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Service
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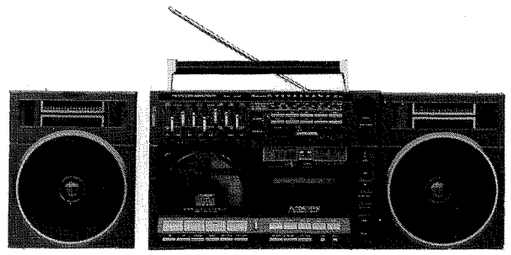

38349 A

Service Manual

For repair hints for the CD mechanism see service manual CDM-2.

For repair hints for the tapedeck mechanism see service manual SER-1, version SER-1/5602.

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CLASS 1
LASER PRODUCT
3122 110 03420

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified be used.

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CHAPTER 1. GENERAL

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Fig. 1-2

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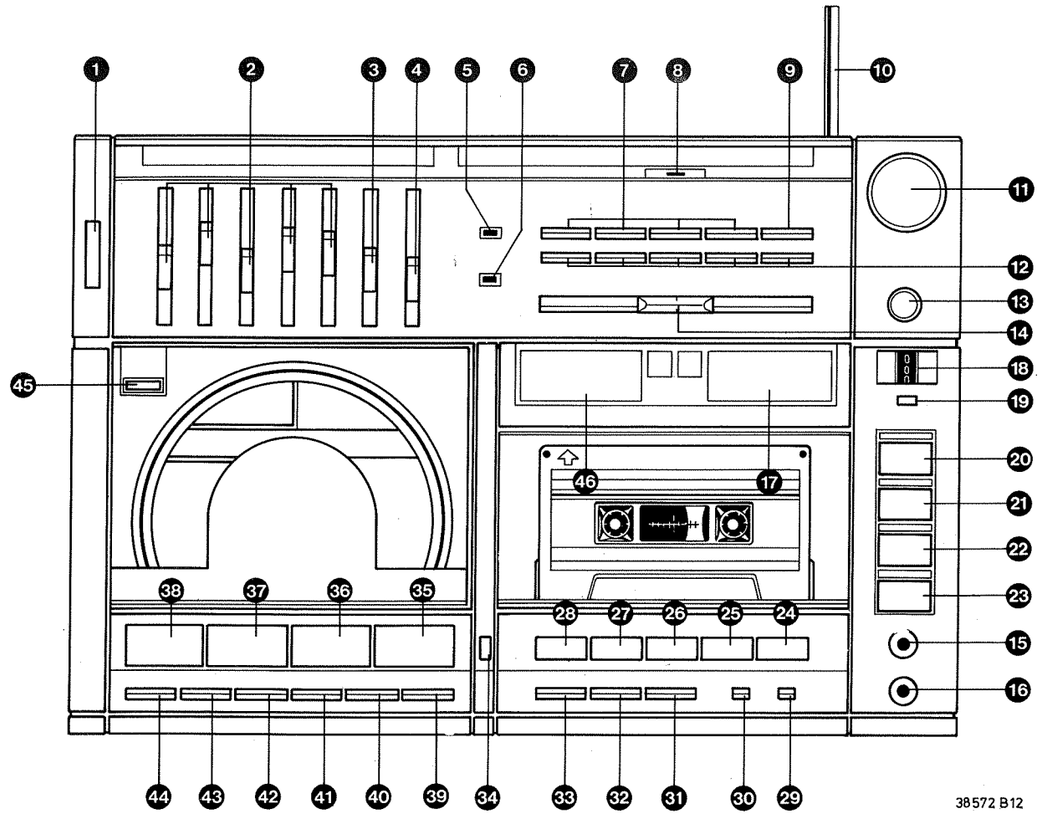


