

Cybernet

System 700

CCD-700

Service Manual

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Specifications

Track system	4-track/2-channel stereo recording and playback.	Applicable microphone sensitivity	200 to 10,000 Ohm.
Tape speed	1-7/8 ips.	Outputs	
Wow and flutter	0.04% WRMS.	Line	580 mV (impedance 2.2 k-Ohm).
Frequency response		Headphone	40 mV (impedance 8 to 125 Ohm).
Metal	20 to 20,000 Hz (30 to 18,000 Hz @ ± 3 dB).	Bias frequency	85 kHz.
CrO₂/FeCr	20 to 18,000 Hz (30 to 17,000 Hz @ ± 3 dB).	Motor	Electronically governed DC constant type.
Normal	20 to 17,000 Hz (30 to 16,000 Hz @ ± 3 dB).	Heads	
S/N	58 dB IHF-A weighted.	Record/Playback	Sendust-guard ("M and X").
Dolby NR effect	10 dB CCIR-weighted.	Erase	Ferrite double gapped.
Time required to fast-forward a C-60 tape	Approx. 90 seconds.	Power requirement	220V 50 Hz AC.
Input sensitivity		Consumption	42W.
Microphone	0.3 mV (impedance 10 k-Ohm).	Dimensions	
Line	60 mV (impedance 47 k-Ohm).	Width	420 mm.
		Depth	430 mm.
		Height	100 mm.

Instruction Information

Features

The Cybernet model CCD-700 is a high fidelity stereo cassette deck designed to be incorporated with other System 700-series components — the integrated stereo amplifier model CA-700 and the digital AM/FM stereo tuner model CT-700S — into a complete stereo system. It features the following:

Dolby noise reduction system for improved S/N ratio/
Tape Selector switch to optimize bias and equalization characteristic for all types of cassette tapes — including metal type/Full automatic-stop function to stop the motor at the tape end in all modes/Sendust-guard head ensures high performance and longer life/Concentrically clutched recording-level controls to permit easy fade-in or fade-out with the possibility of individual adjustment/Adjustable output level/Three modes of memory facility to permit automatic return to the beginning of a recording or a desired section of the tape, replay or repeat, in addition to automatic rewinding/Front-loading design to assure ease of operation and permit space-saving stacked configuration with the amplifier or receiver/
Illuminated pushbuttons.

Cassette Deck Connections

Refer to pictorial connection diagram.

Connection to amplifier [or receiver]. The cassette deck is equipped with both RCA-type pin (cinch) jacks [**Line In** and **Line Out**] and a DIN jack. Employ either of them depending on the conditions of your amplifier [or receiver]. Both connections should not be employed at the same time. Connect the **Line Out** jacks to the Tape Play, Tape In or Aux In terminals of the amplifier with the shielded audio cables terminated with pin plug. Connect the **Line In** jacks to

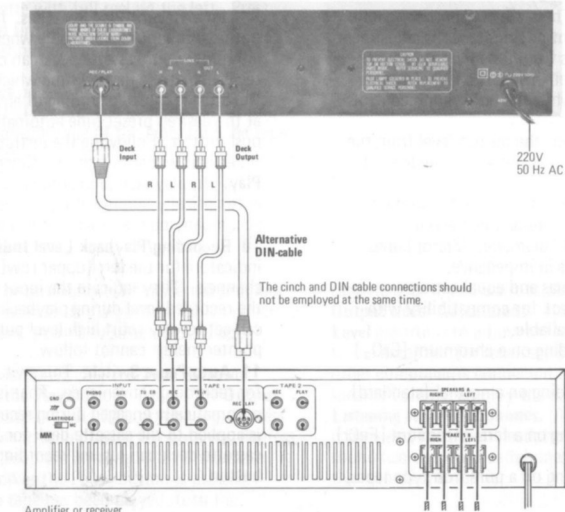
Cassette Deck Installation

Installation of your cassette deck is not complicated. However, the following guidelines must be followed for satisfactory performance and ease of operation of the unit.

Do not attempt to remove the cabinet cover — there are no user serviceable parts inside the unit. Refer servicing only to the qualified personnel/The equipment must not be exposed to excessive dust, moisture, or direct sources of heat or sunlight/To clean the cabinet, wipe with a soft cloth soaked in a neutral cleaner or a polishing cloth. Do not use benzine or thinner which will damage the cabinet finish/Do not place metallic or magnetized objects near the head.

the Tape Rec or Tape Out terminals on the amplifier with the shielded audio cables terminated with pin plug. As an alternative, if the amplifier is equipped with a DIN jack, you may connect to the DIN jack employing a single DIN cable set.

Cassette Deck Power Supply. Plug the power cord into the wall outlet supplying 220V 50 Hz AC.



Control Functions

- 1 Power Switch.** Push to turn power on. Illuminated when power is on.
- 2 Headphone Jack.** Accepts a plug from a stereo headphone for private listening [or monitoring the source being recorded].
- 3 Cassette Compartment.** Accommodates a cassette tape vertically.
- 4 Tape Transport Pushbuttons.** Determine the mode of operation of the tape transport and associated electronics.
Record. Used to activate the record mechanism and must be used in conjunction with the **Play** pushbutton in order to start the tape in motion when recording. To record, depress the **Record** button first, then press the **Play** button.
Rewind. Winds the tape at high speed from the right reel to the left reel. This permits rapid return to previous sections of the tape for replay or to start a new recording.
Fast-Forward. Winds the tape at high speed from the left reel to the right reel. This permits you to advance the tape rapidly

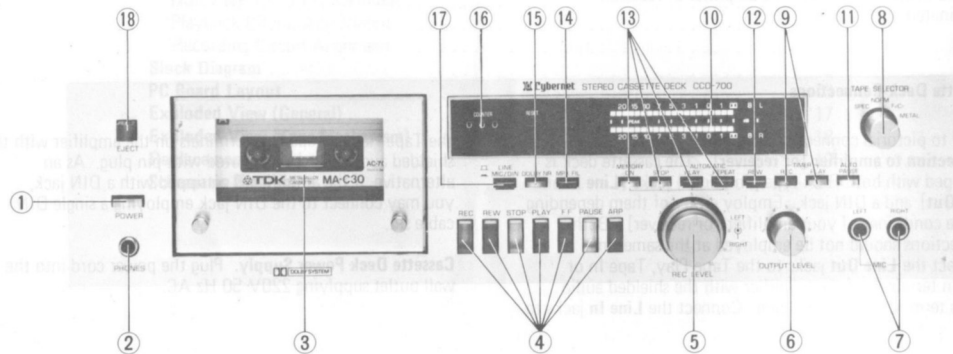
forward to skip sections of undesired material.

Play. Puts the tape in forward motion for playback of prerecorded tapes. This button is also used to start a recording in conjunction with the **Record** button.

Stop. When depressed, this button releases all cassette buttons that are depressed so that all tape functions are stopped. The **Pause** lever is the only exception. It will remain depressed until it is released manually.

Pause. Depressing this button will stop tape movement during record or playback, but will leave the **Record** or **Play** function engaged so that the deck is ready to resume recording or playback as soon as the **Pause** button is released. To disengage the **Pause** button, depress again and release.

ARP. To make non-recorded areas on tapes while recording, depress this pushbutton and the input to the tape is cut off while allowing the tape to run for 3 seconds until it stops automatically. The tape deck can resume recording by depressing the **Pause** pushbutton.



5 Recording Level Controls. These are concentric separate controls that permit independent or simultaneous adjustment of the two channel input signals from the **Microphone** jacks or line input jacks on the rear panel. The left channel level is adjusted with the inner knob, while the outer knob controls the right channel level.

6 Output Level Control. Adjusts the output level from the line output jacks. This control does not affect the level at the headphone jack.

7 Microphone jacks-Left/Right. These are left and right channel input jacks for microphones and will accept 2-conductor phone plugs of 1/4" diameter. Microphones used should be 10 k-Ohm or less in impedance.

8 Tape Selector. Adjusts the bias and equalization characteristics of the cassette deck for compatibility with the 4 types of tape presently available.

Special. When playing or recording on a chromium [CrO₂] type tapes, use this position.

Normal. When playing or recording on a normal [standard] type tapes, use this position.

FeCr. When playing or recording on a ferri-chromium [FeCr] type tapes, use this position.

Metal. When playing or recording on a pure iron type tapes, use this position.

9 Timer-Record/Play Switches. In conjunction with an optional timer unit [available where audio equipment supplies are sold], your cassette deck can commence playback or recording at the desired time which is preset by the timer unit.

Record. To make recording of any desired program material at the desired preset time automatically, depress this pushbutton. Following the instructions accompanying the timer unit will ensure proper timer setting.

Play. To playback prerecorded tapes at the desired time automatically, depress this pushbutton. Follow the instructions accompanying the timer unit to preset the desired time.

