, 16V, Elect.
	Sockets	
P205A, P206A	25050133	NSCT-8P35
	Bracket	
	27140916	Pc board
	Screws	
	82143006	3P+6FN (BC), Pan head

Dbx decoder circuit pc board (NADBX-2075)

REF. NO.	PART NO.	DESCRIPTION
	ICs	
Q301, Q302	222811 or	NJM4558DD or
	222502	NJM4558DX
Q303, Q304	222805	μPC-1252H2
Q305, Q306	222806	μPC-1253H2
	Transistors	
Q307, Q308	2211255,	2SC1815 (GR),
	2212115,	2SC2458 (GR),
	2210746 or	2SC945A (P) or
	2212485	JC501 (Q)
	Capacitors	
C313, C314	352751009	10μF, 25V, Elect.
C329, C330	392880107	1μF, 50V, LL
C331, C332	352751009	10μF, 25V, Elect.
C333, C334	392851005	10μF, 25V, LL
C961-C964	352741009	10μF, 16V, Elect.
	Resistors	
R301, R302	5215010 or	N08HR10KBA,
	5215033	Semi-fixed
R319, R320	5215012 or	N08HR50KBA,
R349, R350	5215035	Semi-fixed
	Sockets	
P105A, P106A	25050130	NSCT-5P32

Dbx encoder circuit pc board (NADBX-2076)

REF. NO.	PART NO.	DESCRIPTION
	ICs	
Q401, Q402	222811 or	NJM4558DD or
	222502	NJM4558DX
Q403, Q404	222805	μPC-1252H2
Q405, Q406	222806	μPC-1253H2
	Transistors	
Q407, Q408	2211255,	2SC1815 (GR),
	2212115,	2SC2458 (GR),
	2210746 or	2SC945A (P) or
	2212485	JC501 (Q)
	Capacitors	
C413, C414	352751009	10μF, 25V, Elect.
C429, C430	392880107	1μF, 50V, LL
C431, C432	352751009	10μF, 25V, Elect.
C433, C434	392851005	10μF, 25V, LL
C965-V968	352741009	10μF, 16V, Elect.
	Resistors	
R419, R420	5215012 or	N08HR50KBA,
R449, R450	5215035	Semi-fixed
	Sockets	
P207A, P208A	25050130	NSCT-5P32

Control circuit pc board (NACOC-2077)

REF. NO.	PART NO.	DESCRIPTION
	ICs	
Q701	222777	LM6402H-425
Q702	222776	LM6402H-424
Q703	222810	LC7800
Q704	222639	LB1275
Q705	222840241	4024BP
Q706	222840692	4069BP
	Transistors	
Q707-Q709	2211455,	2SA1015 (GR),
	2212125,	2SA1048 (GR),
	2210803 or	2SA733A (P) or
	2212945	JA101 (Q)
Q710, Q711	2211255,	2SC1815 (GR),
Q714	2212115,	2SC2458 (GR),
Q744-Q746	2210746 or	2SC945A (P) or
	2212485	JC501 (Q)
Q712	2211454,	2SA1015 (Y),
Q727-Q734	2212124,	2SA1048 (Y),
Q740-Q743	2210804 or	2SA733A (Q) or
	2212494	JA101 (P)
Q713, Q716	2201060,	2SD549,
Q717	2201291 or	2SD985 (K) or
	2201292	2SD985 (L)
Q715	2201350 or	2SD687 or
	2201340	2SD1128
Q718, Q719	2211554	2SA562TM (Y)
Q720	2201074 or	2SD880 (Y) or
	2201385	2SD330 (E)
Q721, Q722	2211254,	2SC1815 (Y),
	2212114,	2SC2458 (Y),
	2210747 or	2SC945A (Q) or
	2212484	JC501 (P)
Q723, Q724	2211683 or	2SD468 (C) or
	2211612	2SD471 (L)
Q725, Q726	2211563	2SB562 (C)
Q735-Q738	2211706	2SD655 (F)
Q739	2211544	2SC1959 (Y)

PRINTED CIRCUIT BOARD PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
	Diodes	
D701	223155	1SS138
D705	2239552, 2243192 or 2242866	RD8.2EB2, MTZ8.2B or EQA02-08C
D706	223145 or 223150	1S2076TD or US1040
	X'tal	
X701	3010069	CSB800A
	Capacitors	
C701	352750479	4.7μF, 25V, Elect.
C702-C704	352780109	1μF, 50V, Elect.
C705	352784799	0.47μF, 50V, Elect.
C706	352741009	10μF, 16V, Elect.
C712	352732209	22μF, 16V, Elect.
C715	352734709	47μF, 10V, Elect.
C718	352781599	0.15μF, 50V, Elect.
	Resistors	
R701-R711	49163392411	3.9kΩx11, 1/10W, Network
R713-R716	49163392404	3.9kΩx4, 1/10W, Network
R726-R731	49163392406	3.9kΩx6, 1/10W, Network
R732-R742	49163392411	3.9kΩx11, 1/10W, Network
R743-R746	49163392404	3.9kΩx4, 1/10W, Network
R761	5215045 or 5215021	N08HR10KBC, Semi-fixed
R763	441722204	22Ω, 2W, Metal oxide film
R785-R796	49163392412	3.9kΩx12, 1/10W, Network
R814-R817	49163392404	3.9kΩx4, 1/10W, Network
R832	4000102	TD5-410D, Thermistor
	Plugs	
P702	25055046	NPLG-10P-34
P703	25055067	NPLG-9P-53
P704	25055154	NPLG-10P-138
P705	25055148	NPLG-4P-132
P706, P707	25055147	NPLG-3P-131
P708	25055146	NPLG-2P-130
P709	25055100	NPLG-3P-84
	Socket	
	25055151	NSAS-7P-135

Display circuit pc board (NADIS-2078)

REF. NO.	PART NO.	DESCRIPTION
	LEDs	
D631-D633	225137	SEL-2413E
D634	225142	SEL-2913K
D635, D636	225137	SEL-2413E
D637	225142	SEL-2913K
D638, D639	225137	SEL-2413E
D640	225142	SEL-2913K
D641, D642	225137	SEL-2413E
D706	225142	SEL-2913K
D707-D709	225137	SEL-2413E
D710	225142	SEL-2913K
D711	225137	SEL-2413E
D712-D714	225142	SEL-2913K
D718-D724	225137	SEL-2413E
D725	225142	SEL-2913K
	Sockets	
P720a	2000335	NSAS-7P-294
P721a	2000344	NSAS-3P-303
P722a	2000339	NSAS-3P-298
	Holder	
	27190294A	LED
	Screws	
	834430068	3TS+6B (BC), Tapping