Fig. 1-1

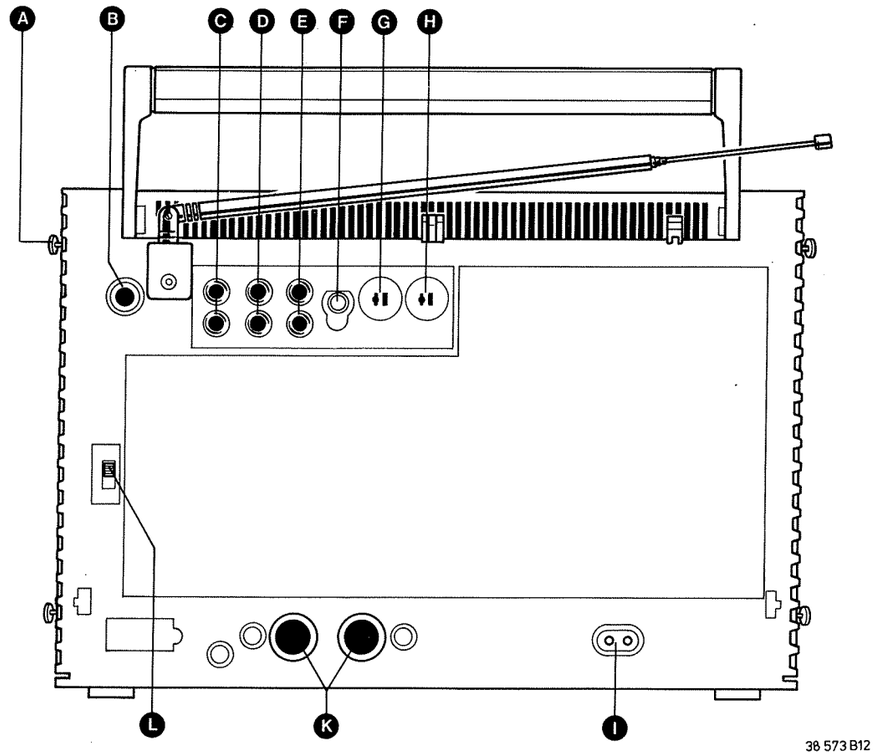


Fig. 1-2

SPECIFICATION		Nominal value	Typical value
General			
Mains voltage		: 220 V ~ Service solution for 110 V - 240 V	: 220 V ~ Service solution for 110 V - 240 V
Mains frequency		: 50-60 Hz	: 50-60 Hz
Power consumption		: 70 W max	: 70 W max
Dimensions (WxHxD)		: 320 x 215 x 200 mm	: 320 x 215 x 200 mm
Weight		: 17,5 kg	: 17,5 kg
Tuner: FM section			
Tuning range		: 87,5 MHz to 108 MHz	: 87,5 MHz to 108 MHz
Aerial inputs		: 75 Ω coaxial 300 Ω symmetrical	: 75 Ω coaxial : 300 Ω symmetrical
Sensitivity	mono	: ⩽2,9 µV 26 dB S/N	: ⩽2 µV 26 dB S/N
	stereo	: ⩽60 µV 46 dB S/N	: ⩽50 µV 46 dB S/N
Selectivity		: ⩾55 dB at 600 kHz bandwidth	: ⩾55 dB at 600 kHz bandwidth
Bandwidth	3 dB	: 180 kHz	: 180 kHz
Suppression	IF-AM	: 60 dB - 50 dB	: 70 dB - 50 dB
	pilot tone	: ⩾25 dB	: ⩾27 dB
	image frequency	: ⩾35 dB	: ⩾40 dB
	cross modulation	: ⩾28 dB	: ⩾31 dB
Channel separation		: ⩾36 dB	: ⩾55 dB
Distortion T.H.D.	mono	: ⩽1 %	: ⩽0,6 %
	stereo	: ⩽1,5 %	: ⩽0,8 %
Signal/noise ratio	mono	: ⩾70 dB	: ⩾72 dB
	stereo	: ⩾68 dB	: ⩾70 dB
Tuner: AM section			
Wave ranges	SW	: 5,59 MHz to 17,9 MHz	: 5,59 MHz to 17,9 MHz
	MW	: 520 kHz to 1605 kHz	: 520 kHz to 1605 kHz
	LW	: 150 kHz to 225 kHz	: 150 kHz to 225 kHz
Sensitivity	MW	: 22 µV 26 dB S/N	: 10 µV 26 dB S/N
Selectivity		: 30 dB at 18 kHz bandwidth	: 32 dB at 18 kHz bandwidth
Suppression	IF	: 64 dB	: 62 dB
	image frequency	: 40 dB	: 32 dB
Amplifier			
Output power		: 16 W in 4 Ω (DIN)	: 16 W in 4 Ω (DIN)
Distortion			
T.H.D. -23 dB, 1 Watt		: ⩽0,3 % at 1 kHz (FTC)	: ⩽0,15 % at 1 kHz (FTC)
Intermodulation, 4 Watt		: ⩽ 1 % at 60/7000 Hz 4:1	: ⩽ 1 % at 60/7000 Hz 4:1
Frequency characteristic			
Phono input	tone control	: from 40 Hz - 20 kHz ± 3 dB (RIAA)	: from 40 Hz - 20 kHz ± 3 dB (RIAA)
Other inputs	neutral	: from 40 Hz - 20 kHz ± 3 dB	: from 40 Hz - 20 kHz ± 3 dB
Equaliser		at 63 Hz - 250 Hz - 1 kHz - 4 kHz 12,5 kHz : -11 dB to + 8 dB	: at 63 Hz - 250 Hz - 1 kHz - 4 kHz 12,5 kHz : -11 dB to + 8 dB
Signal/noise ratio weighted (A-curve)			
Phono input		: for 16 W output ⩾ 80 dB (IEC)	: for 16 W output ⩾ 80 dB (IEC)
Other inputs		: for 16 W output ⩾ 73 dB (IEC)	: for 16 W output ⩾ 73 dB (IEC)
Input sensitivity			
Phono MD		: 2,5 mV at 47 kΩ	: 2,5 mV at 47 kΩ
AUX		: 150 mV at 47 kΩ	: 150 mV at 47 kΩ
Microphone		: 2 mV at 1,5 kΩ (FTC)	: 2 mV at 1,5 kΩ (FTC)
Outputs			
Loudspeakers		: 8 V at 4 Ω 16 W (FTC)	: 8 V at 4 Ω 16 W (FTC)
Headphones		: 350 mV at 8 Ω	: 350 mV at 8 Ω
Line output		: 150 mV	: 150 mV