10 Recording/Playback Level Indicators. These are separate indicators for the left [upper row] and right [lower row] channels. They indicate the input level during recording and the recorded level during playback. The LED level indicators can act to very short high level pulses which conventional pointer meters cannot follow.

11 Auto-Pause Switch. This switch activates a unique feature for recording convenience. That is, pause condition is automatically engaged during recording, provided no signal is applied to the cassette deck for 2.5 seconds. The cassette deck can resume recording by pressing the **Pause** button.

12 Automatic Rewind Switch. When this pushbutton is depressed during playback mode, the tape deck will automatically begin to rewind the tape to the beginning of the tape, after the playback is completed [and the tape has been fully wound up to the right reel].

13 Memory Switch and Automatic Memory Mode Switches. These switches serve for memory convenience features:

Memory. When depressed, activates the memory convenience features. The mode of memory is determined by the following **Stop/Rewind/Repeat** switches and the tape counter.

Stop. When the **Memory** switch and this switch are depressed, rewind will automatically stop when the tape counter reaches **000**. By resetting the counter at the beginning of each section you record, you will later be able to rewind just to the beginning of the section.

Play. When the **Memory** switch and this switch are depressed, the unit will automatically restart to playback after the rewind is stopped at **000** on the counter.

Repeat. When the **Memory** switch and this switch are depressed, the tape deck will automatically start to rewind to the part of the tape where tape counter is set to **000** and restart to play from that part. This procedure is repeated until **Stop** pushbutton is depressed.

14 Multiplex Filter. This switch, when depressed during recording from FM tuner, will introduce 19 kHz filter that will prevent possible interference from the 19 kHz stereo pilot signal which is present in every FM stereo tuner or receiver and which may have been insufficiently filtered in the FM

Loading and Unloading a Cassette

Loading. Open the cassette compartment cover by pressing the **Eject** pushbutton firmly. Place the cassette tape into the compartment slot with the side you wish to hear facing you and the edge with the exposed tape side down. Since normal recording or playback is from the left reel to the right reel, it is customary to insert the cassette with full reel on the left. Press the cassette compartment lid firmly so that it snaps closed. Do not depress any function pushbuttons before the cassette tape is completely set in place.

Unloading. Depress the **Eject** pushbutton firmly. The cassette compartment will open and the cassette can be removed. If you wish to record or play the opposite side of the tape, turn the tape over and reload it into the compartment.

Playback

Playing. Turn the amplifier or receiver on and place the program selector on the amplifier or receiver to the position which selects the output of the cassette deck [normally selected by 'Tape Monitor' switch].

Set the **Dolby NR** switch as required. Set the **Tape Selector** switch as required. Depress the **Play** button. Adjust the **Output Level** control for a desired output level. To stop playing, depress the **Stop** button. If you want to stop playing temporarily, depress the **Pause** button. This will keep the unit ready for immediate resumption of playing as soon as the **Pause** button is pressed again. When one side of the tape has been played, turn the

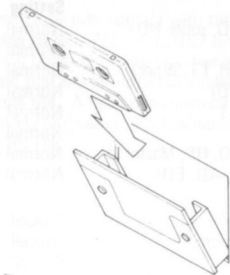
stereo unit.

15 Dolby NR Switch. Switches in the Dolby noise reduction system which, when used with a Dolbyized tape, will provide excellent reproduction. This switch should also be depressed when recording a program [either through the microphone or Line In jacks] to properly Dolbyize the recording. The Dolby noise reduction system should not be used with any conventional [not Dolbyized] stereo prerecorded tape, but should be used at all other times.

16 Tape Counter/Reset. This 3 digits counter will allow you to index the program material on the tape and thus enable you to locate desired sections easily and quickly. The counter is connected to the left reel and thus reads upward toward **999** when the tape moves forward, and downward toward **000** when the tape is rewound. Depressing the **Reset** pushbutton will set the counter to **000**.

17 Line-Mic/DIN Selector. Selects the program source to be recorded. Released position of this switch selects the stereo program connected to the **Line In** jacks on the rear panel. While depressing this switch will select the microphones connected to the **Microphone** jacks on the front panel. This position also selects the stereo program connected to the DIN jack on the rear panel when no microphone plugs are connected to the **Microphone** jacks.

18 Eject Pushbutton. When none of the cassette transport pushbuttons are depressed, depressing this pushbutton will open the cassette compartment cover so that the cassette can be removed.



cassette over if you want to play the opposite side.

Output Level Adjustment. The main purpose of the **Output Level** control is to adjust the level of the output signal supplied to the amplifier [or receiver] so that it is equal to the levels of other components connected to the amplifier. To control the speaker volume, employ the amplifier or receiver volume control.

Listening with Headphones. A phone jack on the cassette deck is provided for stereo headphone listening when desired. The sound heard in the headphones while recording is the signal from the recording amplifier.

Memory Convenience During Playback. The memory function works in conjunction with the tape counter to enable you to return to [or replay or repeat from] any previously selected point on the tape after recording or playback.

Automatic-Stop. This memory feature, working in conjunction with the tape counter in rewind mode, helps you to locate a predetermined spot on the tape to stop the tape run. By resetting the counter at the beginning of each selection on the tape you record, you will later be able to rewind just to the beginning of the selection.

- 1 Push the tape **Reset** button at the beginning of the section you wish to locate to stop rewinding.
- 2 Depress the **Memory** switch and the **[Automatic-] Stop** button.
- 3 Depress the **Rewind** button to start rewinding. During rewinding, the tape will automatically stop as the counter reaches **000**.

Automatic-Play. This memory mode operates in the similar manner as the **Automatic-Stop** mode, except that the deck will

Recommendations for Tape Selector Switch Setting

Following is a list of commercially available cassettes, along with the recommended setting of the tape selector switch. The cassette deck is optimized for the tapes shown in boldface. However, good results will be obtained with any high quality cassette.

Cassette Name		Tape Selector Setting
Agfa	(LN, HD, super HD)	Normal
Ampex	(LN)	Normal
BASF	(LN, LH, LF Super)	Normal
Maxell	(LN, UD)	Normal
Memorex	(MRX ₂)	Normal
Philips	(LN)	Normal
Scotch	(LH, LD, HE, Master I)	Normal
TDK	(D, SD, AD, ED)	Normal
Agfa	(Chrom)	Special
Ampex	(Chromium)	Special
BASF	(CrO ₂)	Special

Recording

Recording with Microphones. Plug the microphones into the left and right channel **Microphone** jacks. Set the **Line/Mic-DIN** button to **Mic/DIN** [depressed]. Set the Dolby NR switch as required. Set the **Tape Selector** switch as required. Depress the **Pause** button. Depress the **Record** button, then **Play** button. The recording condition will not be achieved if the **Play** button is depressed first. These buttons should now be illuminated to indicate that the machine is now in the recording mode [although the tape is not moving]. Adjust the **Recording Level** controls using the level indicators. Release the **Pause** button to commence recording.

automatically start to play the tape which is rewound to predetermined spot [as the counter reaches **000**].

Automatic-Repeat. If you wish to hear particular section of the tape repeatedly:

- 1 Push the counter **Reset** pushbutton at the beginning of the section you wish to hear repeatedly.
- 2 Depress the **Memory** and **[Automatic] Repeat** switches.
- 3 Depress the **Play** button to start the initial playback. Now (1) after the tape has been played [fully rewound onto the right reel], the tape deck will (2) automatically begins to rewind the tape, then (3) stops rewinding as the counter reaches **000**, then (4) starts to replay from the section and reverts to step (1) again. This repetition of tape rewinding and playback is repeated any number of times.
- 4 Depress the **Stop** button to stop playing.
- 5 Release the **Memory** and the **[Automatic] Repeat** switch to resume the deck to normal playback mode.

Dolbyized Tape Playing. It is essential that the **Dolby NR** switch be set to on (depressed) to play Dolbyized tapes. That is, all tapes recorded with the Dolby NR switch on.

Maxell	(CrO ₂ , UD XL II)	Special
Memorex	(CrO ₂)	Special
Philips	(CrO ₂)	Special
Scotch	(CrO ₂ , Master II)	Special
Sony	(CR)	Special
TDK	(SA, KR)	Special
BASF	(Ferrochrom)	FeCr
Scotch	(Master III, classic)	FeCr
Sony	(Ferrichrome)	FeCr
BASF	(Metal pigment)	Metal
Fuji	(Metal)	Metal
Maxell	(Metal)	Metal
Nakamichi	(ZX metalloy)	Metal
Philips	(Metal)	Metal
Scotch	(Metafine)	Metal
Sony	(Metallic)	Metal
TDK	(MA metal alloy)	Metal

Recording Other Sources. To record from **Line In** jacks, set the **Line/Mic-DIN** switch to **Line** [released]. To record from the **DIN** jack, set the switch to **Mic-DIN** [depressed] and disconnect the microphones from the **Microphone** jacks. Otherwise, proceed as above.