Switch pc board (NASW-2079)

REF. NO.	PART NO.	DESCRIPTION
S710-S715	25035389	NPS-111-S353, Push switch
P710a	2000354	NSAS-14P-312, Socket

Counter indicator pc board (NADIS-2080)

REF. NO.	PART NO.	DESCRIPTION
D726	225094	SL-2405-20, LED

Remote control terminal pc board (NARM-2081)

REF NO.	PART NO.	DESCRIPTION
P701	25050070	NSCT-7P20, Socket, DIN

Switch pc board (NASW-2082)

REF. NO.	PART NO.	DESCRIPTION
S716-S718	25035389	NPS-111-S353

Timer switch pc board (NASW-2083)

REF. NO.	PART NO.	DESCRIPTION
D702-D704	223155	1SS138
S720	25065170	NSS-2377

Power switch pc board (NASW-2084)

REF. NO.	PART NO.	DESCRIPTION
C901	3500065A	0.01μF, 400V, AC, Capacitor IS
C901a	27300601	SB-1925, Cover
S901	25035375	NPS-111-L339P, Power switch
	27140823	Bracket, switch
	28320135	Connector, power switch
	82143006	3P+6FN (BC), Pan head screw

Edge light pc board (NAPL-2085)

REF. NO.	PART NO.	DESCRIPTION
PL701	210090	PL14V150mA, Lamp

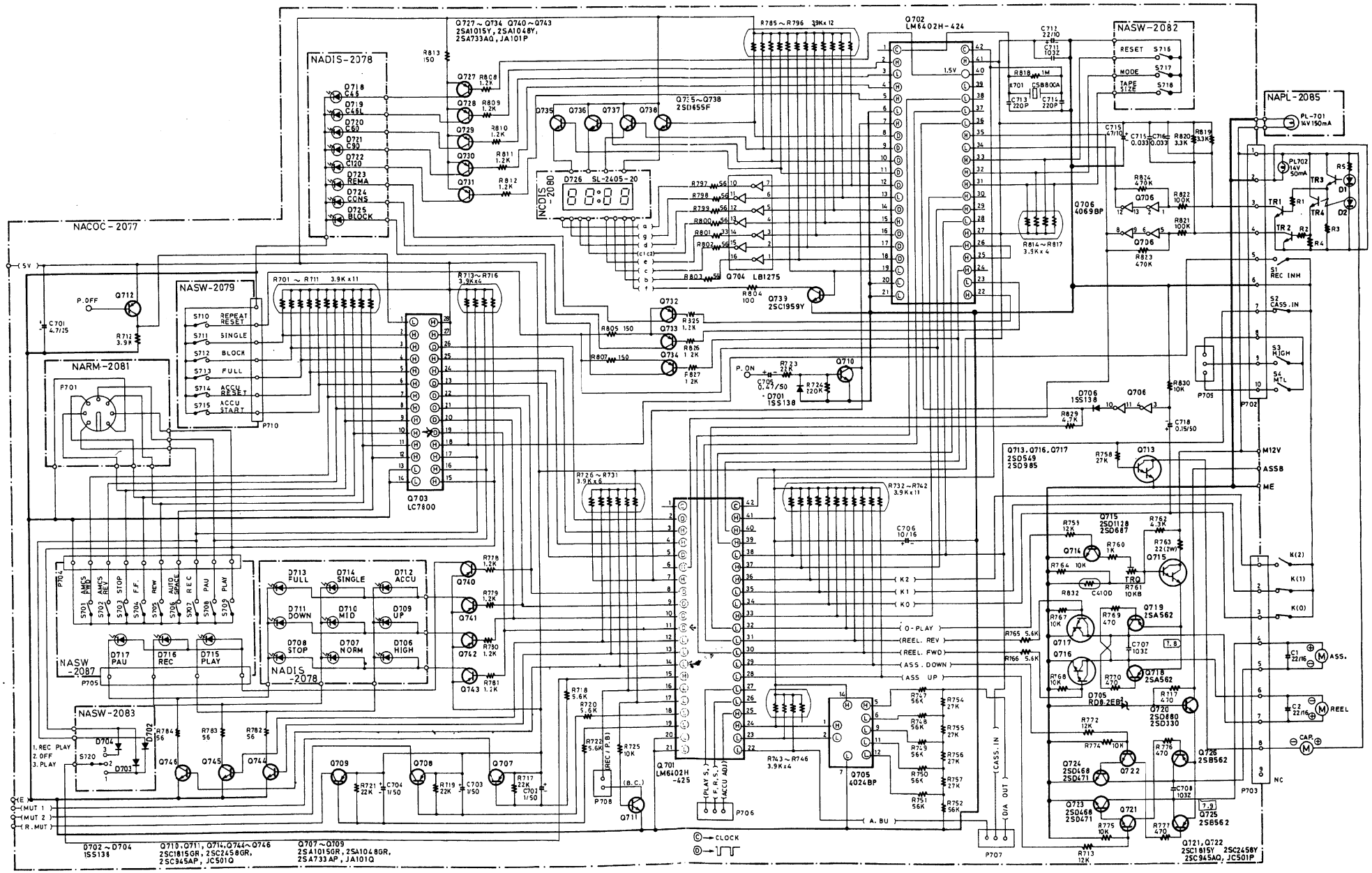
Record callibration volume pc board (NAVR-2086)

REF. NO.	PART NO.	DESCRIPTION
R507, R508	5104159	N09RLC10KB25M Resistor, variable
P505, P506	25055100	NPLG-3P-84, Plug