SPECIFICATION	Nominal value	Typical value
Cassette recorder		
Cassette system	: compact cassette	: compact cassette
Number of tracks	: 2 x 2 (stereo)	: 2 x 2 (stereo)
Tape speed	: 4.76 cm/sec	: 4.76 cm/sec
Speed deviation	: ± 1,5 % (DIN)	: ± 1,5 % (DIN)
Wow and flutter (weighted)	: ⩽0,18 % (DIN)	: ⩽0,18 % (DIN)
Fast-wind time (C60)	: ⩽110 sec	: ⩽110 sec
Bias and erase frequency	: 64 kHz ± 5 %	: 64 kHz ± 5 %
Frequency range	: DIN 45500:	: IEC:
Metal	: 40 - 14000 Hz	: 40 - 14000 Hz
Chromium	: 40 - 14000 Hz	: 40 - 14000 Hz
Normal	: 40 - 13000 Hz	: 40 - 13000 Hz
Signal/noise (without dolby)	: DIN 45500:	: DIN 45500:
Metal	: ⩾53 dB	: ⩾56 dB
Chromium	: ⩾53 dB	: ⩾56 dB
Normal	: ⩾52 dB	: ⩾54 dB
Distortion (K3)	: ⩽3 %	: ⩽3 %
Compact Disc		
Frequency range	: 20 Hz ÷ 20 kHz ± 0,4 dB	
Output impedance	: ⩽100 Ω	
Signal/noise ratio	: ⩾90 dB	
Channel separation	: ⩾90 dB	
Channel difference	: ⩽0,8 dB	
Distortion T.H.D.	⩽0,005 % (0 dB)	
Intermodulation	: ⩽0,005 % (0 dB)	
De-emphasis	: 0 15/50 µs (switched by the subcode on the disc)	

THE CASSETTE RECORDER

A special tape drive and a built-in microprocessor make it possible to use both sides of the tape without turning over the cassette, to repeat the playback of a side, to play back both sides in succession or to repeat them in succession.
It is also possible to program a side for playback. In addition, the recorder is itself able to search for the beginning of the previous or the following track (= passage of music) during playback.
The display indicates which mode the recorder is in.