Recording Level Adjustment. If the recording level is too low, tape hiss will be a problem, but adjusting the level too high will result in overloaded and distorted recordings. Generally, optimum recording level is when the indicators deflect as close as possible to **0** on the highest peaks of the

program material without going significantly beyond **0**. When recording with the Dolby NR button depressed, the indicators may deflect up to double-D mark.

Automatic-Recording-Pause [ARP] and Auto-Pause Convenience in Recording. Your cassette deck incorporates two unique pause facilities — ARP and auto-pause. The ARP provides the great convenience in cutting out unwanted parts of the program source when recording, such as commercials. If you wish to omit a commercial on FM, for example, simply depress the **ARP** switch. This will cut out the recording input signal to the tape deck while allowing the tape to run 3 seconds, and the tape deck will be automatically engaged in pause

Protection of Recorded Program

New cassettes are provided with protective plastic tubs on the opposite side of the tape openings. To prevent the accidental erasure of the recordings on one side, hold the cassette as shown with the side you want to protect upward. Remove the tab marked **1** in the diagram. To protect the recording on the opposite side of the cassette, remove the tab marked **2** in the diagram. When you want to make a new recording after you have removed the tab(s), reseal the holes with cellophane or adhesive tape.

Maintenance

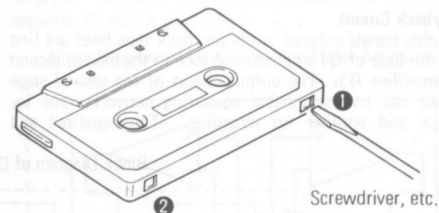
Cleaning the Head, Capstan and Pinch Roller. For optimum performance, the tape heads, capstan, and pinch roller surfaces should be cleaned after every 15 to 20 hours of actual use to remove oxide deposits. To clean the tape heads, use a cotton tipped swab slightly moistened with alcohol [available where tape supplies are sold]. Depress the **Eject** button to open the cassette compartment and remove cassette. Carefully wipe the faces of heads and the surfaces of pinch roller and

Trouble Shooting Guide

The following guide is intended as an aid in correcting problems you may encounter when setting up the stereo system. Although suggested remedy might seem quite elementary, it may be sufficient to make corrections without returning the unit to your dealer.

Problem	Suggested Remedy
Cassette deck will not operate when power switched on.	Be sure power cord is properly wired to power outlet supplying correct voltage and frequency.
Pushbutton(s) illuminates but no output from associated amplifier.	1 Turn program selector on your amplifier to position which selects the output of tape deck. 2 Check connecting audio cables from cassette

condition. After the commercial has been over, simply depress the **Pause** button. The deck will not automatically resume recording after 3 seconds, so be sure to depress the **Pause** button to restart recording. The auto-pause feature may be used to automatically finish or temporarily stop recording when the program source to be recorded has been over. With the **Auto-Pause** switch depressed, the deck will automatically be set in pause condition if no signal is applied to the deck inputs for longer period than 2.5 seconds. This will enable you to finish recording without making tapes run too far with no signal to record, or you can depress the **Pause** button to resume recording, if desired.



capstan which come into contact with the tape. **Demagnetizing Heads.** After period of time, a residual magnetism will build up on the tape heads. It is therefore recommended that the heads be demagnetized after every 20 hours of actual use. A head demagnetizer will perform this function quickly and easily. Follow manufacturer's instructions for use.

deck to the amplifier. 3 Rotate the output level control on the deck fully clockwise.

No output one channel.	1 Refer to above. 2 Exchange connecting audio cables to determine if problem is in equipment or cables.
Hum.	Be sure audio cables are fully inserted into amplifier jacks. 3 Move audio cables around [while listening] to reveal an intermittent or broken shielded lead. Repair or replace.

Record button will not function.

- 1 Reseal recording protecting tab holes on cassette.

Play and Record buttons depressed but not tape movement.

- 1 Release the **Pause** button.

Recording sounds loud and distorted.

- 1 Adjust the **Recording Level** controls so that the indicators do not read beyond **0** dB point.

Playing sound too bright.

- 1 If Dolbyized tape is used, set Dolby NR switch to on.

Sound quality lacks high.

- 1 If tape is not Dolbyized, set Dolby NR switch off.

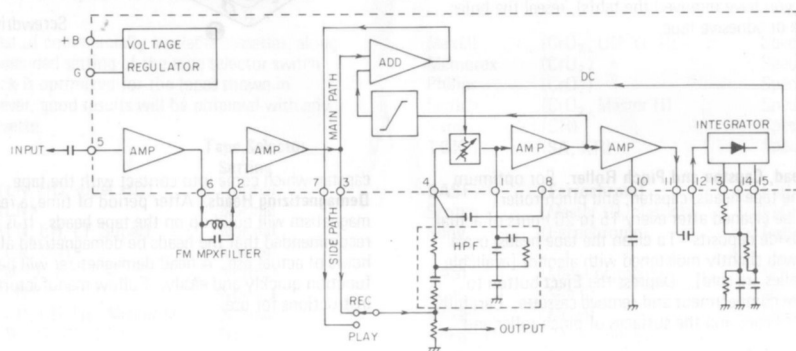
Circuit Description

1. Playback Circuit

The audio signals induced in the playback tape head are first led to the base of Q1 amplifier and then to the base of second stage amplifier Q3. The output circuit of the second stage amplifier has two switchable equalizing networks, one for playback and another for recording. The equalized and

amplified signals are then applied to the pin 5 of Dolby NR IC and further amplified, then decoded as shown in the block diagram of the Dolby NR system IC. The decoded playback signals are developed at pin 7 of the IC U1 and applied to the OUTPUT jacks and DIN jack through the output Volume control VR2.

Block Diagram of Dolby NR System IC, U1:



2. Recording Circuit

The recording circuit consists of the Dolby NR System IC, record head amplifier, final record amplifier and an oscillator unit.

Recording signals from LINE IN jacks are applied to the pin 5 of U1 through REC LEVEL control VR1, while the microphone signals are first led to the head amplifier and the amplified signals are applied to the pin 5 of the IC1 through LINE/MIC/DIN switch and REC LEVEL control. The amplified/encoded signals are developed at pin 3 of the IC. Thus amplified and encoded recording signals are led to the record amplifier of Q5, and the amplified output are led to the record head through a bias trap circuit (L1/C69). On the other hand, switching transistor Q13 is turned on during record mode of operation and supplies the power to the oscillator unit, thereby supplying the bias signal of 85 kHz to the record head. The transistor Q14 connected to the base of Q13 is also a switching transistor which controls the Q13. The base of Q14 is designed to be "H" level when STOP or PAUSE

button is depressed with the tape deck set to the record mode of operation.

The transistor Q7 is a switching transistor which incorporates the MPX filter to the Dolby NR processing circuit to remove undesirable MPX stereo switching noises, thereby reducing erroneous operation of the Dolby NR processing.

FET Q9 (Q10) functions as an ARP Muting circuit. The base (gate) of Q9 is connected to the ARP Control circuit consisting of Q1 and four logic units (U2) on the PC board of PSSW209COX. (ARP: Automatic Recording Pause, depressing the ARP button allows the tape to run for approx. 3 seconds without making any recording to provide non-recorded area on the tape for later use such as automatic program selection, etc.).

Provided on right side of the ARP circuit is the Auto Pause circuit consisting of transistors Q2-Q5. This circuit makes the tape deck set to Pause mode of operation provided no signal is applied to the deck for more than 2.5 seconds.

Two AND logics (U1-3 & 4) are the circuit which control

the automatic operation of Stop, Play, Repeat and Rewind. Another two AND logics (U1-11 & 10) are for timer recording and playback.

3. Logic Controls

The tape deck has employed the full logic control system for feather touch, simple operation, and the logic circuits are mounted on the PC board PSSW209COX.

Description for every logic operation may be omitted, however the common rules required to read the logic operation is given below. Namely, the gate output is always high level if both gate inputs are low levels simultaneously. For all other input level combinations the logic output are always low levels.

The input stage of the logic circuits is comprised of four flip-flops, each of which consists of two logic units. The flip-flop has two logic states which are always opposite in output level. For example, if U1 (9) is high level, U3 (11) is low level or vice versa (refer to the schematic diagram).