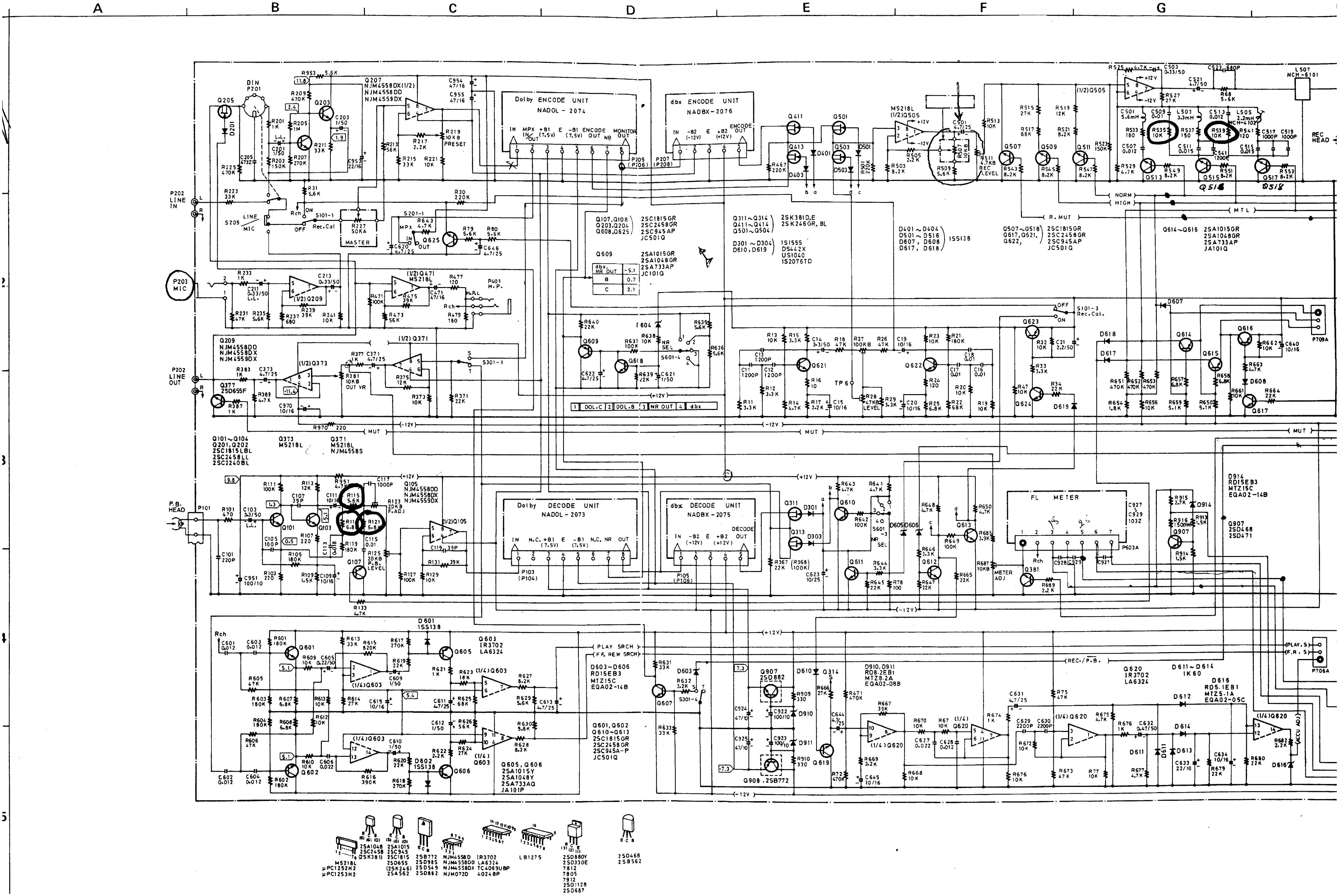
Switch pc board (NASW-2087)

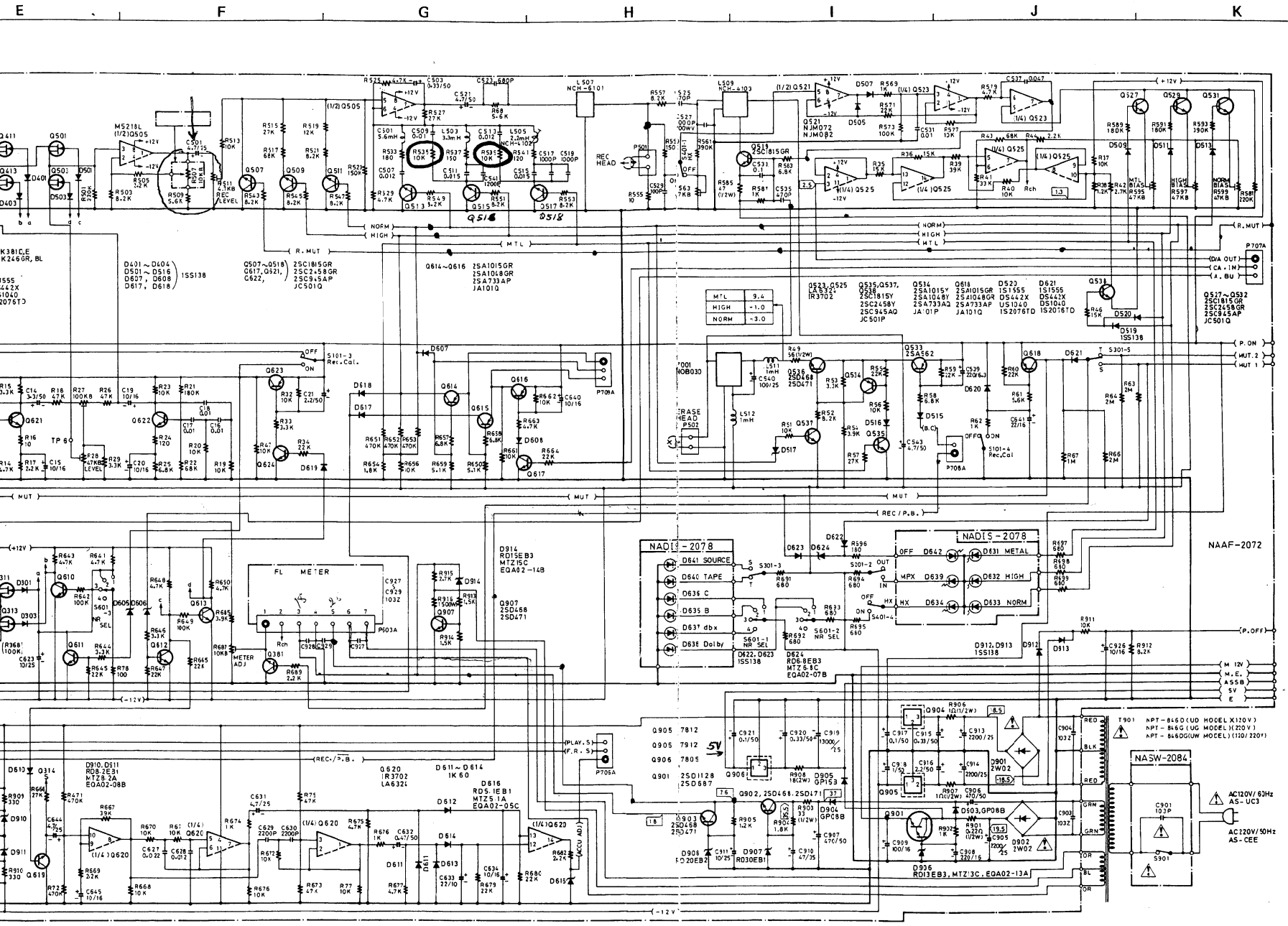
REF. NO.	PART NO.	DESCRIPTION
D715	225134	GL-3NG1, LED
D716, D717	225126	GL-3PR1, LED
S701-S709	25035408	NPS-111-S372, Push switch
P704a	2000323	NSAS-10P-282, Socket
P705a	2000324	NSAS-4P-283, Socket
	27270103	Spacer, LED