HOW TO OPERATE THE RECORDER

When the unit is switched on with key (1) "ON/OFF", the recorder automatically selects the simplest mode of operation, namely the non-programmed, non-reverse mode. This means that the tape is transported to the right and the recorder stops when the tape reaches the end, both during recording and playback. The indication "00" on the display shows that nothing has been programmed. The display is as shown in Fig. 1-3a.
Starting from this situation, you can play back and record in various ways.

Fig. 1-3a

Playback

- Open the cassette holder by pressing key (34) "EJECT".

– Place a recorded cassette in the holder with the open side downwards.
Assuming that the display is as in Fig. 1-3a, the full reel should be placed on the left, as the tape is transported to the right!

– With the full reel on the left, the arrow in Fig. 1-3a should point to the right. If this is not the case, press key (26) "DIRECTION".
– Where necessary, switch on the Dolby NR system with key (29) "DOLBY".
– Press key (24) "PLAY". "PLAY" now appears on the display (Fig. 1-3b) and playback begins.

Fig. 1-3b

– Assuming that the display is as in Fig. 1-3b, the tape will automatically stop at the end.

You can now, however, select automatic reversal of the direction in which the tape is running by pressing key (22) "REVERSE MODE".
– Select repeated playback of the side which is being played by selecting the repeat mode (Fig. 1-3c).
The recorder will continue to play back the selected side until key (23) "STOP/CLEAR" is pressed.

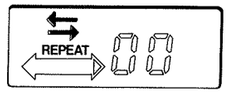


Fig. 1-3c

– Select playback of the side which is being played, followed immediately by the other side, by selecting the single-reverse mode (Fig. 1-3d).
The recorder will play back both sides and will then automatically stop.
– Select continuous repetition of both sides by selecting the continuous-reverse mode with key (22) (Fig. 1-3e).

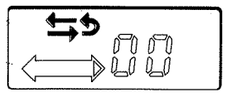


Fig.1-3d

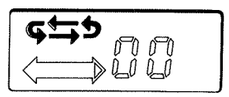


Fig. 1-3e

– During playback you can make the recorder search for the beginning of the next or the previous track by pressing key (27) "NEXT" or key (28) "PREVIOUS".
The display will light up as shown in Figs. 1-3f and 1-3g.

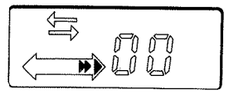


Fig. 1-3f

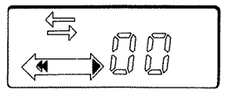


Fig. 1-3g

Programmed playback

Basically, this takes place in the same way as normal playback. There are a number of important restrictions, however.
– Only one side can be programmed for playback, namely the side which is played from left to right.
– The tracks on this side should be separated from one another by "quiet passages" of at least 4 seconds.
– A maximum of 20 tracks on this side can be programmed.
– A programmed side can only be played back in the non-reverse mode or the repeat mode, and not in the single-reverse or continuous-reverse mode. In other words, the display should be as in Figs. 1-3h or 1-3c and not Figs. 1-3d an 1-3e.
– Irrespective of your programming sequence, the recorder plays back the selected programme in ascending order of the track numbers.
- Programmed playback can be ended by pressing key (23) "STOP/CLEAR".
This not only stops playback but also deletes the memory.

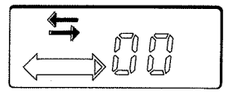


Fig. 1-3h

Programming a tape

A tape, or more precisely the side of a cassette running from left to right, is programmed as follows:
– Place the recorder in the stop position if it is not already in it.
– Place a programmable cassette in the cassette compartment.
– Press key (27) "NEXT" or (28) "PREVIOUS".
This automatically sets the recorder for programmed playback, i.e. where necessary it automatically rapidly rewinds to the left and playback with the tape running to the right is selected. Programming can already be started while the tape is winding back.
– By pressing key (27) "NEXT" or (28) "PREVIOUS you select on the display the track numbers from "1" to "20". These are the track numbers which should be familiar to you from the list of contents of the side which is to be played back.
Let us asume that you want to programme tracks "3", "5", "7" and "15".
– Keep pressing key (27) "NEXT" or (28) "PREVIOUS" until the display is as shown in Fig. 1-3i.
The "–" sign after the "3" flashes to indicate that track "3" has not yet been programmed.