Some examples of the logic states in relation to the operation mode selector switches are also given below:

With Play button depressed: U2 (6) is H level

U3 (9) is H level

U3 (4) is H level

With Pause button depressed: U1 (6) is H level

U3 (4) is H level

With REC button depressed: U1 (9) is H level

U4 (3) is H level

Other control circuits mounted on the logic control PC board are as follows:

Q1 & U4 (10): Timing circuit for Rew to Play, FF to Play and Stop to FF, Rew & Play

Q2, Q4, Q3 & Q5: Solenoid drivers

Q6 and Q7: Motor driver

Q8: Cassette sensor

Q9: Play LED driver

Q10: Pause LED driver

Q11: Stop LED driver

Q12: Rec LED driver

Q13: Rec solenoid driver

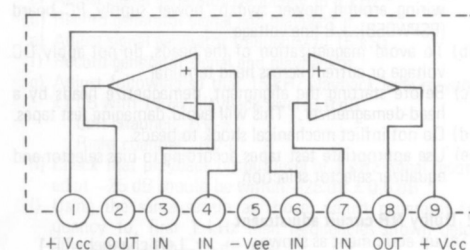
Q14 & Q15: Auto-stop switching

Q16: Audio muting

4. Headphone and VU Meter Circuits

Recording or playback signals developed at pin 3 or pin 7 of IC U1 are also applied to the inverting input of the operational amplifier U3 and the amplified output are developed at pin 2 (pin 8 for another channel). The output signals at pin 2 are split into two: one is led to the meter driver amplifier U1 and the U1 drives the meter, and another to the headphone jack. Transistor Q1 on the meter unit PC board PSDS002COX is an AVR. The block diagram of the Headphone and the Meter amplifier IC will be given below.

Block Diagram of Headphone and Meter Amplifier IC:



Service Information

Alignment Procedure

1. Measurement condition

- 1) Reference temperature: 25°C
- 2) Reference humidity: 65%

NOTE: Unless otherwise specified strict accuracy of alignment is required and alignment may be performed under the room temperature of 5 - 35°C and humidity of 45 - 85%.

- 3) Power supply
Voltage: AC 220V ± 1%
Frequency: 50 Hz ± 2%
THD: less than 2%

2. Test equipment

Any testing equipment used in this alignment should have their known accuracy and capability to operate within a range of specified tolerance.

NOTE: All testing equipment used should be properly calibrated.

EQUIPMENT

- 1) AF signal generator:
- 2) mV meter:
- 3) Oscilloscope:
- 4) Frequency counter:
- 5) Distortion meter:
- 7) Head demagnetizer:

SPECIFICATION

Frequency range: 20 - 100 kHz.
Output: 600 Ohm, 0.1 mV - 1V.
THD: less than 0.1%.
Frequency range: 20 Hz - 1 MHz.
Measurement range: 1 mV - 1.0V.
Input impedance: more than 1 MOhm.
Frequency range: 20 Hz - 1 MHz.
Input range: 0.5 mV - 10V.
Frequency range: 20 Hz - 1 MHz.
Frequency range: 400 Hz/1 kHz (315 Hz).
Measurement range: 0.1% - 3%.
DIN/JIS/NAB
Measurement range: 0.1% - 3%.

b) Test tapes:

Usage	Model	Purpose
a) Playback level adjustment	MTT-150 (TEAC)	400 Hz at Dolby NR level.
b) Head azimuth adjustment	MTT-114 (TEAC)	10 kHz at -10 dB.
c) Playback frequency response alignment	MTT-217E (TEAC) MTT-216 (TEAC) MTT-316 (TEAC)	63 Hz/1 kHz/10 kHz at -10 dB. 3180 μ s ~ 120 μ s at -20 dB. 3180 μ s ~ 70 μ s at -20 dB.
d) Wow/flutter and tape speed alignment	MTT-111 (TEAC)	3 kHz at -10 dB.

3. Alignment

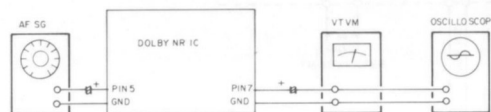
3.1 Preadjustment

- Before turning power on, check thoroughly and visually wiring around power switch, power supply PC board (PSPW058), + B line voltage.
- To avoid magnetization of the heads, do not apply DC voltage or current across head terminal.
- Before starting the alignment, demagnetize heads by a head-demagnetizer. This will avoid damaging test tapes.
- Do not inflict mechanical shock to heads.
- Use appropriate test tapes according to bias selector and equalizer selector selection.

3.2 Dolby NR circuit adjustment

Set up equipment as shown:

Left channel: TP-1
Right channel: TP-2
MPX filter switch: off



3.2.1 VU meter (Fluorescent-tube) adjustment

- Set Dolby NR switch to off and Set the deck to recording mode.
- Adjust AF signal generator frequency to **400 Hz**.
- Adjust AF signal generator to obtain level meter reading of **580 mV**.
- Rotate the following on PSDS002 until +3 dB (Dolby NR level) point LED's light up:
Left channel: RV-1,
Right channel: RV-2.

3.2.2 Dolby NR encoding characteristic check

- Adjust AF signal generator frequency to 5 kHz.
- Set Dolby NR switch to "on" position.
- Check for proportional increase in Dolby NR IC output to signal generator input as follows:

Input	Output	Acceptable tolerance
0 dB	0 dB (580 mV)	0 dB
-10 dB	-8.5 dB	± 2 dB
-20 dB	-17 dB	± 2 dB
-30 dB	-22 dB	± 2 dB
-40 dB	-30 dB	± 2 dB

- S/N adjustment MTT-212 315 Hz DIN reference (TEAC)
- Test music tape
Any tape available in the market.
- Record, playback, level and bias adjustment and measurement.
Normal bias (STD) D C-60 (TDK)
CrO₂ bias SA C-60 (TDK)
FeCr bias FCR C-60 (BASF)
Metal bias MA. AC-711 C-60 (TDK)

3.2.3 M.P.X. (19 kHz) filter check

- Set up equipment as before, set the deck to recording mode.
- Adjust signal generator frequency to 19 kHz.
- Set M.P.X. FIL switch to "ON" position.
- Connect level meter (discrete) to Line output jacks.
- Check 19 kHz signal is attenuated by more than 30 dB (580 mV = 0 dB) in comparison with the attenuation at 400 Hz.

3.3 Playback circuit alignment

Set up equipment as shown:

Dolby NR switch: off
Bias/Equalizer: normal
M.P.X. filter: off
Output volume: maximum



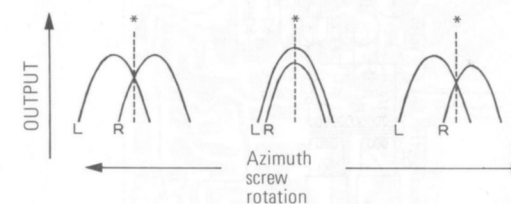
3.3.1 Playback output level adjustment

- Set up equipment as above.
- Insert level test tape **MTT-150** into the cassette compartment.
- Set the deck to playback mode.
- Adjust following for **580 mV $\pm$ 0.5 dB** level indicator reading:
Left channel: RV-1,
Right channel: RV-2.

3.3.2 Head azimuth alignment

- Set up equipment as above.
- Insert azimuth test tape **MTT-114** into the cassette compartment.
- Adjust head azimuth screw for maximum output (voltage reading).

- If azimuth screw will not give equal maximum output for both left and right channels at the same point, use the following:



Adjust azimuth screw to: *

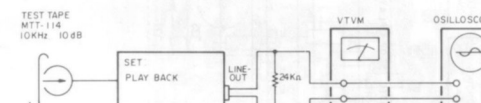
3.4 Recording circuit alignment

3.4.1 Bias frequency check

- Set the deck to REC mode.
- Connect frequency counter to #1 and #3 pin on PC board PSRP025.
- Check frequency as follows: 85 kHz $\pm$ 5 kHz.

3.4.2 Recording and playback level alignment

Set up equipment as shown below:



- Adjust signal generator frequency to 1 kHz.
- Insert TDK SA C-60 blank tape, set the deck to REC mode.
- Adjust signal generator output until voltmeter connected to Line out jacks shows 580 mV (580 mV = 0 dB).
- Decrease generator output by 25 dB.
- After steps c) and d) above, adjust following for -25 dB playback level just recorded: (on PC board PSRP025)
Left channel: RV-3,
Right channel: RV-4.

3.4.3 Bias current alignment (REC/PB frequency response)

Use same set up as in 3.4.2.

- Insert blank test tape TDK SA C-60 into the deck.
- Set the deck to REC mode.
- Adjust signal generator frequency to 1 kHz.
- Record generator signal and playback it.
- Adjust signal generator frequency to 15 kHz.
- Record generator signal and playback it.
- Adjust following so that 15 kHz playback level is within ± 1 dB with 1 kHz playback level as 0 dB:
Left channel: RV-5,
Right channel: RV-6.