SCHEMATIC DIAGRAM-CONTROL SECTION



SCHEMATIC DIAGRAM-AMPLIFIER SECTION




E
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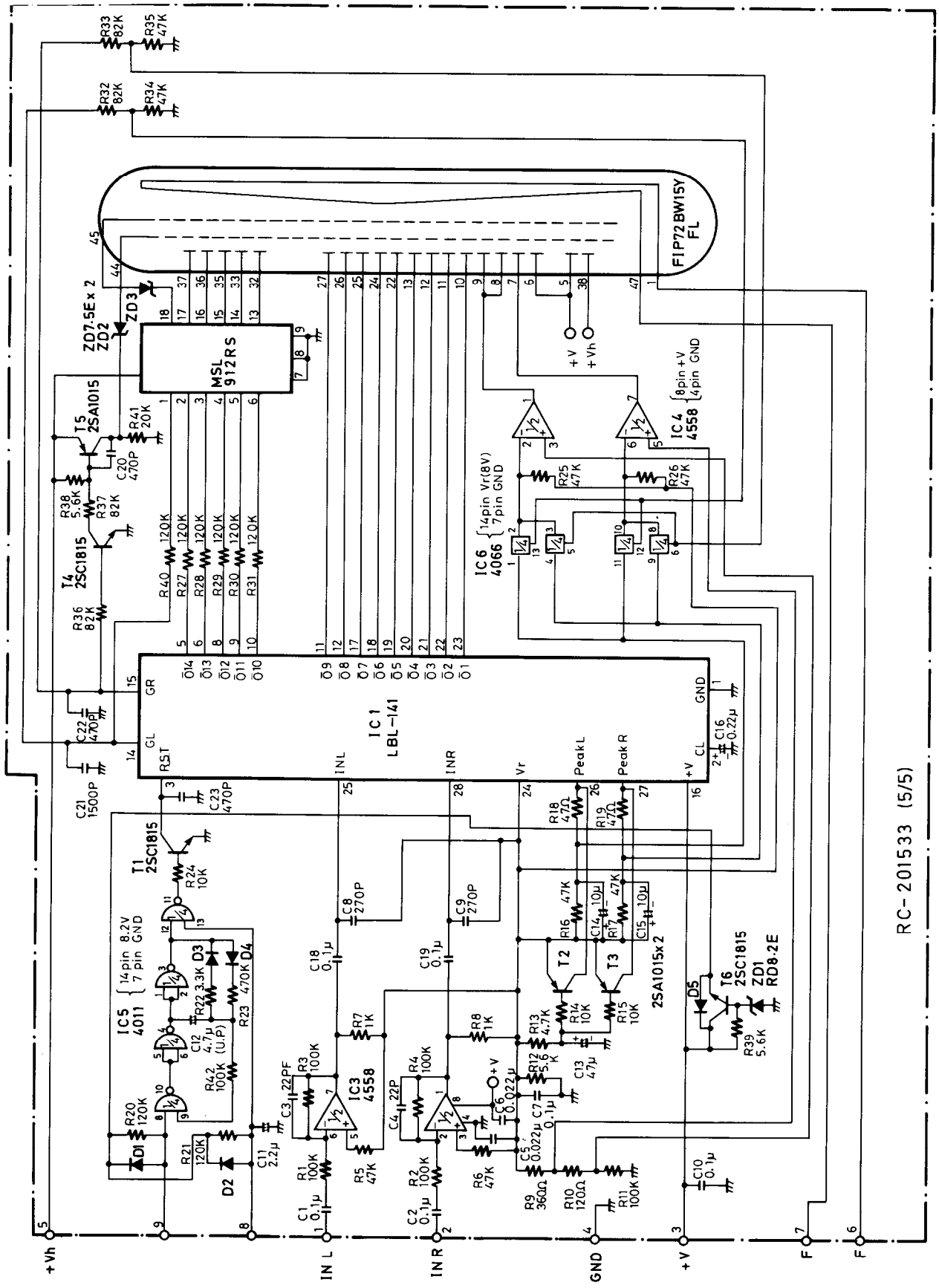
NAADF-2072
NADIS-2078
D641 SOURCE
D640 TAPE
D636 C
D635 B
D637 dbx
D638 Dolby
OFF
MPX
HX
D642
D639
D634
D631 METAL
D632 HIGH
D633 NORM
FL METER
METER ADJ
NASW-2084
AC120V/60Hz AS-UC3
AC220V/50Hz AS-CEE
T901 NPT-846D(UD MODEL X120V)
NPT-846G(UG MODEL)(220V)
NPT-846DG(UW MODEL)(120/220V)
REC
BLK
RED
GRN
GR
BL
REC/P.B.
MUT
NORM
HIGH
MTL
R.MUT
P.ON
MUT.2
MUT.1
P.OFF
M 12V
M.E.
ASSB
5V
E
(PLAY.S)
(F.R.S)
P705A
P707A
P708A
P709A
D/A OUT
CA.IN
A.BU
REC HEAD
ERASE HEAD
P501
P502
P503A
S101-3 Rec.Cal.
S101-4 Rec.Cal
S301-3
S301-5
S401-4
S201-2
S601-1 NR SEL
S601-2 NR SEL
5601 NR SEL
MTL 9.4
HIGH -1.0
NORM -3.0
Q527~Q532 2SC1815GR 2SC2458GR 2SC945AP JC501Q
Q533 2SA562
Q534 2SA1015Y 2SA1048Y 2SA733AQ JA101P
Q535,Q537, Q538 2SC1815Y 2SC2458Y 2SC945AQ JC501P
Q536 2SD468 2SD471
Q539 2SC1815GR
Q540 2SA1015GR 2SA1048GR 2SA733AP JA101Q
Q541 NJM072 NJM082
Q523,Q525 LA3322 IR3702
D501~D516 D607,D608 D617,D618 1SS138
D520 1SS138
D519 1SS138
D621 1S1555 DS442X DS1040 IS2076TD
D622,D623 1SS138
D624 RD6.8EB3 MTZ6.8C EQA02-07B
D907 2SD468 2SD471
D914 RD15EB3 MTZ15C EQA02-14B
D910,D911 RD8.2EB1 MTZ8.2A EQA02-08B
D916 RD5.1EB1 MTZ5.1A EQA02-05C
D936 RD13EB3,MTZ13C,EQA02-13A
Q620 IR3702 LA6324
D611~D614 1K60
Q902,2SD468,2SD471
Q903 2SD468 2SD471
Q904 1Ω(1/2W)
Q905 7812
Q905 7912
Q906 7805
Q901 2SD1128 2SD687
D903,GP08B
D904 GP08B
D905 GP15J
D907 RD30EB1
D908 RD20EB2
NOTES
• ALL RESISTORS ARE IN OHMS 1/4WATT AND 1/8WATTS UNLESS OTHERWISE NOTED.
• ALL CAPACITORS ARE IN μF/50WV UNLESS OTHERWISE NOTED.
• ELECTROLYTIC CAPACITOR (—⊕—) ARE IN μF/WV.
• VOLTAGE (MEASURED WITH V.T.V.M.) ( ) V IS DC VOLTAGE (NO INPUT SIGNAL)
• THE COMPONENTS INDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLASE ONLY WITH PART NUMBER SPACIFIED.