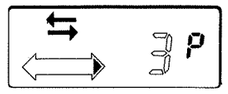


Fig. 1-3i

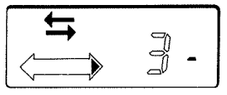


Fig. 1-3j

- While the "–" sign is flashing you can store the track number in the memory with key (33) "PROGRAM".
When this operation has been completed, a "P" appears after the track number (Fig. 1-3j).
- Repeat this procedure for programming the remaining track numbers.
- Whenever you wish, you can have the programmed track number appear on the display by pressing key (33) "PROGRAM".
Wait, however, until the indication after the track number ("–", "P" or "C") has stopped flashing!
- If you wish to delete a track number, enter the track number on the display with keys (27) and (28) and while "P" is flashing, press key (33) "PROGRAM".

"C" appears after the track number instead of "P" to show that the track number indicated has been deleted.

Does the word "ERROR" appear during programming? These are instructions which do not make sense and cannot be carried out during programming.

Recording

This can be done in different ways, namely in the normal way or synchronously or automatically. The two latter methods of recording relate to recording from Compact Disc. This is dealt with separately.

1. Open the cassette holder by pressing the "EJECT" key (34) "EJECT".
2. Place a cassette which has not been protected against recording in the holder with the open side downwards. Although there is no longer any need to do so, you place the full reel on the left.
Close and lock the cassette holder by pressing against the top left-hand corner of the lid.
3. With the full reel on the left, the arrow next to "PLAY" should point to the right (Fig. 1-3k). If this is not the case, press key (26) "DIRECTION".
4. If required, switch on the DOLBY NR system with key (29) in order to suppress noise.
5. Select the sound source to be recorded by depressing the appropriate key (12).

N.B.: As recording from the Compact Disc player offers special options (synchro operation!), this is dealt with separately.

6. Make the recorder ready for recording by pressing the "RECORD" key (32)
The display should now light up as shown in (Fig. 1-3l).

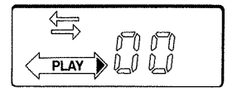


Fig. 1-3k

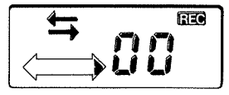


Fig. 1-3l

7. Actuate the sound source selected under point 5 (e.g. a record player) if this has not already been done.
8. Press key (24) "PLAY" to start recording. The word "PLAY" will light up on the display (Fig. 1-3n).
The first side is now used for the recording. At the end of the tape the recorder will automatically stop.
If you want to continue recording on the other side immediately after the first side, place the recorder in the single-reverse mode with key (22) (Fig. 1-3d).

The recorder now uses both sides for recording. After the first side the direction in which the tape runs is automatically reversed and the recorder stops at the end of the second side.

N.B.: The "repeat mode" and "continuous reverse mode" should not (and cannot!) be selected during recording. This would mean that the side or both sides would be used again, resulting in the deletion of a recording that has just been made!

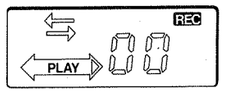


Fig. 1-3m

9. For short pauses depress key (25) "PAUSE".The indication "PLAY" will then flash.
10. To resume recording, press key (24) "PLAY" again. The word "PLAY" lights up again continuously.
11. For inserting a quiet passage (e.g. between two recordings) you can keep key (30) "MUTE" depressed for a short period of time.
    In this way you can insert quiet passages of 4 seconds between the tracks, this being necessary to make a recording programmable.
12. To stop, press key (23) "STOP".
13. The cassette can be removed after pressing the "EJECT" key (34).

Synchronous recording from Compact Disc

Combining the Compact Disc player and the recorder in a single unit has made it possible to simplify recording from Compact Disc considerably.
The recorder is controlled by the actuation of the keys of the Compact Disc player.
You should therefore first seek to familiarise yourself with the operation of the Compact Disc player.

