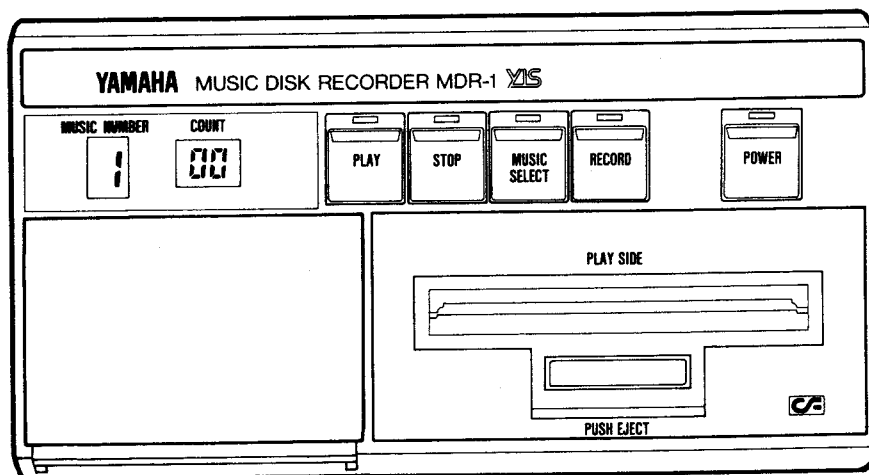


MUSIC DISK RECORDER

MDR-1

SERVICE MANUAL



MC-Service

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SINCE 1887



YAMAHA

NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

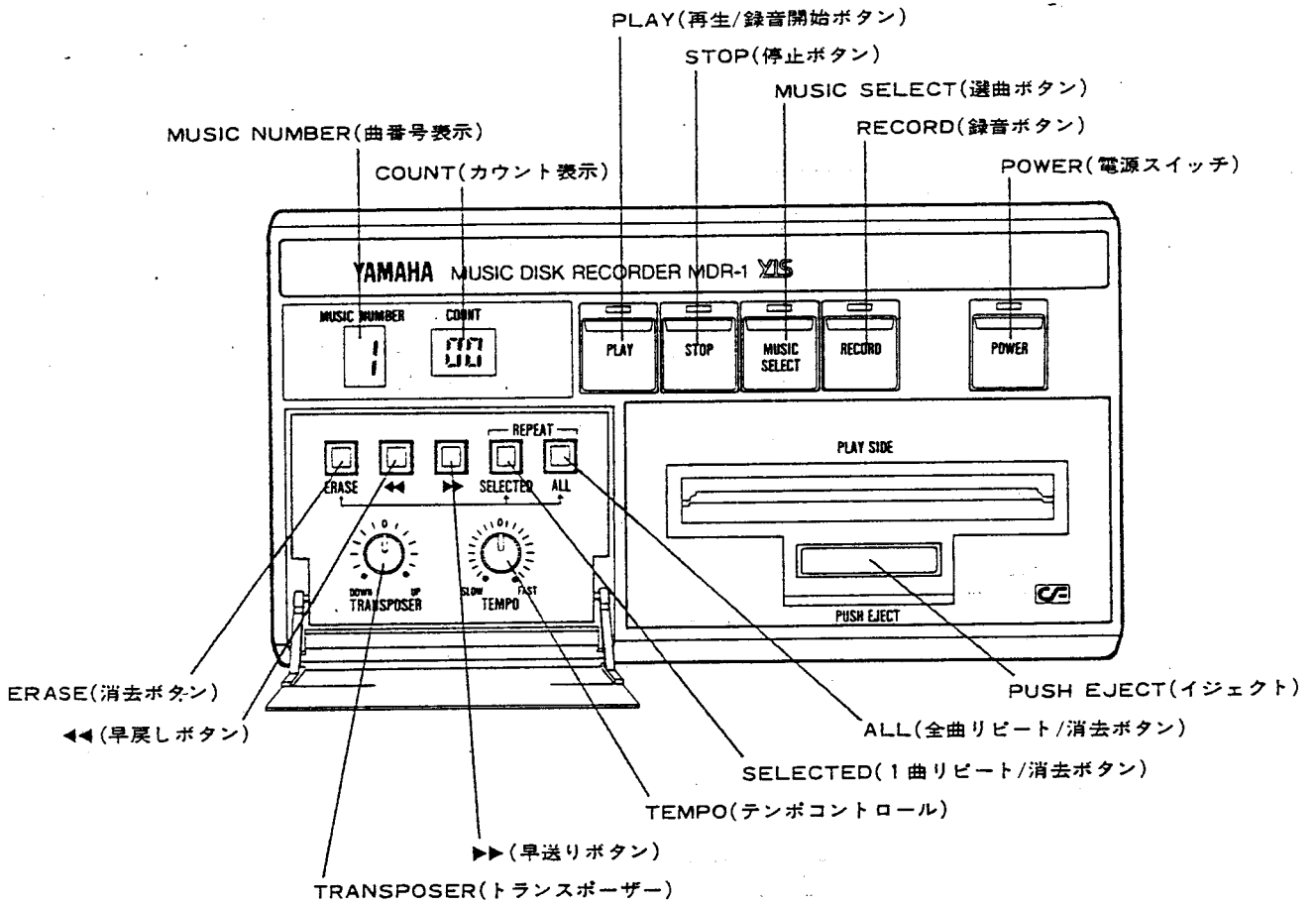
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MDR-1

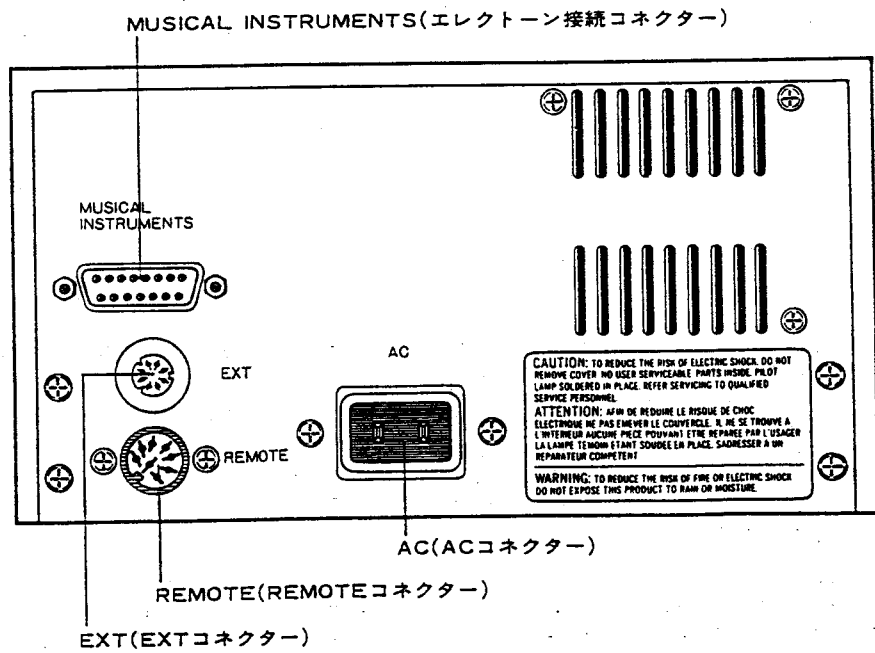
■ SPECIFICATIONS (仕様)

- **Recording Medium** 3" compact floppy disk
(記録媒体) (3インチコンパクトフロッピーディスク)
- **Memory Capacity** 200 kbytes per side/max. 9 programs
(記録容量) (片面200kバイト/最大9曲)
- **Controls** Power, stop, play, record, music select, erase, fast forward,
(コントロール) rewind, selected (repeat/erase), all (repeat/erase)
- **Display** Music number, count
(ディスプレイ)
- **Terminals** AC outlet, Electone attachment connector, remote connector, external connector
(端子) (ACアウトレット) (エレクトーン接続コネクタ) (リモートコネクタ)
(外部通信用コネクタ)
- **Rated Power Supply Voltage** Refer to the name plate
(定格電源電圧) (銘板を参照)
- **Rated Power Supply Frequency** 50/60 Hz
(定格電源周波数)
- **Rated Power Consumption** Refer to the name plate
(定格消費電力) (銘板を参照)
- **Operational Environment** Temperature 10°C to 40°C
(使用環境) (温度10°C~40°C)
Humidity 20% to 80%
(湿度20%~40%)
- **Dimensions** 190 (W) x 273 (D) x 109 (H) mm
(寸法)
- **Weight** 4.5 kg
(重量)
- **Accessories** 5 floppy disks
(付属品) (フロッピーディスク5枚)

FRONT PANEL

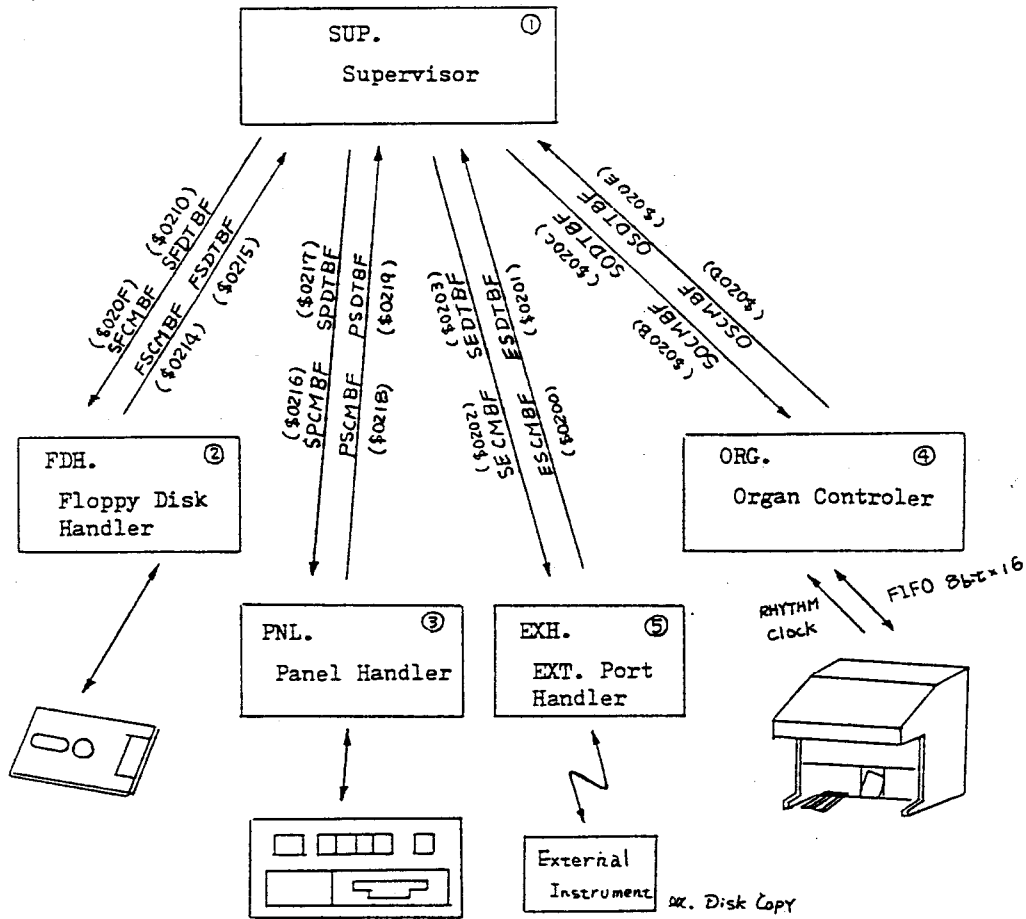


REAR PANEL



■ MDR-1 OPERATIONAL OUTLINE(動作概要)

1.(ソフト上の動作ブロック)



Single Port Band Rate 9600 Baud

Vector

Reset	\$9000	. TXD
Main	\$9003	. RXD
IRQ	\$9006	. DCD
		. +5v
		. Reset

① Supervisor

This program oversees the entire operation of the MDR-1. Based on each operation of the program, it directs the operational order of each program with requests from other programs used as actual operational commands. Basically (with emergency exceptions) each inter-module procedures are carried out through the command buffer (XXCMBF) and the data buffer (XXDTBF) by way of the supervisor.

② Floppy Disk Handler

This program carries out micro-floppy disc data transactions. It controls the ON/OFF switching of the motor, head restore (transfer of the "0" track) and read/write of sector units. However, for the format mode (all programs erase), another separate program is used (FMT: Format Module). The FDH does not affect the format.

① Supervisor

MDR-1の全体の動作を監視するプログラム。各動作モードに基づき、他のプログラムからのリクエストを実際の動作コマンドとして、各プログラムに動作手順を指示する。基本的には(急を要する時等例外はあるが)、各モジュール間の手続きは必ずコマンドバッファ(XXCMBF)とデータバッファ(XXDTBF)を通じて行ない、このスーパーバイザを経由して行なわれる。

② Floppy Disk Handler

マイクロフロッピーとのデータのやりとりをするプログラム。モーターのON-OFF、ヘッドのリストア(「0」トラックへ移動)、セクター単位のRead/Writeを行なう。ただし、フォーマット(全面消去)のときは別のプログラム(FMT:Format/Module)が動き、FDHはフォーマットには関与しない。

③ Panel Handler

This program reads out the position of the panel switches and controls the ON/OFF of the LEDs. Although all operations of MDR-1, begins from this point, it does not possess a decision maker. Decisions whether to accept or not are all carried out by the supervisor.

④ Organ Controller

This program is for the program of the actual control of organs. According to the type of organ used, it carries out the proper data and command input/output. It carries out command transactions from the supervisor. According to the mode controlling section (ORG: Organ) and the rhythm clock from the organ, it can be divided into event checkers which are operated by IRQ, which is produced from the event clock, which is in turn produced from the hardware. System and organ command transactions are carried out by ORG and performance data are handled by ECK.

⑤ External Port Handler

This section is for communication with external devices by way of the ACIA (non-synchronized serial input/output). Programs and data input from this section can use part or all functions of MDR-1. Commands which possess functions as well as panel directives are contained in the software. When there are no external program inputs, an ACIA error is produced, after which this program is ignored.

③ Panel Handler

パネルのSWを読み取り、LEDのON-OFFのコントロールをする。MDR-1のすべての動作はここを起点として行なわれるが、判断機能はもっていない。受け付けるか否かはすべてSupervisor①が行なう。

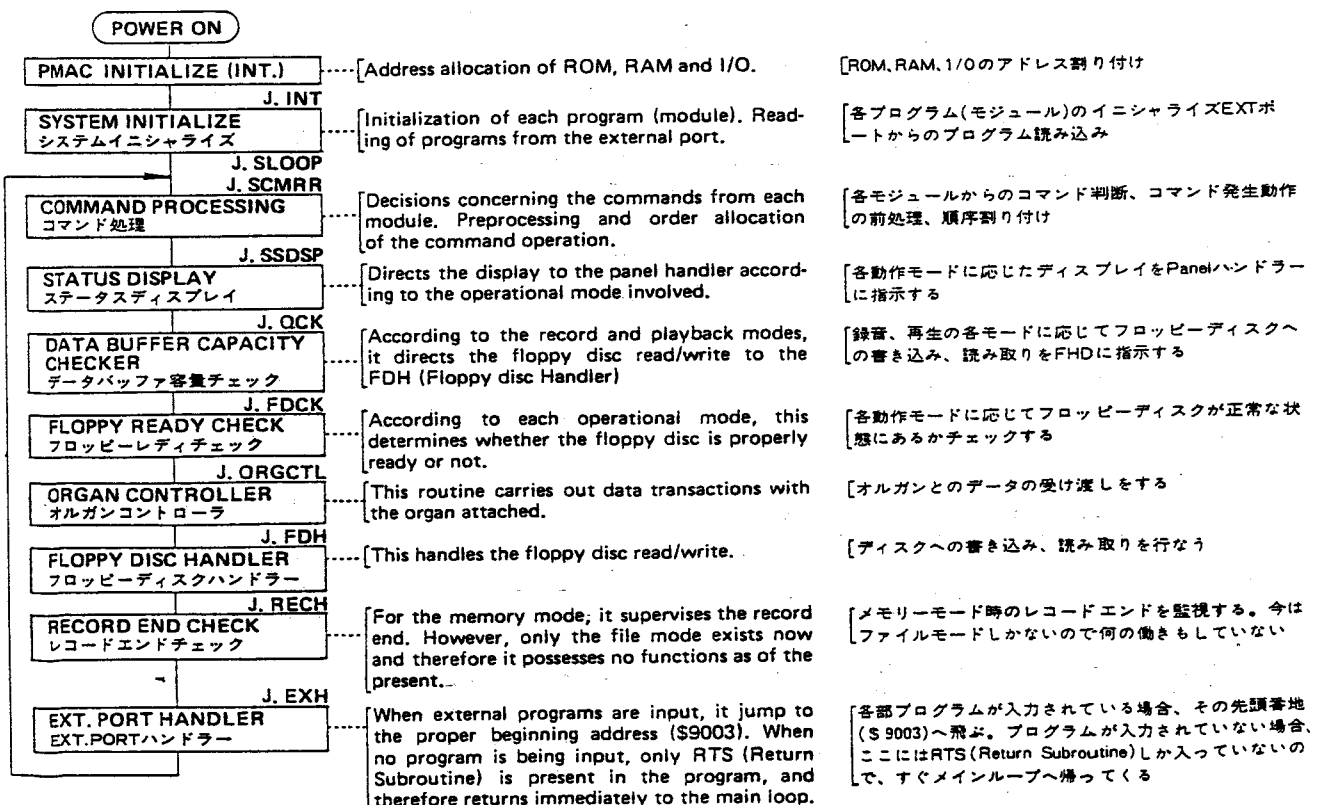
④ Organ Controller

オルガンと実際の動作を受け持つプログラム。オルガンの機種に応じて各データ、コマンドの入出力を行なう。動作上は、スーパーバイザからのコマンドをやりとりして、モードを制御する部分(ORG)と、オルガンからのRHYクロックに応じてハードで発生するEvent clockで発生するIRQにより動作するEvent Checker(ECK)とに分かれる。オルガンとのコマンドの受け渡しはORGが行ない、演奏データはECKが行なう。

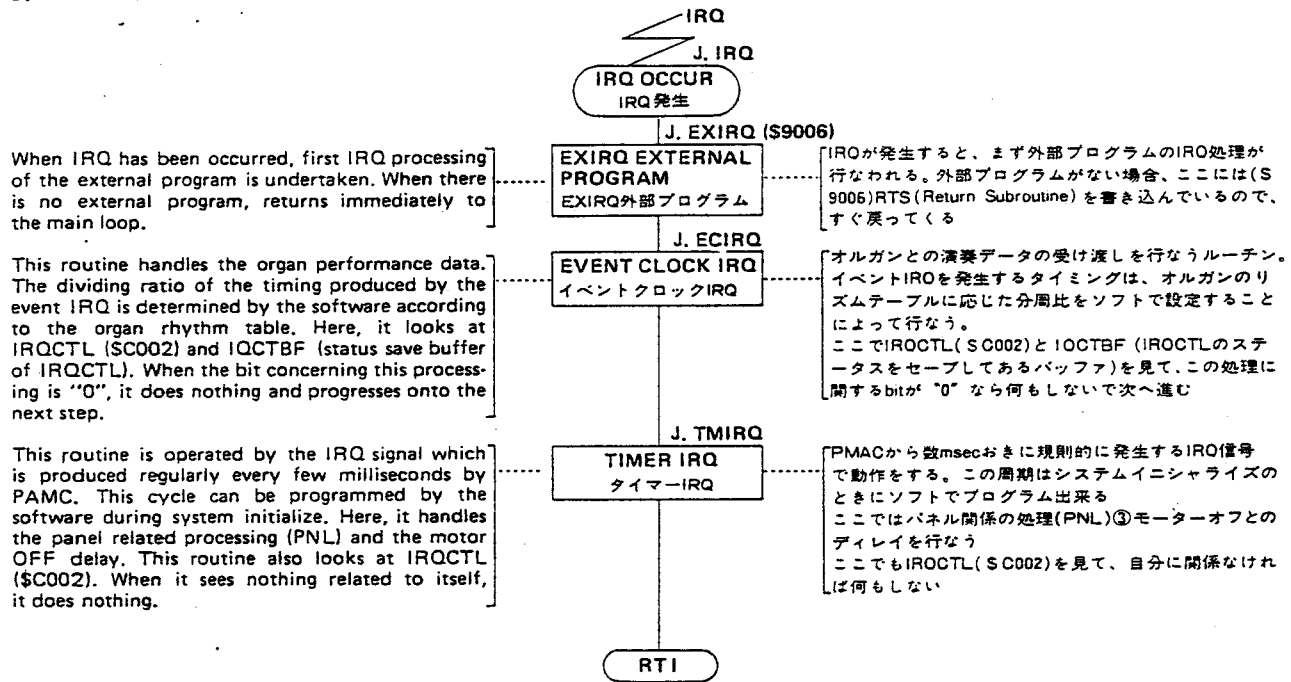
⑤ External Port Handler

ACIA(非同期シリアル入出力)を通じて、外部機器とのコミュニケーションを行なう部分。ここから入力されるプログラムやデータは、MDR-1の一部または全機能を使用することが出来る。パネルからの指示と同等の機能を持つコマンドがソフト上用意されている。外部からのプログラムの入力がないときやACIAエラーが発生すると、その後はこのプログラムは無視される。

2. Software Flow Chart <main> (ソフトの流れ<メイン>)



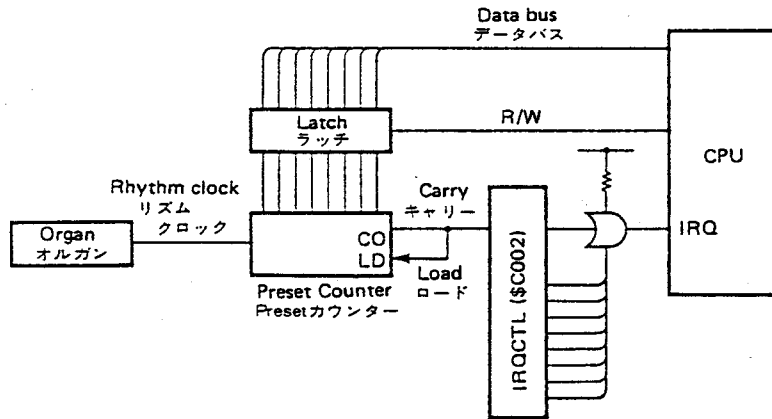
3. Software Flow Chart <IRQ> (ソフトの流れ<IRQ>)



4. Explanation of the Recording and Playback Operation (録音・再生の動作説明)

(1) Outline of the Event IRQ

(1) Event IRQ発生のおくみ



Note: In actuality, PMAC enters between the CPU. However, for all practical purposes, you can consider that the software is directly connected as is shown in the diagram.

注：実際はCPUとの間には、PMACが入っているが、ソフト上は図の様に直結されているものとみなして良い。

- ① According to the model, the fastest tempo mode is stored in the latch.
- ② After recording begins, the tempo from the organ is sent. Therefore, the tempo data based value is stored in the latch.
* During playback, based on the tempo data contained in the overall data, the operation of No. 2 is repeated.
- ③ The rhythm clock progresses the counter, after which the counter overflows and outputs a carrier signal.
- ④ This carry signal is stored in IRQCTL (\$C002). It then directs the CPU to occur IRQ.
* Simultaneously, this carrier is input to the counter LD (load terminal) and preset to the value stored in the latch. Controlled by the organ rhythm clock, it repeats the operations of 3 and 4.
- ⑤ In the IRQ routine, the CPU looks at the mode of IRQCTL (\$C002) and senses when to occur the event IRQ.

- ①機種に応じて最速テンポの状態をラッチに貯える。
- ②録音を開始すると、そのうちにオルガンからテンポ情報が送られてくるので、そのテンポ情報に基づいた値をラッチに貯える。
*再生時には、データ中のテンポ情報に基づき②と同じ動作をする。
- ③リズムクロックがカウンターを進め、そのうちカウンターがオーバーフローし、キャリアを出力する。
- ④このキャリアはIRQCTL(\$C002)に貯えられ、CPUにIRQ発生を教える。
*このキャリアは同時にカウンターのLD(ロード)端子に入力され、ラッチに貯えられている値にプリントされ、オルガンのリズムクロックにより③-④の動作をくり返す。
- ⑤IRQルーチンの中でCPUがIRQCTL(\$C002)の状態を見て、イベントIRQの発生を知る。

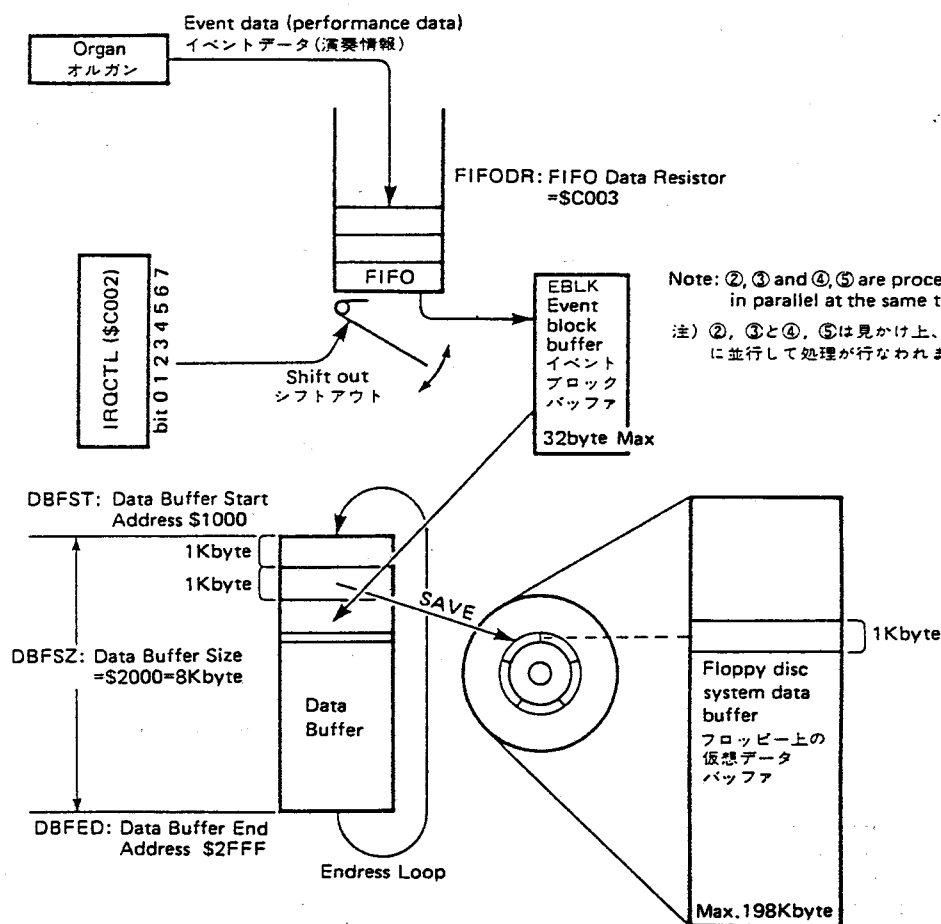
(2) Recording Operation

- ① Performance information from the organ is sent in 2-byte increments to MDR-1.
- ② When the event clock is occurred, the data stored in FIFO buffer at that time is sent into the event block buffer. When there is no data it adds "+1" to the value of ETIME which is the software counter.
- ③ When the data are sent into the buffer, the data are sandwiched between the ETIME value at that point, and 1/2 the value of the data byte number (1 block = 2 bytes) and stored in the data buffer.

(2) 録音動作

- ①オルガンから一度に2byte単位で演奏情報が送られてきます。
- ②イベントクロックが発生すると、その時点でFIFOに貯えられているデータをイベントブロックバッファに取り込みます。データがないときは、ETIMEというソフト上のカウンタの値を+1します。
- ③データをバッファに取り込んだら、その時点のETIMEの値とデータのbyte数1/2の値(ノブロックは2byte)で取り込んだデータをサンドイッチにしてデータバッファに貯えます。

※②,③はECK(イベントチェッカー)にて動作します。



- ④ Inside the main routine, J. QCK checks the data amount. If the data exceed 1 kbyte by even 1 byte, it sends a command from the supervisor to FDH for the data to be stored onto the floppy disc (1 kbyte increments).
- ⑤ Eventually, after FDH begins to operate, 1 kbyte of the data will be recorded onto the floppy disc (the data-acceptance speed is slower than the data input speed). When the data store pointer of the endless loop data buffer passes the disc data acceptance pointer, it outputs error code No. 35.

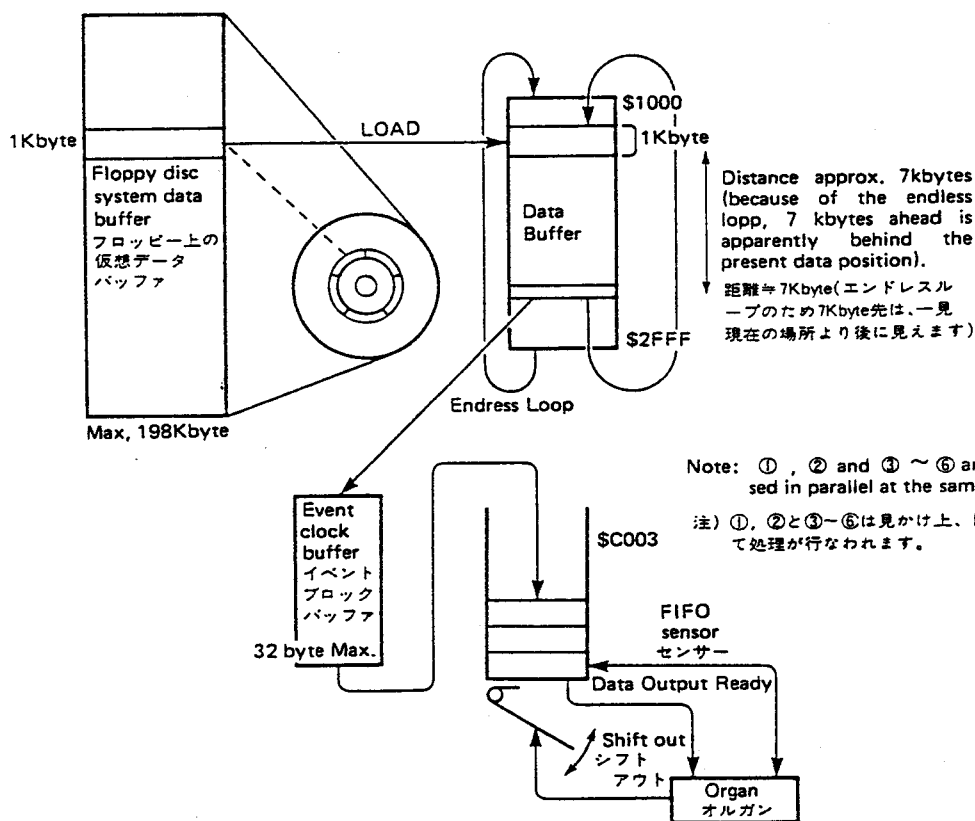
- ④メインルーチンの中でJ.QCKがデータの量をチェックして、データの数が1Kbyteを1byteでも超えたら、データをFloppyに格納する命令をSupervisorからFDHに伝えます。(1kbyte単位)
- ⑤FDHが動作を開始して、そのうちにその1Kbyteのデータはフロッピー上に記録される事になります。(格納のスピードがデータ入力のスピードよりも遅くて、Endress Loop状になっているデータバッファのデータストアポイントが、ディスクへの格納ポイントを追いこすとエラーコード#35を出力する様になっています。)

(3) Performance Operation

- ① Inside the main routine, J. QCK checks to see the address for the data of the current performance is 7 kbytes ahead. If the data are 7 kbytes ahead, it sends a data load command to FDH (in 1 kbyte increments). At the beginning of the play operation, it forcefully loads 7 kbytes (or to the end of short programs).
- ② Then, FDH loads the data onto the data buffer.

(3) 演奏動作

- ① メインルーチンの中で、現在演奏している場所から7Kbyte先にデータがあるか調べ(J.QCKで調べる)、7Kbyte先にデータがあれば、FDHに対してデータのロードする命令を出します(1kbyte単位)。プレイの最初では、強制的に7Kbyte(短い曲では曲の終了まで)ロードします。
- ② そのうちにFDHが、データをデータバッファにロードします。



- ③ At the beginning of the play operation, the event block buffer holds ready the first data block to be output. The time data of that block are stored onto the software timer ETIME.
- ④ When the IRQ is occurred, "1" is subtracted from ETIME and it does nothing and returns if any value except "0" appears. When ETIME becomes "0" after several IRQs, that block is stored onto FIFO.
- ⑤ When EVENT BUFFER finishes transmitting the data to FIFO, it loads the next block into the event block buffer, stores the time data of that block onto ETIME, and returns to the main routine.
* ④, ⑤ operates by means of ECK (event checker).
- ⑥ When data are stored in FIFO, the organ senses this, produces a shift out pulse, which then returns to the organ. This operation is repeated for as long as FIFO has data.
(However, when the loading of the data from the floppy disk has fallen behind and consequently, the data output pointer has passed the load pointer, it outputs error code No. 34.)