SCHEMATIC DIAGRAM-METER SECTION



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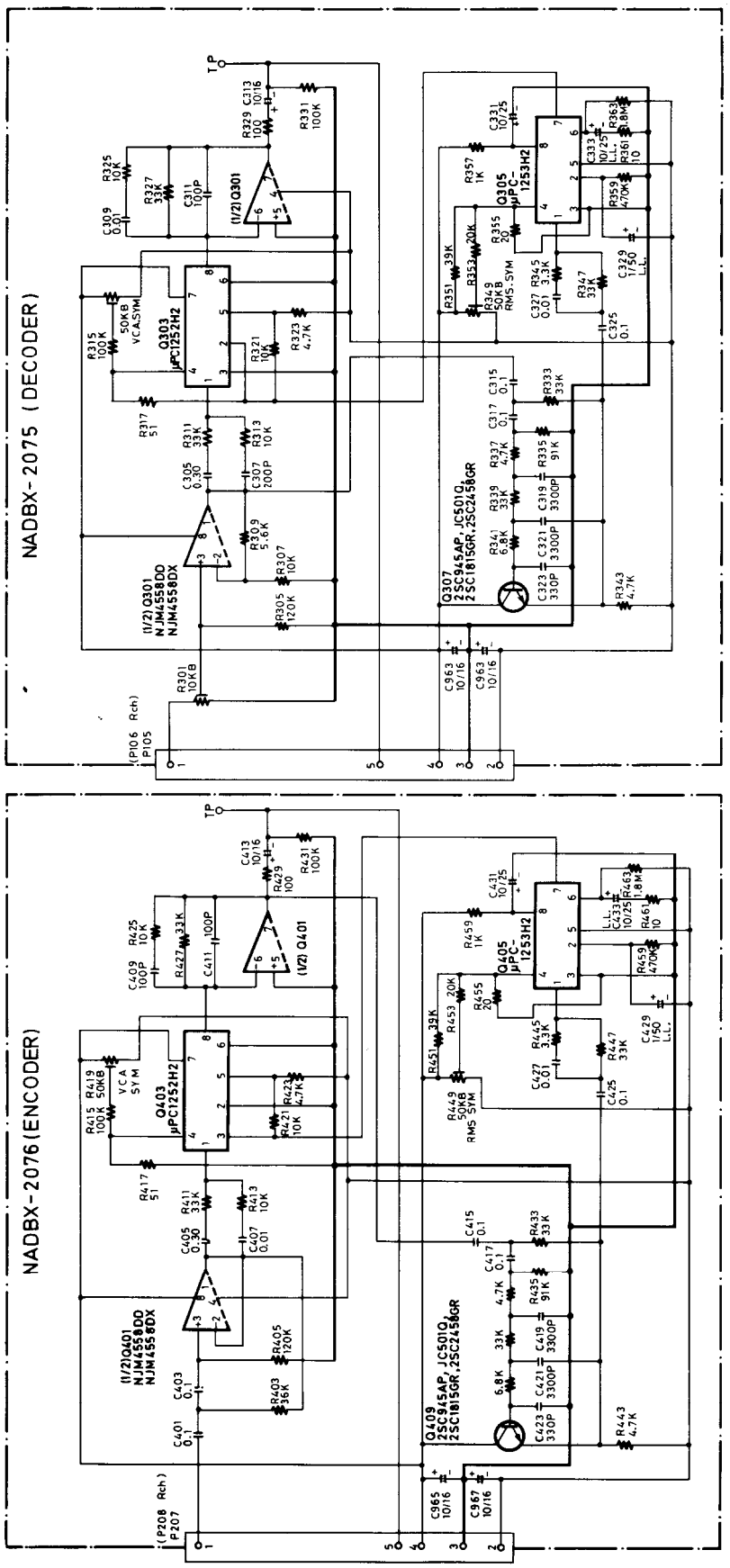