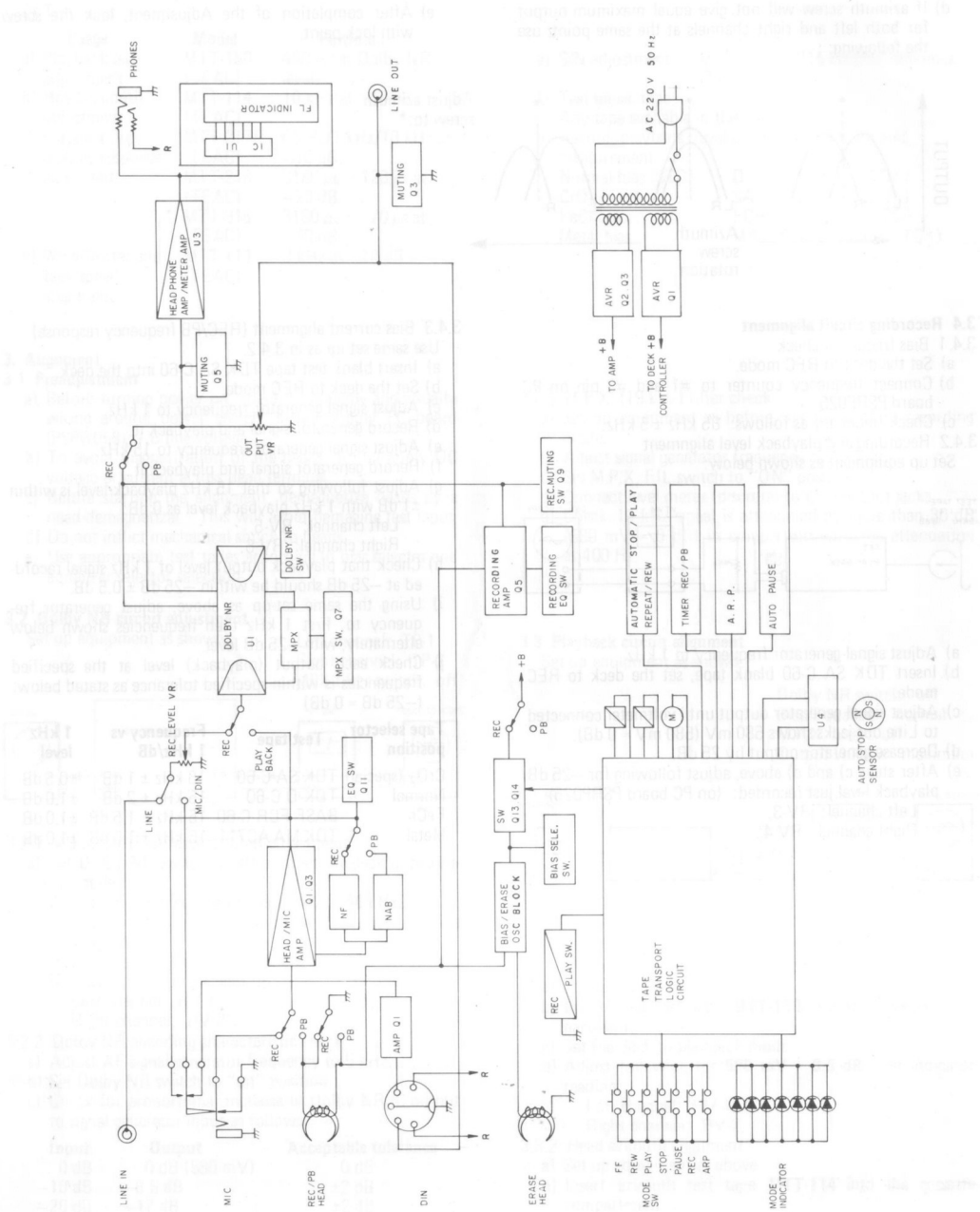
- Check that playback output level of 1 kHz signal recorded at -25 dB should be within -25 dB $\pm$ 0.5 dB.

- Using the same set-up as above, adjust generator frequency to, first 1 kHz then frequencies shown below alternately, with -25 dB level.

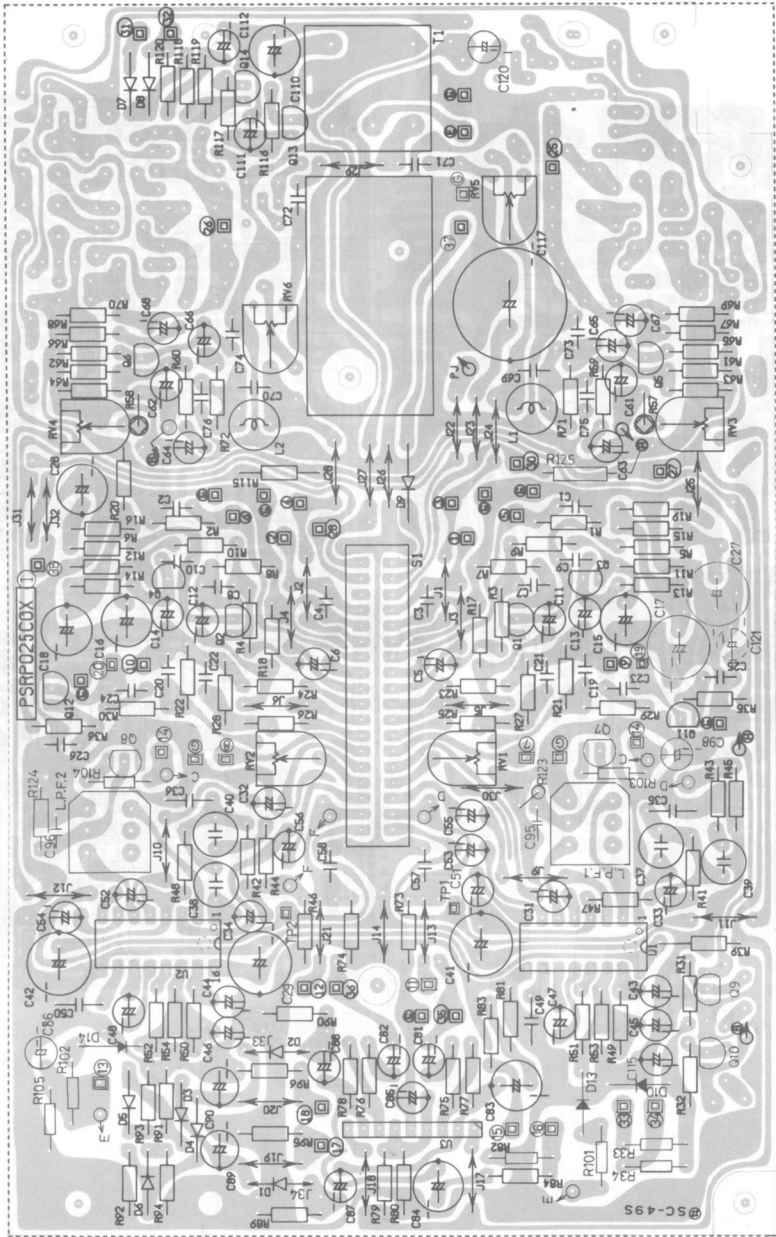
- Check each output (playback) level at the specified frequencies is within specified tolerance as stated below: (-25 dB = 0 dB)

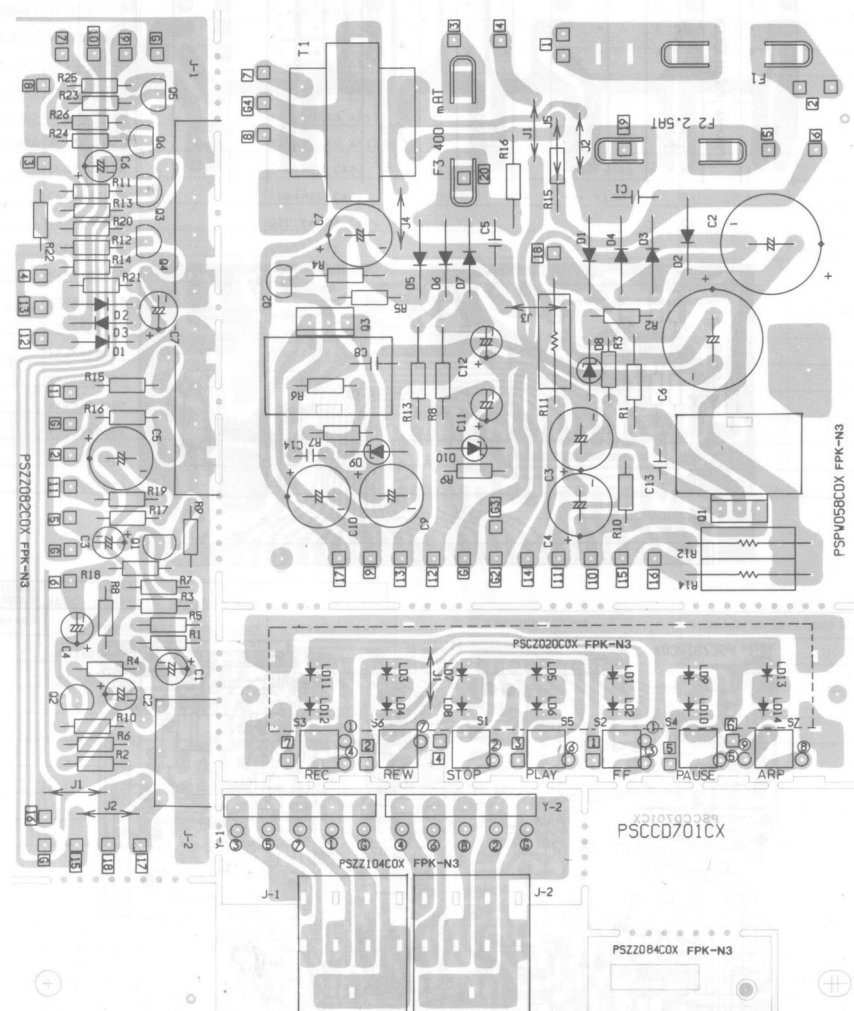
Tape selector position	Test tape	Frequency vs 1 kHz/dB	1 kHz level
CrO ₂ (special)	TDK SA C-60	15 kHz $\pm$ 1 dB	± 0.5 dB
Normal	TDK D C-60	15 kHz $\pm$ 2 dB	± 1.0 dB
FeCr	BASF FCR C-60	15 kHz $\pm$ 1.5 dB	± 1.0 dB
Metal	TDK MA AC711	15 kHz $\pm$ 1.5 dB	± 1.0 dB