- ③ プレイの最初では、最初に出すべきデータブロックをイベントブロックバッファに用意して、そのブロックに付いていたタイムデータをETIMEというソフト上のタイマーにストアします。
- ④ イベントIRQが発生すると、ETIMEから1を引き"0"でないなら何もしないでもどります。何回かのIROでETIMEが"0"になると、そのブロックをFIFOに貯えます。
- ⑤ FIFOにデータを出し終えると、次のブロックをイベントブロックバッファにロードして、そのデータのタイムデータをETIMEにストアしてメインルーチンへ戻ります。
*④、⑤はECK(イベントチェッカー)にて動作します。
- ⑥ FIFOにデータが貯えられると、オルガンがそれを検知して、シフトアウトのパルスを出しオルガンに取りこみます。この動作はFIFOにデータがあるかぎり、くり返し行われます。(なお、Floppyからデータをロードするのが遅れて、データの出力ポイントがロードポイントを追いこすと、エラーコード#34を出力します。)

5. Explanation of Software Operation (ソフトの動きの説明)

● As it is impractical to explain all of the software operations, here we shall limit our explanation to the process from turning the Play switch ON until the organ produces sound.

● すべてのソフトの動きを説明しきれないため、ここでは「Play SW ON～オルガンから音が出る迄」を説明する。

● Major Operations

- ① Play switch ON ... PNL reads the switch status
- ② PNL → SUP PNL notifies the supervisor (SUP) that the Play switch has been turned ON.
- ③ SUP SUP commences appropriate preparations according to the current MDR-1 status.
- ④ SUP → FDH After the internal preparation of SUP has finished, it directs FDH and ORG to commence play preparation operations. The mode is "Play Wait".
- ⑤ SUP → FDH After confirming that the preparation operations of each module have been finished, the SUP gives the play commence command and the mode turns to "Play".
- ⑥ ORG ORG transmits the play commence command to the organ, sets the organ mode to "Play" and turns the event IRQ ON.
- ⑦ ECK When the event IRQ is ON, according to the status, ECK outputs data to the organ.

● 大きな動作としては

- ① Play SW ON PNLがSWステータスを読み込み。
- ② PNL → SUP PNLからスーパーバイザ(SUP)にPlay SWがONした事を知らせる。
- ③ SUP SUPは現在のMDR-1のステータスに応じた準備を開始。
- ④ SUP → FDH SUP内部準備完了後、FDHとORGにPlay準備動作を指示し、モードを"Play Wait"の状態にする。
- ⑤ SUP → FDH 各モジュールが準備完了した事を確認し、play開始のコマンドを指示、モードを"Play"の状態にする。
- ⑥ ORG オルガンに対しplay開始を伝え、オルガンのモードをplayにし、イベントIRQをONにする。
- ⑦ ECK イベントIRQがONになると、その状況に応じてデータをオルガンに出力する。

■ ERROR DISPLAY (エラー表示について)

● Refer to the table below for possible display of error codes in COUNT display.

● COUNT表示にエラーコードが表示された場合、下表をご覧ください。

E. NO エラーコード	COMMENTS コメント	EXPLANATION	説明
20	DISK READ WRITE RETRY OVER	<ul style="list-style-type: none"> This code is output when for some reason, the disk write or read has failed for over ten times. As possible reasons: <ul style="list-style-type: none"> ○ Gaps in the special media tracks. ○ Malfunction of the FDC IC. ○ PMAC transmission error. This is commonly output when the media or driver periphery is at fault. 	<ul style="list-style-type: none"> ● 何等かの原因でディスクの書き込み、または読み取りを10回以上失敗したときに出るコード。原因としては、 <ul style="list-style-type: none"> ○ メディアの特定のトラックに欠陥があるときに生じる ○ FDCのICの動作不良 ○ PMACの転送エラー等、メディアとドライバー周辺に原因があるときに出る事が多い。
25	DISK CRC ERROR	<ul style="list-style-type: none"> During the disk R/W by means of the hardware, FDC carries out a CRC error check. Depending on the result, it indicates that an error has been found. Quite often this indicates that mistaken data have been recorded onto the media. (CRC is similar to a sum check.) 	<ul style="list-style-type: none"> ● ディスクのR/W時にFDCがハードウェアで、CRCというエラーチェックをしている。その結果にエラーがあった事を示す。多くの場合、メディア上に誤ったデータが記録されている事を示す。(CRCとは、チェック・サムのようなもの)
28	DISK BUSY TIME OUT	<ul style="list-style-type: none"> In actuality this indicates that FDC will not output an operations completion signal when the driver or FDC exceed the time when they should have finished operations by a wide margin. It is thought that most of the reasons for this will occur around the FDC hardware. 	<ul style="list-style-type: none"> ● 本来ならば、ドライバーやFDCが完全に動作を終了しているはずの時間を大幅に過ぎても、FDCが動作終了の信号を出さない事を示す。FDC回りのハードウェアに起因する事が多いと思われる。
29	DISK LOST DATA	<ul style="list-style-type: none"> This indicates that the data were not transmitted within the time set by FDC. Since DMA is carried out by way of PMAC, it is thought that most of the reasons for this occur around the PMAC periphery or the hardware around the driver. 	<ul style="list-style-type: none"> ● FDCの要求する時間以内に、データの転送が行われなかった事を示す。DMAはPMACを通じて行われているため、原因はPMAC周辺かドライバー回りのハードウェアに起因するのが多いと考えられる。
31	DMA NOT END	<ul style="list-style-type: none"> This indicates that PMAC cannot output an operations completion signal even when other operations besides PMAC have been completed. Most reasons for this error occur around the FDC section. Therefore, first an FDC related error code is produced. It is thought that most of the time this error code will not appear. 	<ul style="list-style-type: none"> ● PMAC以外が動作を終了しても、PMACが動作終了の信号を出さない事を示す。このエラーは、ほとんどFDC回りに起因する事が多いため、先にFDC関係のエラーコードを出力し、このエラーコードは、ほとんど出ないと思われる。
34	QUEN READ OVER RUN	<ul style="list-style-type: none"> This code is output when the disk record/playback speed falls behind the input/output speed of the organ. As the timing of this speed is within limits as of the present, it is thought that this code will not appear. 	<ul style="list-style-type: none"> ● ディスクへの録/再のスピードが、オルガンに対する入出力のスピードに負けたときに出るコード。今の所、このスピードはタイミング的に間に合っているため、このコードは出る事はないと思う。
35	QUEN WRITE OVER RUN		
36	DISK STORE ERROR	<ul style="list-style-type: none"> This code is output indicating that there is an error in the disk store operation when the reason is not Disk Not Ready, CRC error nor Lost Data. (Verify) 	<ul style="list-style-type: none"> ● ディスクへのストア動作がエラーをしたが、Disk Not Ready, CRCエラー, Lost Dataのいずれでもないときに出るコード。(ベリファイ等)
37	DIRECTORY STORE RETRY OVER	<ul style="list-style-type: none"> This indicates that after the directory has been written, it does not match up with the verify process. (Retried 10 times) 	<ul style="list-style-type: none"> ● ディレクトリーを書き込んだ後、ベリファイをして、一致しなかった事を示す。(10回リトライしている)
38	RESTORE ERROR	<ul style="list-style-type: none"> This indicates that the FDC flag has not stood up when the driver head has moved to track "00". 	<ul style="list-style-type: none"> ● ドライバーのヘッドが、トラック "00" へ移動出来た事を示す。FDCのフラグが立たなかった事を示す。
39	ACIA TIME OUT	<ul style="list-style-type: none"> This error indicates that there has been no reply from the unit hooked up to the ACIA port (EXT port) for approx. 10 seconds. 	<ul style="list-style-type: none"> ● ACIAポート(EXT. PORT)に相手からの返信が来なかった事を示すエラー。(約10sec)
46	ORGAN INPUT 1ST CODE ERROR	<ul style="list-style-type: none"> This code is output when other data besides the communication code used for the 1st bit appears during the organ input/output process. 	<ul style="list-style-type: none"> ● オルガンとの入/出力の際に、1st Byteに使用する通信コード以外のデータが現われると、出力されるコード。
47	ORGAN OUTPUT 1ST CODE ERROR		
50	DIRECTORY ERROR	<ul style="list-style-type: none"> This indicates that there is a contradiction in the directory recording. It is thought that this error often occurs during the directory rewrite. 	<ul style="list-style-type: none"> ● ディレクトリーの記録に矛盾があった事を示す。多くはディレクトリーの書き換え時きのエラーと考えられる。
53	FIFO RECEIVE OVER	<ul style="list-style-type: none"> This code is output when there is more than 225 bytes of some sort of data in FIFO when no data from the organ should be sent. It is thought that this either indicates a hardware error in FIFO or that the organ has not received the "Rec End" command. 	<ul style="list-style-type: none"> ● オルガンからデータが送られてくるべきときではないときに、255個以上の何らかのデータがFIFO上に存在したときに出るコード。FIFOのハードエラーか、オルガンか、"Rec End"で受け取っていないかのどちらかと考えられる。

UNIT CONNECTIONS (エレク トーンへの取付方法)

● INSTALLATION OF MDR-1A TYPE

Applicable model: FX-1

- Before installation, check the parts and accessories with the list of parts to see that you have everything.

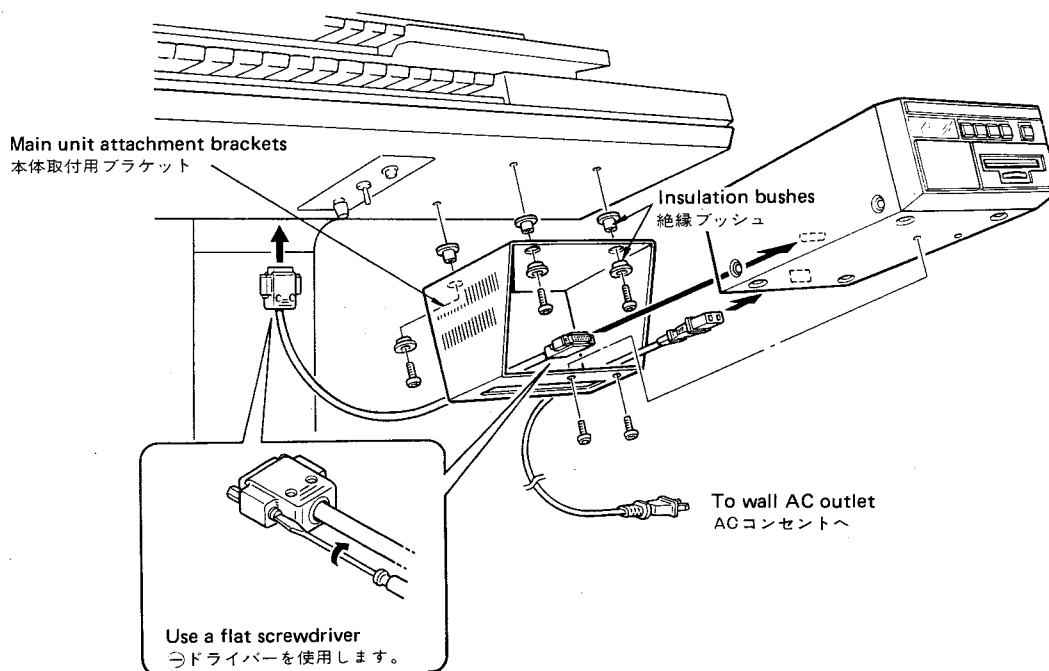
- ① First, remove the white rubber caps from the three holes for the bracket attachment screws. These are on the lower right hand side of the FX-1 rack.
- ② After attaching the insulation bushes to the main unit attachment bracket, secure the bracket to the lower right hand side of the FX-1 rack, using the three bracket attachment screws.
- ③ Secure the MDR-1 main unit with the 2 main unit attachment screws.
- ④ Connect the FX-1 and the MDR-1 with the 15P cable and also connect the power cord.

● MDR-1Aタイプの取り付け

適応機種:FX-1

- 取り付けの前に部品が揃っているか部品表と付属部品とで確認をしてください。

- ①はじめに、FX-1棚下右のブラケット取付用ネジのための下穴3ヶ所より白ゴムキャップを取り除きます。
- ②本体取付用ブラケットに絶縁ブッシュを取り付けた後、FX-1の棚下右にブラケット取付用ネジ3本でブラケットを固定します。
- ③MDR-1本体を本体取付用ネジ2本で固定します。
- ④15PケーブルでFX-1とMDR-1を接続すると共に電源コードを接続します。



● LIST OF MDR-1A PARTS (部品表)

Item	名称	Amount 数量
MDR-1 Main unit	MDR-1 本体	1
Compact floppy disks	コンパクトフロッピーディスク	5
Power cord	電源コード	1
Main unit attachment bracket	本体取付用ブラケット	1
15P cable	15Pケーブル	1
Bracket attachment screws	ブラケット取付用ネジ	3
Main unit attachment screw	本体取付用ネジ	1
Insulation bushes	絶縁ブッシュ	3 sets

● INSTALLATION OF MDR-1B TYPE

Applicable models: FX-10, FX-20, FS-20 (*FS-100), FS-30 (*FS-200), FS-50 (*FS-300), FS-70 (*FS-500).

(* Mode name) are for the American market.

- Before installation, check the parts and accessories with the list of parts to see that you have everything.

● MDR-1Bタイプの取り付け

適応機種: FX-10, FX-20, FS-20(*FS-100), FS-30(*FS-200), FS-50(*FS-300), FS-70(*FS-500) ※アメリカ仕向モデル

- 取り付けの前に部品が揃っているか部品表と付属部品とで確認をしてください。

● LIST OF MDR-18 PARTS(部品表)

Item	名称	Amount 数量
MDR-1 Main unit	MDR-1本体	1
Compact floppy disks	コンパクトフロッピーディスク	5
AIF circuit board	AIFシート	1
Power cord	電源コード	1
15P cable	15Pケーブル	1
16P shielded cable assembly	16ピンシールドケーブル	1
40P flat cable	40Pフラットケーブル	1
10P connector wirings	10Pコネクタ束線	1
5P connector wirings	5Pコネクタ束線	1
Support pins	サポートピン	5
Wire tie	束線留めビニールタイ	3

Applicable models: FX-10, FX-20

1. Remove back cover. FX-10, FX-20 have 10 screws.
2. Remove the metal plate used to cover the opening on the back of the Electone provided for this accessory (2 screws). Retain these screws as they will be used in step #8 (see figure 1).
3. Remove top board retaining screws and open the top board. FX-10, FX-20 have two (2) screws in front.
4. Disconnect roll-top assembly. The elastic strap shock absorbers retaining pins must be removed from their spring clip retainers (see figure 2, No special tools are necessary).
5. Remove the roll-top assembly.
6. Remove control panel retaining screws (4), (see figure 2).

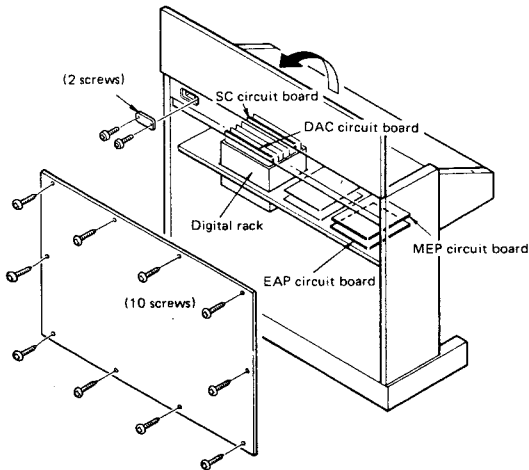


Fig. 1

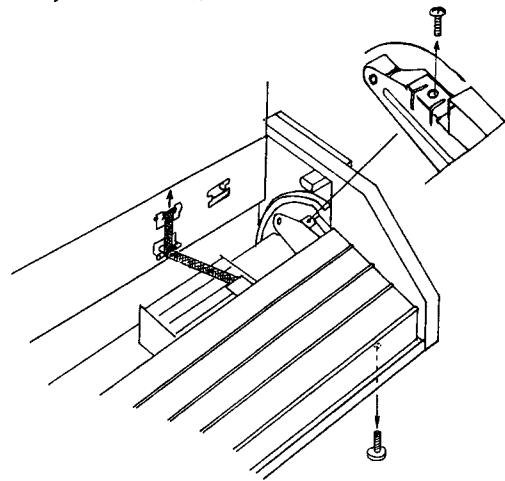


Fig. 2

7. Pass the 16 pin shielded cable assembly with a phono-type pin plug through the opening established when the cover plate is removed (see figure 3). Make sure that the cable passes between the case and the roll-top guide as shown in figure 3. Cable placement is vitally important. Route the cable as shown in the illustration. Make sure that the 16 pin cable assembly is routed behind the existing wire harness as it passes the routed space in the shelf of the organ.
8. Using the two screws retained from step #2, attach the socket mounting bracket to the back as shown in figure 3.

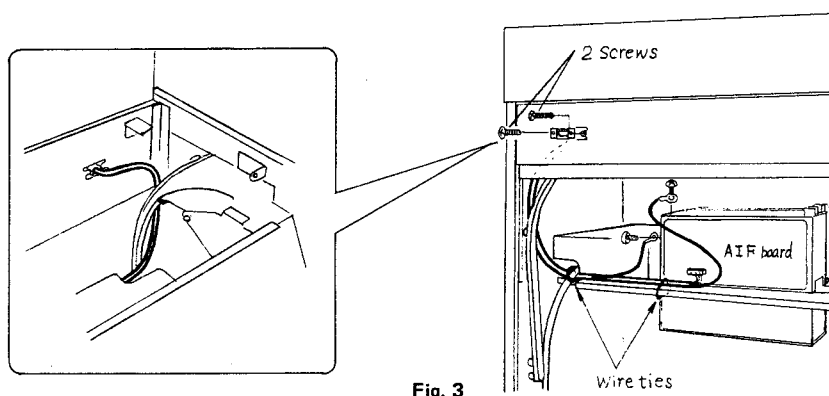


Fig. 3

9. Connect the ground wires as shown in figure 4 by removing the digital circuit cage securing screws.
10. Attach the AIF circuit board (supplied in the installation kit) to the back side of digital circuit board cage as shown in figure 4.

Note: Please check the position of switches SW1 and SW2 (see figure 4). For models FX-10 and FX-20 set switch 1 to the right and switch 2 to the left (when viewed in mounted position).
11. Plug the 16 pin shielded cable connector into socket CN2 and the phono-type pin plug into J1 of the AIF circuit board (see figure 4). Place the excess shielded cable in the slot formed by the digital board cage and the shelf in the organ. Tie the shielded cable close to the AIF board. A cable tie has been provided on the board for the shielded cable that connects to J1.
12. Tie the 16 pin cable as shown in figure 4, using the supplied wire ties.

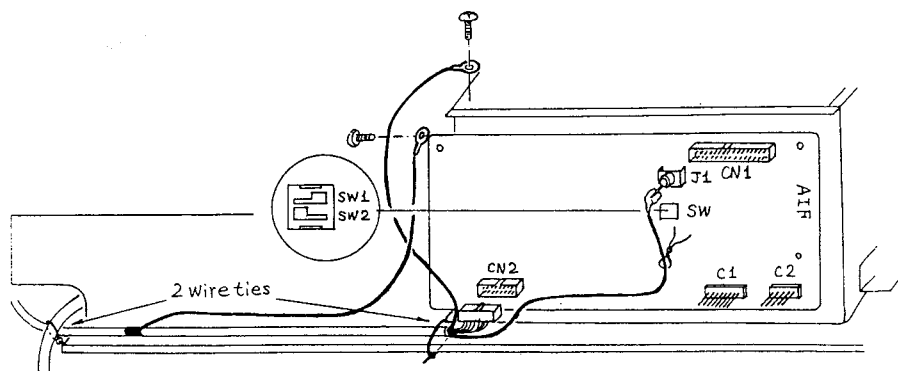


Fig. 4

13. Using the 40 pin flat cable assembly, (ribbed side up, polarity marking on the right when viewed from back of organ) connect to socket CN1 of the AIF circuit board, and to socket CN1 of the "SC" circuit board (see figure 5).
14. Using the 10 pin connector cable assembly (supplied in the installation kit), connect to plug C1 of the AIF circuit board and to socket C1 of the DAC circuit board (see figure 5).
15. Using the 5 pin connector cable assembly, connect to plug C2 of the AIF circuit board. Leave the other end free. This will be connected in step #18 later (see figure 5).

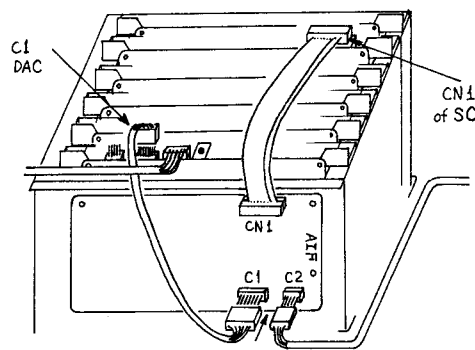


Fig. 5

16. For this step, the control panel must be in the "UP" (service) position. Now, locate the metallized paper cover used to shield the EAP circuit board. Loosen the retaining screws (4). Removal of the retaining screws is not necessary, "Key hole" slots have been provided. Now, remove the metal brackets and metallized paper cover (see figure 6).
17. Remove the MEP circuit board (upper left) from the support pins so that the EAP circuit board can be easily accessed (lower left). Disconnect the 5 pin socket to connector C14. Using tape or a cable tie, secure this cable in a location where it will not generate rattles, or short circuit possibilities (This connector is not used).

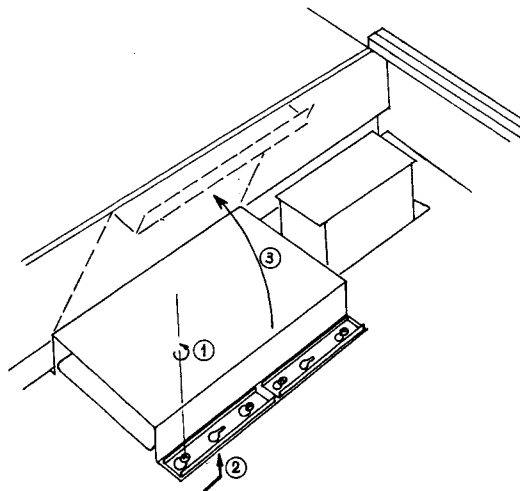


Fig. 6

18. Now, connect the loose end of the 5 conductor cable connected to C2 on the AIF circuit board in step #15 to connector C14 of the EAP circuit board (see figure 7).
19. Shift the 3 pin connector from C15 to C16 on the EAP circuit board (see figure 7).

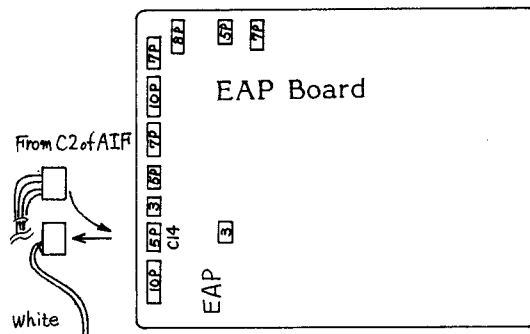


Fig. 7

20. Reinstall the MEP circuit board back to its original position, and secure with provided clips.
21. Cable routing is not critical. Excess cable should be secured to preclude the possibility of vibrations.
22. Replace metallized paper cover and metal brackets removed in step #16.
23. Lower the control panel to normal position and reinstall retaining screws (4).
24. Reinstall roll-top assembly. Make sure that the shock absorber straps retaining pins are snapped securely into their spring clips.
25. Cycle the sliding fall board several times, visually inspecting the proximity of any and all cables to the sliding assembly. The fall board should not touch any wiring under any condition.
26. Close the top board and reinstall the retaining screws.
27. Attach the back cover removed in step #1.
28. Connect the MDR-1 to the Electone with the 15 pin conductor cable (supplied in the MDR-1A), using the socket installed in step #8 (located in back). This connector is fitted with retaining bolts on each side of the plug housing. Tighten to moderate tension only. Overtightening may fracture the plug housing.
29. Using the power cord (supplied in the MDR-1A), connect the MDR-1 to the 120V ac.
30. Installation is now complete.

MDR-1

Applicable models: FS-500, FS-300, FS-200, FS-100

1. Remove back cover. FS-500, FS-300, FS-200 and FS-100 have 10 screws.
2. Remove the metal plate used to cover the opening on the back of the Electone provided for this accessory (2 screws). Retain these screws as they will be used in step #8 (see figure 1).
3. Remove top board retaining screws and open the top board. FS-500 FS-300 FS-200 and FS-100 have three (3) screws, two in front & one in back.
4. Disconnect roll-top assembly.
The elastic strap shock absorbers retaining pins must be removed from their spring clip retainers (see figure 2, No special tools are necessary).
5. Remove the roll-top assembly.
6. Remove control panel retaining screws (2), (see figure 2).

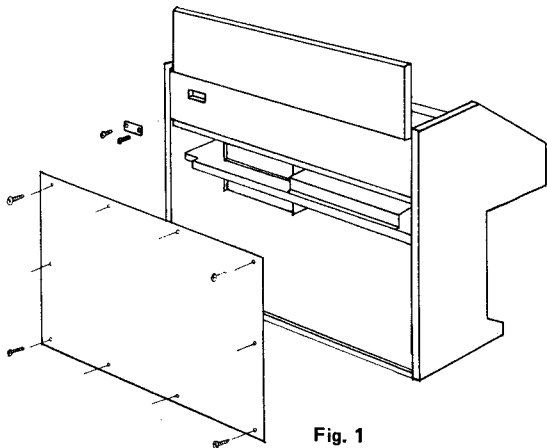


Fig. 1

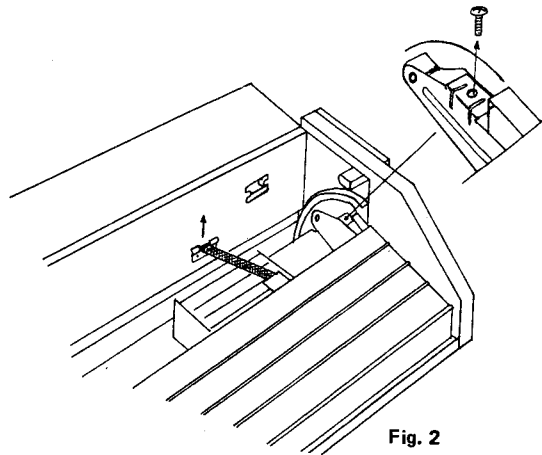


Fig. 2

7. Pass the 16 pin shielded cable assembly with a phono-type pin plug through the opening established when the cover plate is removed (see figure 3). Make sure that the cable passes between the case and the roll-top guide as shown in figure 3. Cable placement is vitally important. Route the cable as shown in the illustration. Make sure that the 16 pin cable assembly is routed behind the existing wire harness as it passes the routed space in the shelf of the organ.
8. Using the two screws retained from step #2, attach the socket mounting bracket to the back as shown in figure 3.

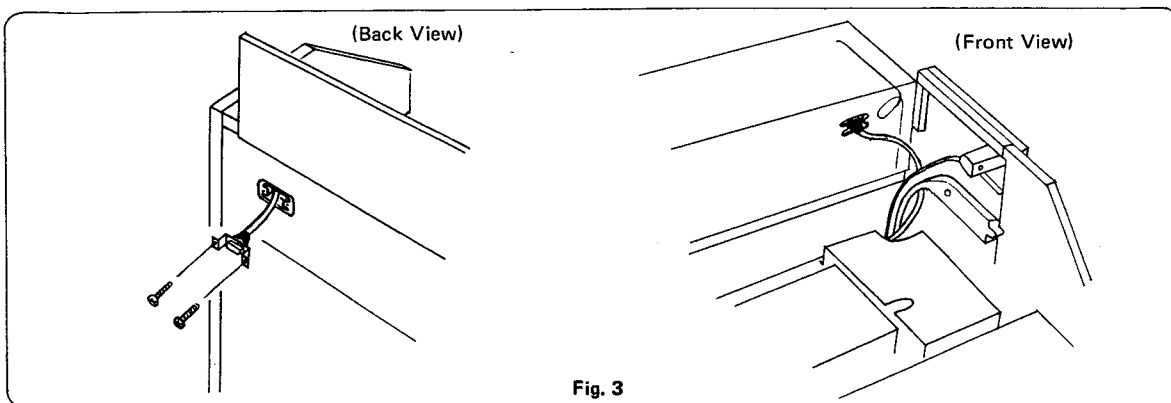


Fig. 3

9. Connect the ground wires as shown in figure 4 (FS-500, FS-300) or in figure 5 (FS-200, FS-100) by removing digital circuit cage securing screws.
10. Attach the AIF circuit board (supplied in the installation kit) to the back side of digital circuit board cage as shown in figure 4 or 5.
 Note: Please check the position of switches SW1 and SW2 (see figure 4 or 5). For models FS-500 FS-300 FS-200 and FS-100 set switch 1 to the right and switch 2 to the left (when viewed in mounted position).
11. Plug the 16 pin shielded cable connector into socket CN2 and the phono-type pin plug into J1 of the AIF circuit board (see figure 4 or 5). Place the excess shielded cable in the slot formed by the digital board cage and the shelf in the organ. Tie the shielded cable close to the AIF board. A cable tie has been provided on the board for the shielded cable that connects to J1.
12. Tie the 16 pin cable as shown in figure 4 (FS-500, FS-300) or figure 5 (FS-200, FS-100), using the supplied wire ties.

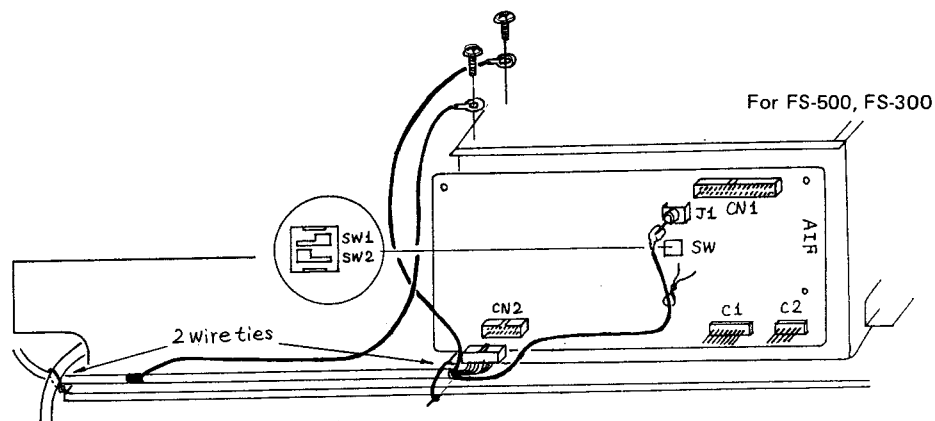


Fig. 4

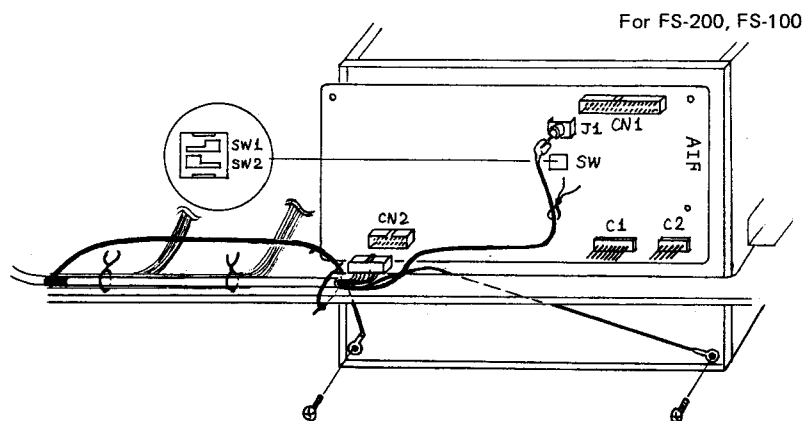


Fig. 5

MDR-1

13. Using the 40 pin flat cable assembly, (ribbed side up, polarity marking on the right when viewed from back of organ) connect to socket CN1 of the AIF circuit board, and to socket CN1 of the "SC" circuit board (see figure 6 or 7).
14. Using the 10 pin connector cable assembly (supplied in the installation kit), connect to plug C1 of the AIF circuit board and to socket C1 of the DAC circuit board (see figure 6 or 7).
15. For models FS-200, FS-100 tie down 40 pin flat cable. Loosen retaining screws (2) that secure the center circuit board bracket in the digital circuit board cage. Lift the assembly (vertically) just enough to permit the passing of the wire tie (supplied in the installation kit) thru the appropriate holes in the top of the bracket. Lock the tie temporarily to prevent the tie from falling back through the holes. Reinstall the circuit board and tighten the bracket retaining screws. Now, pass one the 40 pin flat cable through the loop of the wire tie. Make sure that no stress is supplied to the plug and that the roll top will clear (see figure 7).
16. Using the 5 pin connector cable assembly, connect to plug C2 of the AIF circuit board. Leave the other end free. This will be connected in step 18A or 18B later (see figure 6 or 7).