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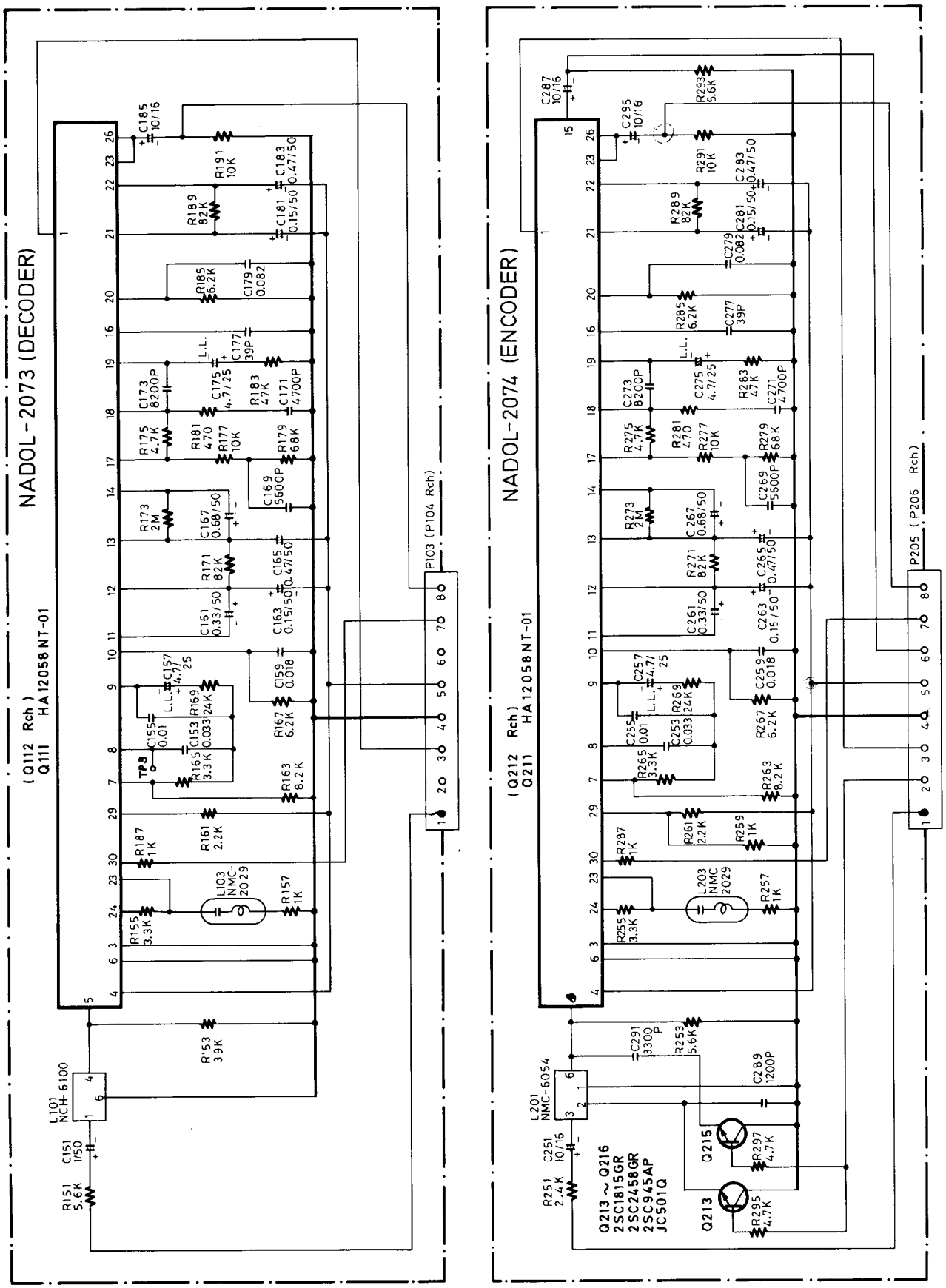

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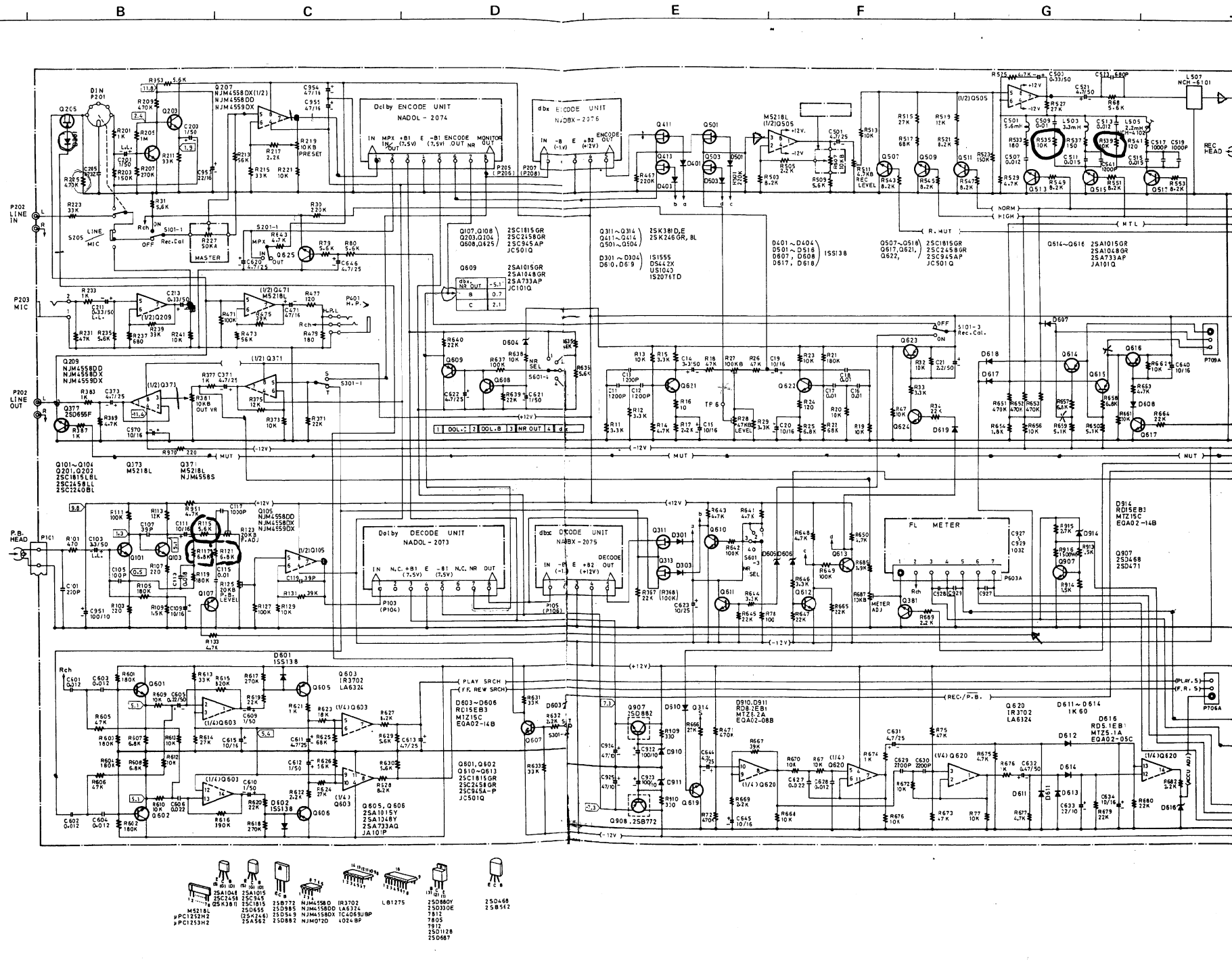