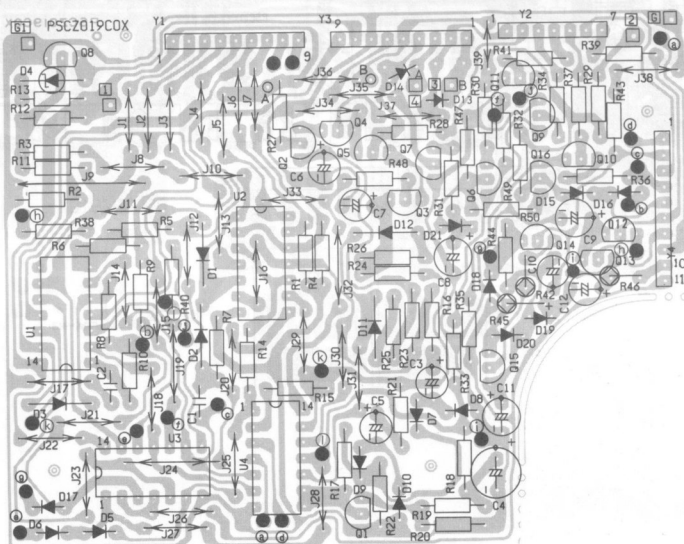
Block Diagram



PC Board Layout





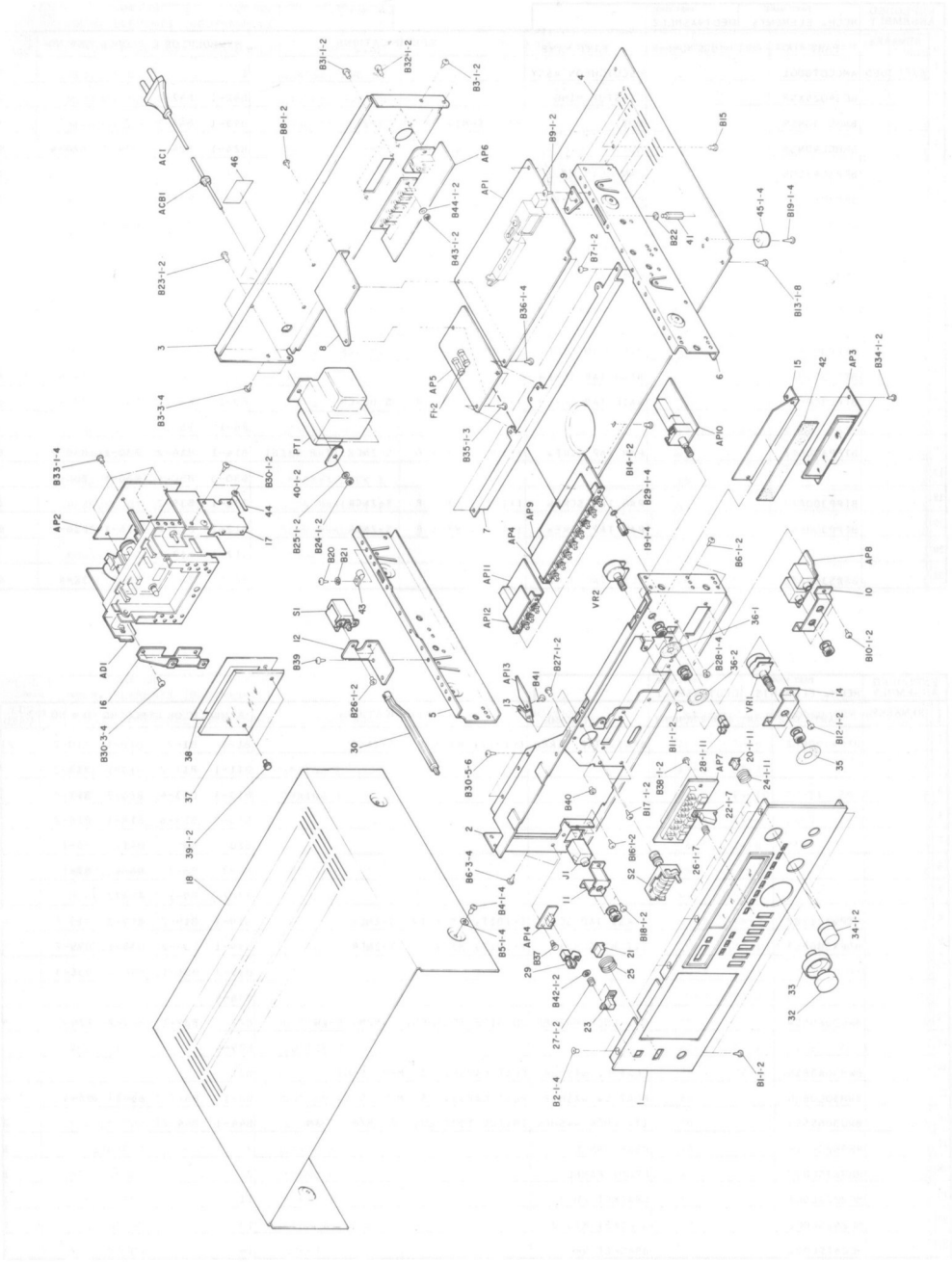


Replacement Parts List

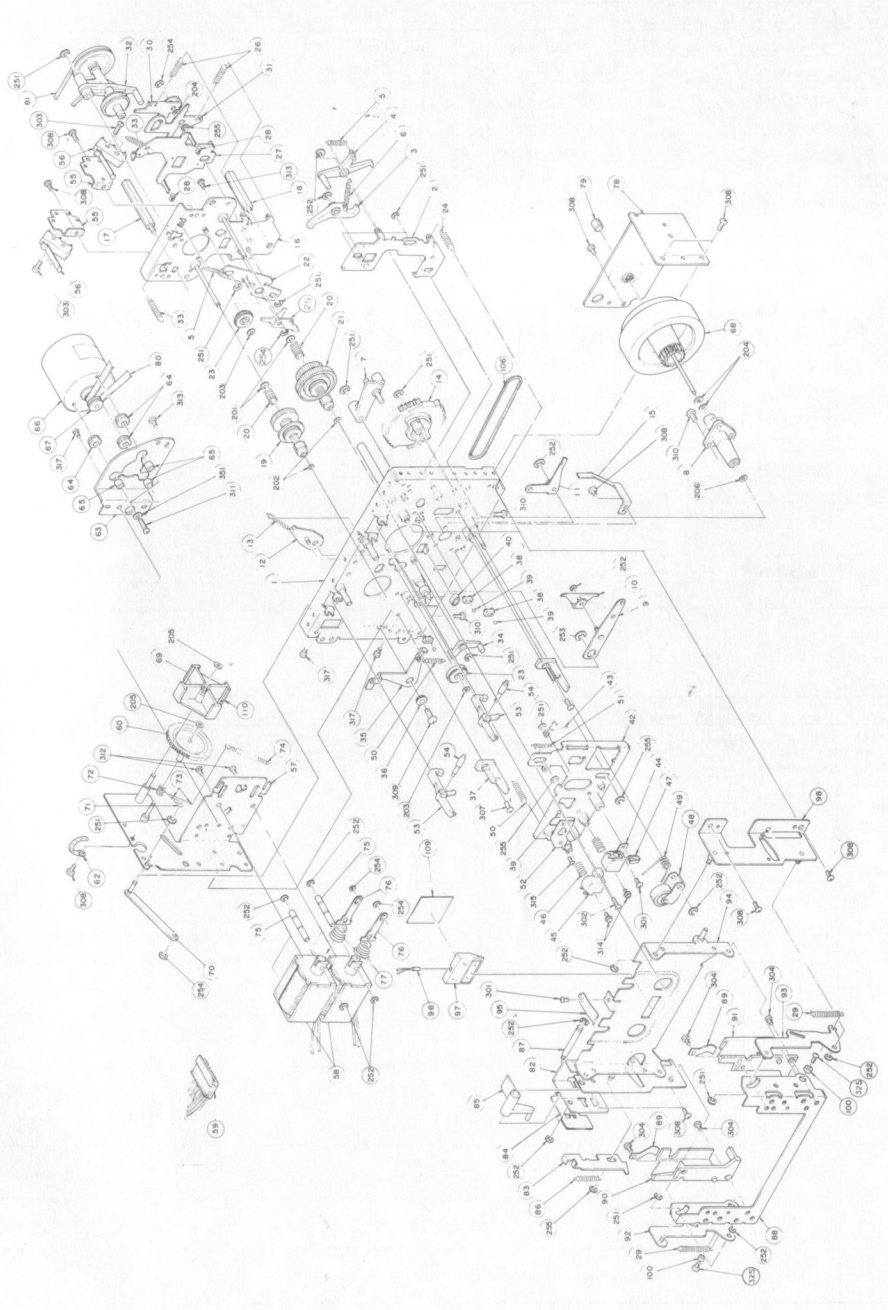
EXPLODED ASSEMBLY	ELEC. ELEMENTS	PART CODE DED79ASMCL1	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME			
1		ACAC035EEA		AC CORD ASSY	AC1		1
2	EXPLODED	ADF1TAZ36G		TAPE DECK ASSY	AD1		1
3	EXPLODED	APSCC07012		P.W.B. BOARD ASSY			1
4	EXPLODED	APSCC07021		P.W.B. BOARD ASSY			1
5	EXPLODED	APSCZ019AD		P.W.B. BOARD ASSY			1
6	EXPLODED	APSDS00ZCA		P.W.B. BOARD ASSY			1
7	EXPLODED	APSLD133AA		P.W.B. BOARD ASSY			1
8	EXPLODED	APSRP025CD		P.W.B. BOARD ASSY			1
9		CKDB103ZFM		CERAMIC CAP.	0.01MFD 50V -20% +80% F	C2 C3	2
10		CKDB472PEM		CERAMIC CAP.	4700PF 50V -0% +100% E	C4 C5	2
11		CNST103MAN		OIL PAPER CAP.		C1	1
12		GCCD700AU1		WIRES KIT			1
13		RVPA203AU7		VR		VR1	1
14		RVQA103A13		VR		VR2	1
15		SP01AAS12N		PUSH SWITCH		S1	1
16		TPJ66S004Y		POWER TRANS		PT1	1
17		VM270N8004		BUSHING		ACB1	1
18		VX432VL002		C-COVER		ZZ1	1
19		YJS03S008Z		6P JACK		J1	1
20		ZFBQ25203A		FUSE		F1	1
21		ZFBQ40102A		FUSE		F2	1

EXPLODED ASSEMBLY		PART NAME		PART CODE						
ELEC. ELEMENTS		DED79AS4CL1								
ITEM NO.	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1		ZK03A00017		COUNTER		S2				
2		ZZZ0000154		SOLDERLESS CONN		ZZZ				
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										

Exploded View(General)



Exploded View(Tape Mechanism)



EXPLODED ASSEMBLY		PART NAME		PART CODE		PART CODE			
MECH. ELEMENTS		DE079ASMCL2							
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1	EXPLODED	AMCCD70001		ESCUTCHEON ASSY			1		1
2		BC54025XSP		C5-STOP RING			B42-1	B42-2	2
3		BNHCL30NSN		NUT	M3, S-NI, THIN-TYPE		B43-1	B43-2	2
4		BNHCL40NSN		NUT	M4, S-NI, THIN-TYPE		B24-1	B24-2	4
5		BRP3045QNB		PAN HEAD RIVET			B37		1
6		BRP3055QNB		PAN HEAD RIVET	3Mx5.5		B32-1	B32-2	2
7		BSPB2606NZ		BIND HEAD SCREW	(+)BIT, M2.6 X 6 S-ZNCR		B33-1	B33-2	4
8		BSPB4012NB		BIND HEAD SCREW	(+)BIT, M4 X 12 S-BLACK		B23-1	B23-2	2
9		BSPC3006NZ		CEMS SCREW	(+)BIT, M3 X 6 S-ZNCR		B15	B26-1	10
10							B27-2	B28-1	
11							B28-2	B28-3	
12		BSPP3008NB		PAN HEAD SCREW	(+)BIT, M3 X 8 S-BLACK		B40		
13		BTPB5010TN		BIND TAP SCREW			B31-1	B31-2	2
14		BTPL3008BB		NAIL TAP SCREW	(+)BIT, M3 X 8 S-BLACK		B4-1	B4-2	4
15							B4-3	B4-4	4
16		BTPP3006TZ		PAN TAP SCREW	(+)BIT, M3 X 6 S-ZNCR (TAP TITE)		B3-1	B3-3	6