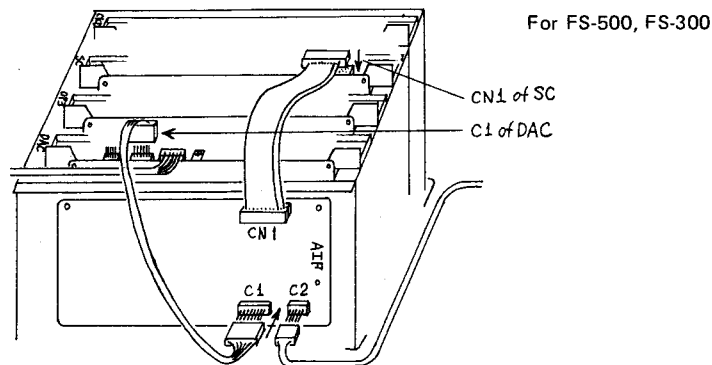


Fig. 6

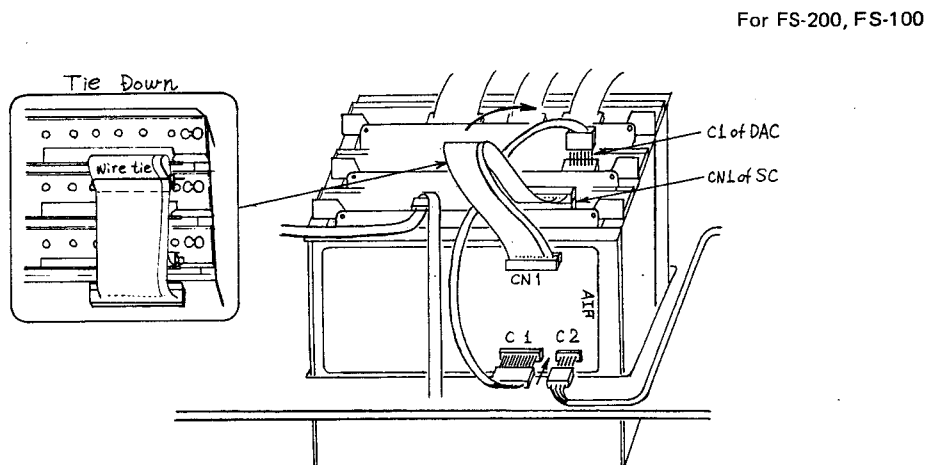


Fig. 7

17. For this step, the control panel must be in the "UP" (service) position. Locate the metallized paper cover used to shield the EAP (FS-500, FS-300) or MA (FS-200, FS-100) circuit board. Loosen the retaining screws (4). Removal of the retaining screws is not necessary, "Key hole" slots have been provided. Now, remove the metal brackets and metallized paper cover (see figure 8).

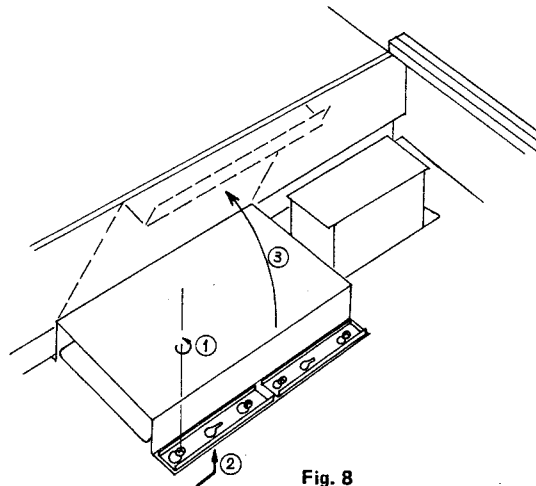


Fig. 8

- 18A. For models FS-500, FS-300. Remove the MEP circuit board (upper left) from the support pins so that the EAP circuit board can be easily accessed (lower left). Disconnect the 5 pin socket to connector C14. Using tape or a cable tie, secure this cable in a location where it will not generate rattles, or short circuit possibilities (This connector is not used). Now, connect the loose end of the 5 conductor cable connected to C2 on the AIF circuit board in step #16, to connector C14 of the EAP circuit board (see figure 9). Reinstall the MEP circuit board back to the original position, and secure with provided clips. Then go to step #19.
- 18B. For models FS-200, FS-100 (see figure 10). Disconnect the 5 pin socket to connector C7 of the MA circuit board. Using tape or a cable tie, secure this cable in a location where it will not generate rattles, or short circuit possibilities (This connector is not used). Now, connect the loose end of the 5 conductor cable connected to C2 on the AIF circuit board in step #16, to connector C7 of the MA circuit board. Then go to step #19.
19. Cable routing is not critical. Excess cable should be secured to preclude the possibility of vibrations.

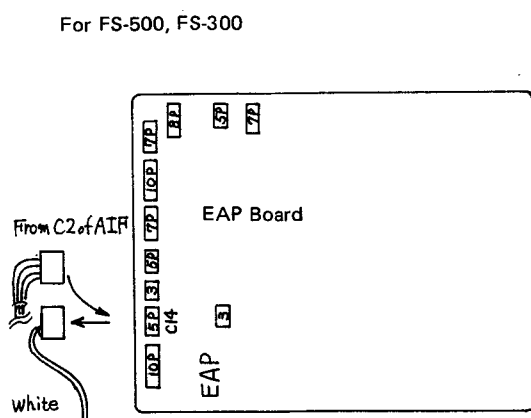


Fig. 9

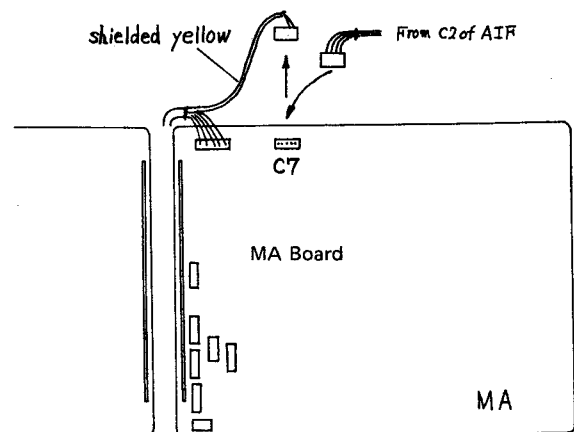


Fig. 10

MDR-1

20. Replace metallized paper cover and metal brackets removed in step #17.
21. Lower the control panel to normal position and reinstall retaining screws (2).
22. Reinstall roll-top assembly. Make sure that the shock absorber straps retaining pins are snapped securely into their spring clips.
23. Cycle the sliding fall board several times, visually inspecting the proximity of any and all cables to the sliding assembly. The fall board should not touch any wiring under any condition.
24. Close the top board and reinstall the retaining screws.
25. Attach the back cover removed in step #1.
26. Connect the MDR-1 to the Electone with the 15 pin conductor cable (supplied in the MDR-1A), using the socket installed in step #8 (located in back). This connector is fitted with retaining bolts on each side of the plug housing. Tighten to moderate tension only. Overtightening may fracture the plug housing.
27. Using the power cord (supplied in the MDR-1A), connect the MDR-1 to the 120V ac.
28. Installation is now complete.

Applicable model: FX-3

1. Remove the metal plate used to cover the opening on the back of the Electone provided for this accessory (2 screws). Retain these screws as they will be used in step #6 (see figure 1).
2. Remove top board retaining screws and open the top board. FX-3 has two (2) screws on top.
3. Remove control panel retaining screws (2), (see figure 2).

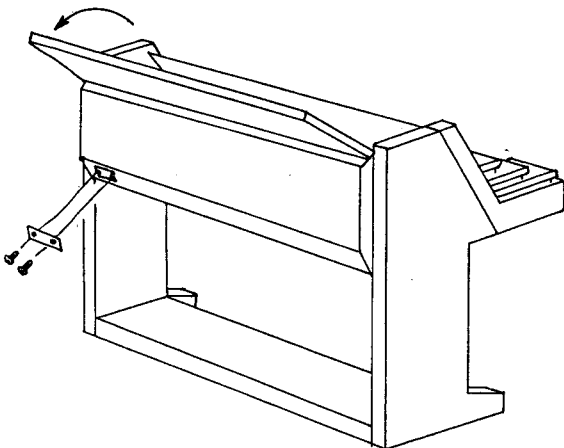


Fig. 1

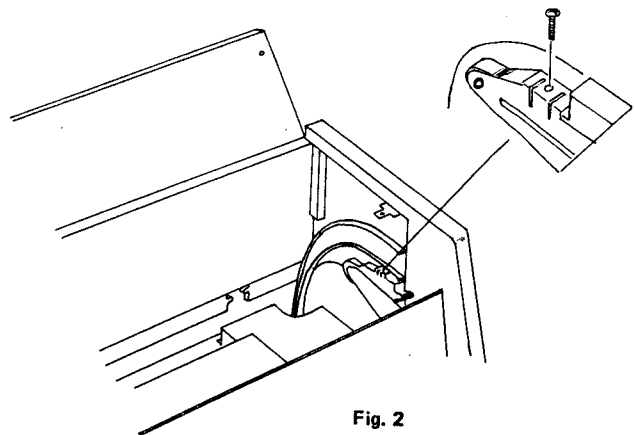


Fig. 2

4. The control panel must be in the "UP" (service) position. Remove the digital circuit board cage retaining screws(4), (see figure 3).
5. Pass the 16 pin shielded cable assembly with a phono-type pin plug through the opening established when the cover plate is removed in step #1.
6. Using the two screws retained from step #1, attach the socket mounting bracket to the back (Cable clamp is not required for FX-3).
7. Route the 16 pin shielded cable assembly on the organ shelf as shown in figure 4.
8. Temporarily, place the AIF circuit board on top of the digital circuit board cage (board will be installed in step #12). Connect the 16 pin socket to connector CN2 of the AIF circuit board, and the phono-type pin plug to the socket J1. Tie the shielded cable close to the AIF circuit board. A cable tie has been provided on the board for the shielded cable that is connected to J1.
 Note: Please check the position of switches SW1 and SW2, (see figure 3).
 For model FX-3 set switch 1 to the right and switch 2 to the left (when viewed in mounted position).
9. Connect one end of the 10 pin socket to connector C1 of the AIF board as shown in figure 3 (leave the other end free, This will be connected in step #15).
10. Connect one end of the 5 pin socket to connector C2 of the AIF board as shown in figure 3 (leave the other end free, this will be connected in step #17).
11. Connect the ground wires to the top of the digital circuit board cage securing screws, as shown in figure 3.
12. Now, install the AIF circuit board as shown in figure 3.
13. Tie the 16 pin shielded cable as shown in figure 4, using the supplied wire tie.

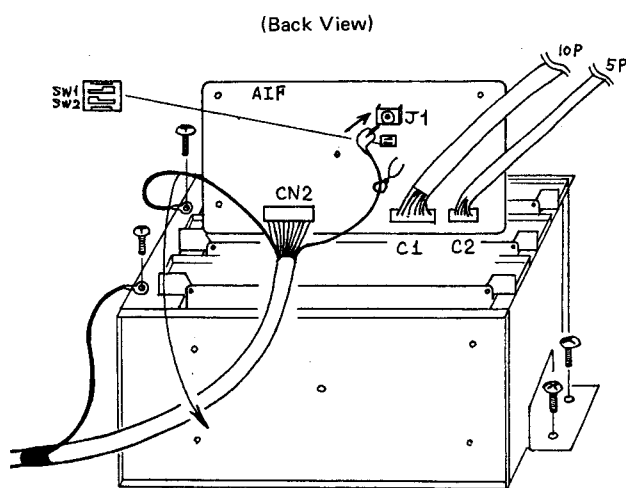


Fig. 3

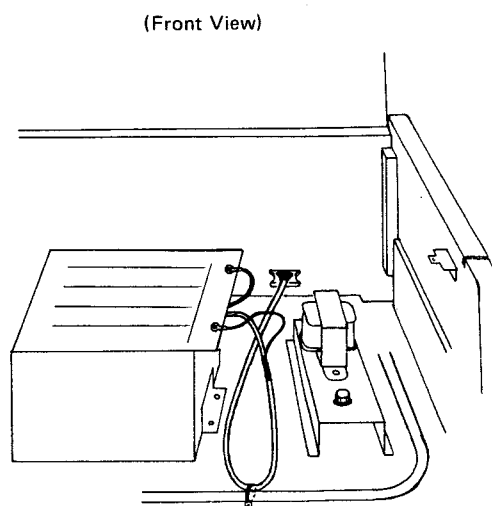


Fig. 4

14. Using the 40 pin flat cable assembly (ribbed side up, polarity marking on the right when viewed from back of organ) connect to socket CN1 of the AIF circuit board, and to socket CN1 of the "SC" circuit board (see figure 5).
15. Connect the loose end of the 10 conductor cable assembly connected in step #9, to C1 of the AIF circuit board, and to connector C1 of the DAC circuit board (see figure 5).

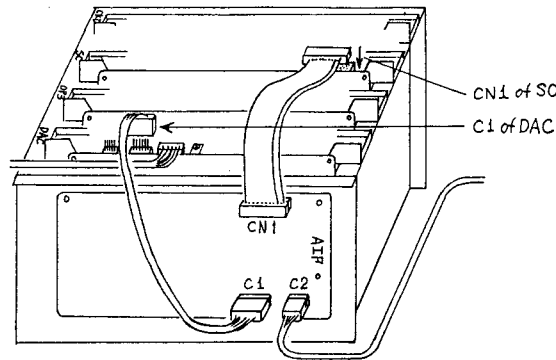


Fig. 5

16. Locate the metallized paper cover used to shield the EAP circuit board. Loosen the retaining screws (4). Removal of the retaining screws is not necessary, "Key hole" slots have been provided. Now, remove the metal brackets and metallized paper cover (see figure 6).

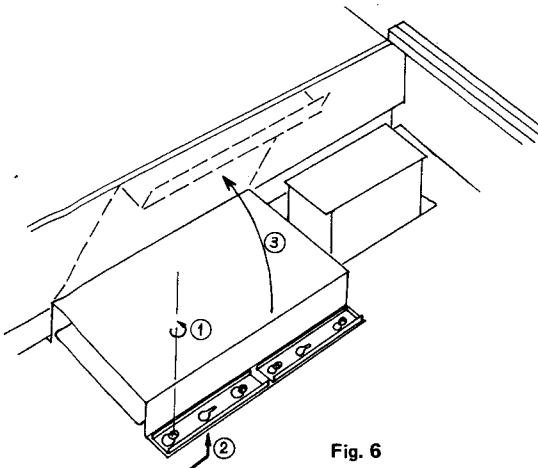


Fig. 6

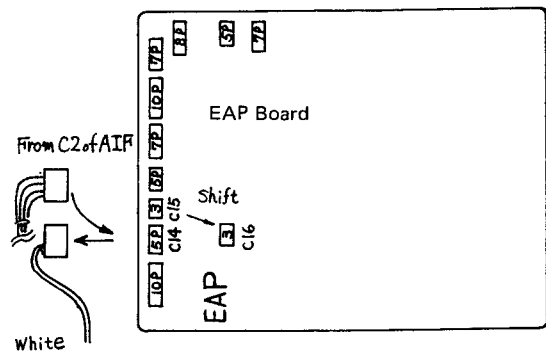


Fig. 7

17. Remove the MEP circuit board (upper left) from the support pins so that the EAP circuit board can be easily accessed (lower left). Disconnect the 5 pin socket to connector C14. Using tape or a cable tie, secure this cable in a location where it will not generate rattles, or short circuit possibilities (This connector is not used). Now, connect the loose end of the 5 conductor cable connected to C2 of the AIF circuit board in step #10, to connector C14 of the EAP circuit board (see figure 7). Reinstall the MEP circuit board.
18. Cable routing is not critical. Excess cable should be secured to preclude the possibility of vibrations.

19. Replace metallized paper cover and metal brackets removed in step #16.
20. Reinstall the digital circuit board cage retaining screws (4).
21. Lower the control panel to its normal position, and reinstall retaining screws (2).
22. Close the top board and reinstall the retaining screws.
23. Connect the MDR-1 to the Electone with the 15 pin conductor cable (supplied in the MDR-1A), using the socket installed in step #6 (located in back). This connector is fitted with retaining bolts on each side of the plug housing. Tighten to moderate tension only. Overtightening may fracture the plug housing.
24. Using the power cord (supplied in the MDR-1A), connect the MDR-1 to the 120V ac.
25. Installation is now complete.

MDR-1

Applicable model: FS-200X

1. Remove back cover. FS-200X has 3 screws.
2. Remove the metal plate used to cover the opening on the back of the Electone provided for this accessory (2 screws). Retain these screws as they will be used in step #6 (see figure 1).
3. Remove top board retaining screws and open the top board. FS-200X has two (2) screws on top.
4. Remove control panel retaining screws (2), (see figure 2).

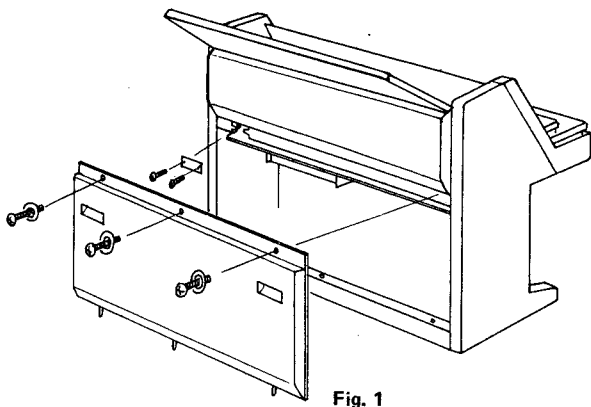


Fig. 1

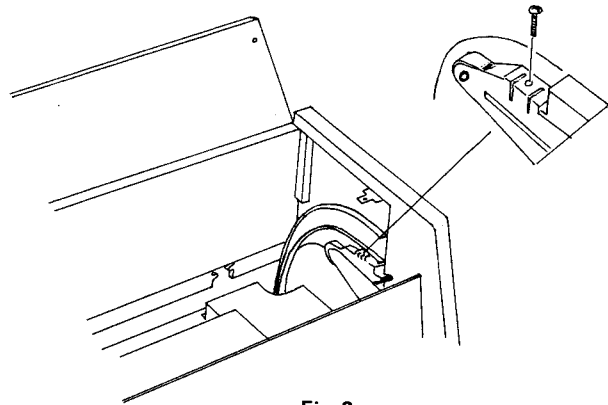


Fig. 2

5. Pass the 16 pin shielded cable assembly with a phono-type pin plug through the opening established when the cover plate is removed (see figure 3).
6. Using the two screws retained from step #2, attach the socket mounting bracket to the back as shown in figure 3.
7. Route the 16 pin shielded cable assembly on the organ shelf as shown in figure 4.

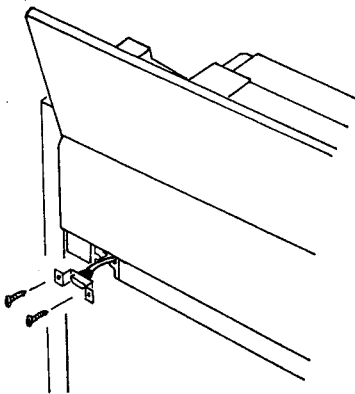


Fig. 3

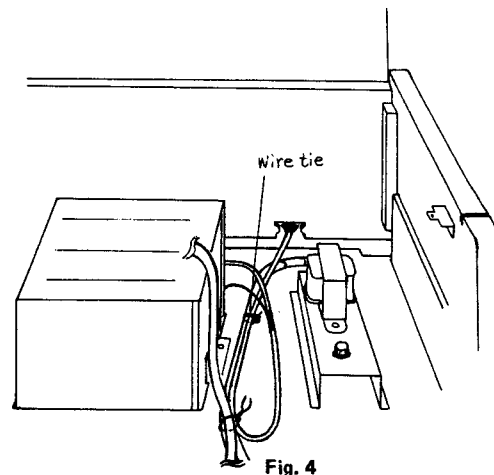


Fig. 4

8. Temporarily, place the AIF circuit board on top of the digital circuit board cage (board will be installed in step #11). Connect the 16 pin socket to connector CN2 of the AIF circuit board, and the phono-type pin plug to the socket J1. Tie the shielded cable close to the AIF circuit board. A cable tie has been provided on the board for the shielded cable that is connected to J1.
Note: Please check the position of switches SW1 and SW2 (see figure 5), For model FS-200X set switch 1 to the right and switch 2 to the left (when viewed in mounted position).
9. Connect one end of the 10 pin socket to connector C1 of the AIF board as shown in figure 5 (leave the other end free, This will be connected in step #15).
10. Connect one end of the 5 pin socket to connector C2 of the AIF board as shown in figure 5 (leave the other end free, This will be connected in step #17).
11. Now, install the AIF circuit board as shown in figure 5.

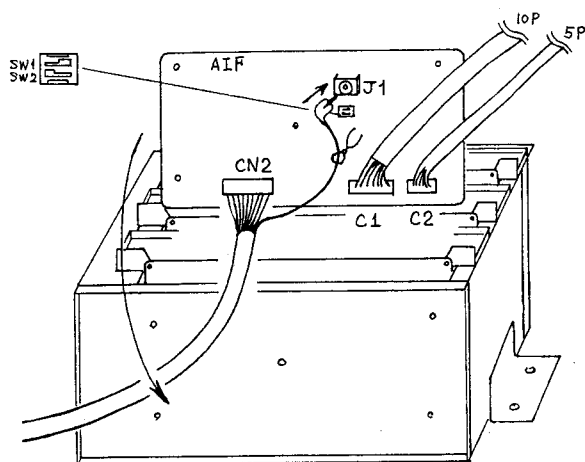


Fig. 5

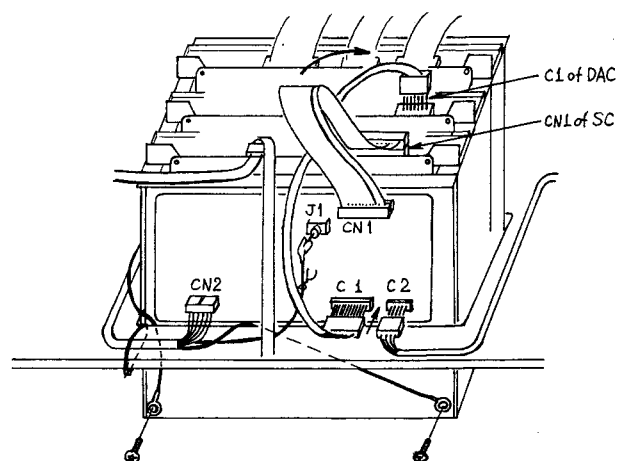


Fig. 6

12. Connect the ground wires to the bottom of the digital circuit cage securing screws, as shown in figure 6.
13. Tie the 16 pin shielded cable as shown in figure 4 and 6 by using the supplied wire tie.
14. Using the 40 pin flat cable assembly, (ribbed side up, polarity marking on the right when viewed from back of organ) connect to socket CN1 of the AIF circuit board, and to socket CN1 of the "SC" circuit board (see figure 6).
15. Connect the loose end of the 10 conductor cable assembly connected in step #9, to C1 of the AIF circuit board, and to connector C1 of the DAC circuit board (see figure 6).

MDR-1

16. For this step, the control panel must be in the "UP" (service) position. Now, locate the metallized paper cover used to shield the MA circuit board. Loosen the retaining screws (4). Removal of the retaining screws is not necessary. "Key hole" slots have been provided. Now, remove the metal brackets and metallized paper cover (see figure 7).

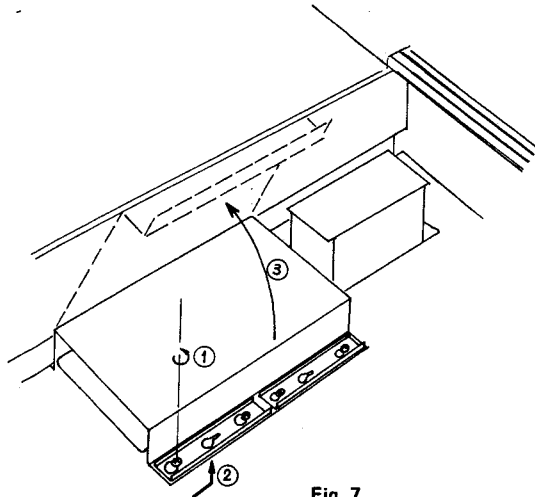


Fig. 7

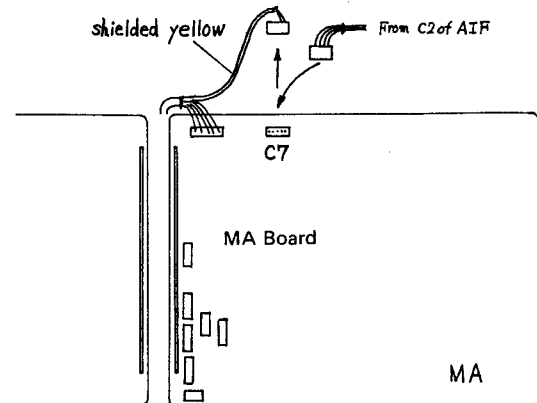


Fig. 8

17. Disconnect the 5 pin socket to connector C7 of the MA circuit board. Using tape or a cable tie, secure this cable in a location where it will not generate rattles, or short circuit possibilities (This connector is not used). Now, connect the loose end of the 5 conductor cable Connected to C2 of the AIF circuit board in step #10, to connector C7 of the MA circuit board (see figure 8).
18. Cable routing is not critical. Excess cable should be secured to preclude the possibility of vibrations.
19. Replace metallized paper cover and metal brackets removed in step #16.
20. Lower the control panel to its normal position, and reinstall retaining screws (2).
21. Close the top board, and reinstall the retaining screws.
22. Attach the back cover removed in step #1.
23. Connect the MDR-1 to the Electone with the 15 pin conductor cable (supplied in the MDR-1A), using the socket installed in step #6 (located in back). This connector is fitted with retaining bolts on each side of the plug housing. Tighten to moderate tension only. Overtightening may fracture the plug housing.
24. Using the power cord (supplied in the MDR-1A), connect the MDR-1 to the 120V ac.
25. Installation is now complete.

DISASSEMBLY PROCEDURE (分解手順)

Procedure 1

● Removing Top Cover

Unscrew screws ① to ④, then slide top cover in the direction marked to removal. (See Fig. 1)

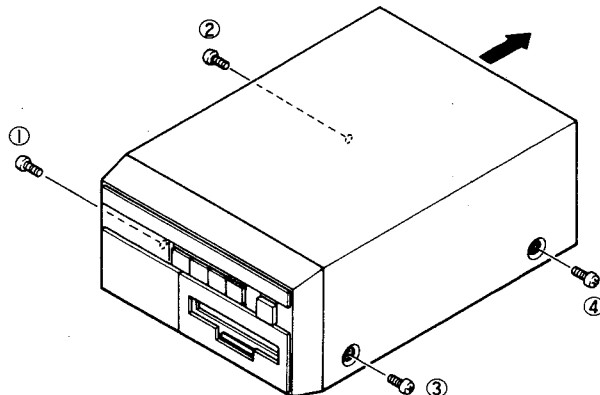


Fig. 1

➡ This procedure permits removal of ACPU and AIO circuit boards (in Procedure 2).

手順 1

● トップカバーの取りはずし

図1に示すネジ①～④をはずし、トップカバーを背面方面にスライドさせて取りはずします。

➡この状態でACPUシートおよびAIOシートの取りはずし(手順2)ができます。

Procedure 2

● Removing ACPU and AIO circuit boards

- Disconnect connectors (CN1 to CN4) on ACPU circuit board.
- Unscrewing screws ① to ④ permits ACPU and AIO circuit boards to be removed (with connectors attached). (See Fig. 2)
*When removing screws ① to ④, be careful not to lose spacers.
- To completely detach AIO circuit board, disconnect connectors CN3 to CN7.

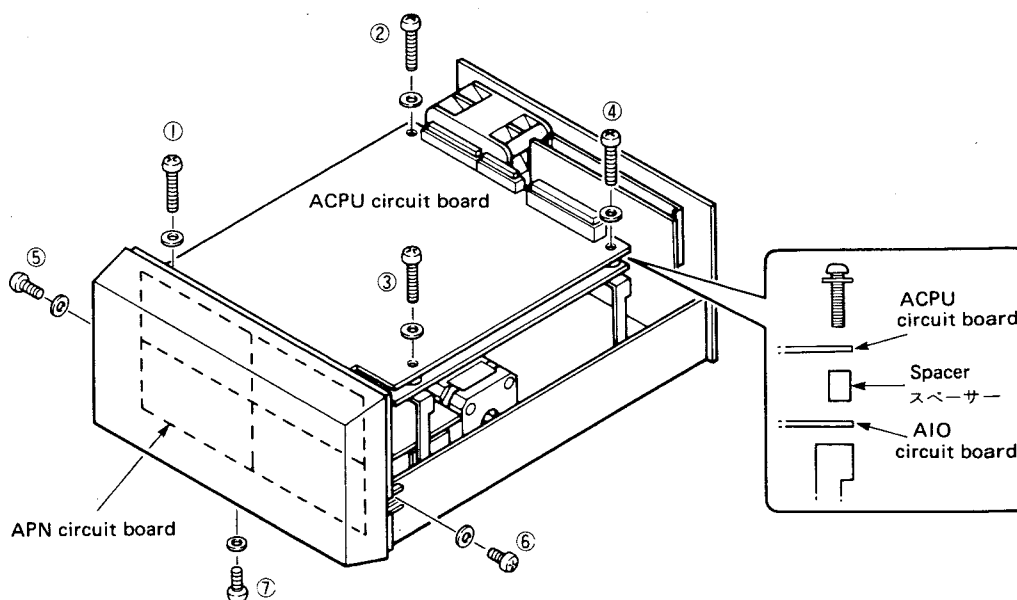


Fig. 2

➡ This procedure permits removal of front panel, ACT circuit board and cooling fan (in Procedure 3).

手順 2

● ACPUシートおよびAIOシートのはずし方

- ACPUシートの各コネクタ(CN1～4)をはずします。
- 図2に示すネジ①～④をはずせば、ACPUシートとAIOシート(コネクタが差し込まれた状態で)がはずれます。
*ネジ①～④の取りはずしの際、スペーサーをなくさないようご注意ください。
- AIOシートのCN3～CN7をはずせば、AIOシートが完全にはずれます。

➡この状態でフロントパネル、ACTシートおよび冷却ファンの取りはずし(手順3)ができます。

MDR-1

Procedure 3

● Front panel removal

Unscrew screws ⑤ to ⑦ to remove front panel. (See Fig. 2)

➡ This permits removal of the FDD and power supply unit (in procedure 4) and APN circuit board.

● ACT Circuit board Removal

a) Disconnect connectors CN1 and CN2 on ACT circuit board.

b) Unscrew screws ① and ② to remove ACT circuit board (See Fig. 3)

● Cooling Fan Removal

a) Disconnect 3P connector.

b) Remove screws and flanged nuts ③ to ⑤ for removal of cooling fan.

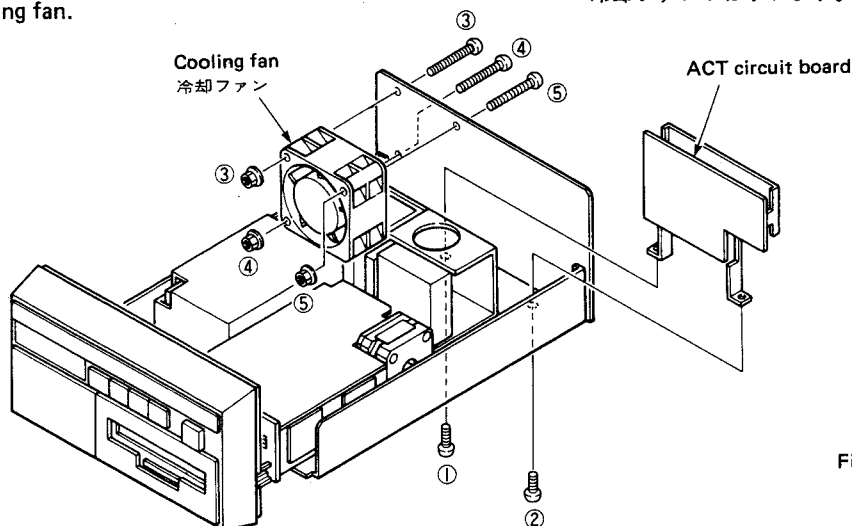


Fig. 3

Procedure 4

● Dismounting the FDD and Power Supply Unit

a) To dismount the FDD, unscrew screws ① to ④, then disconnect flat cable and 4P connectors. (See Fig. 4)

b) To dismount power supply unit, unscrew screws ⑤ to ⑦.

* Do not disassemble the FDD. Do not tamper with DIP switches.