A synchronous recording from Compact Disc proceeds as follows:

1. Make the recorder ready for recording by placing a cassette in the holder, etc., as described under "recording", points 1., 2., 3., 4., 5. and 6.
2. Press key (31) "REC MODE" to select synchronous recording (Fig. 1-3n).
3. Place a Compact Disc in the player, selecting the desired track number if you do not want to play the whole disc.
4. Now press key (35) "PLAY" of the Compact Disc player .
   The player begins playback and the recorder simultaneously starts recording.
5. By pressing key (39) "STOP" of the Compact Disc player not only the Compact Disc player but also the recorder is stopped. The latter goes into the pause position (the word "PLAY" flashes!).
   This also happens at the end of the Compact Disc if the Compact Disc player stops automatically.
   In both cases the recorder remains ready for a subsequent recording. If you wish, you can change the Compact Disc.
6. Using key (36) "PAUSE" of the Compact Disc player also causes the recorder to pause.
7. When you stop recording, you have to stop the recorder with its own stop key (23).The Compact Disc player continues playback, however.

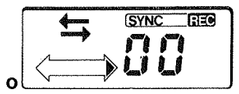


Fig. 1-3n

Automatic recording from Compact Disc

This method of recording can be selected for making a tape recording which can be programmed for playback. In other words, the required quiet passages of 4 seconds are automatically entered on the tape.
The preparations for such a recording are the same as those for a synchronous recording, the only difference being that "REC MODE" for automatic recording must be selected on the recorder with key (31): press key (31) twice. The display should be as in (Fig. 1-3q).

1. This automatic recording is also started by key (35) "PLAY" of the Compact Disc player
2. The recorder automatically inserts quiet passages of 4 seconds between the tracks, irrespective of the length of the pause between the tracks on the disc.
3. Actuating key (35) "PAUSE" on the Compact Disc player now results, however, in the Compact Disc player stopping for 4 seconds and then automatically resuming playback.
   This is important if you want to divide up a long track without a pause on a Compact Disc into several short tracks with pauses of 4 seconds between them, thus making the recording programmable.
4. In this case, too, the Compact Disc player stops at the end of the disc or by pressing key (39) "STOP", which causes the recorder to go into the pause position and remain ready for the next recording.
   If required, you can place another Compact Disc in the Compact Disc player.
5. By pressing key (35) "PLAY", playback of the disc and recording with the recorder is resumed.
6. Recording is stopped by pressing key (23) "STOP/CLEAR" of the recorder.

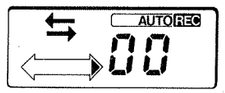


Fig. 1-3o

The Compact Disc player

Compact Disc represents the greatest ever advance in sound reproduction. Refined digital and optical techniques provide an absolute optimum in terms of playback technology, as well as rapid access to each track on the disc and simple programmability.

How to operate

Playback of a Compact Disc is obtained by first switching on the unit with key (1) "ON/OFF" and then selecting Compact Disc playback with key (12) "CD".

Other points you should know

- Unlike a conventional grammophone record, a Compact Disc is played from the middle outwards.
- The disc is read on the non-labelled side, which is protected by a plastic layer, Every care should nevertheless be taken to prevent any mechanical force from being applied to the labelled side by scratches or by ballpoint pens. This may damage the information on the disc. thus causing the player not to work properly.

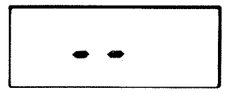


Fig. 1-3p

On/Off indication (Fig. 1-3p)
This lights up when the unit has been switched on with key (1) "ON/OFF" and Compact Disc playback has been selected with key (12) "CD".

Stand-by-indication (Fig. 1-3p flashing)
This happens as soon as the disc holder has been closed to indicate that the player is rotating and reading the contents of the disc. Until this has taken place, the indication continues to flash.

Playing back a complete disc

To do this, press key (35) "PLAY" after a disc has been placed in the holder and the holder has stopped moving after reading the disc. Instead of the total number of track numbers the display indicates the first track number. If you have selected playing time indication, the pause between the contents and the first track will be counted off alongside the indication "TIME" (e.g. "PO2", "PO1", "PO0"). Counting off of the elapsed playing time per track begins immediately afterwards.
While the following track is being sought the track number appears. The pause is then counted off again, followed again by the indication of the elapsed playing time.
If track indication has been selected, the track numbers "1.01", "2.01", "3.01", etc., will appear in succession. The index numbers "01" will only move on if the tracks are sub-divided into indices. This is indicated on the disc case. They then move on as "02", "03", etc., as soon as the following index number is reached.