17							B8-1	B8-2	
18		BTPP3008AZ		PAN TAP SCREW	(+)BIT, M3 X 8 S-ZNCR		B14-1	B14-2	8
19		BTPP3008BZ		PAN TAP SCREW	(+)BIT, M3 X 8 S-ZNCR		B30-1	B30-2	6
20							B30-3	B30-4	
21		BTPS3006TB		FLAT TAP SCREW			B30-5	B30-6	
							B38-1	B38-2	2
							B12-1	B12-2	6
							B16-1	B16-2	
							B17-1	B17-2	
							B2-1	B2-2	
							B2-3	B2-4	

EXPLODED ASSEMBLY		PART NAME		PART CODE						
		MECH. ELEMENTS		DED79ASMCL2						
1	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED		
1		BTPW3008BZ		BRAS. TAP SCREW	(+)BIT, M3 X 8 S-ZNCR	B1-1	B1-2	B10-1	B10-2	22
2						B11-1	B11-2	B13-1	B13-2	
3						B13-3	B13-4	B13-5	B13-6	
4						B13-7	B13-8	B18-1	B18-2	
5						B20	B39	B41	B6-1	
6						B6-2	B6-3	B6-4	B7-1	
7						B7-2	B9-1	B9-2		
8		BTPW3012BZ		BRAS. TAP SCREW	(+)BIT, M3 X 12 S-ZNCR	B19-1	B19-2	B19-3	B19-4	4
9		BTPX3008BZ		L.T BT SCREW	(+)BIT, M3 X 8 S-ZNCR	B34-1	B34-2	B35-1	B35-2	9
10						B35-3	B36-1	B36-2	B36-3	
11						B36-4				
12		BWG30655SW		UT. LOCK WASHER	OUTSIDE TOOTHED, 3M/M S-ZN	B22	B29-1	B29-2	B29-3	9
13						B29-4				
14		BWM30A08SN		FLAT L. WASHER	FLAT LARGE, 3 M/M S-NI	B21				1
15		BWM50C08SN		FLAT L. WASHER	FLAT LARGE, 5 M/M S-NI	B5-1	B5-2	B5-3	B5-4	4
16		BWU30655SW		LT. LOCK WASHER	INSIDE TOOTHED, 3 M/M S-ZN	B44-1	B44-2			2
17		MB962SK016		REAR PANEL		3				1
18		MB962SL009		FRONT PANEL		2				1
19		MC222SL001		BRACKET PH J		11				1
20		MC242SL002		BRACKET MIC J		10				1
21		MC261SL001		BRACKET VR		14				1

EXPLODED ASSEMBLY		PART NAME		PART CODE		STOCK NO.		
MECH. ELEMENTS		DE079ASML2						
1	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS		SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
1		ML321SL001		BRACKET PWB			13	1
2		ML333SL002		BRACKET PWR SW			12	1
3		ML542SL002		BRACKET DECK R			17	1
4		ML662SL001		BRACKET BK			8	1
5		ML722SD001		BRACKET FL			15	1
6		ML932SL001		BRACKET C			7	1
7		MN276XA038		KNOB			34-1 34-2	2
8		MN286XA064		KNOB W R			33	1
9		MN286XA065		KNOB W L			32	1
10		MS31752006		PLATE			40-1 40-2	2
11		MS336SL003		BRACKET SD			9	1
12		MS765AA010		PLATE CASSETTE			38	1
13		MS986SX013		BOTTOM PLATE			4	1
14		MT164AA007		SCREW			39-1 39-2	2
15		MT263BD010		SPACER SW			19-1 19-2 19-3 19-4	4
16		MT563BJ001		SUPPORT			41	1
17		MU621SL002		BRACKET DECK L			16	1
18		MU852SL007		SIDE BRACKET R			6	1
19		MU852SL011		SIDE BRACKET L			5	1
20		MU896SM007		COVER			18	1
21		MW161LY002		SPRING D			26-1 26-2 26-3 26-4	7