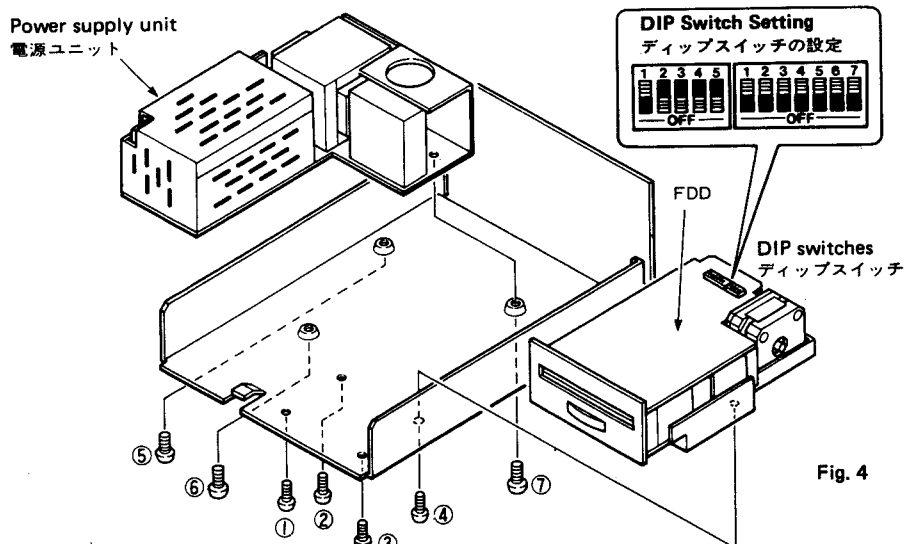


Fig. 4

手順 3

● フロントパネルのはずし方

図2に示すネジ⑤～⑦をはずせば、フロントパネルがはずれます。

➡この状態でFDDおよび電源ユニットの取りはずし(手順4)、およびAPNシートの取りはずしができます。

● ACTシートのはずし方

a) ACTシートのCN1、CN2をはずします。

b) 図3に示すネジ①、②をはずせば、ACTシートがはずれます。

● 冷却ファンのはずし方

a) 3Pコネクタをはずします。

b) 図3に示すネジおよびフランジナット③～⑤をはずせば、冷却ファンがはずれます。

手順 4

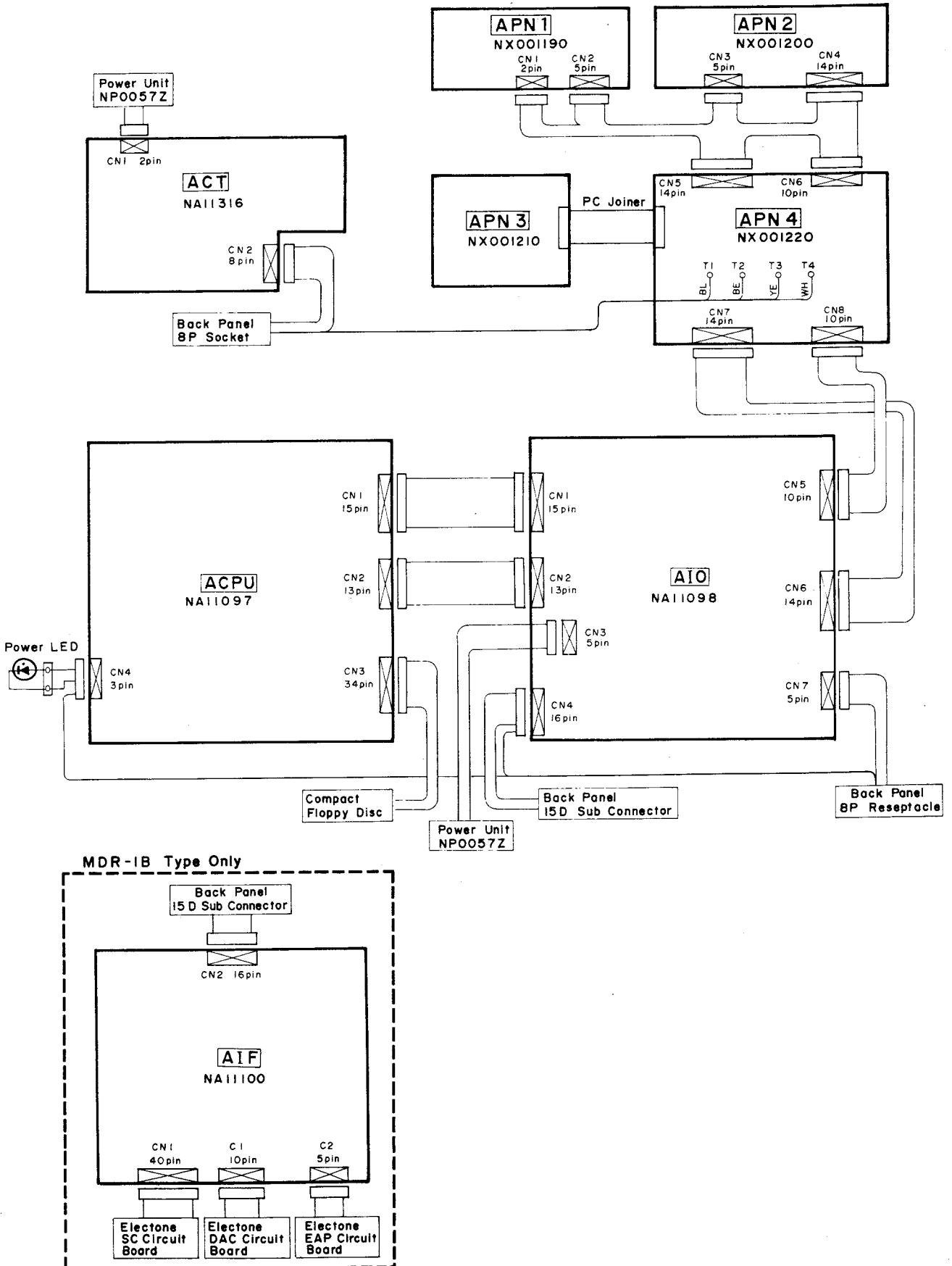
● FDDおよび電源ユニットのはずし方

a) 図4に示すネジ①～④をはずした後、フラットケーブルコネクタおよび4Pコネクタをはずせば、FDDがはずれます。

b) 図4に示すネジ⑤～⑦をはずせば、電源ユニットがはずれます。

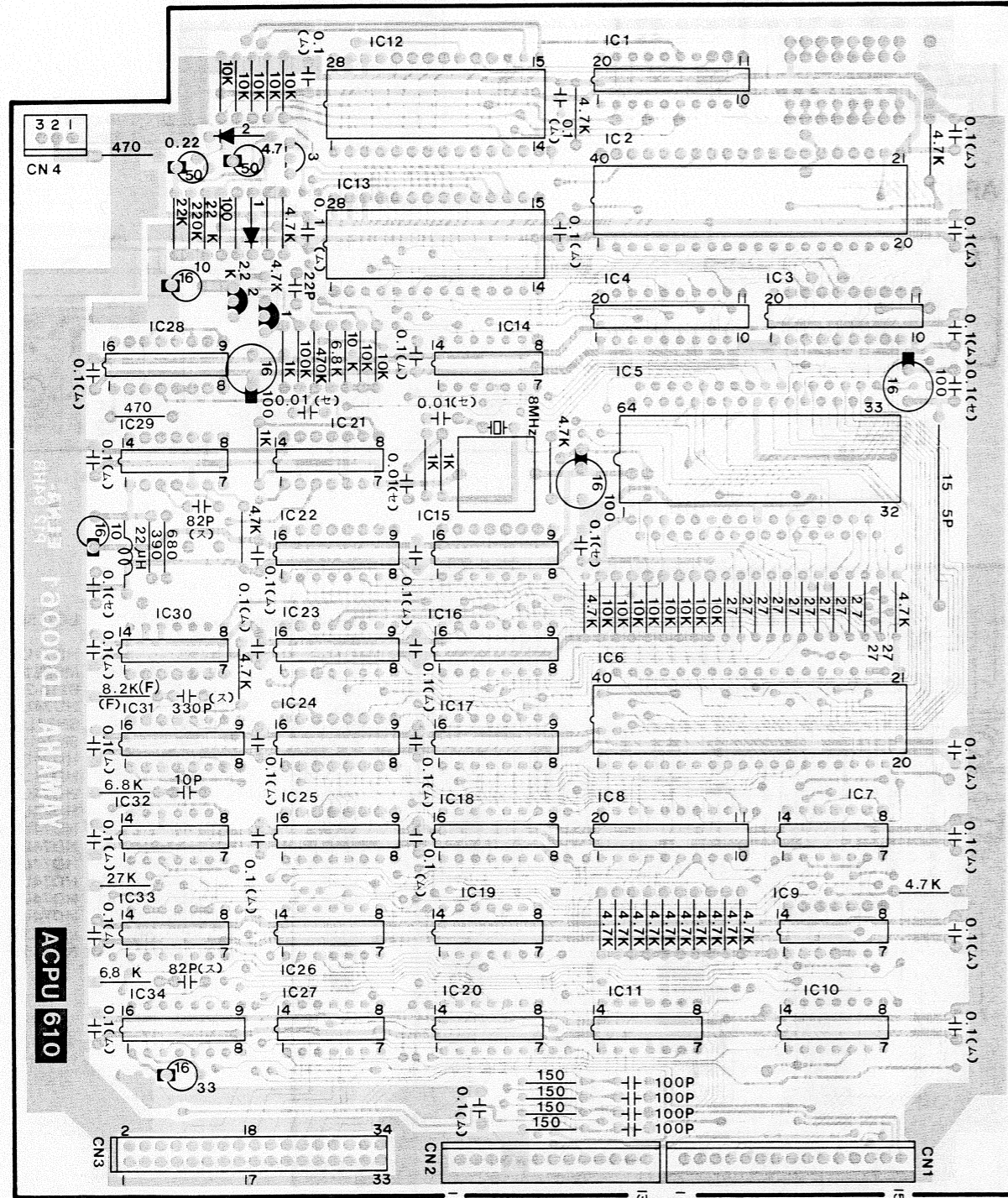
* FDDを分解したり、ディップスイッチにむやみに触れたりしないようにしてください。

■ WIRING (結線図)



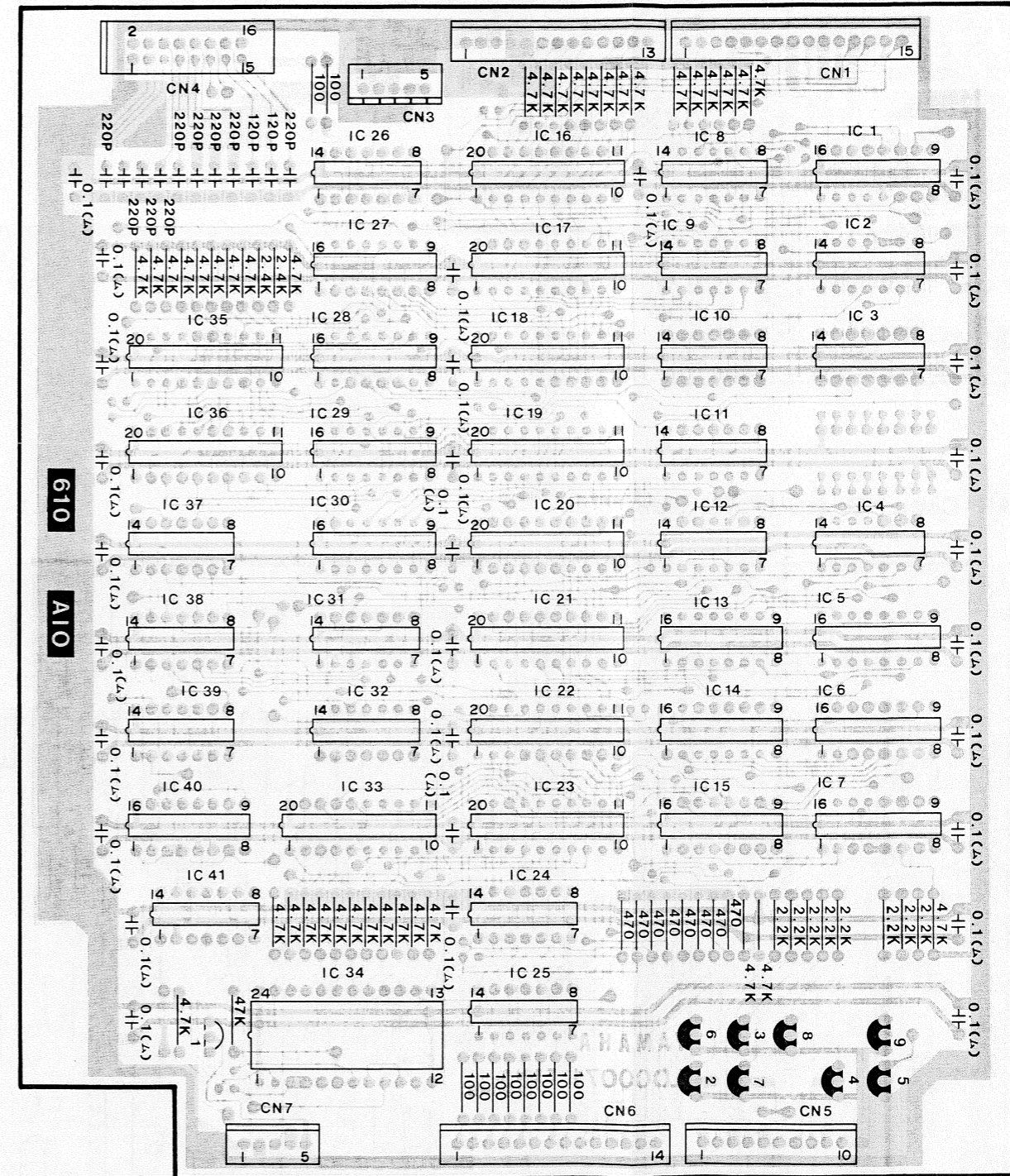
■ CIRCUIT BOARDS (シート図)

ACPU Circuit Board (Parts side)



Notes)					
1. Circuit Board	: LD00061	IC12, 13	: MBM2764-30	IC33	: HD74LS51P
2. IC		IC14	: HD7404P	3. Transistor	
IC1, 3, 4, 8	: HD74LS244P	IC15 ~ 18,	: MB8265-202	Tr1, 2	: 2SA1015(Y)
IC2	: YM2025	22 ~ 25		Tr3	: 2SC1959(Y)
IC5	: YM5205	IC19	: HD74LS00P	4. Diode	
IC6	: MB8877C-G	IC21	: MC4044	D1, 2	: 1S1555
IC7, 20, 32	: HD74LS74A	IC27	: HD7406P		
IC9	: HD74LS14P	IC28	: TC4049BP		
IC10, 26	: HD74LS04P	IC29	: MC4024		
IC11	: HD74LS125P	IC30	: HD74LS293P		
		IC31, 34	: F9602		

AIO Circuit Board (Parts side)

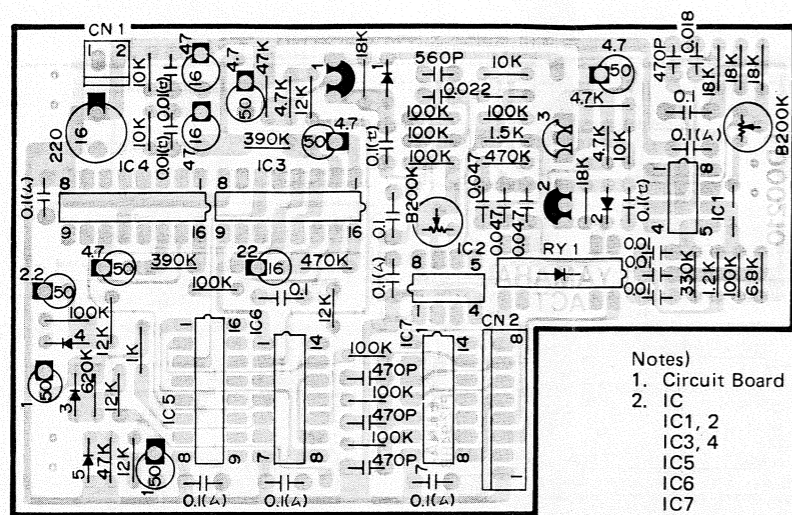


Notes)					
1. Circuit Board	: LD00071	IC16, 33	: HD74LS245P	IC40	: HD74LS161P
2. IC		IC17, 19, 22,	: HD74LS244P	IC41	: HD74LS393P
IC1	: HD74LS138P	35, 36		3. Transistor	
IC2, 32	: HD74LS00P	IC18, 20, 21,	: SN74LS374	Tr1	: 2SC752(Y)
IC3, 4, 12	: HD74LS32	23		Tr2 ~ 9	: 2SA1164(Y)
IC5, 6, 13	: HD74LS163P	IC24, 25	: HD7406P		
IC7	: 74H138	IC27 ~ 30	: CD40105BE		
IC8, 9, 38	: HD74LS04P	IC31	: HD74LS74A		
IC10, 11, 26	: HD74LS03P	IC34	: MB8863HM		
IC14, 15	: HD74LS175P	IC37	: HD74LS14P		
		IC39	: HD74LS164P		

MDR-1

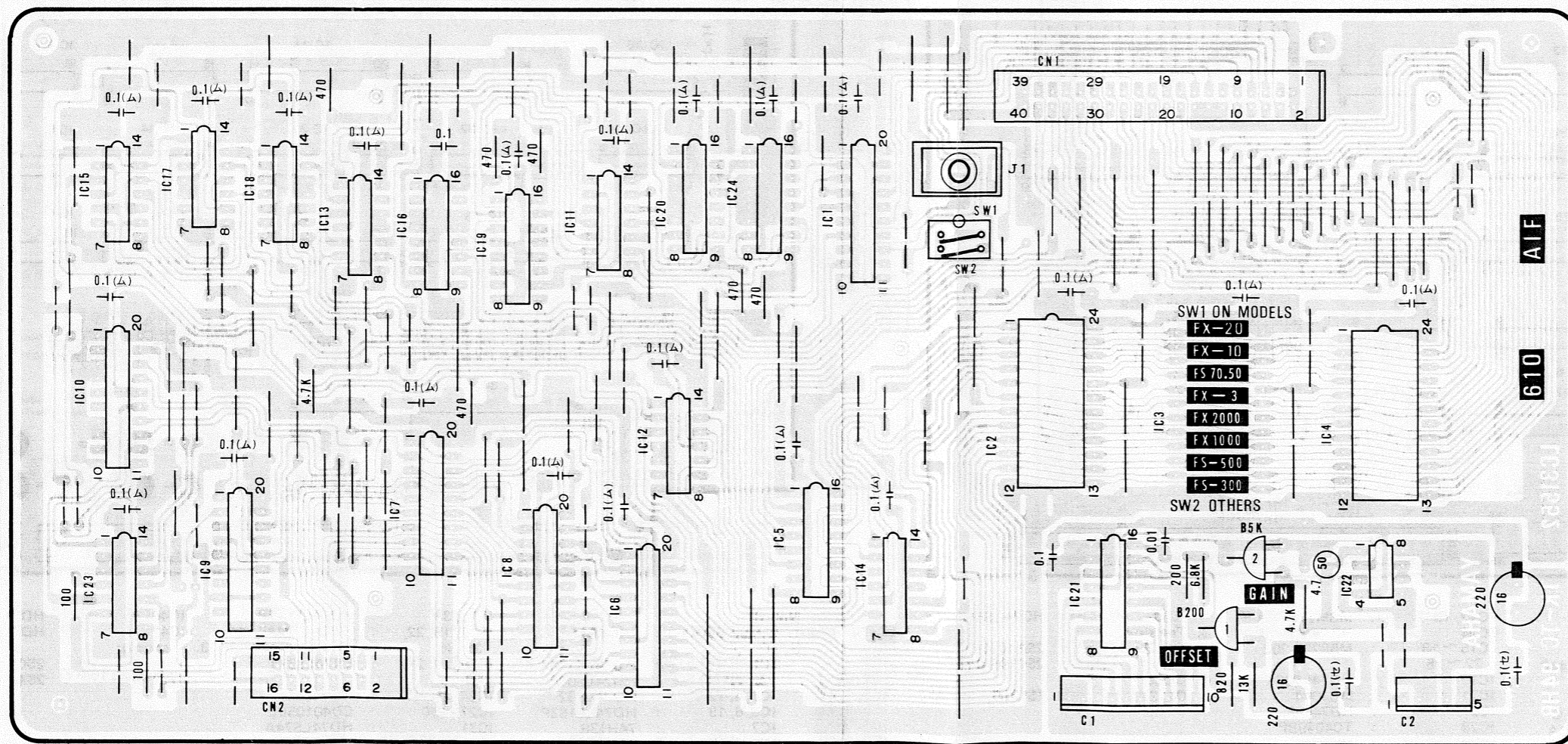
■ CIRCUIT BOARDS (シート図)

ACT Circuit Board (Parts side)



- Notes)
1. Circuit Board : LD00021
 2. IC :
 IC1, 2 : NJM4558DV
 IC3, 4 : TC4528BP
 IC5 : TC4027BP
 IC6 : TC4081BP
 IC7 : TC4066BP
 3. Transistor :
 Tr1, 2 : 2SA733A(P, Q)
 Tr3 : 2SC1815(Y)
 4. Diode :
 D1 ~ 5 : 1S2473VE
 5. Relay :
 RY1 : 12V1A

AIF Circuit Board (Parts side)

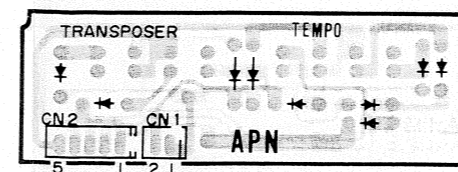


- Notes)
1. Circuit Board : LC31552
 2. IC :
 IC1, 7 : HD74LS244P
 IC2, 3 : MB8516 (16KROM)
 IC4 : 6116-2 (16KRAM)
 IC5 : HD74LS139P
 IC6 : SN74LS245
 IC8, 10 : SN74LS374
 IC9 : HD74LS240P
 IC11, 23 : HD74LS05P
 IC12, 15 : HD74LS32P
 IC13 : HD74LS02P
 IC14 : HD74LS20P
 IC16 : HD74LS174P
 IC17 : HD74LS00P
 IC18 : HD74LS14P
 IC19 : HD74LS365P
 IC20, 24 : HD74LS161P
 IC21 : μPC624D (DAC)
 IC22 : NJM4558DV

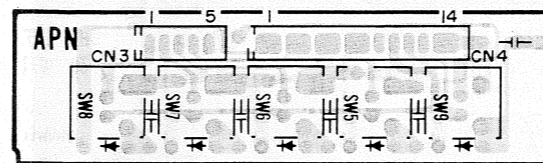
※ MDR-1B Type Only

APN Circuit Board (Pattern side)

APN1 (TRANSPOSER)

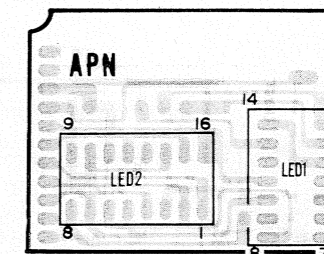


APN2 (ERASE)

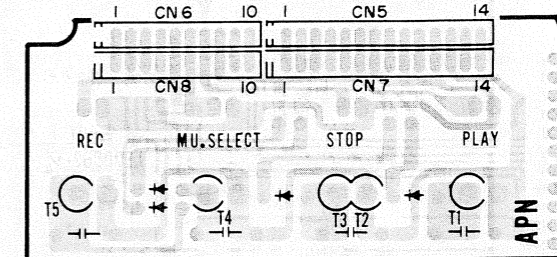


- Notes)
1. Circuit Board : LE00062
 2. Diode :
 D1 ~ 18 : 1SS133
 3. LED :
 LED1 : GL-9R03
 LED2 : GL-7N202

APN3 (MUSIC NUMBER)



APN4 (PLAY)



INSTALLATION OF IFB-2

● INSTALLATION OF IFB-2

Applicable Model: CV-300

- Before installation, check the accessories with the list of accessories with the list of parts to see that you have everything.

● IFB-2の取り付け

適応機種：CV-300

- 取り付けの前に部品が揃っているか部品表と付属部品とで確認をしてください。

● LIST OF IFB-2 PARTS

Item	名称	Amount 数量
MDR-1 Main unit	MDR-1本体	1
Compact floppy disks	コンパクトフロッピーディスク	5
CMI circuit board	CMIシート	1
Bottom metal cover	下側金属カバー	1
Top metal cover	上側金属カバー	1
Electrical power supply unit	電源ユニット	1
Power cord	電源コード	1
15P cable	15Pケーブル	1
16P flat cable assembly	16PフラットケーブルAss'y	1
30P connector wirings	30Pコネクター束線	1
10P connector wirings	10Pコネクター束線	1
5P connector wirings	5Pコネクター束線	1
3P connector wirings	3Pコネクター束線	1
Cable holder	束線止め金具	1
Bottom metal cover attachment screws	下側金属カバー取付ネジ	4
Top metal cover attachment screws	上側金属カバー取付ネジ	4
Electrical power supply unit attachment screws	電源ユニット取付ネジ	5
Cable holder attachment screws	束線止め金具取付用ネジ	2

- ① As shown in Fig. 1, remove the back board (10 screws) and open the top board.
- ② As shown in Fig. 1, remove the blind plate (2 screws) which is attached to the back frame.
*The 2 screws removed, will be used to secure the connector chassis in step ⑤.

- ①図1のように裏蓋(ネジ10本)をはずします。また、天屋根も開きます。
- ②図1のように背面框に取り付けられているめくら板(ネジ2本)をはずします。
*はずしたネジ2本は、手順⑤でコネクタシャーシの固定に使用します。

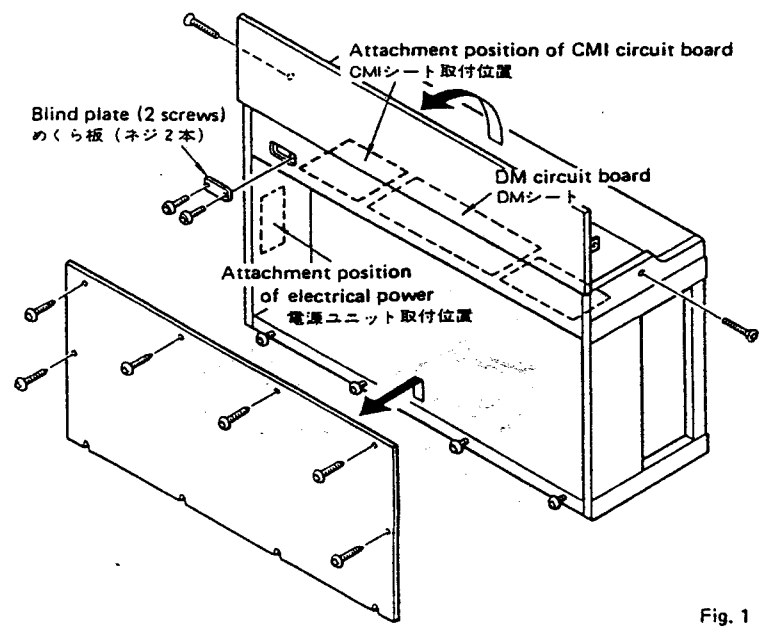


Fig. 1

001182

- ③ As shown in Fig. 2, after attaching the bottom metal cover (4 screws), while inserting the CMI circuit board into the circuit board fastener tabs of the metal cover, push it into the forward support pins and secure it.

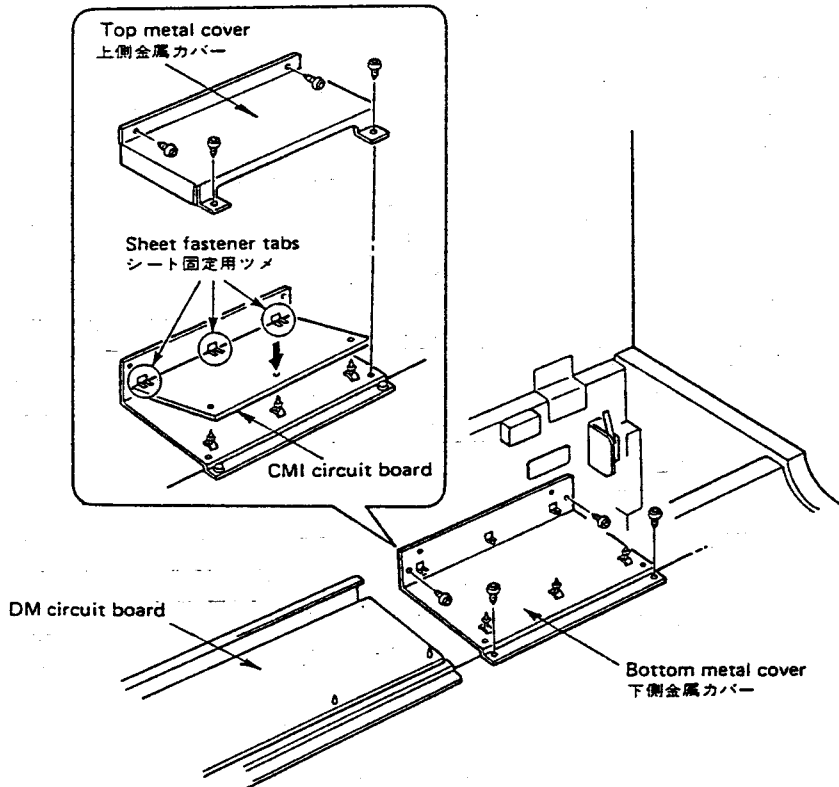


Fig. 2

- ③ 図2のように下側金属カバー(ネジ4本)を取り付けた後、CMIシートを金属カバーのシート固定用ツメに差し込みながら、手前側のサポートピンに押し込み固定します。
*上側金属カバーは、配線終了後に取り付けます。

- ④ As shown in Fig. 3, from the rear side of the main unit, attach the electrical power supply unit (4 screws) to the inside of the main plate, in the position indicated. (When the electrical power supply unit has a voltage switching device, set it also to the indicated position.)

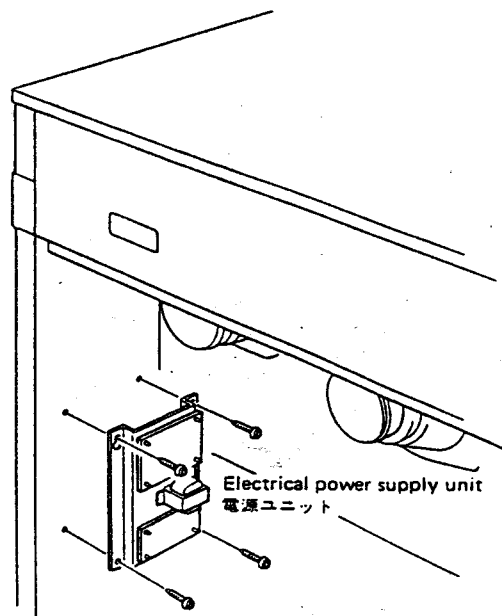


Fig. 3

- ④ 図3のように本体の裏面より電源ユニット(ネジ4本)を親板の内側に取り付けます。(電源ユニットに電圧切替器がある場合には、きめられたポジションにセットします。)

- ⑤ As shown in the Fig. 4, pass the 16P flat cable assembly through the blind plate hole. After securing the connector chassis (2 screw), insert the 16P connector into CN4 of the CMI circuit board.

- ⑤ 図4のように16PフラットケーブルAss'yをめくら板穴より通し、コネクタシャーシ(ネジ2本)を固定した後、CMIシートのCN4へ16Pコネクタを差し込みます。

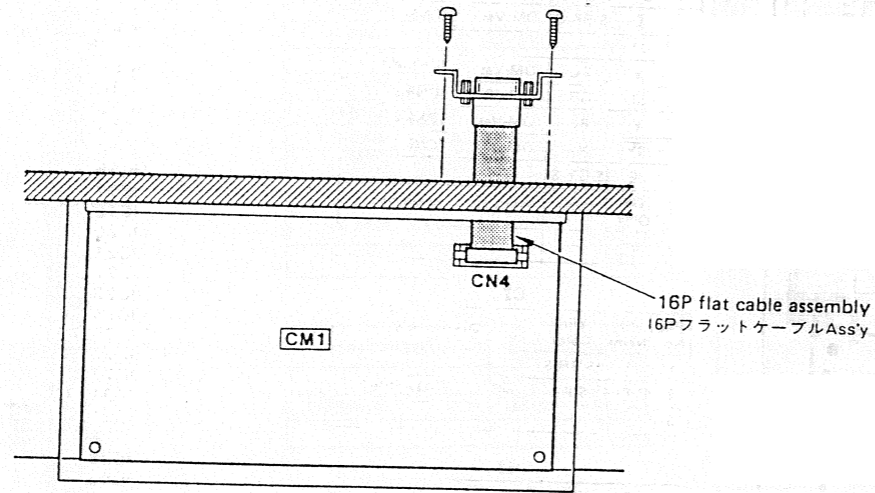


Fig. 4

- ⑥ Remove the 30P keyboard flat cable inserted into CN5 of the DM circuit board and the 3P damper connector inserted into CN7.
- ⑦ Connect the cables as shown in Fig. 5.
*After connecting all of the cables, check to see that there are no errors.
- ⑧ As shown in Fig. 2, attach the top metal cover (4 screws) of the CMI circuit board.