Once the whole disc has been played, the disc stops and the display shows the total number of tracks or their total playing time.

Fig. 1-3q

Number indication (Fig. 1-3q)
Indicates the total number of tracks on a disc.

Returning to the beginning of a track

It is possible to return to the beginning of a track by pressing key (35) "PLAY" during playback, the track is then played again from the beginning.

Moving on to another track

During playback you can at any time select another track with the keys (37) "NEXT" or (38) "PREVIOUS".
The index indication "–" will flash for about two seconds. This is in order to enable you, where necessary, to select another index number, something which will be dealt with later.

Selecting the following track

Press key (37) "NEXT" until the desired track number appears on the display. If you do this while the last track is being played back, the word "ERROR" lights up to indicate that there is no following track. Playback of the last track is therefore continued.
If you want to obtain a quick impression of what is on the disc, you can keep pressing key (37) "NEXT" and just listen to the beginning of each track.

Selecting the previous track

Press key (38) "PREVIOUS" until the desired track number appears. The word "ERROR" lights up if you do this while the first track is being played. As in this case there is no previous track, plaback of the first one is continued.

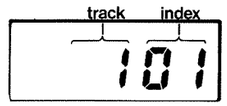


Fig. 1-3r

Track number indication (Fig. 1-3r)
For track indication the first digits indicate the track number and the two following ones represent the index number. The index is the sub-division of a track. Not every disc is sub-divided into indices in this way.

Moving on to another index number

With the keys (37) "NEXT", (38) "PREVIOUS" and (40) "TIME/TRACK" it is possible to move on during playback to the previous or following index number. This can be an index number of either the same or another track.
After selecting the other index number, playback is interrupted, the laser moves to the desired index number and playback is resumed. The display then shows the normal indication again.
This procedure should be followed within the time during which the track number is active, which can be recognised by the flashing bar after the number, this lasting about two seconds. If you exceed this time, playback begins again with the track and index number which are shown on the display.
If you have selected an index number which is too high, the "ERROR" indication appears and playback begins with the first index number of the track.

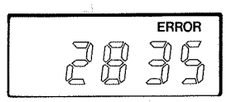


Fig. 1-3s

Error indication (Fig. 1-3s)
Operating errors can be recognised by the word "ERROR" lighting up. This indication also lights up when a damaged disc is used.

Selecting within the same track number

First move on to the following track number with key (37) "NEXT" or to the previous track number with key (38) "PREVIOUS" and then return immediately with (38) or (37). While "–" is flashing, press key (40) "TIME/TRACK". This causes the index indication to move to "0".
Then select the desired index number with (37) "NEXT".

Selecting within another track number

First select the desired track number with keys (37) "NEXT" or (38) "PREVIOUS".
While the index indication "–" is flashing, press key (40) "TIME/TRACK" to bring the index indication to "0".
Then select the desired index number with key (37) "NEXT".

Beginning with a specific index number

You can also begin playback with a specific index number. After the disc has been placed in the holder and no longer rotates and the total number of tracks is shown on the display, obtain the required track number on the display by pressing key (37) "NEXT" or (38) "PREVIOUS". While the index indication "–" flashes (two seconds!) quickly press key (40) "TIME/TRACK". This causes the index indication "0" to appear on the display. Then select the desired index number with key (37) "NEXT".
Press key (35) "PLAY" to begin playback.

Did you exceed the two-second period?

If the index indication stopped flashing before you pressed key (40) "TIME/TRACK":
Press key (37) "NEXT" or (38) "PREVIOUS" to return to the following or the previous track number and then return again to the desired one. The index indication will again flash and the index selection can be completed.