EXPLODED ASSEMBLY		PART NAME		PART CODE						
MECH. ELEMENTS		DED79ASMCL2								
ITEM NO.	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
1						26-5	26-6	26-7		
2		MW161LY003		SPRING E		27-1	27-2			2
3		MW271LY004		SPRING A		24-1	24-10	24-11	24-2	11
4						24-3	24-4	24-5	24-6	
5						24-7	24-8	24-9		
6		MW271LY005		SPRING C		25				1
7		MX4155Z001		CLAMPER		44				1
8		VM2835B001		FOOT		45-1	45-2	45-3	45-4	4
9		VN220AX001		BUTTON A		20-1	20-10	20-11	20-2	11
10						20-3	20-4	20-5	20-6	
11						20-7	20-8	20-9		
12		VN220AX003		BUTTON C		21				1
13		VN240AX001		BUTTON D		22-1	22-2	22-3	22-4	7
14						22-5	22-6	22-7		
15		VN240AX002		BUTTON E		23				1
16		VQ6115B002		SHAFT		30				1
17		V5417NN003		CLAMPER		43				1
18		V5627RF001		SPONG FL		42				1
19		V5654FB001		BARRIER		50				1
20		V5769AC001		LTD CASSETTE		37				1
21		V5805YB004		SHEET A		35				

NOTE.

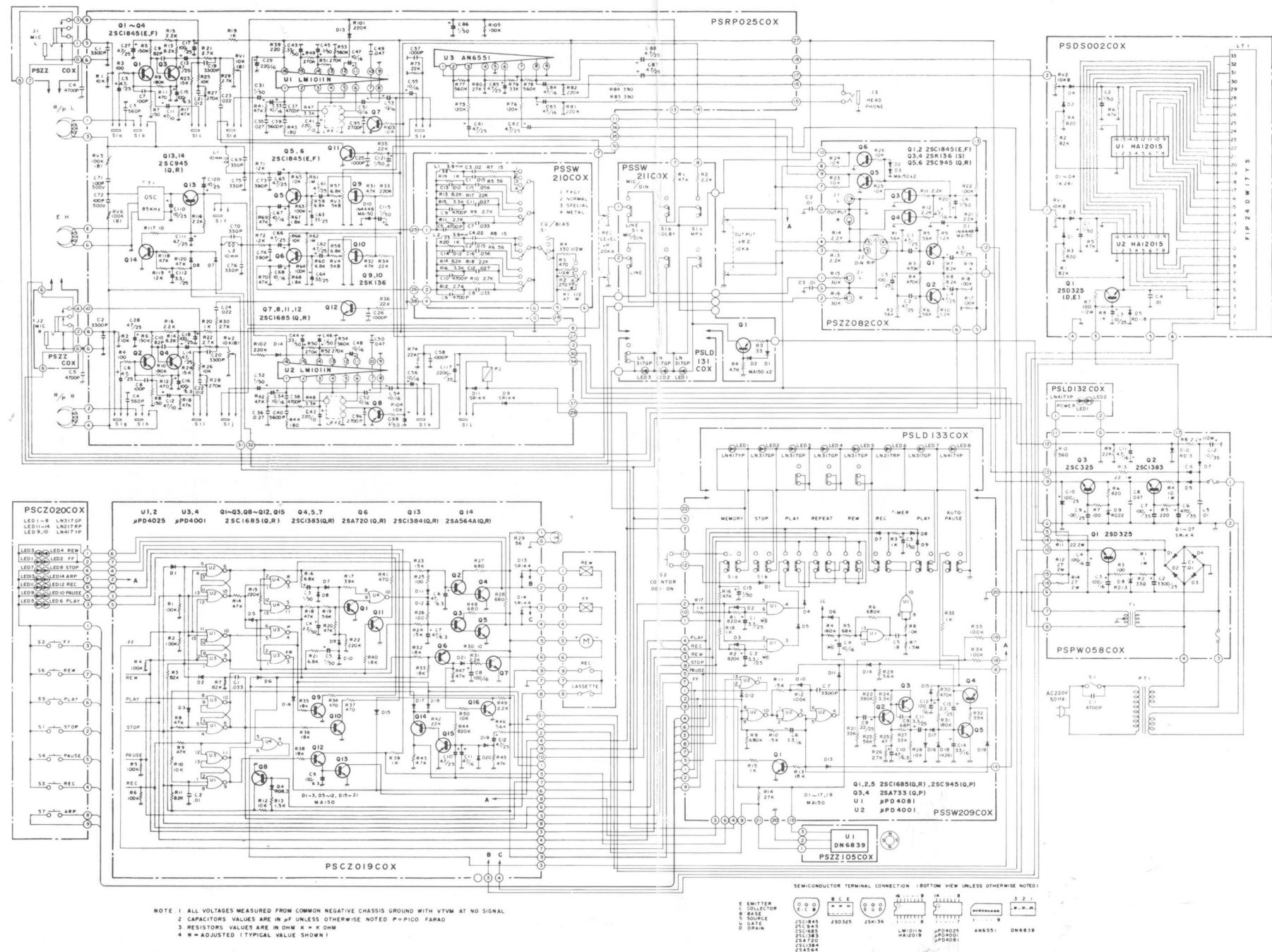
EXPLODED ASSEMBLY		PART NAME P.W.=BOARD ASSY	PART CODE APSZZ082BD						
QTY USED	REMARKS	PART CODE	PART, STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.			
1		CEAD4R7ZMN		ELYT. CAPACITOR	4.7MFD 16V MS	C7			
2		CEAE101ALX		ELYT. CAPACITOR	100MFD 25V	C5			
3		CEAG010ZMN		ELYT. CAPACITOR	1MFD 50V MS	C6			
4		CEVE4R7ALX		ELYT. CAPACITOR		C1	C2	C3	C4
5		MW201B5001		TERMINAL					
6		MW401CX006		SHOT JAMPER	10MM				
7		PSZZ082COX		PRINTED W.B.OARD					
8		QDSMA150XN		SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D1	D2	D3	
9		QTC0945ADA		TRANSISTOR	25C945A Q,R-RANK	Q5	Q6		
10		QTC1845XAA		TRANSISTOR	25C1845 E,F-RANK	Q1	Q2		
11		QTK0136XBN		TRANSISTOR	25K136 S-RANK	Q3	Q4		
12		RD25PJ102X		CARBON FILM R.	0.25W 1K OHM 5%	R19			
13		RD25PJ103X		CARBON FILM R.	0.25W 10K OHM 5%	R11	R12	R23	R24
14						R25	R26		
15		RD25PJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R17	R18	R22	
16		RD25PJ122X		CARBON FILM R.	0.25W 1.2K OHM 5%	R10	R9		
17		RD25PJ222X		CARBON FILM R.	0.25W 2.2K OHM 5%	R13	R14		
18		RD25PJ223X		CARBON FILM R.	0.25W 22K OHM 5%	R21			
19		RD25PJ303X		CARBON FILM R.	0.25W 30K OHM 5%	R15	R16		
20		RD25PJ474X		CARBON FILM R.	0.25W 470K OHM 5%	R3	R4		
21		RD25PJ563X		CARBON FILM R.	0.25W 56K OHM 5%	R1	R2	R5	R6

EXPLODED ASSEMBLY		PART NAME		PART CODE	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
REMARKS		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS		
1		RD25PJ822X		CARBON FILM R.	0.25W 8.2K OHM 5%	R7	RB
2		YJD055011Z		5P DIN JACK		J2	
3		YJP045013U		4P PIN JACK		J1	

EXPLODED ASSEMBLY		PART NAME		PART CODE				
REMARKS		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		QTY USED
1		PSZ2104C0X		P-W BORD				
2		VJ5095005Z		HEAD PHONE JACK		J1	J2	
3		YTA2500001		5P TERMINAL		Y1	Y2	

EXPLODED ASSEMBLY		PART NAME		PART CODE						
ASSEMBLY		P.W.BDARD ASSY		APSZZ105AA						
S	REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USE
1		PSZZ105COX		P.W BORD						
2		QQMN6839AN		HALL. I.C.	DN6839 HALL-I.C.	U1				
3		WUG015EKAX		HI-WRAP WIRE		N02				
4		WUG115EKXX		HI-WRAP WIRE		N01				
5		WUG215EKXX		HI-WRAP WIRE		N03				
6										
7										
8										
9										

Schematic Diagram



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