- ⑥ DMシートのCN5に差し込まれている30Pの鍵盤フラットケーブルとCN7に差し込まれている3Pのダンパーコネクタを取りはずします。

- ⑦ 図5のように各束線を接続します。

*すべての束線を接続した後、各配線に誤りがないことを確認してください。

- ⑧ 図2のようにCMIシートの上側金属カバー(ネジ4本)を取り付けます。

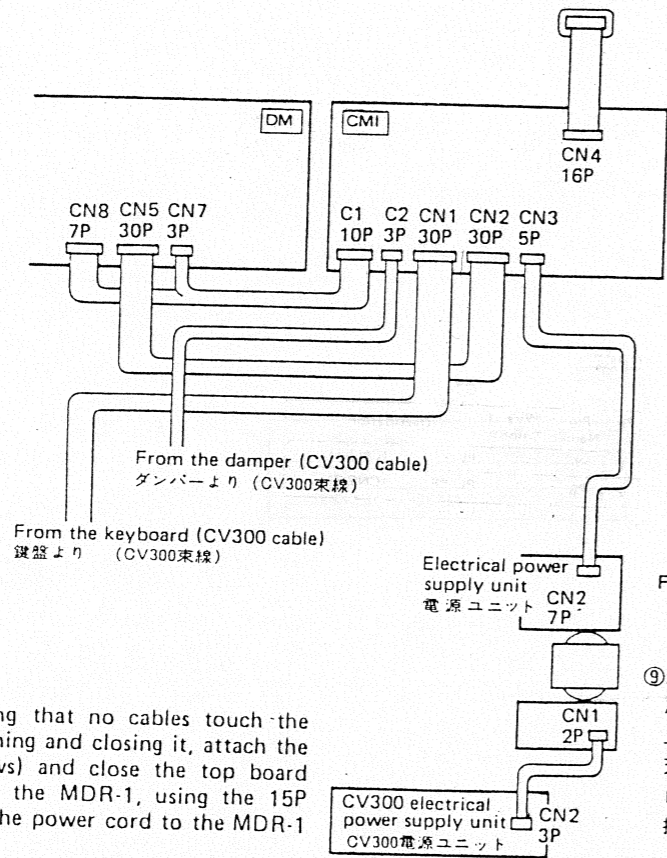


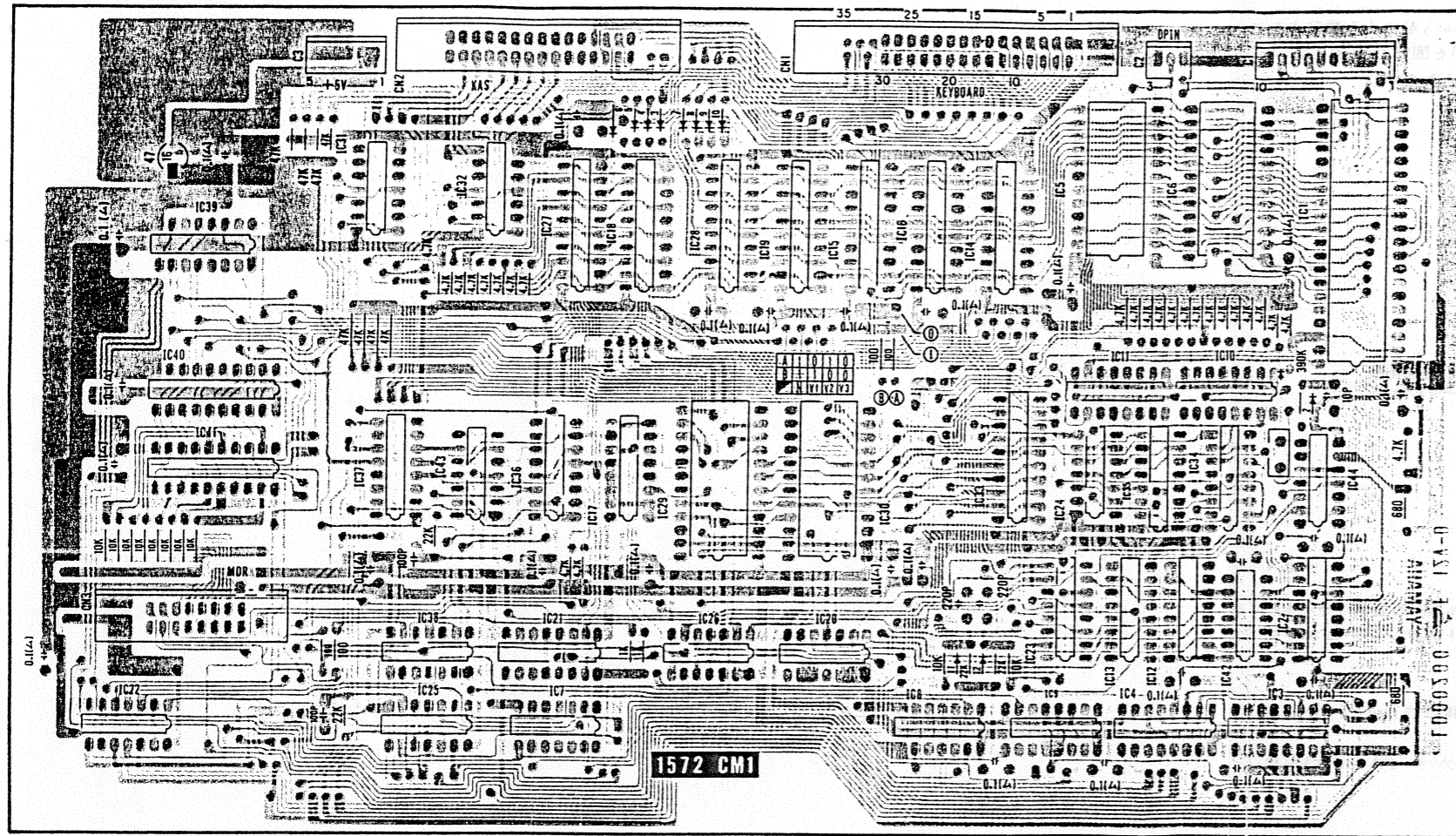
Fig. 5

- ⑨ Finally, after checking that no cables touch the slide cover when opening and closing it, attach the back board (10 screws) and close the top board (2 screws). Hook up the MDR-1, using the 15P cable. Next, connect the power cord to the MDR-1 and you are finished.

- ⑨ 最後にスライド蓋の開閉時に束線があたらないことを確認した上で裏蓋(ネジ10本)を取り付け、天屋根(ネジ2本)を閉じた後、15Pケーブルを用いてMDR-1と接続し、更にMDR-1に電源コードを接続すれば完了です。

MC-Service

CM1 CIRCUIT BOARD



CM1

Pin No.	Pin Name	Wire Color	Destination
1	IC1N	S BR	DM-IC (CN8-1)
2	E	S BR S	DM-Vss (CN8-2)
3	φ1	-	-
4	E	BL	DM-Vss (CN8-4)
5	φ2	GR	DM-φ2 (CN8-5)
6	E	BL	DM-Vss (CN8-6)
7	SY	VI	DM-SY (CN8-7)
8	E	S GY S	-
9	DP OUT	S GY	DM-LD (CN7-2)
10	E	-	-

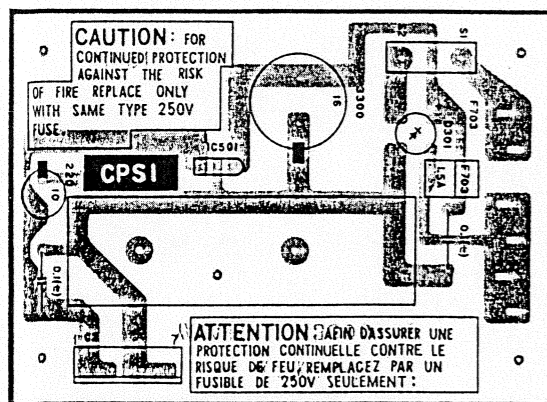
Pin No.	Pin Name	Wire Color	Destination
1	E	S BR S	-
2	D PIN	S BR	PDD (DAMPER)
3	-	-	-

Pin No.	Pin Name	Wire Color	Destination
1	+5	PK	CPS1-+5 (C2-1)
2	+5	PK	CPS1-+5 (C2-2)
3	E	BL	CPS1-E (C2-4)
4	E	BL	CPS1-E (C2-5)
5	E	BL	CPS1-E (C2-6)

Note)

- Circuit Board : LD00200
- ICs
 - IC1 : YM2025
 - IC2-4 : 74LS138 or TC40H138P
 - IC5, 29, 30 : HM6116-2 or 3
 - IC6 : IN00650 (2732A-20)
 - IC7, 8 : 40H164
 - IC9 : 40H175
 - IC10, 11 : 4050BP
 - IC12 : 40H163
 - IC13 : 4048BP
 - IC14, 15, 41 : 74LS374 or TC40H374P
 - IC16 : 40H374
 - IC17 : 40H151
 - IC18, 19, 33, 40 : 74LS244 or TC40H244P
 - IC20 : 74LS08 or TC40H008P
 - IC21, 37, 39 : 74LS175 or TC40H175P
 - IC22 : 40H032
 - IC23 : 4049BP
 - IC24 : 40H000
 - IC25, 43 : 4011BP
 - IC26 : 74LS00 or TC40H000P
 - IC27, 28 : 40H244
 - IC31, 32 : 4066BP
 - IC34, 35 : 40H148
 - IC36 : 74LS368 or TC40H368P
 - IC38 : 74LS05
 - IC42 : 74LS32 or TC40H032P
 - IC44 : 74LS04 or TC40H004P
- Diodes
 - C1-12 : 1SS133
- Resistors : All 1/6W Resistors
- Capacitor
 - 0.1 (Δ) Marked : TF Capacitor
- X'tal : 2.5 MHz

CPS1 CIRCUIT BOARD



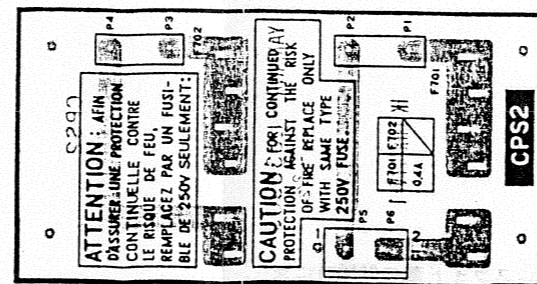
CPS1

Pin No.	Pin Name	Wire Color	Destination
1	+5	PK	CM1-+5 (C3-1)
2	+5	PK	CM1-+5 (C3-2)
3	+5	-	-
4	E	BL	CM1-E (C3-3)
5	E	BL	CM1-E (C3-4)
6	E	BL	CM1-E (C3-5)
7	E	-	-

Note)

- IC
 - IC501 : μPC14305H
- Diode
 - D301 : 1D4B1

CPS2 CIRCUIT BOARD



CPS2

Pin No.	Pin Name	Wire Color	Destination
1	P5	V1	PU-P7 (CN2-1)
2	P6	GY	PU-P8 (CN2-2)

PARTS LIST

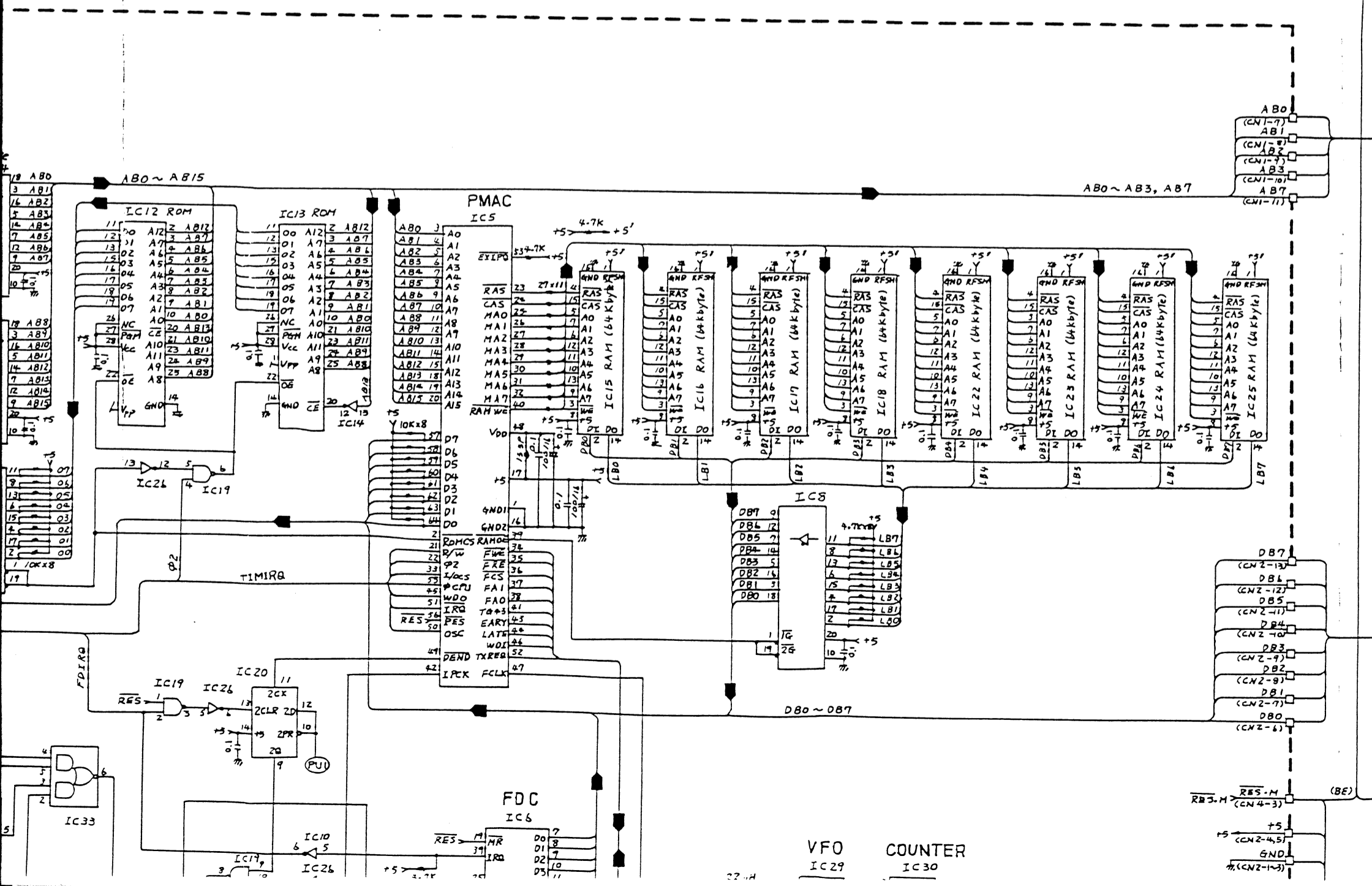
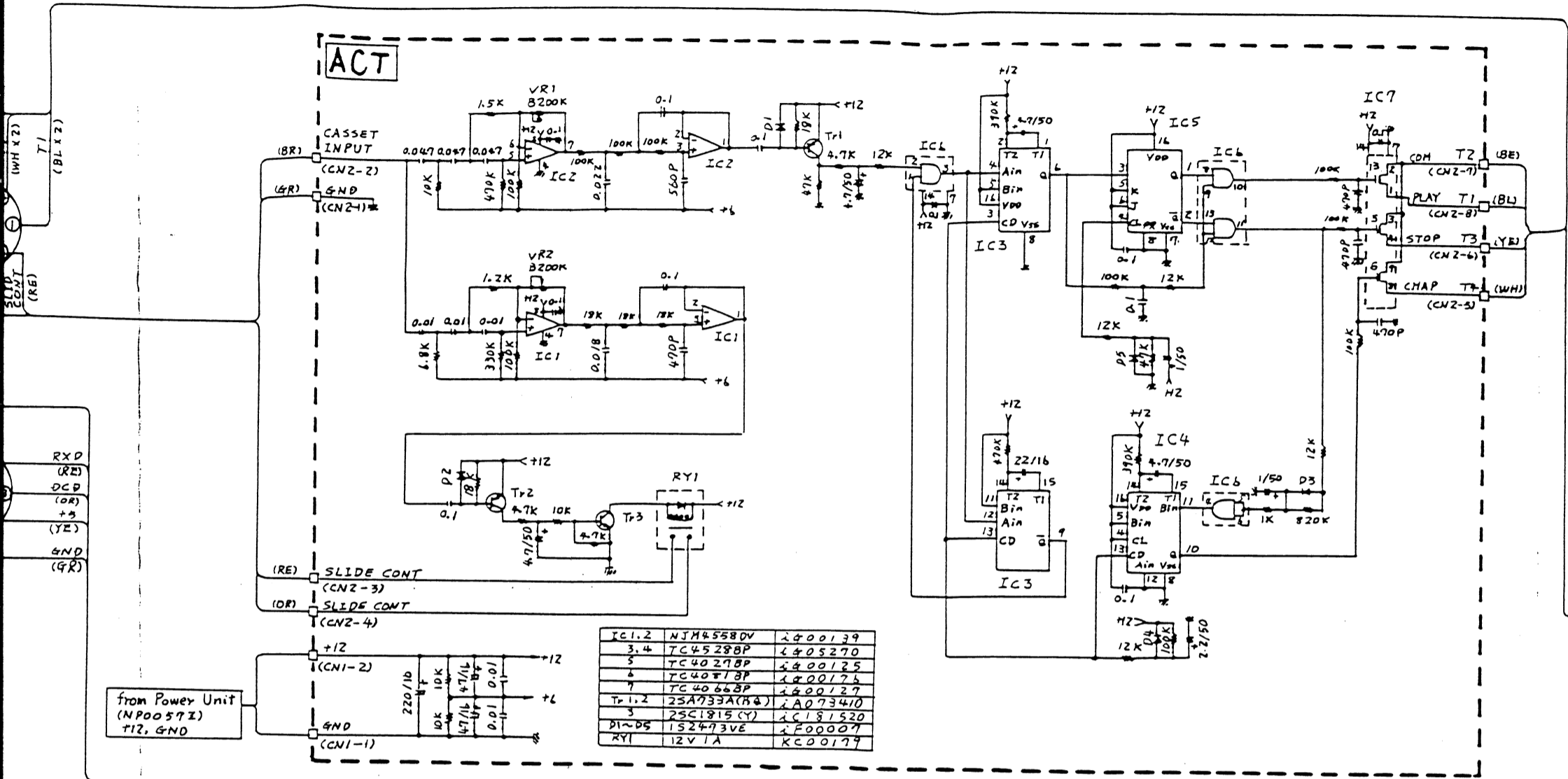
IFB-2 ELECTRICAL PARTS

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
*	NA 11 32 50	CM 1 Circuit Board	C M 1 シ ー ト				
	UA 55 51 00	Mylar Cap	0.1 μ F	T F コ ン			
*	QU 00 57 00	X'tal	2.5MHz	セ ラ ロ ッ ク			
	IF 00 34 60	Diode	ISS133	ダ イ オ ー ド			
	iG 02 69 10	IC	HD74LS00	I C 2 IN NANDx4			
	iG 02 70 10	"	HD74LS04	" INVERTER	Inter- changeable		
	iG 05 10 00	"	TC40H004P	" "			
	iG 05 26 00	"	HD74LS05	" HEX INVERTER			
	iG 04 37 00	"	HD74LS08	"	Inter- changeable		
	iG 09 64 00	"	TC40H008P	"			
	iG 04 98 00	"	HD74LS32	" 2 IN NOR			
	iG 04 42 00	"	HD74LS138	" DECODER	Inter- changeable		
	iG 11 19 00	"	TC40H138P	" "			
	iG 05 01 00	"	HD74LS175	" D FLIP-FLOP			
	iG 06 00 00	"	HD74LS244	" OCTAL BUS DRIV			
	iG 05 05 00	"	HD74LS368	"	Inter- changeable		
	iG 07 84 00	"	TC40H368P	"			
	iG 05 07 00	"	HD74LS374	" D FLIP-FLOP			
	iG 08 07 00	"	TC40H000	"			
	iG 05 28 00	"	TC40H032	"			
*	iG 11 90 00	"	TC40H148	" ENCODE			
*	iG 11 89 00	"	TC40H151	"			
	iG 10 67 00	"	TC40H163	"			
	iG 10 41 00	"	TC40H164	"			
	iG 09 67 00	"	TC40H175	"			
	iG 10 72 00	"	TC40H244	" BR DRIVE			
	iG 07 86 00	"	TC40H374	" NOTE READ			
	iT 20 25 00	"	YM2025	" System Controller			
	iG 10 33 00	"	HM6116P-2	" RAM			
*	IN 00 65 00	"	MBM2732A-30Z	" ROM			
	iG 00 12 40	"	TC4011BP	" 2 IN NAND			
	iG 05 24 00	"	TC4040BP	" 12 Stage Binary Ripple Counter			
	iG 00 12 60	"	TC4049BP	"			
	iG 00 17 40	"	TC4050BP	" 6 Buffer			
	iG 00 12 70	"	TC4066BP	" TRACKING SW			
	LB 30 07 70	Base Pin	3P	ベ ー ス ピ ン			
	LB 50 02 50	"	5P	"			
	LB 60 24 70	"	10P	"			
	LB 60 60 00	Conector	16P	コ ネ ク タ ー			
	LB 60 24 30	"	30P	"			
*	NP 00 62 10	Power Supply Unit		電 源 ユ ニ ッ ト		J	
	NP 00 62 20	"		"		G.S.I	
	NP 00 62 30	"		"		U.C	
	NP 00 62 50	"		"		B.A	
	NP 00 62 60	"		"		E	
	LB 00 22 80	Voltage Selector		電 圧 切 換 器		G.S.I	
*	GA 05 13 00	Power Transformer		電 源 ト ラ ン ス		J	

*New Parts (新規部品)

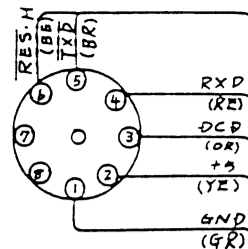
MDR-1

E F G H I J

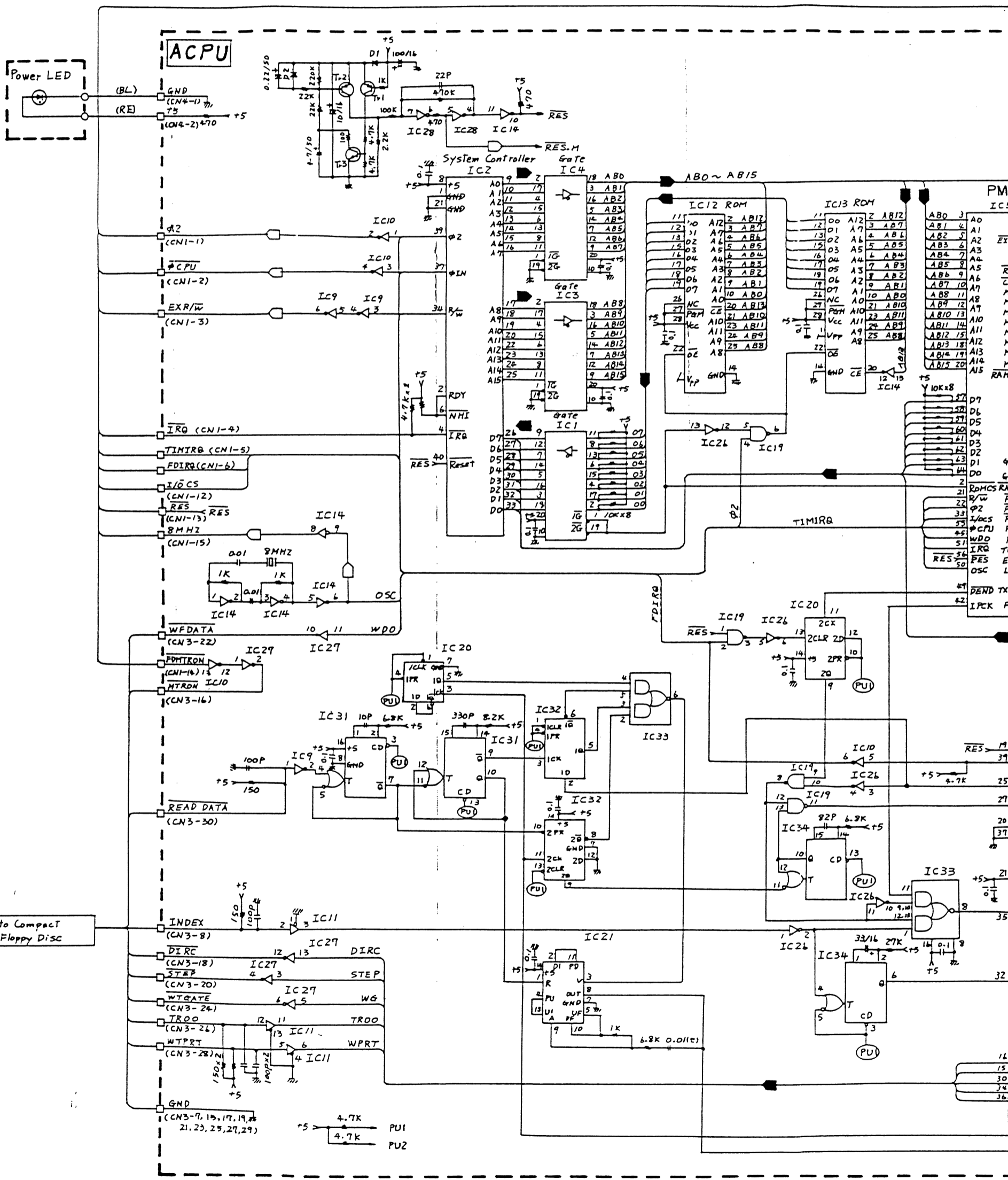


MC-Service

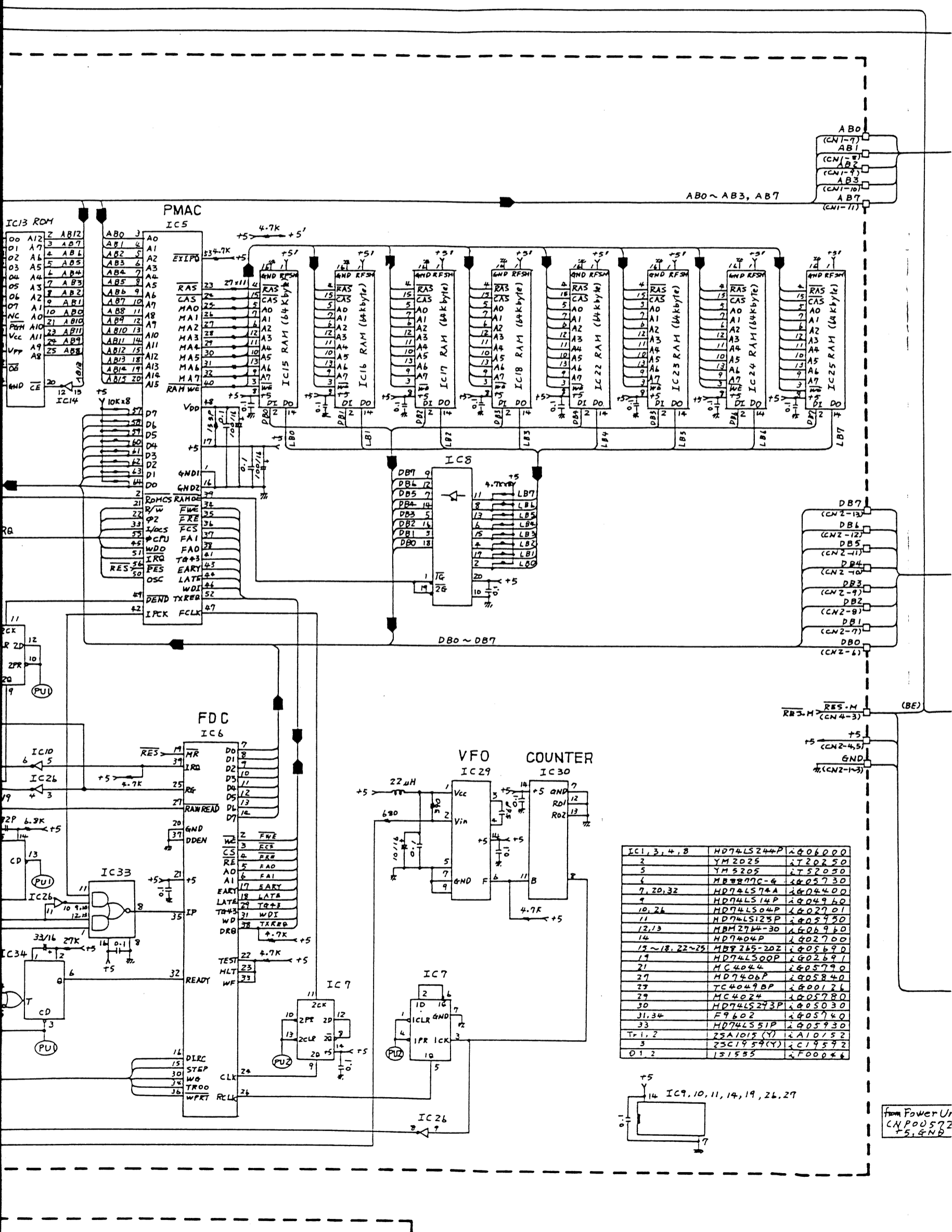
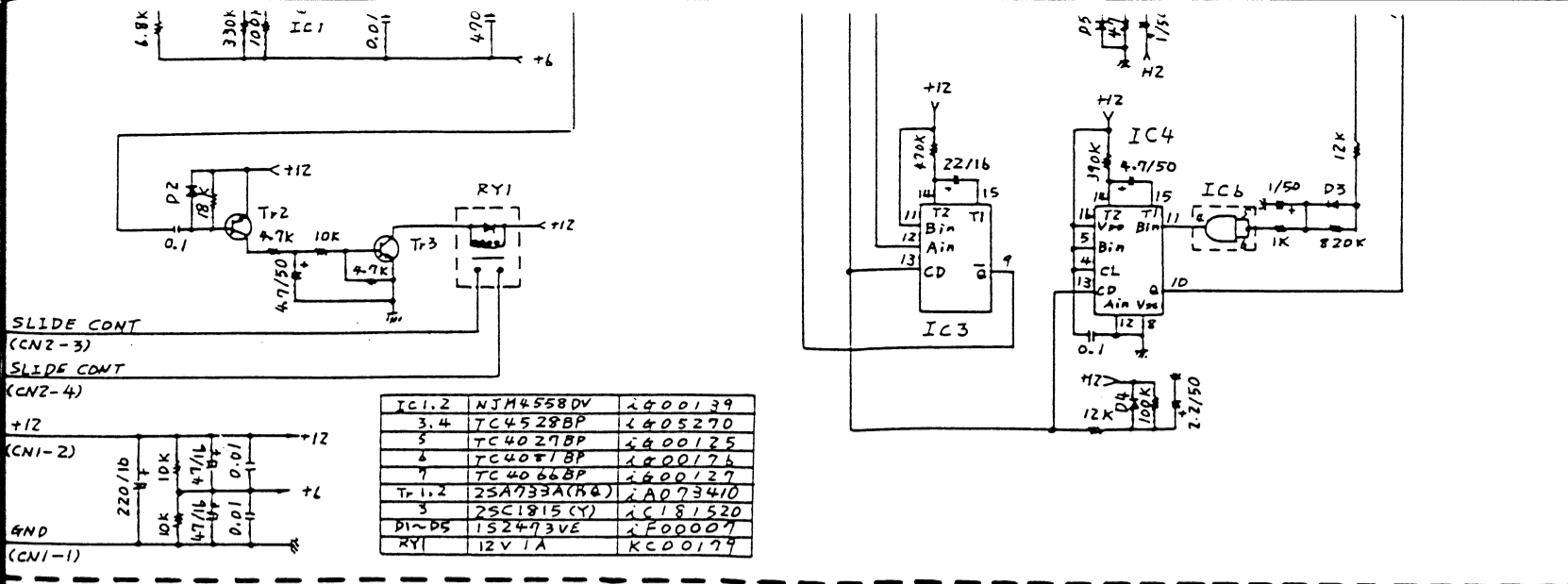
Back Panel
8P Receptacle