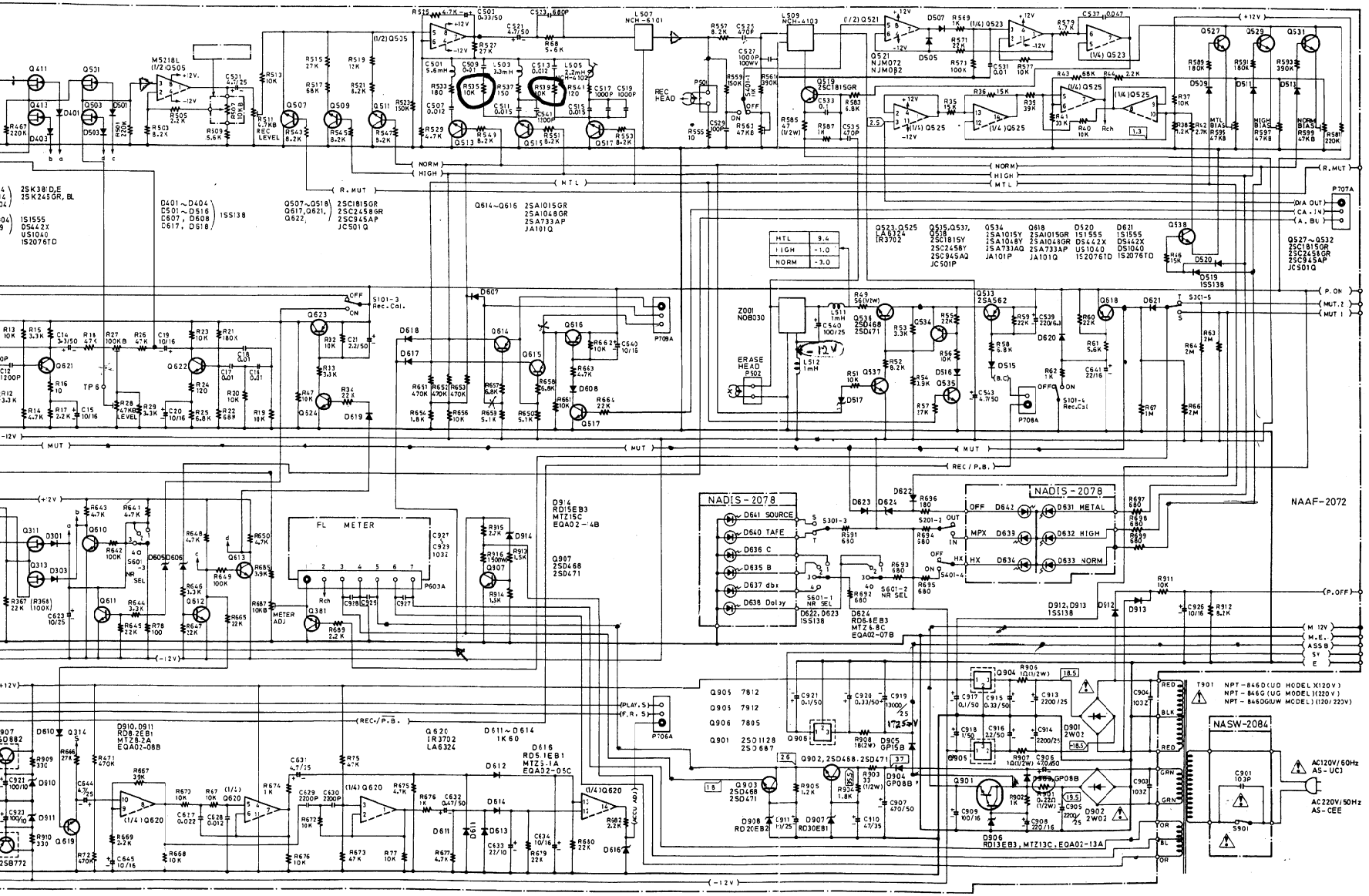
E
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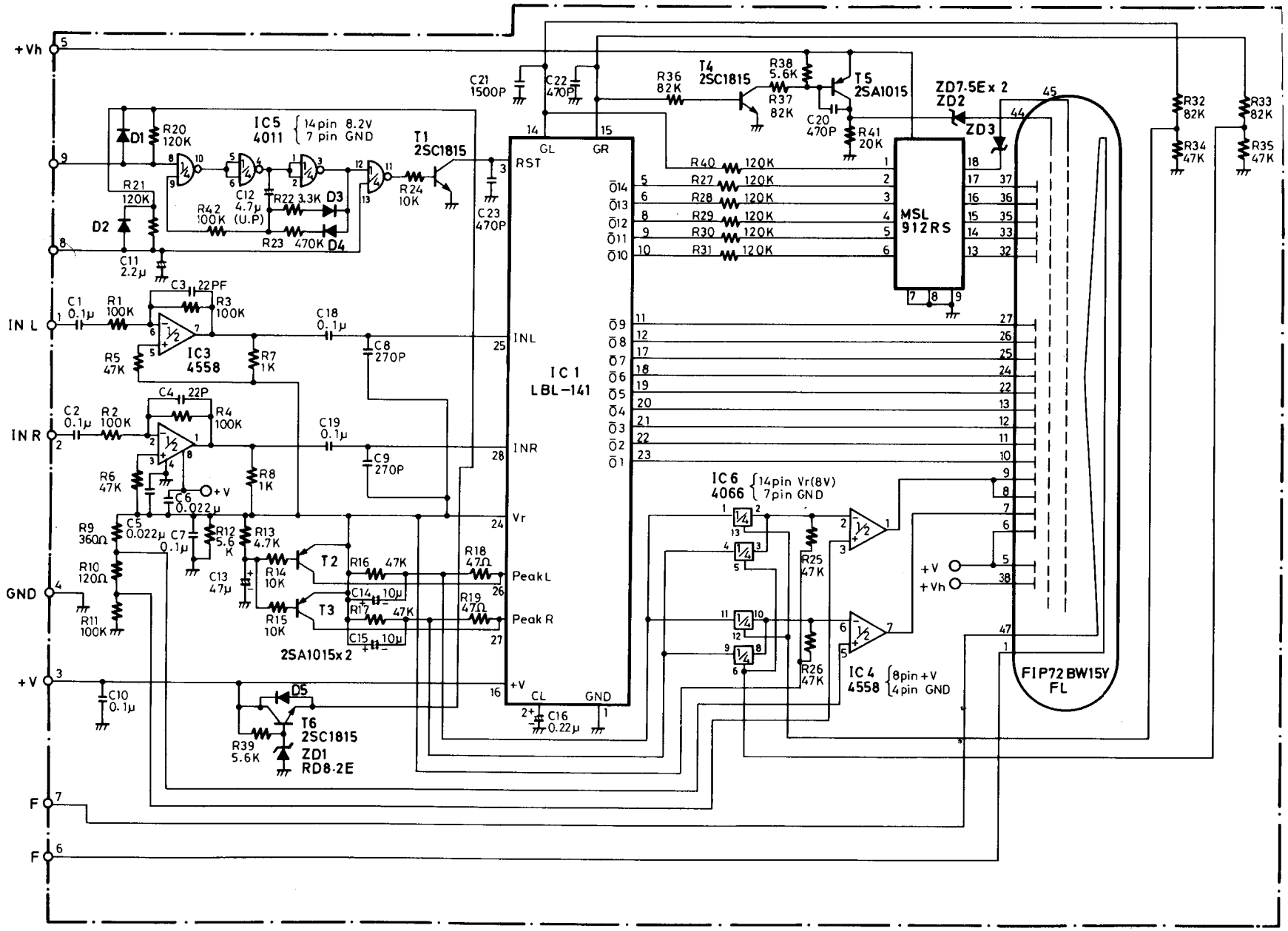
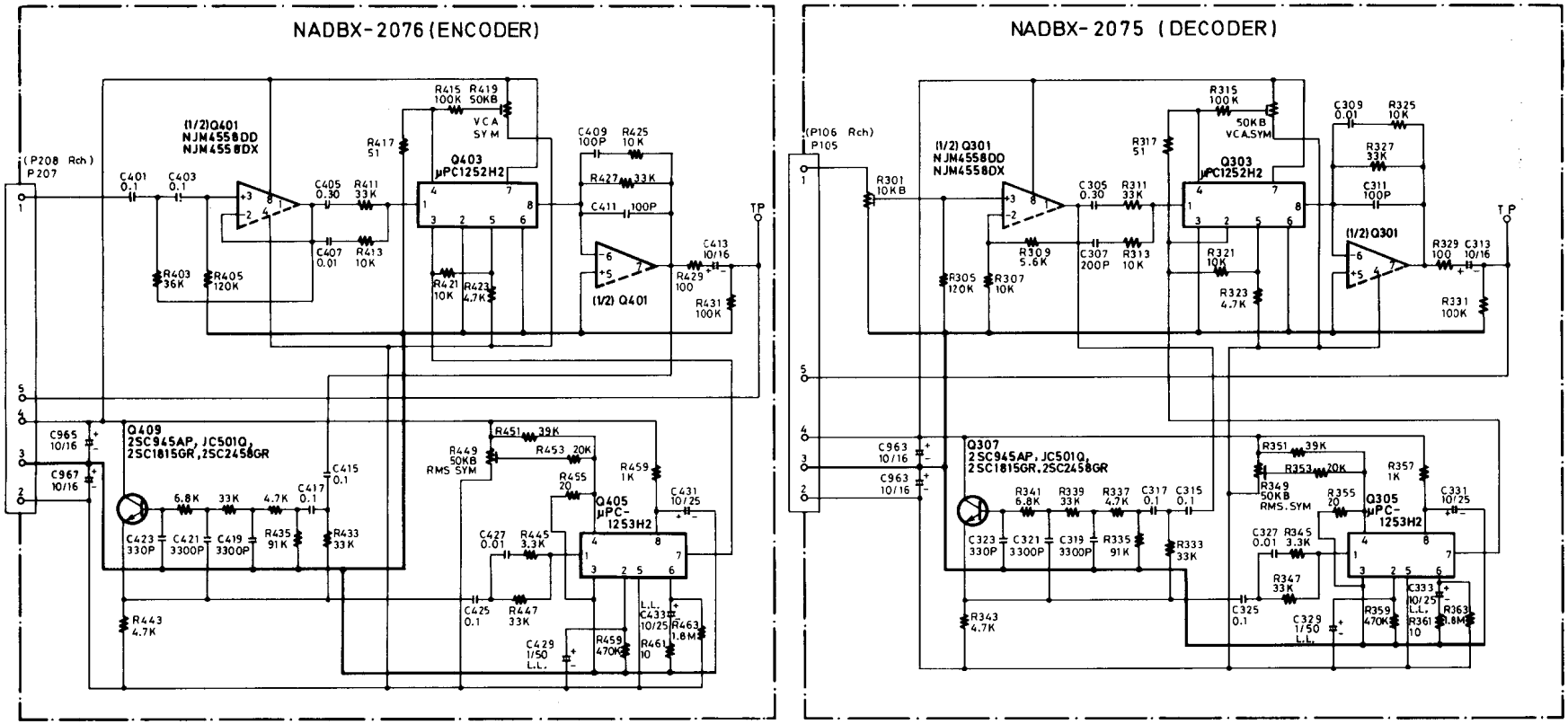
NAAF-2072
NADIS-2078
NADIS-2078
FL METER
NASW-2084
NOTES
ALL RESISTORS ARE IN OHMS 1/4WATT AND 1/4WATTS UNLESS OTHERWISE NOTED.
ALL CAPACITORS ARE IN μF/50WV UNLESS OTHERWISE NOTED.
ELECTROLYTIC CAPACITOR (—⊕—) ARE IN μ F WV
VOLTAGE (MEASURED WITH V.T.V.M.) V IS DC VOLTAGE (NO INPUT SIGNAL)
THE COMPONENTS INDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY.
REPLASE ONLY WITH PART NUMBER SPACIFIED

SCHEMATIC DIAGRAM-METER SECTION



SCHEMATIC DIAGRAM-DBX SECTION



SCHEMATIC DIAGRAM-DOLBY SECTION