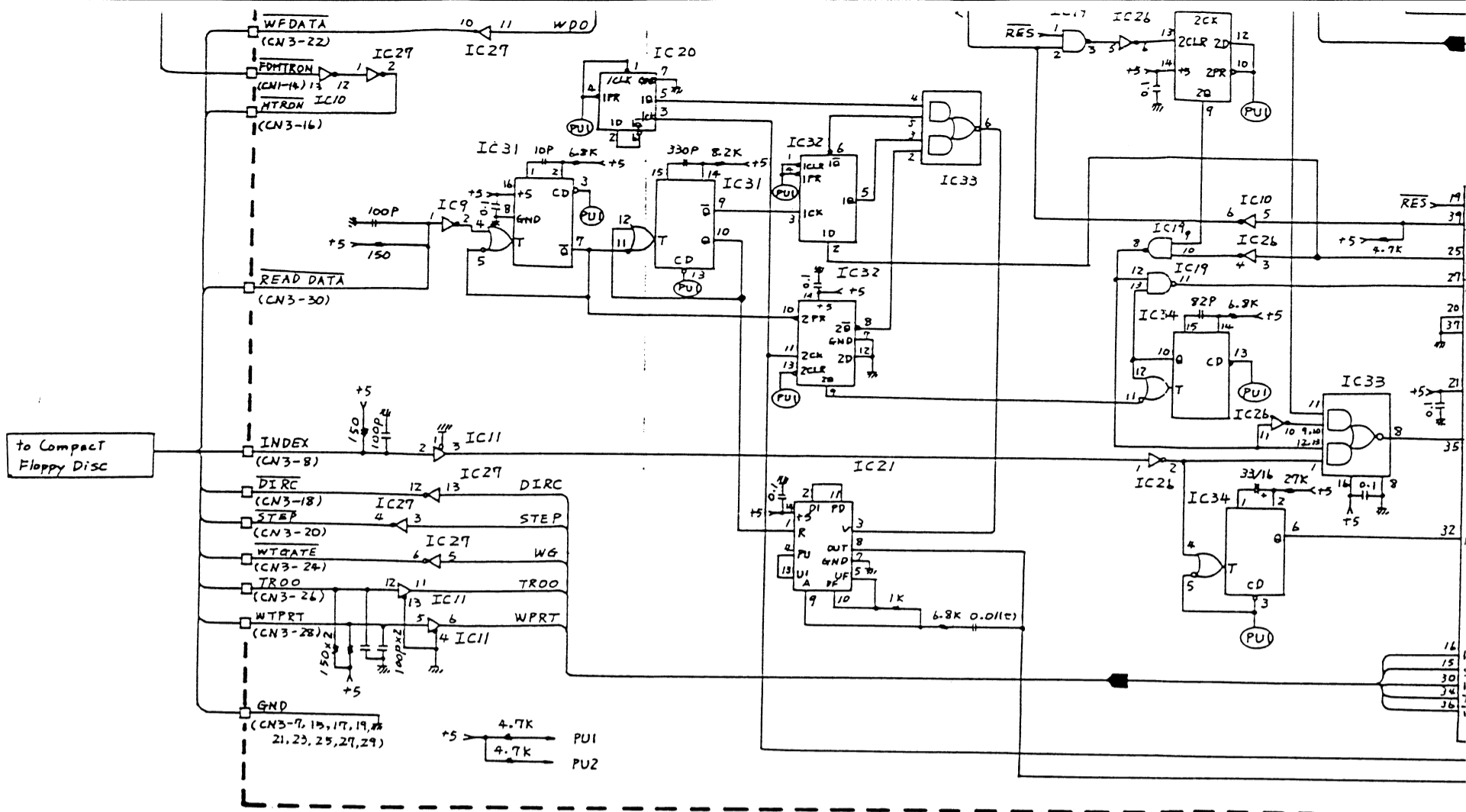


from Power Unit
(NPO057Z)
TIZ, GND



MDR-1B Model Only

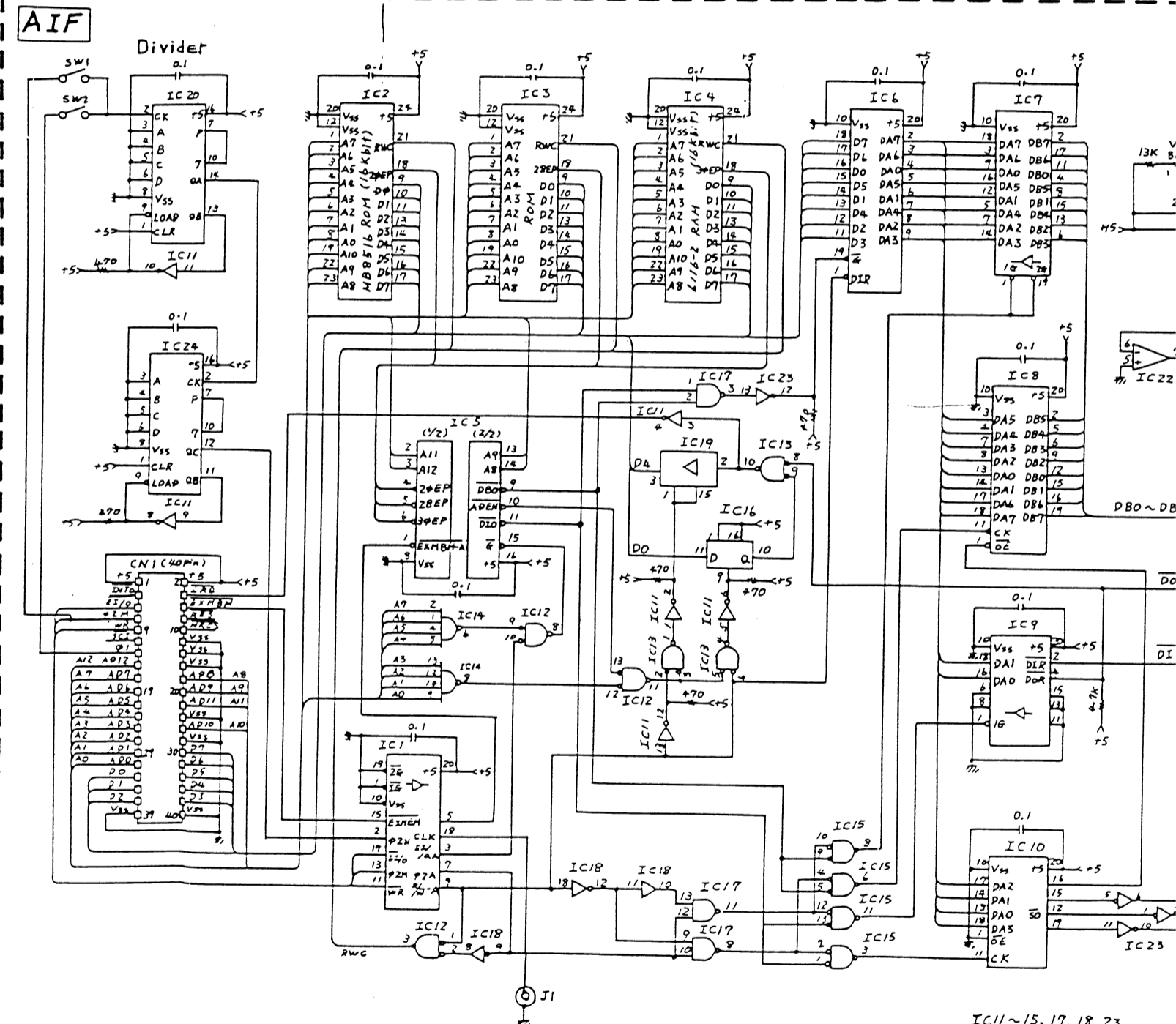




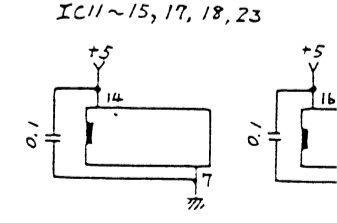
Model	SW1	SW2
Fx 20, 10	on	off
Fs 70, 50, 500 * 300*	on	off
Fs 30, 20	off	on
Fs 200 * 100*	off	on

* US MODEL ONLY

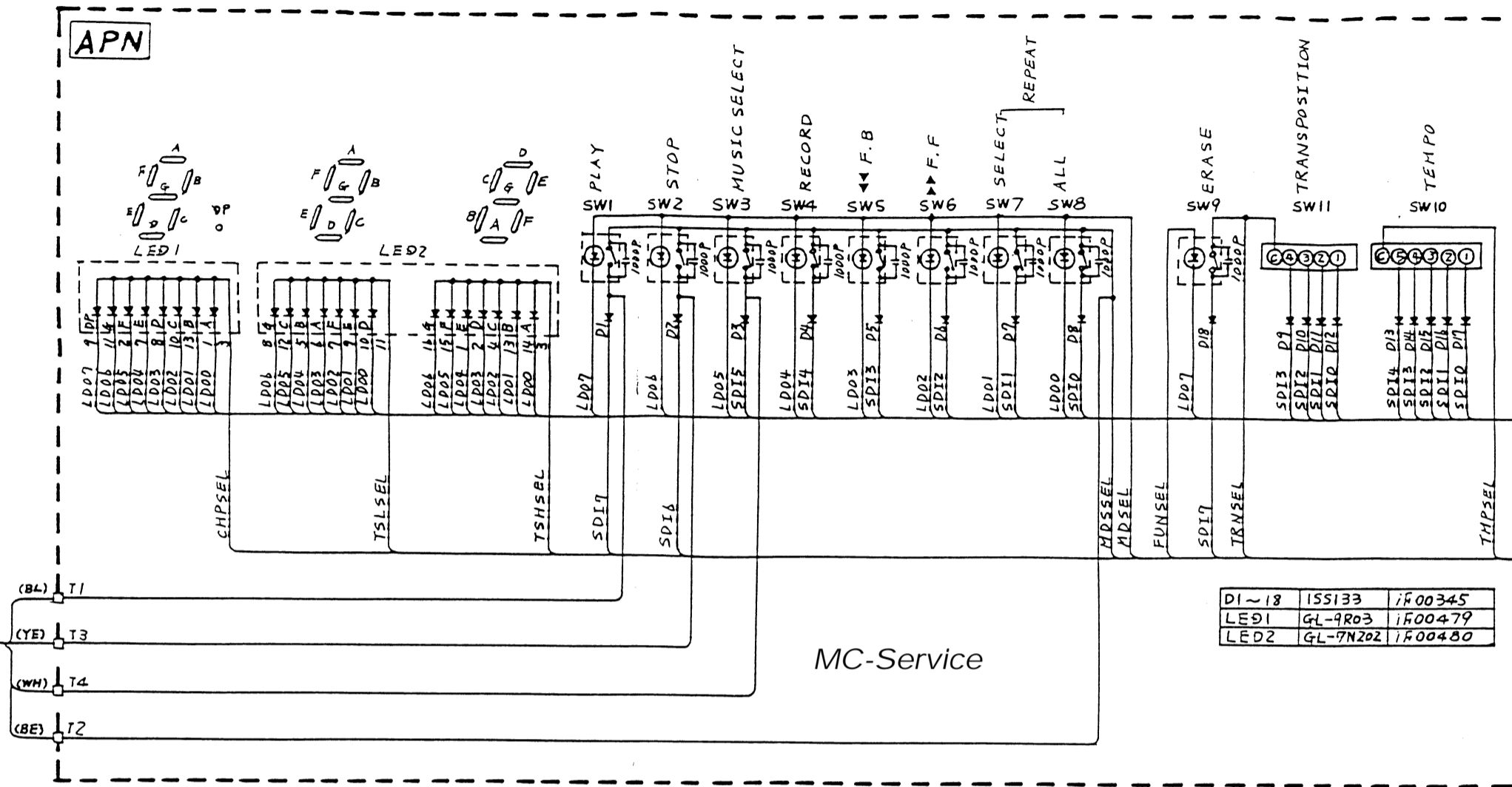
MDR-1B Model Only



IC1,7	HD74LS74AP	20046000	IC13	HD74LS02P	2002900
2,3	MB8516(16KRAM)	2004510	14	HD74LS30P	2002181
4	2116-2(16KRAM)	2010330	15	HD74LS174P	2005000
5	HD74LS139P	2004990	17	HD74LS00P	2002591
6	SN74LS245	2004460	18	HD74LS14P	2004960
7,10	SN74LS374	2005070	19	HD74LS365P	2010320
8	HD74LS240P	2004450	20,21	HD74LS161P	2004240
9,23	HD74LS05P	2005240	21	4PC240(DAC)	2003360
12,15	HD74LS32P	2004980	22	V3M-588PV	200139



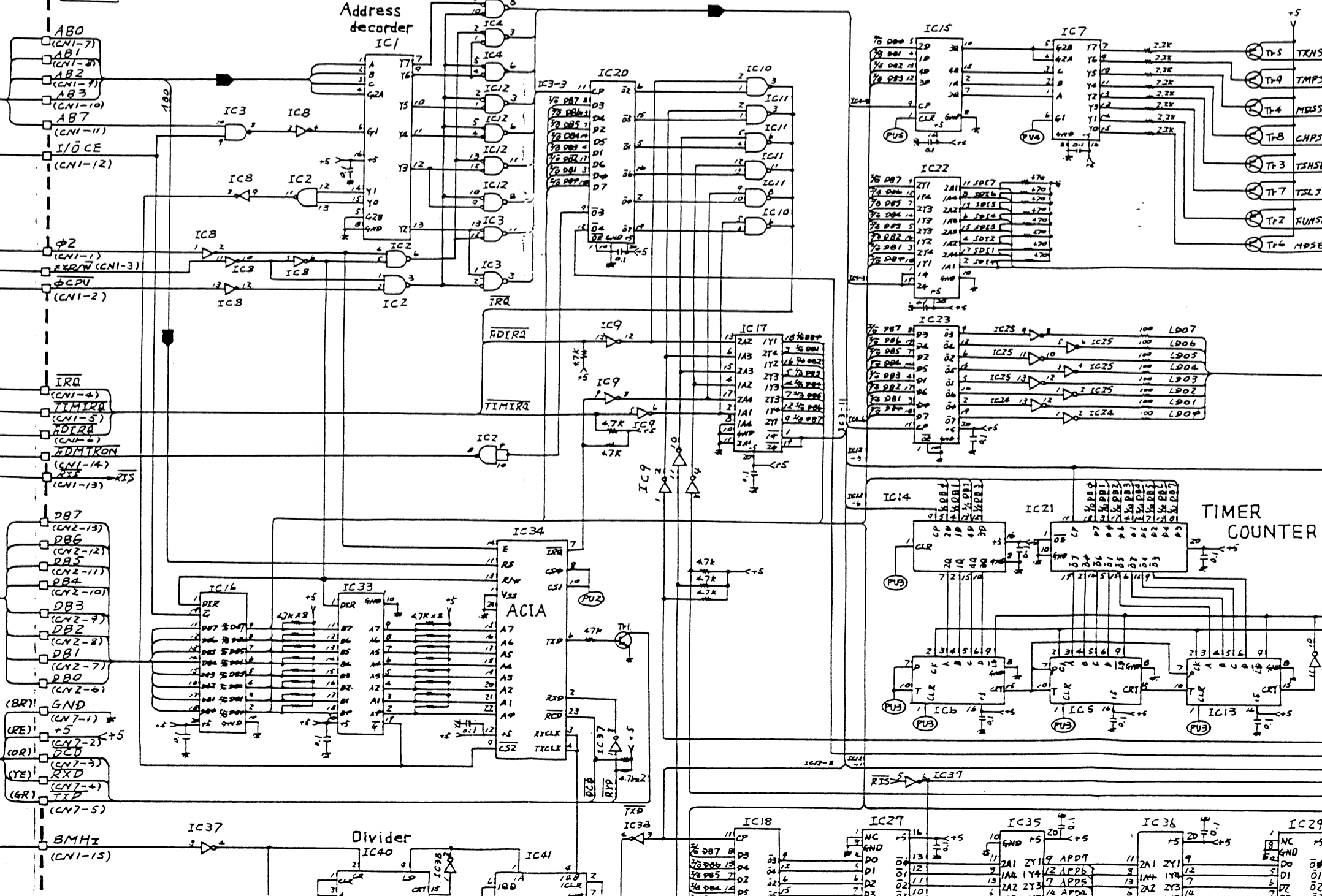
APN

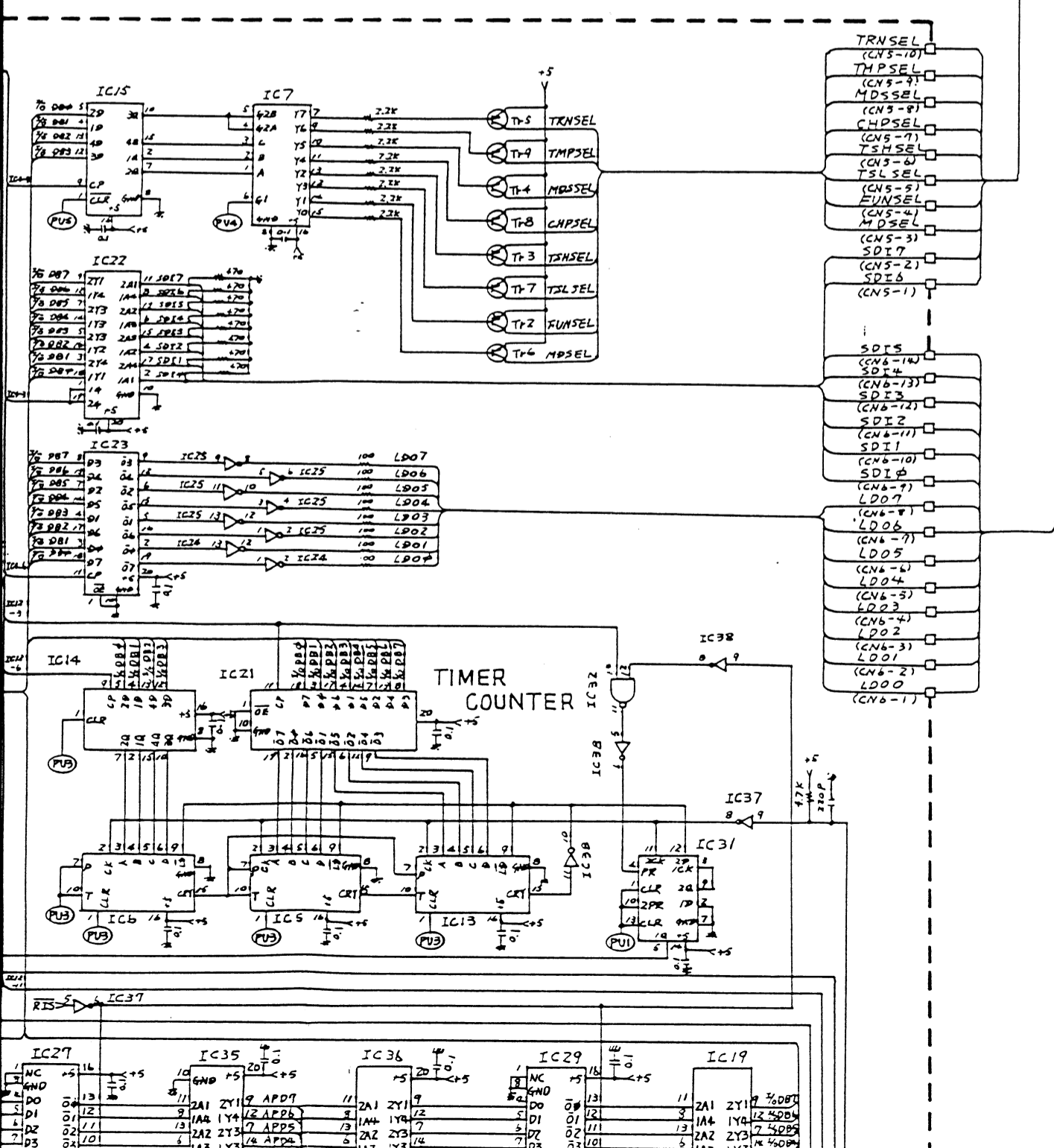
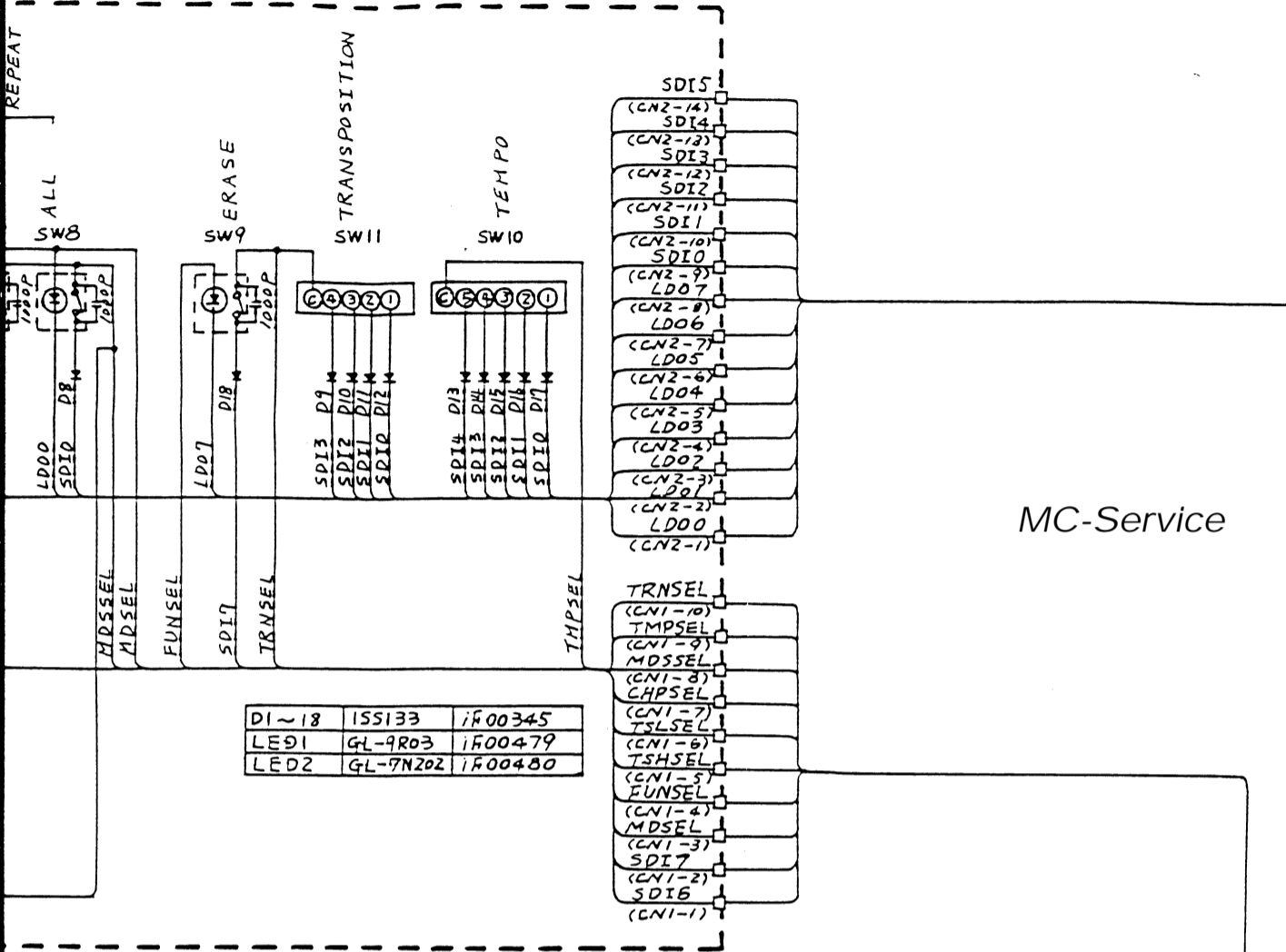


DI ~ 18	ISS133	iF00345
LED1	GL-9R03	iF00479
LED2	GL-7N202	iF00480

- SDI5 (CN2-14)
- SDI4 (CN2-13)
- SDI3 (CN2-12)
- SDI2 (CN2-11)
- SDI1 (CN2-10)
- LD07 (CN2-9)
- LD06 (CN2-8)
- LD05 (CN2-7)
- LD04 (CN2-6)
- LD03 (CN2-5)
- LD02 (CN2-4)
- LD01 (CN2-3)
- LD00 (CN2-2)
- LD00 (CN2-1)
- TRNSEL (CN1-10)
- TMPSEL (CN1-9)
- MDSSEL (CN1-8)
- CHPSEL (CN1-7)
- TSLSEL (CN1-6)
- TSHSEL (CN1-5)
- FUNSEL (CN1-4)
- MSEL (CN1-3)
- SDI7 (CN1-2)
- SDI6 (CN1-1)

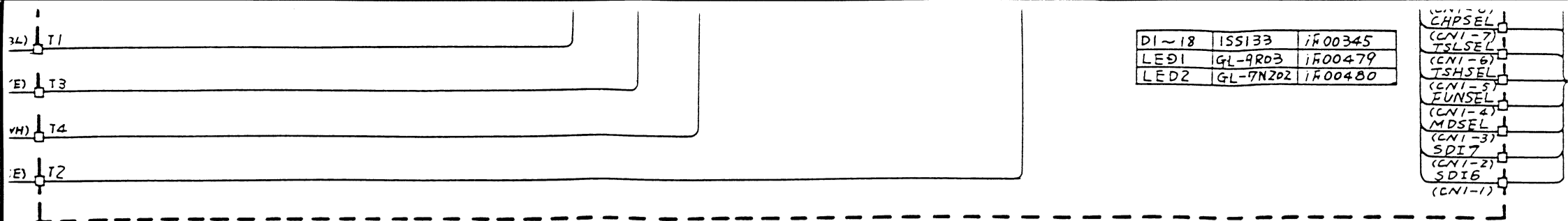
A10



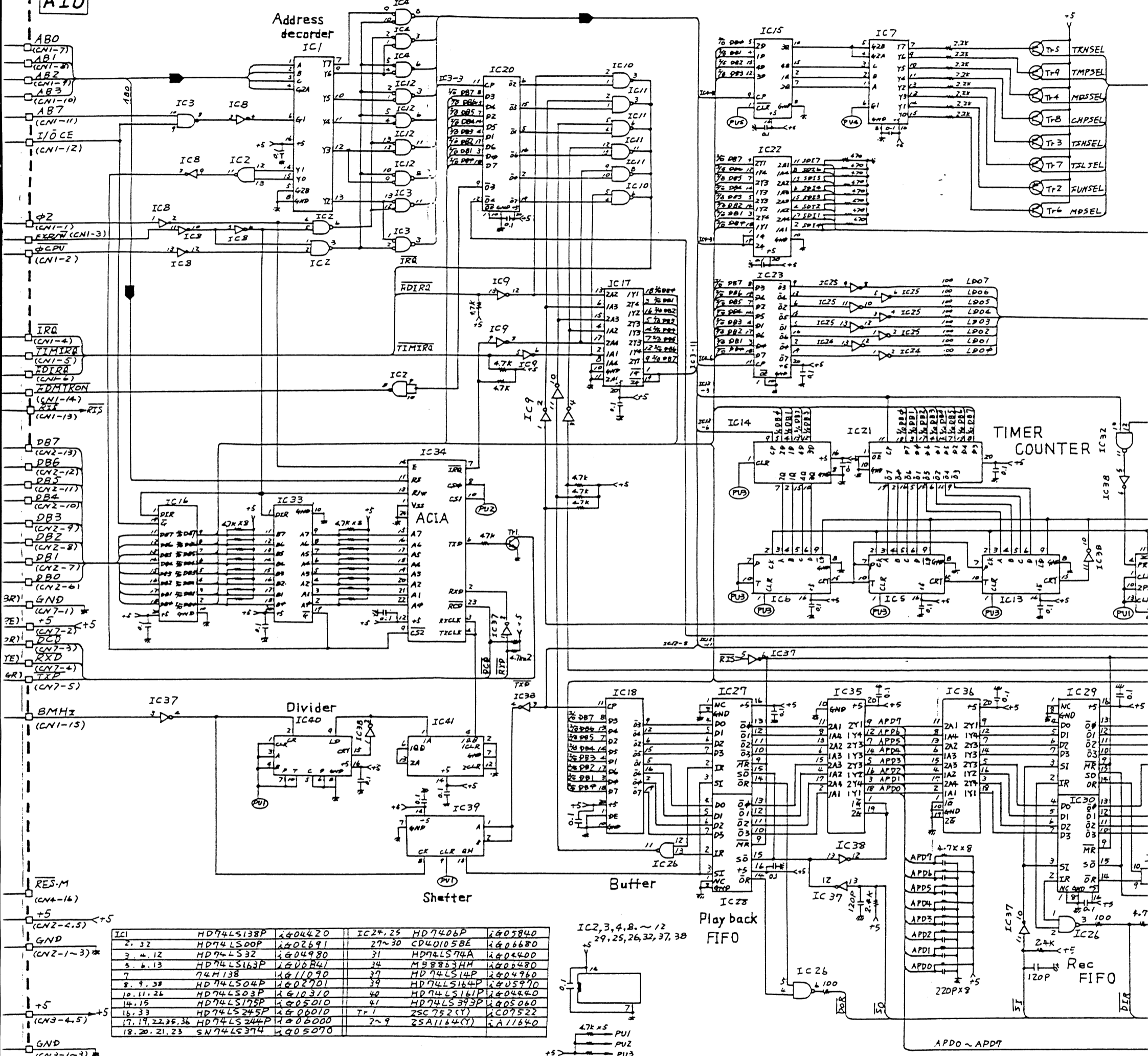


DI~18	ISS133	IF00345
LED1	GL-9R03	IF00479
LED2	GL-7N202	IF00480

- CHPSEL (CN1-7)
- TSLSEL (CN1-6)
- TSHSEL (CN1-5)
- FUNSEL (CN1-4)
- MDSEL (CN1-3)
- SDI7 (CN1-2)
- SDI6 (CN1-1)



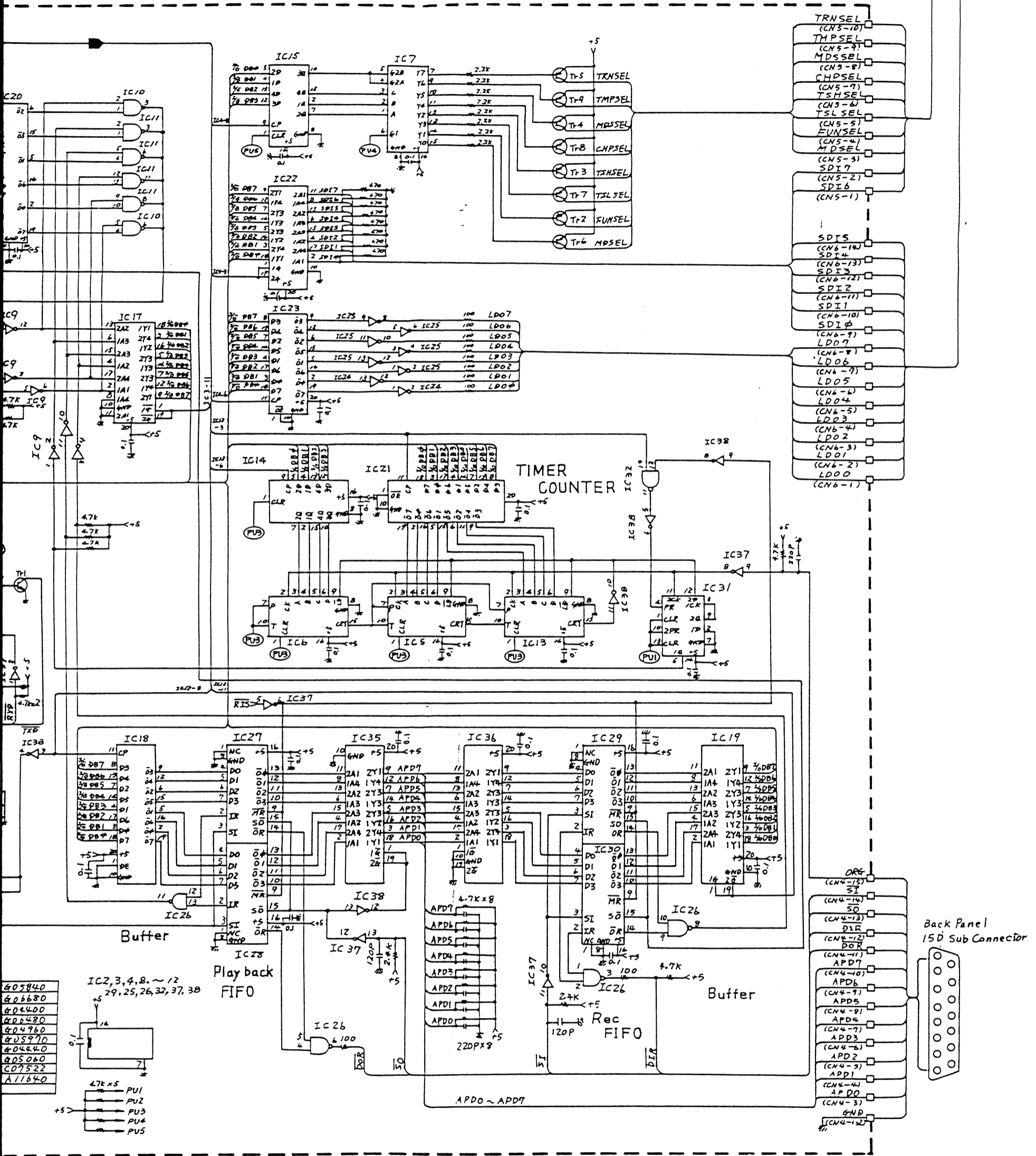
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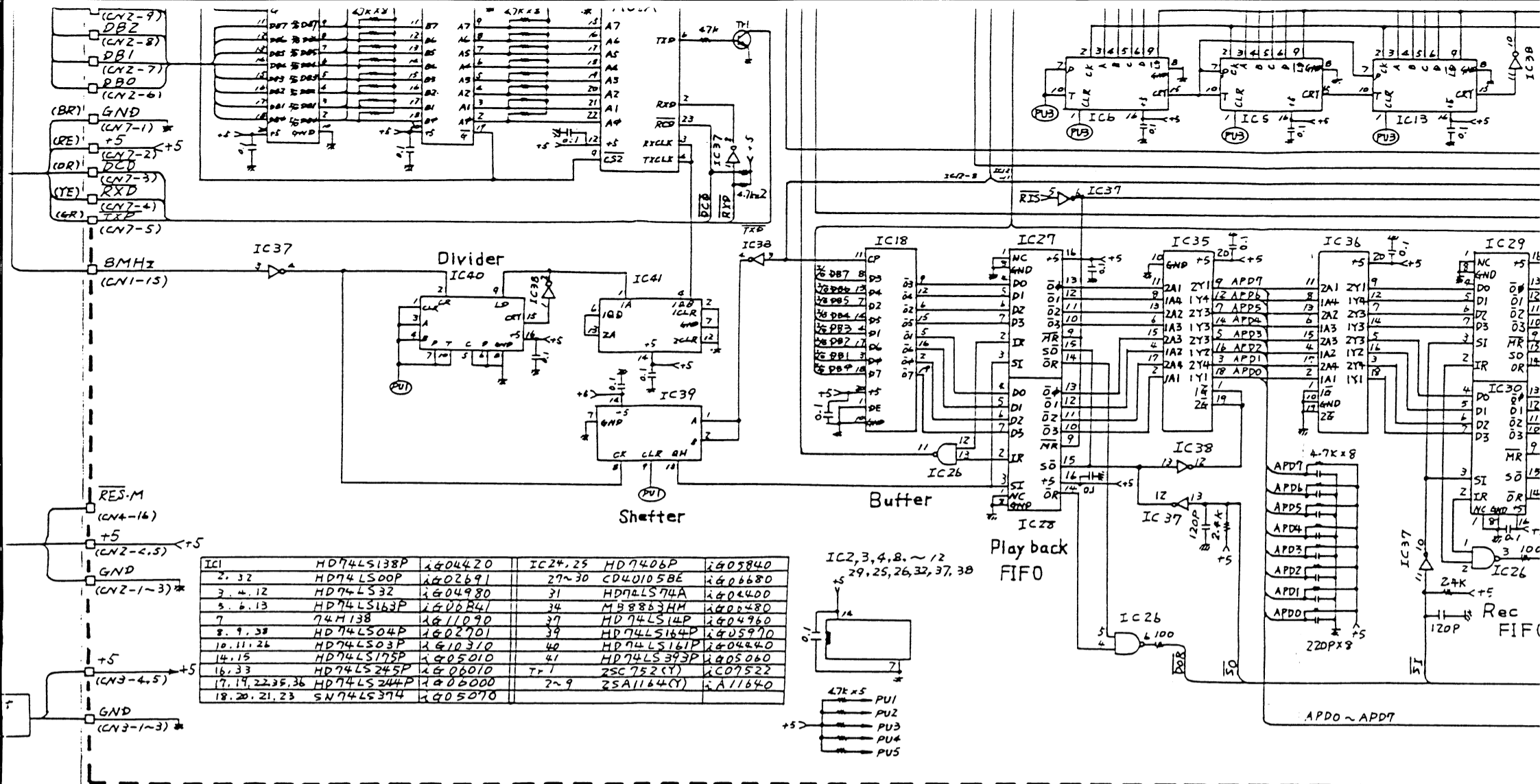
IC1	HD74LS138P	1404420	IC24,25	HD7406P	1405840
2, 32	HD74LS00P	1402691	27~30	CD40105BE	1406680
3, 4, 12	HD74LS32	1404980	31	HD74LS74A	1404400
5, 6, 13	HD74LS163P	1406841	34	M98863HM	1406480
7	74H138	1411090	37	HD74LS14P	1404960
8, 9, 38	HD74LS04P	1402701	39	HD74LS164P	1405970
10, 11, 24	HD74LS03P	1410310	40	HD74LS161P	1404440
14, 15	HD74LS175P	1405010	41	HD74LS393P	1405060
16, 33	HD74LS245P	1406010	T-1	ZSC752(Y)	1407522
17, 19, 22, 35, 36	HD74LS244P	1406000	2~9	ZSA1164(Y)	1411640
18, 20, 21, 23	SN74LS374	1405070			

DI~18	ISS133	IF00345
LED1	GL-9R03	IF00479
LED2	GL-7N202	IF00480

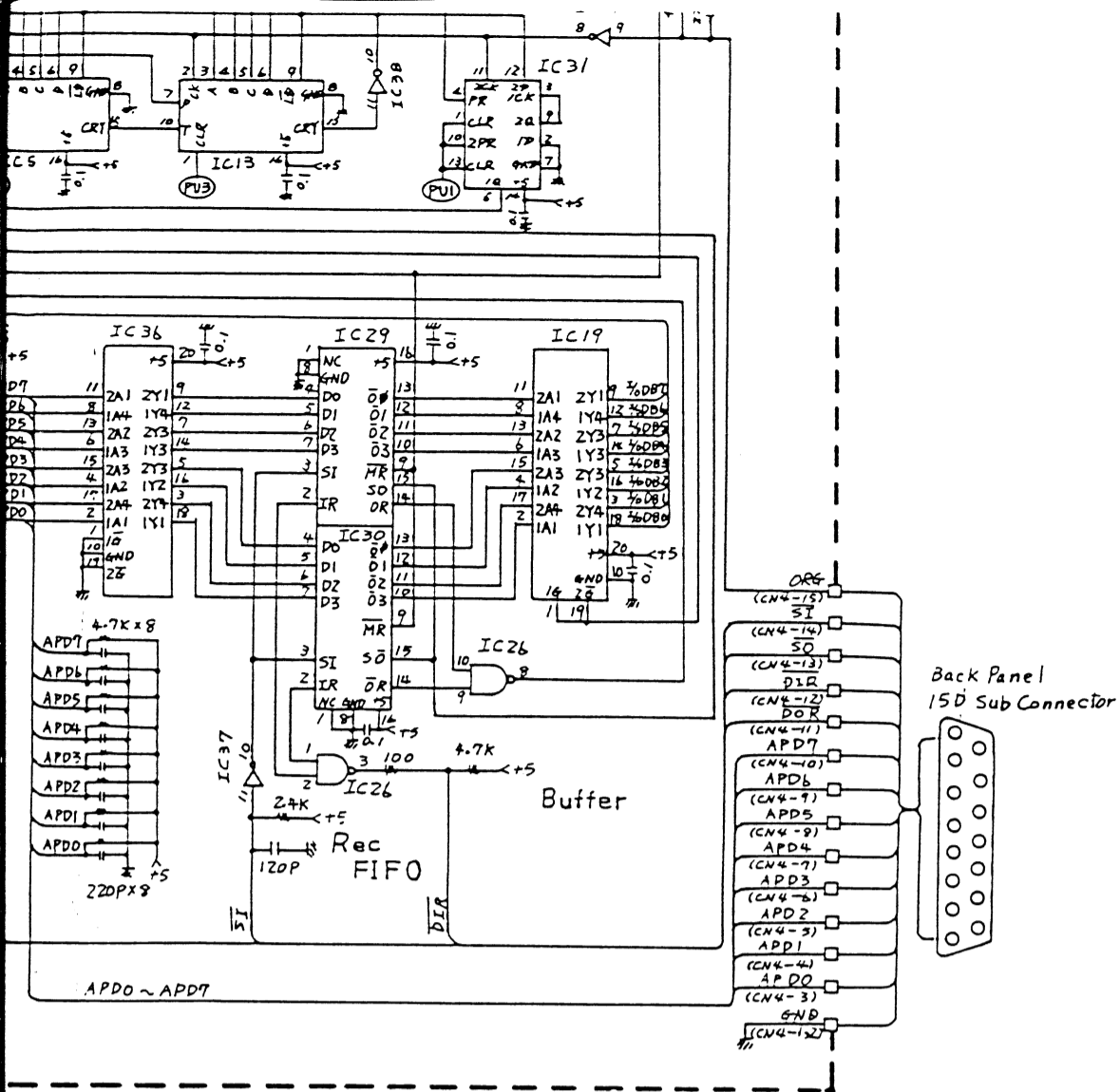
- CHPSEL (CN1-7)
- TSLSEL (CN1-6)
- TSHSEL (CN1-5)
- FUNSEL (CN1-4)
- MDSEL (CN1-3)
- SDI7 (CN1-2)
- SDI6 (CN1-1)



605840	IC2, 3, 4, 8, ~12
606680	29, 25, 26, 32, 37, 38
604400	
600480	
604960	
605970	
604440	
605060	
607522	
A11840	



MC-Service

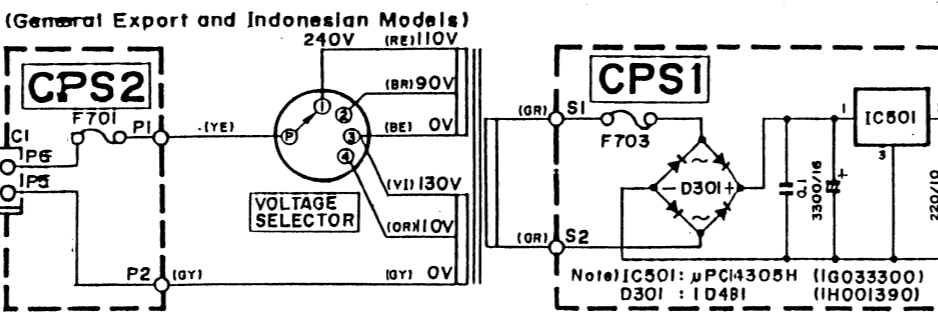
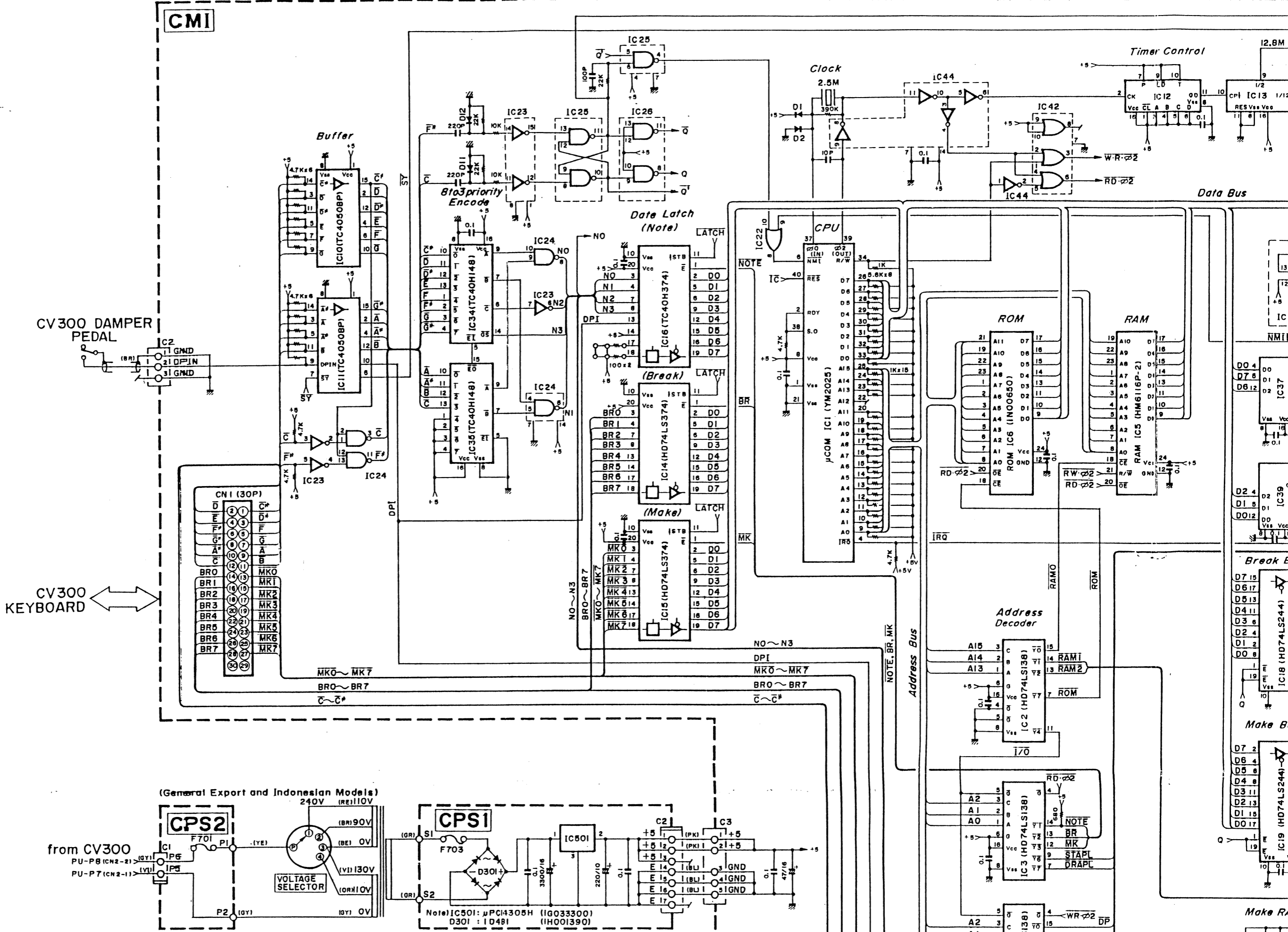


MC-Service

- WIRE COLOR ABBREVIATIONS
- | | |
|------------|-------------|
| BE ▶ Blue | OR ▶ Orange |
| BL ▶ Black | RE ▶ Red |
| BR ▶ Brown | WH ▶ White |
| GR ▶ Green | YE ▶ Yellow |

IFB-2 OVERALL CIRCUIT DIAGRAM 002706

MC-Service



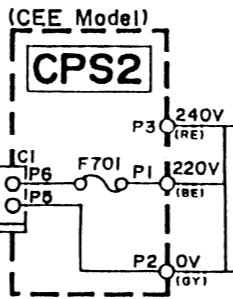
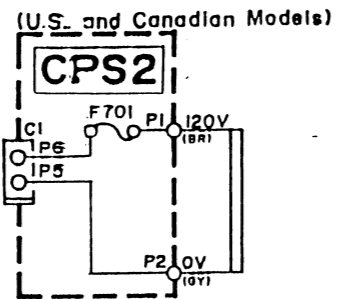
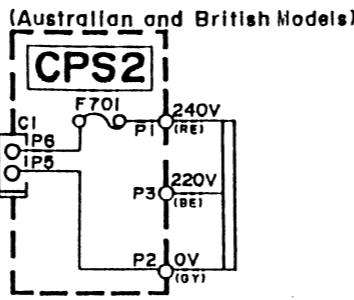
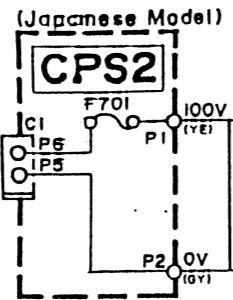
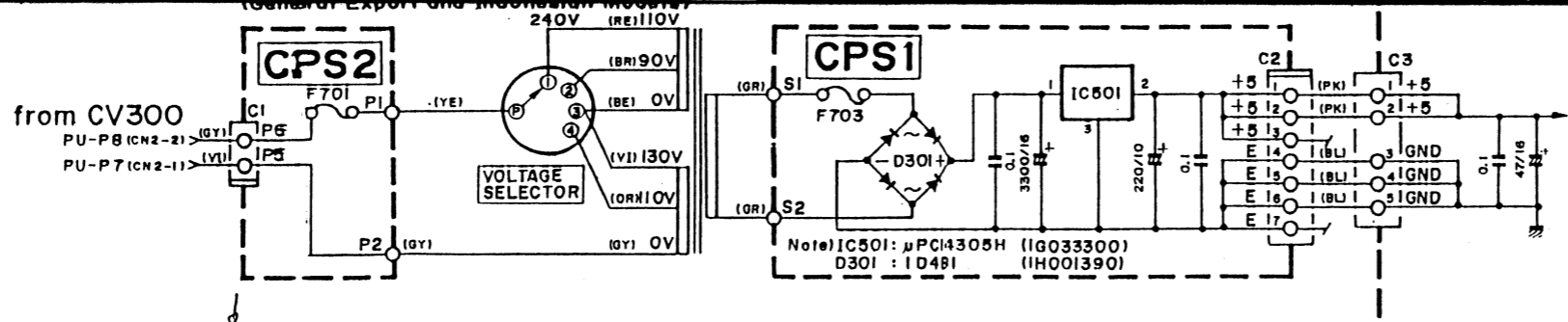
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7

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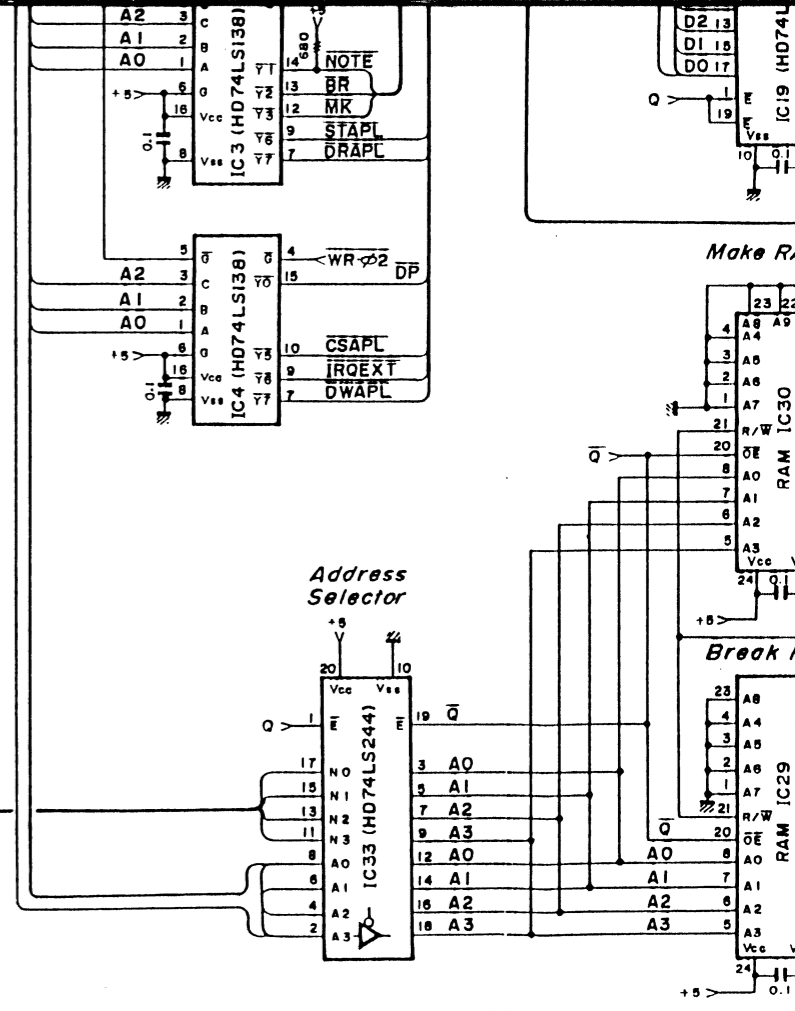
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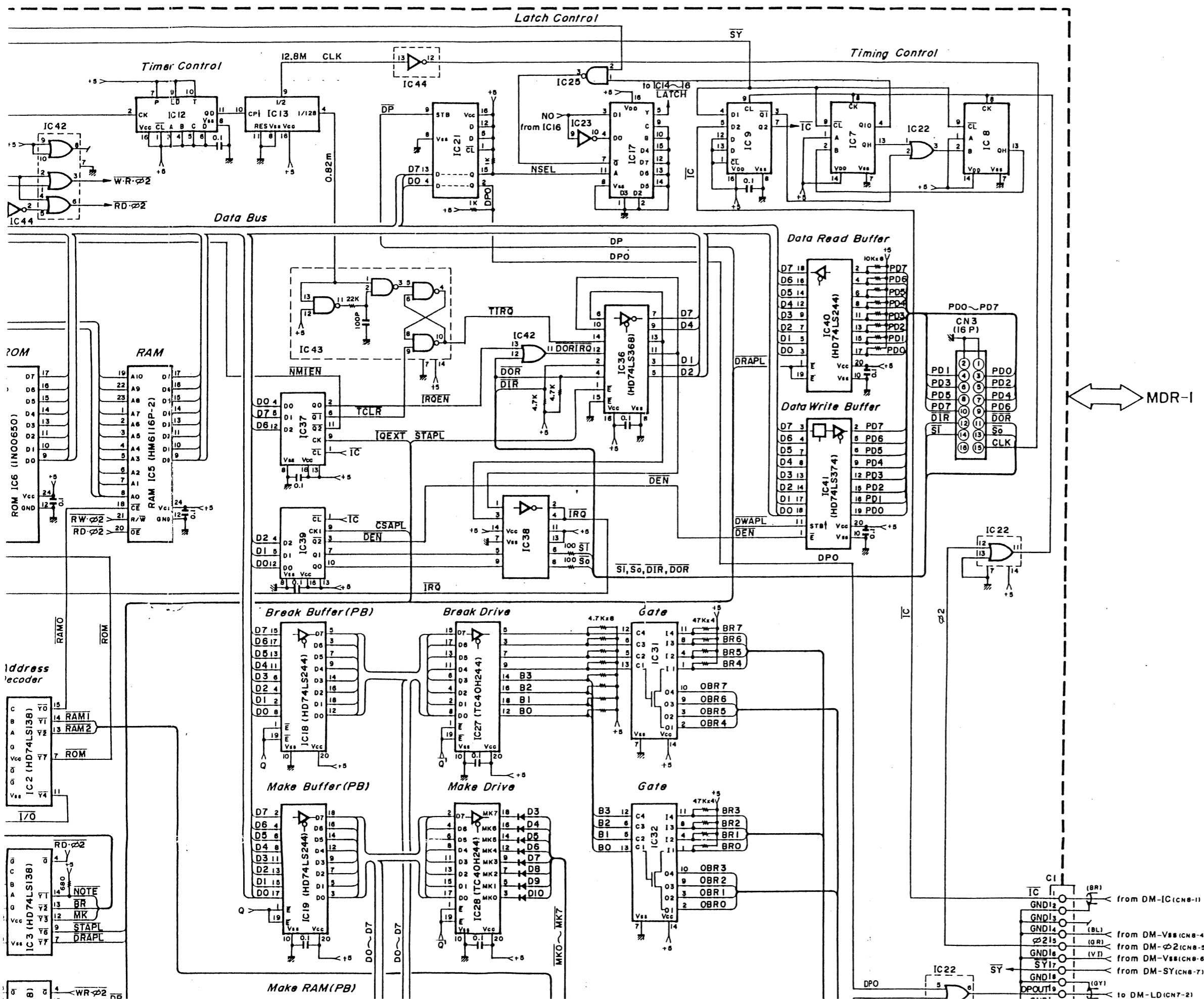


	Power Transformer	F701	F703
General Export	GA05160	0.3A	1.5A
Japanese	GA05130	0.5A	1.5A
U.S. Canadian	GA05140	0.4A	1.5A
CEE, British, Australian	GA05150	T0.125A	T1.6A

BR0~BR7
MK0~MK7
DPI
NO~N3



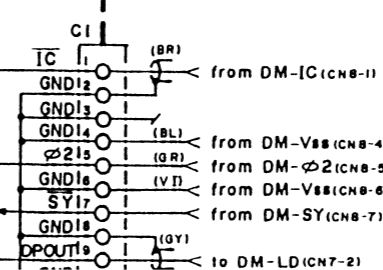
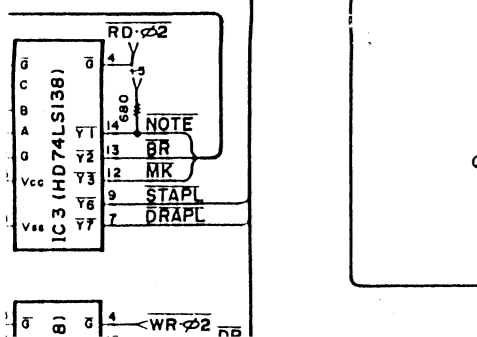
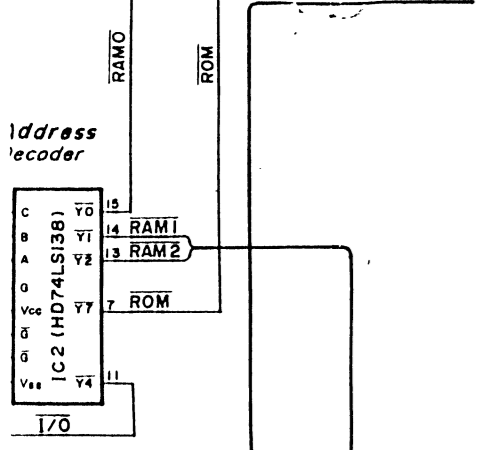
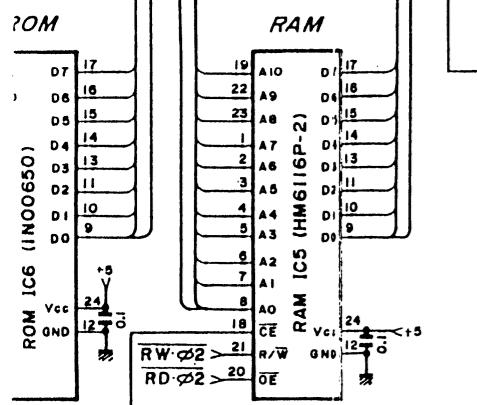
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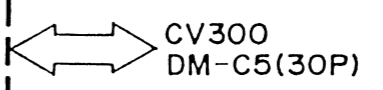
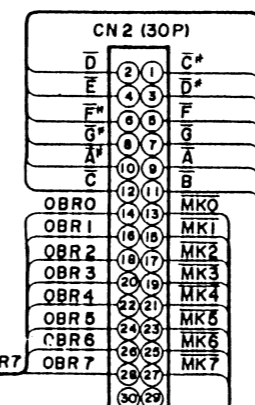
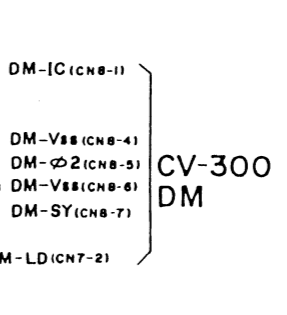
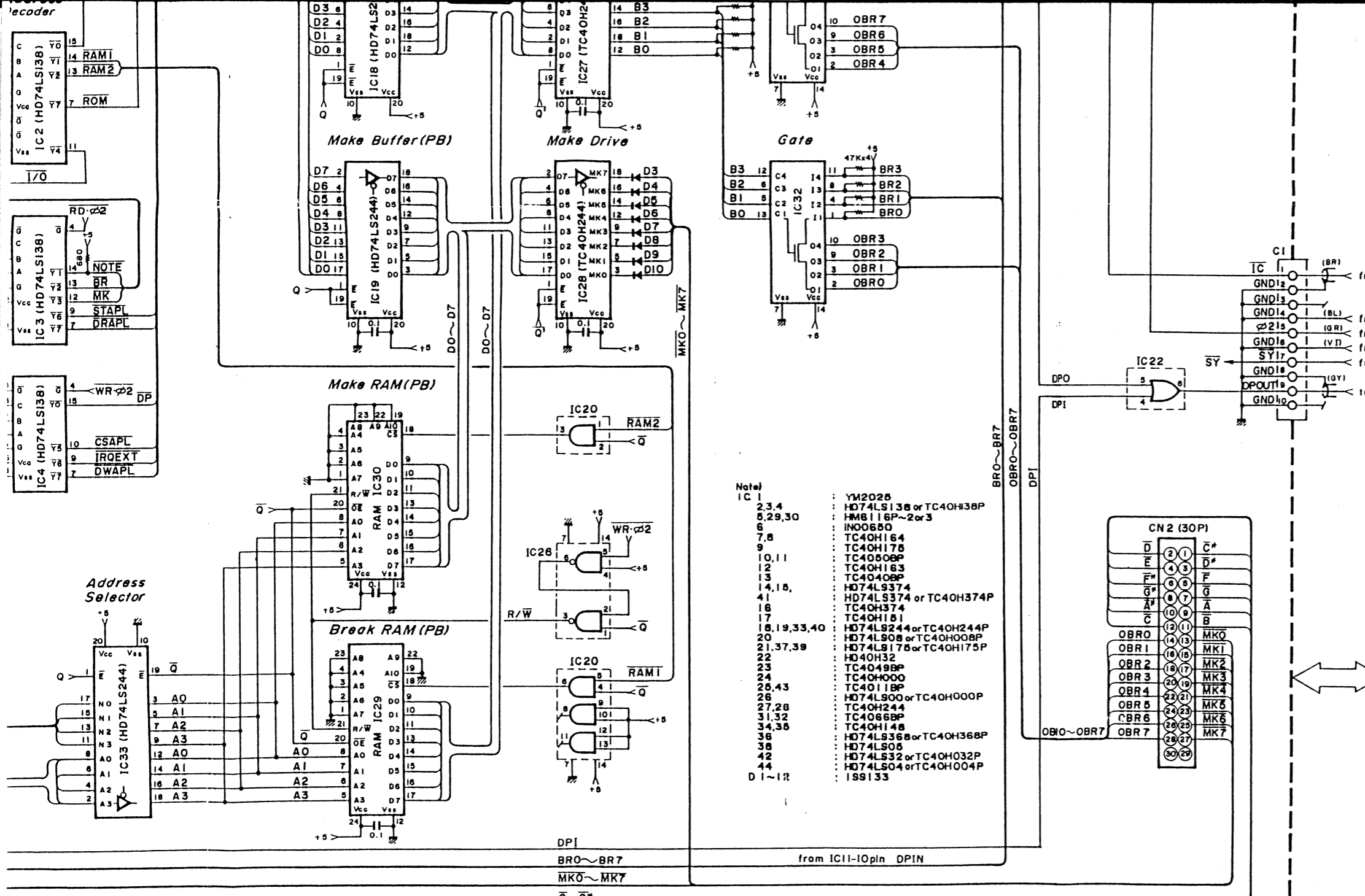


MDR-1

MC-Service

CV-300 DM





CM1

Pin No.	Pin Name	Wire Color	Destination
1	IC1N	S BR	DM-IC (CN8-1)
2	E	S BR S	DM-V _{SS} (CN8-2)
3	φ1	-	-
4	E	BL	DM-V _{SS} (CN8-4)
5	φ2	GR	DM-φ2 (CN8-5)
6	E	BL	DM-V _{SS} (CN8-6)
7	SY	V1	DM-SY (CN8-7)
8	E	S GY S	-
9	DP OUT	S GY	DM-LD (CN7-2)
10	E	-	-

CPS1

Pin No.	Pin Name	Wire Color	Destination
1	+5	PK	CM1-+5 (C3-1)
2	+5	PK	CM1-+5 (C3-2)
3	+5	-	-
4	E	BL	CM1-E (C3-3)
5	E	BL	CM1-E (C3-4)
6	E	BL	CM1-E (C3-5)
7	E	-	-

C2

Pin No.	Pin Name	Wire Color	Destination
1	E	S BR S	-
2	D PIN	S BR	PDD (DAMPER)
3	-	-	-

CPS2

Pin No.	Pin Name	Wire Color	Destination
1	P5	V1	PU-P7 (CN2-1)
2	P8	GY	PU-P8 (CN2-2)

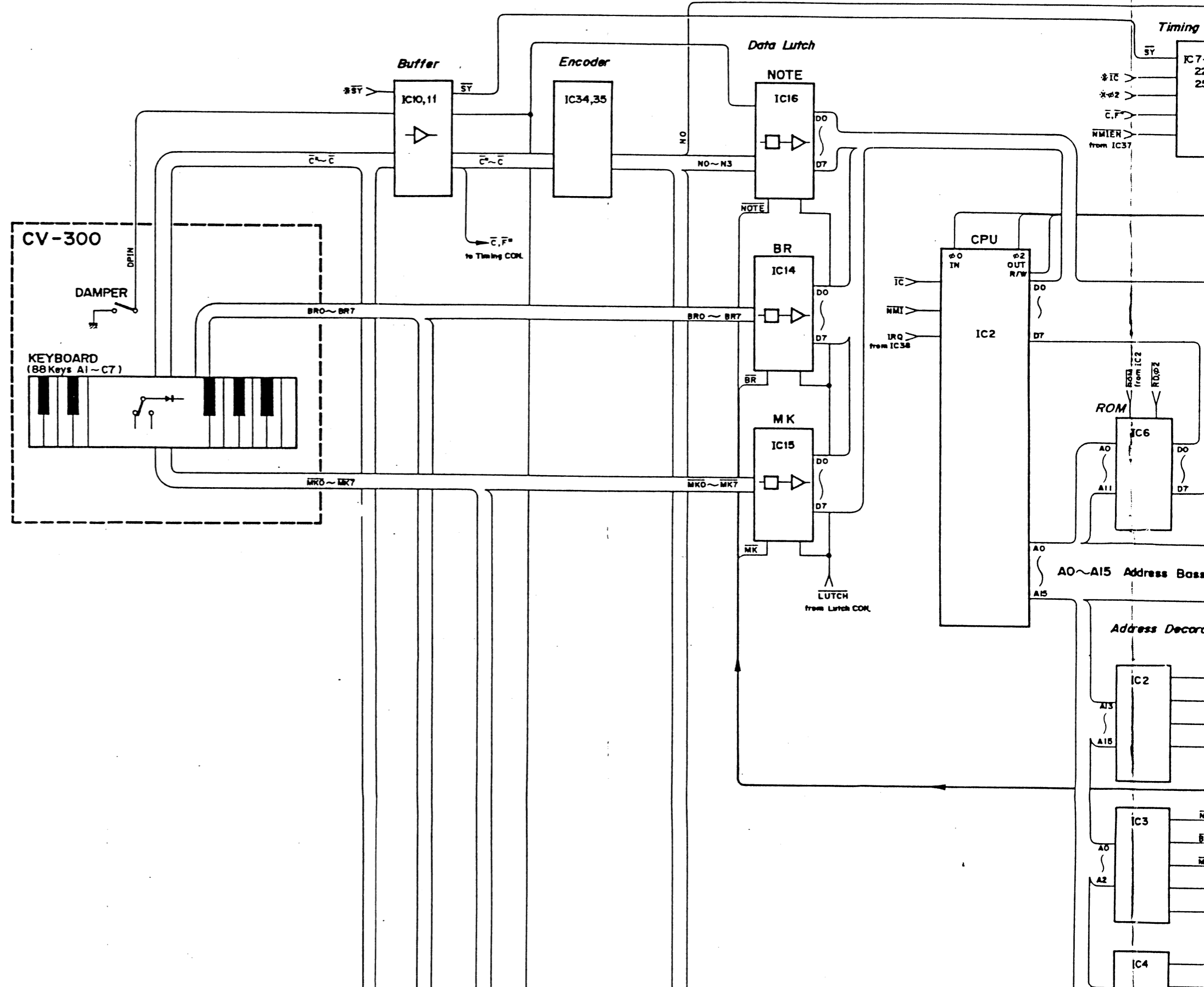
C3

Pin No.	Pin Name	Wire Color	Destination
1	+5	PK	CPS1-+5 (C2-1)
2	+5	PK	CPS1-+5 (C2-2)
3	E	BL	CPS1-E (C2-4)
4	E	BL	CPS1-E (C2-5)
5	E	BL	CPS1-E (C2-6)

MC-Service

IFB-2 BLOCK DIAGRAM 002706

1
2
3
4
5
6



3

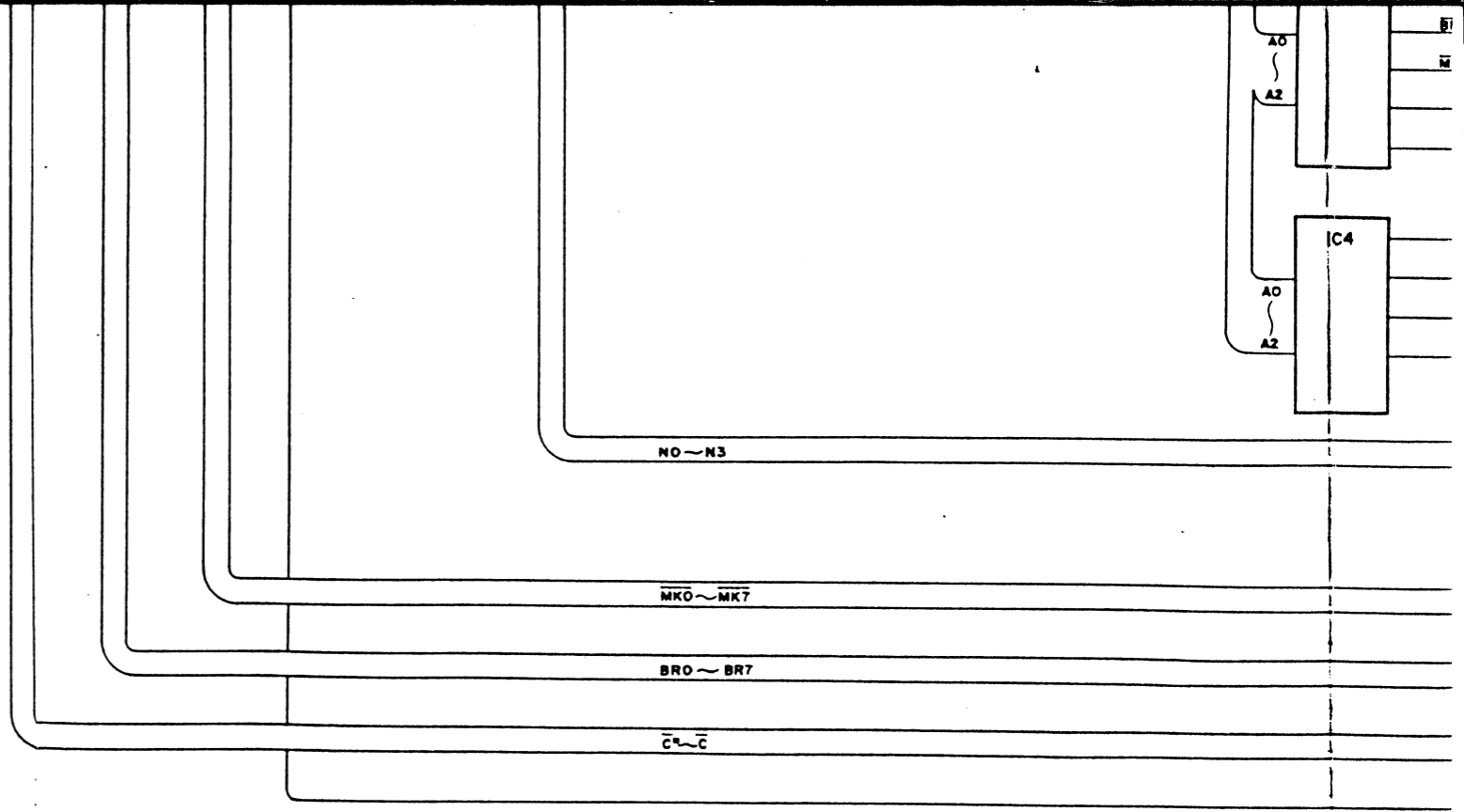
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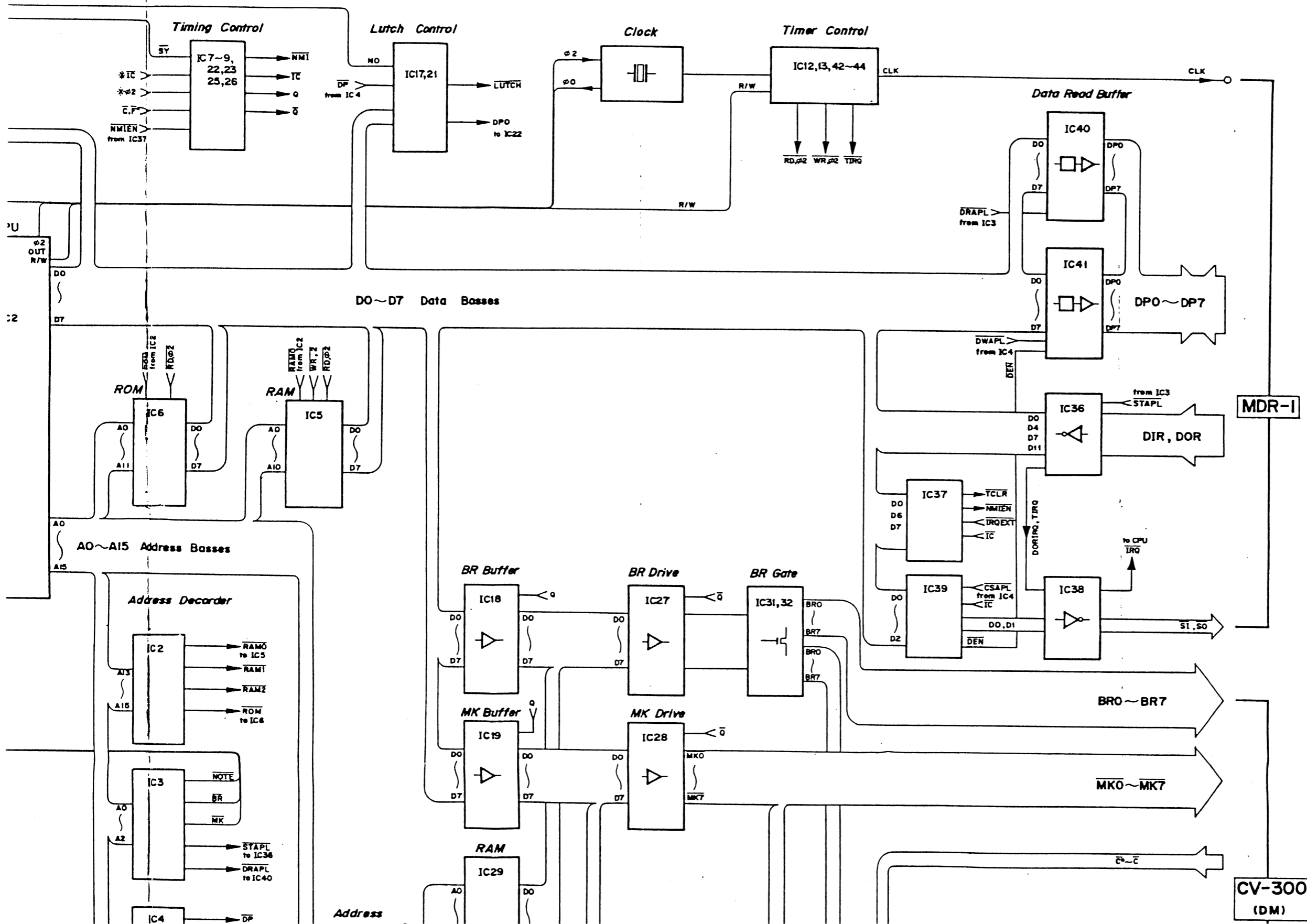
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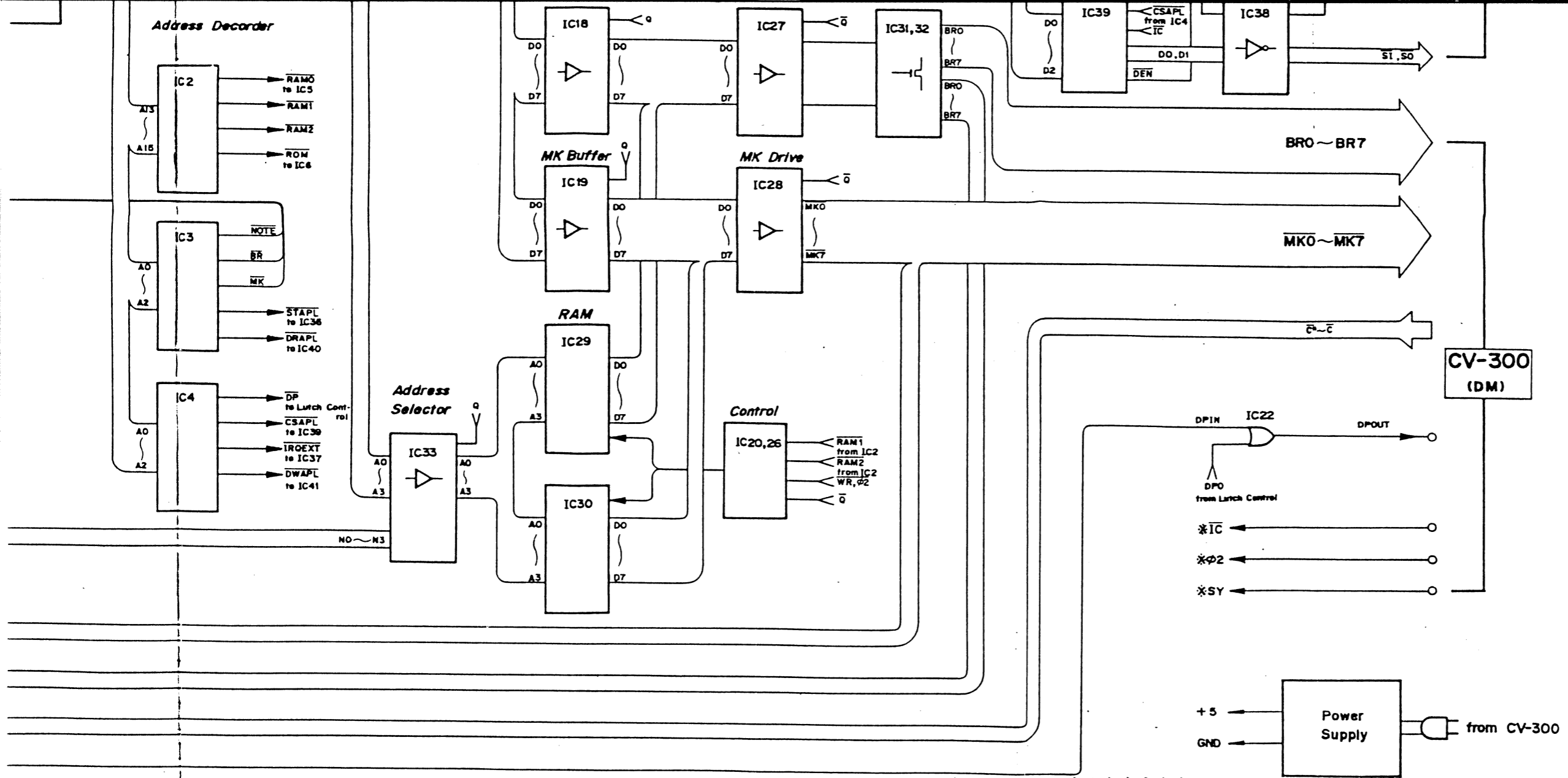
9

10





MC-Service



MC-Service

PARTS LIST

MUSIC DISC RECORDER

MDR-1

EXPLODED VIEW (分解図).....	1
MECHANISM PARTS (メカ部品).....	2/3
ELECTRICAL PARTS (電気部品).....	4~6

SINCE 1887



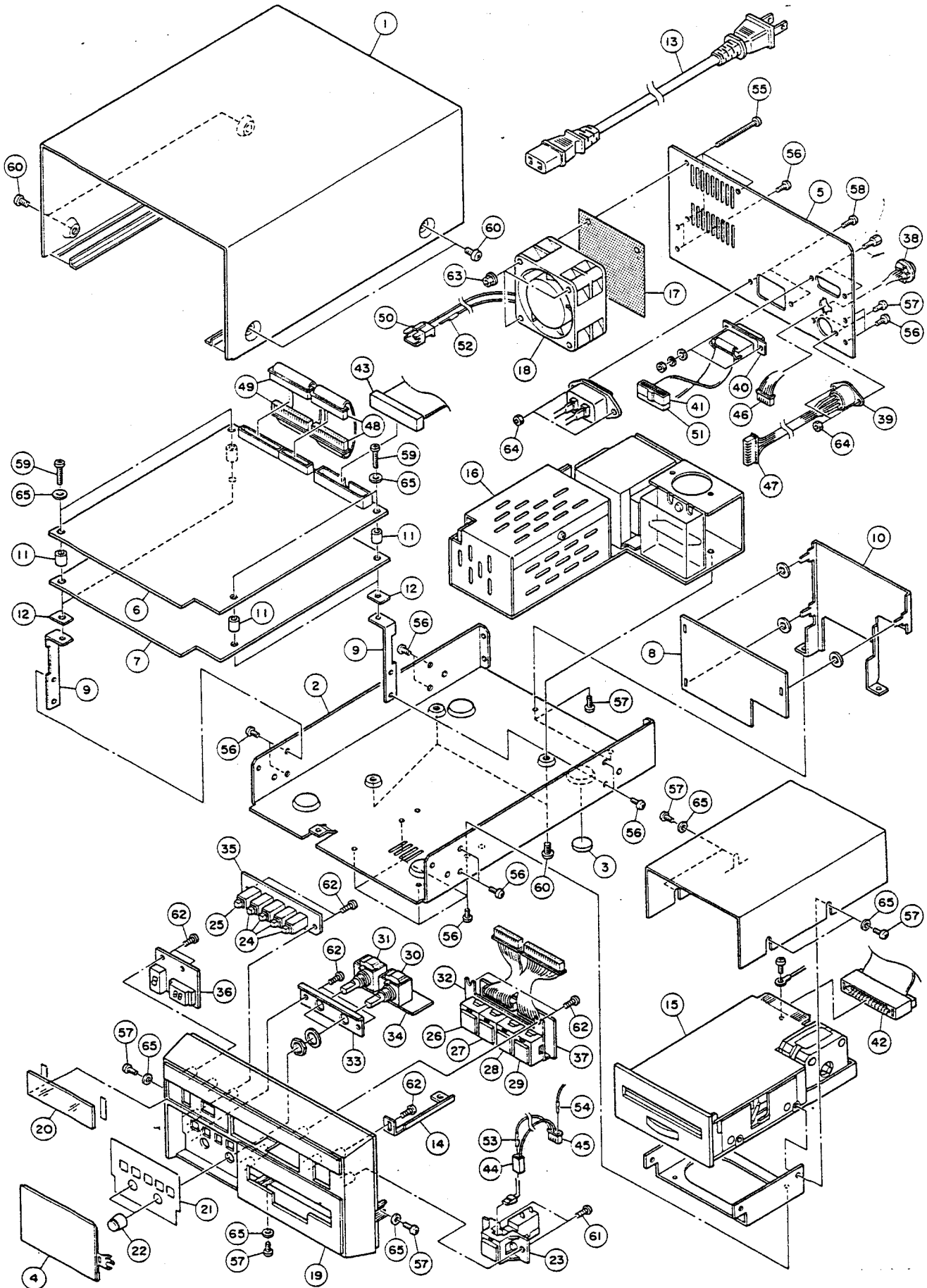
YAMAHA

NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN

001182

MC-Service

■ EXPLODED VIEW (分解図)



MECHANISM PARTS (メカ部品)

Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
※ 1	AA 05 80 40	Top Cover	ト ッ プ カ バ ー				
※ 2	AA 05 80 50	Bottom Cover	ボ ト ム カ バ ー				
※ 3	CB 04 87 10	Foot	ス ベ リ 座				
※ 4	CB 04 84 60	Sealing Panel	シ ー リ ン グ パ ネ ル				
※ 5	NK 00 84 20	Rear Panel	リ ア パ ネ ル				
※ 6	NA 11 09 70	Circuit Board, ACPU	#11097 A C P U シ ー ト				
※ 7	NA 11 09 80	" , AIO	#11098 A I O シ ー ト				
※ 8	NA 11 31 60	" , ACT	#11316 A C T シ ー ト				
※ 9	AA 05 81 00	Bracket, Circuit Board	基 板 取 付 金 具	AIO			
※ 10	AA 10 11 50	"	"	ACT			
※ 11	CB 01 09 80	Spacer	ス ベ ー サ ー				010
※ 12	CB 04 87 30	Insulation Plate	絶 縁 板				
※ 13	MG 00 16 40	Power Cord	電 源 コ ー ド			J,R	
※ "	MG 00 12 80	"	"			U,C	
※ "	MG 00 16 60	"	"			A	
※ "	MG 00 16 70	"	"			G	
※ "	MG 00 16 80	"	"			B	
※ "	MG 00 16 90	"	"			S	
※ 14	AA 10 00 80	Bracket	ブ ラ ケ ッ ト				
※ 15	PB 06 35 00	FDD	F D D				
※ 16	NP 00 57 10	Power Supply Unit	電 源 ユ ニ ッ ト				
※ "	NP 00 57 20	"	"			J	
※ "	NP 00 57 30	"	"			R	
※ "	NP 00 57 60	"	"			U,C	
※ "	NP 00 57 60	"	"			G	
※ "	NX 00 11 80	"	"			B	
※ 17	CE 20 70 10	Net	ネ ッ ト				
※ 18	JC 00 09 50	Radiate Fan	冷 却 フ ァ ン				
※ 19	NK 00 84 10	Front Panel	フ ロ ン ト パ ネ ル				
※ 20	CB 04 87 50	Display Panel	デ ィ ス プ レ イ 板				
※ 21	CB 04 88 00	Sheet	シ ー ト				
※ 22	CB 81 98 50	Knob	ツ マ ミ				010
※ 23	KA 80 40 00	Push Switch	プ ッ シ ュ ス イ ッ チ	POWER			
※ 24	KA 90 27 00	"	"				050
※ 25	KA 90 27 10	"	"	ERASE			050
※ 26	KA 90 54 30	"	"	PLAY			
※ 27	KA 90 54 40	"	"	STOP			
※ 28	KA 90 54 50	"	"	MUSIC SELECT			
※ 29	KA 90 54 60	"	"	RECORD			
※ 30	KA 50 18 60	Rotary Switch	ロ ー タ リ ー ス イ ッ チ	TEMPO			
※ 31	KA 50 18 70	"	"	TRANSPOSER			
※ 32	AA 05 80 80	Bracket, Push Switch	プ ッ シ ュ ス イ ッ チ 取 付 金 具				
※ 33	AA 05 80 90	Bracket, Power Switch	ロ ー タ リ ー ス イ ッ チ 取 付 金 具				
※ 34,35 36,37	NA 11 09 90	Circuit Board, APN1, 2, 3, 4	APN1,2,3,4シ ー ト				
※ 38	LB 60 60 60	Receptacle	8P 丸 型 リ セ プ タ ク ル				
※ 39	LB 60 66 80	Socket	8P D I N ソ ケ ッ ト				
※ 40	LB 60 59 80	Connector	1 5 D コ ネ ク タ				
※ 41	LB 60 56 10	"	1 6 P コ ネ ク タ				
※ 42	LB 60 48 20	"	3 4 P コ ネ ク タ				090
※ 43	LB 60 42 10	Connector Socket	34Pコネクタソケット				060
※ 44	LB 20 07 20	Housing	2P ハ ウ ジ ン グ				

*New Parts (新規部品)

(ランク : Japan only)

ELECTRICAL PARTS (電気部品)

Ref. No.	Part No.	Description	部品名	Remarks	Common Model	Markets	ランク
	NA:11:09:70	Circuit Board, ACPU	#11097	ACPUSHIRT			
	FD:65:15:60	Polystyrene Film Cap.	56pF 50V	ステコン			020
	FD:65:18:20	"	82pF 50V	"			020
	FD:65:23:30	"	330pF 50V	"			020
	UA:55:51:00	Mylar Cap.	0.1 μ F 50V	マイラーコン			020
	GE:90:05:60	Coil	22 μ H	コイル			020
	QU:00:14:00	X'tal	8MHz	水晶振動子			050
	HM:55:41:50	Cement Molded Resistor	15 Ω 5W	セメント抵抗			020
	HU:57:68:20	Metal Film Resistor	8.2k Ω 1/4W	金属被膜抵抗			020
	iA:10:15:20	Transistor	2SA1015 (Y)	トランジスタ			030
	iC:19:59:20	"	2SC1959 (Y)	"			030
	iF:00:04:60	Diode	1S1555	ダイオード			010
	iG:02:69:10	IC	HD74LS00P	I C	2 IN NAND \times 4		040
	iG:02:70:10	"	HD74LS04P	"	INVERTER		040
	iG:04:96:00	"	HD74LS14P	"	HEX SCHMIDT TRIGER		050
	iG:05:93:00	"	HD74LS51P	"	AND-OR-INV.		030
	iG:04:40:00	"	HD74LS74A	"	D FLIP-FLOP		040
	iG:05:95:00	"	HD74LS125P	"	3S-BUFF		030
	iG:06:00:00	"	HD74LS244P	"	OCTAL BUS DRIV		060
	iG:05:03:00	"	HD74LS293P	"	4 BIT COUNTER		040
	iG:05:84:00	"	HD7406P	"	HEX INV/BUF.		030
	iG:02:70:00	"	HD7404P	"	INVERTER		040
	iG:05:73:00	"	MB8877C-G	"	FDD CONT.		180
	iG:05:78:00	"	MC4024	"	DUAL V-CONT.M.V.		090
	iG:05:79:00	"	MC4044	"	PHASE FREQ. DETECT		080
	iG:06:96:00	"	MBM2764-30	"	64 KEP ROM		
	iG:05:69:00	"	MB8265-20Z	"	64K DRAM		140
	iG:05:74:00	"	F9602	"	MULTI-VIBRATOR		050
	iG:00:12:60	"	TC4049BP	"			030
	iT:20:25:00	"	YM2025	"	System Controller		
	iT:52:05:00	"	YM5205	"	PMAC		
*	LB:91:80:30	Base Pin	3P	ベースピン			
*	LB:91:81:30	"	13P	"			
*	LB:91:81:50	"	15P	"			
*	LB:60:60:10	Connector	34P	34Pコネクタ			
	LB:60:47:30	Socket	28P	ICソケット			050
	NA:11:09:80	Circuit Board, AIO	#11098	AIOSHIRT			
	UA:55:51:00	Mylar Cap.	0.1 μ F 50V	マイラーコン			020
	iA:11:64:00	Transistor	2SA1164 (Y)	トランジスタ			030
	iC:07:52:20	"	2SC752 (Y)	"			030
	iG:02:69:10	IC	HD74LS00P	I C	2 IN NAND \times 4		040
	iG:10:31:00	"	HD74LS03P	"			
	iG:02:70:10	"	HD74LS04P	"	INVERTER		040
	iG:04:96:00	"	HD74LS14P	"	HEX SCHMIDT TRIGER		050
	iG:04:98:00	"	HD74LS32P	"	2 IN NOR		030
	iG:04:40:00	"	HD74LS74A	"	D FLIP-FLOP		040
	iG:04:42:00	"	HD74LS138P	"	DECODER		040
	iG:04:44:00	"	HD74LS161P	"	4 BIT COUNTER		050
	iG:06:84:10	"	HD74LS163P	"			
	iG:05:97:00	"	HD74LS164P	"	8B-S.R.		050
	iG:05:01:00	"	HD74LS175P	"	D FLIP-FLOP		050

* New Parts (新規部品)

(ランク: Japan only)

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Ref. No.	Part No.	Description	部 品 名	Remarks	Common Model	Markets	ランク
	iG 06:00:00	IC	HD74LS244P	I C	OCTAL BUS DRIV		060
	iG 06:01:00	"	HD74LS245P	"	TRANCEIVER		080
	iG 05:06:00	"	HD74LS393P	"	4 BIT COUNTER		070
	iG 05:84:00	"	HD7406P	"	HEX INV/BUF.		030
	iG 05:07:00	"	SN74LS374	"	D FLIP-FLOP		060
	iG 06:48:00	"	MB8863HM	"	A.C.I. ADAPTOR		100
	iG 06:68:00	"	CD40105BE	"	FIFO RESISTOR		070
*	iG 11:09:00	"	74H138	"			
	LB 50:02:70	Base Pin	5P	ベースピン			010
*	LB 91:80:50	"	5P	"			
*	LB 91:81:00	"	10P	"			
*	LB 91:81:30	"	13P	"			
*	LB 91:81:40	"	14P	"			
*	LB 91:81:50	"	15P	"			
*	LB 60:60:00	Connector	16P	16Pコネクタ			
	NA 11:31:60	Circuit Board, ACT	±11316	A C T シート			
	FA 15:41:00	Mylar Cap.	0.01 μ F 50V	マイラーコン			020
	FA 15:41:80	"	0.018 μ F 50V	"			020
	FA 15:42:20	"	0.022 μ F 50V	"			020
	FA 15:44:70	"	0.047 μ F 50V	"			020
	FA 15:51:00	"	0.1 μ F 50V	"			020
	UA 55:51:00	"	0.1 μ F 50V	"			020
	HT 56:01:10	Variable Resistor	B200k Ω	可変抵抗器			050
	iA 07:34:10	Transistor	2SA733A(Q,P)	トランジスタ			030
	iC 18:15:20	"	2SC1815(Y)	"			030
	iF 00:00:70	Diode	1S2473VE	ダイオード			010
	iG 00:13:90	IC	NJM4558DV	I C	OP AMP		030
	iG 00:12:50	"	TC4027BP	"	J-K FLIP FLOP		050
	iG 00:12:70	"	TC4066BP	"	TRACKING SW		050
	iG 00:17:60	"	TC4081BP	"			030
	iG 05:27:00	"	TC4528BP	"			060
*	KC 00:17:90	Relay	12V 1A	リレー			
	LB 91:80:20	Base Pin	2P	ベースピン			010
	LB 91:80:80	"	8P	"			010
	NX 00:11:90	Circuit Board, APN1,2,3,4		A P N 1 シート	TRANSPOSER, ERASE MUSIC NUMBER, PLAY		
	iF 00:34:50	Diode	1SS133	ダイオード			010
*	iF 00:47:90	LED	Red	L E D	MUSIC NUMBER		
*	iF 00:48:00	"	Green	"	COUNT		
	KA 90:27:00	Push Switch	Green	プッシュスイッチ			050
	KA 90:27:10	"	Red	"	ERASE		050
	LB 92:40:20	Housing	2P	ハウジング	SAN-type		010
	LB 92:40:50	"	5P	"	"		010
	LB 92:41:00	"	10P	"	"		010
	LB 92:41:40	"	14P	"	"		010
	LB 00:91:00	"	10P	"	XH-type		010
	LB 00:91:40	"	14P	"	"		010

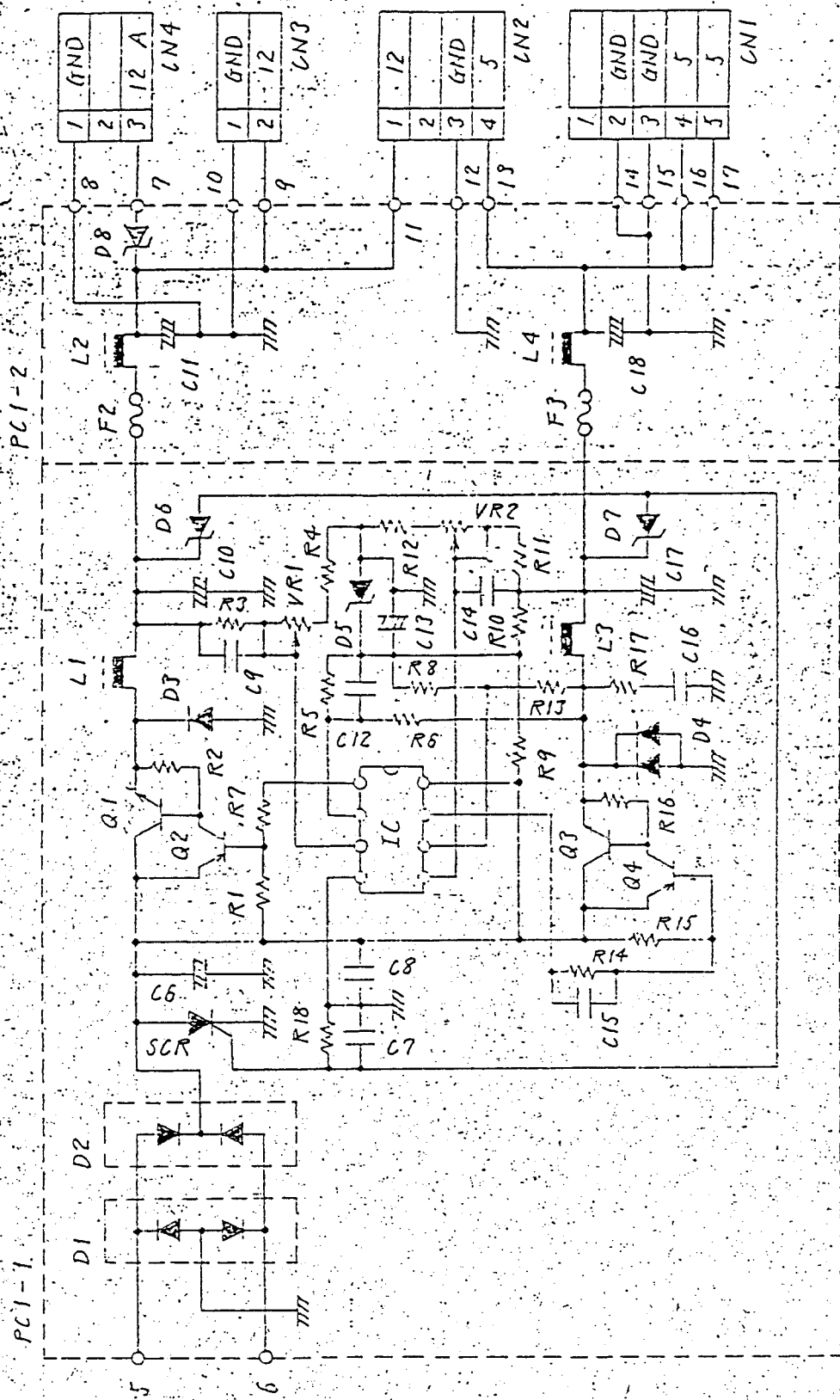
* New Parts (新規部品)

(ランク: Japan only)

品番	品名	規格	製造業者	備考
L1	70-9130	TC-9130	707	
L2	"	70-9131	"	
L24	"	70-9074	"	
IC	集積回路	4FL391C	NEC	-
Q1	トランジスタ	2SC2331	NEC	
Q2,4	"	2SA684	松下	
Q3	"	2SC2334	NEC	
D1	ダイオード	CTM-21K	トクデン	
D2	"	CTM-21E	"	
D3	"	ERS81-094	三洋電機	
D4	"	ESA532-027	"	
D5	1/2T-ダイオード	HZ400	日立	
D6	"	HZ15-2	"	
D7	"	HZ401	"	
D8	"	05Z2.4Z	東芝	
		3pin HZ3A1	日立	
5CR	コンデンサ	5P4M	NEC	X-D-100V正電圧用
		3pin 5P25M	"	50SP100V正電圧用
C6	コンデンサ	35LF6300	信友通信	
C7	"	AMX1H104	ニチコン	
C8,16	"	AMX1H102	"	
C9,14,15	"	AMX1H102	"	
C10	"	16TAMS470M	信友通信	
C11,18	"	16TAMS67M	"	
C12	"	AMX1H680	ニチコン	
C13	"	16TAMS17M	信友通信	
C17	"	16TAMS1000M	"	

部品

部品定数表



本圖係1次側回路之合意圖

製圖	檢閱	承認	日期	57年12月2日	標準	1-7
705E			圖號	NF0057	圖名	4T-178-043E