Holding the beginning of a track or passage/interrupting playback

You can make the laser stop exactly at the beginning of a track or passage by pressing key (36) "PAUSE" before beginning playback of the whole disc, moving on to a track or index number, beginning playback of a specific track or index number, or rapidly searching for a specific passage. The indication "PAUSE" appears on the display to show that you have depressed this key.
When returning to the beginning of a track you should proceed in the opposite way: first press key (35) "PLAY" and directly afterwards key (36) "PAUSE". At the moment when you want to begin playback, you press key (35) "PLAY". The "PAUSE" indication is then extinguished.
For short interruptions, likewise press key (36) "PAUSE". The disc continues to rotate but the sound is inaudible. The display indicates "PAUSE". Playback is resumed by actuating key (35) "PLAY". The "PAUSE" indication is extinguished.

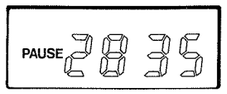


Fig. 1-3t

Pause indication (Fig. 1-3t)
This lights up as soon as key (36) "PAUSE" is depressed and is extinguished as soon as playback is resumed by key (36) "PLAY" being pressed again.

Searching for a specific passage on a track

A specific passage on a track can be quickly found during playback with keys (43) ">>" and (44) "<<".
As long as key (44) "<<" is pressed, the laser returns to the beginning and when key (43) ">>" is pressed it goes to the end of the disc. When the keys are released, playback is resumed.
During searching the laser moves at three speeds. First slowly, then faster and, after ten seconds, very fast.
At the first two speeds the sound of the disc can be heard speeded up (not if you have depressed key (36) "PAUSE"!), and then it becomes inaudible.
When searching for a passage by ear it is therefore advisable to release the key briefly at that moment.

If you are searching with the aid of index or playing time indication, you can use the highest speed. Once you are near the desired passage, release the key briefly so as to obtain the lowest speed again.
If the laser pick-up moves out of the run-in groove of the first track as a result of key (44) "<<" being pressed, the "ERROR" indication appears and the laser stops at the beginning of that track. The disc continues to rotate, however, so that playback is resumed as soon as the key is released.
If as a result of key (43) ">>" being pressed, the laser is moved out of the run-out groove of the last track, the "ERROR" indication appears and for a few seconds the laser returns to the disc and remains there until you release the key. This prevents the disc from being stopped inadvertently during searching.

Fig. 1-3u

Elapsed playing time indication (Fig. 1-3u)
During playback the elapsed playing time can be indicated for each track.
This is done in minutes and seconds.
The word "TIME" also lights up.

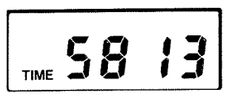


Fig. 1-3v

Total playing time indication (Fig. 1-3v)
Indicates the total playing time in minutes and seconds.

PROGRAMMING

As well as playing back a disc in its entirety, you can also select a number of tracks and play back only these. You can also determine the order in which you wish to hear them. A further option is playing back all the tracks in a different order from that on the disc.
To do this, you have to store your selection in the form of a program in the memory of the player. The memory has a capacity of twenty positions, in other words a maximum of twenty tracks can be stored in it, though each track can only be stored once. If you exceed the maximum of twenty tracks, the "ERROR" indication appears to let you know that the memory is full and cannot accept any more instructions.
Programming is only possible if the disc is in the player and the disc holder is closed. The highest track number that can be programmed is then shown on the display and thus fixed, so that there is no possibility of mistakes in this respect.
Index numbers cannot be programmed. However, they remain accessible during playback, except if you have only programmed one track number.
The track numbers which you wish to include in a program are obtained on the display on the basis of the contents on the disc case by pressing key (37) "NEXT" or (38) "PREVIOUS", depending on which is the quickest way of reaching them, and you program them with key (42) "PROGRAM".
Between the displaying and the programming of a number not more than about 5 seconds should elapse, otherwise the microprocessor assumes that you have changed your mind and extinguishes the flashing bar after the number. It can then no longer be programmed and the "ERROR" indication will therefore appear if you now press key (42) "PROGRAM". You can, however, re-activate a number that you have missed by making the previous or the next number appear and then immediately going back to the desired one.

Example: You wish to listen in succession to the numbers 7, 3, 9, 5, 12 and 10 on a disc with 14 tracks. Place the disc in the disc holder and close the latter. After the contents have been read the figure "14" appears. Now press key (37) "NEXT" until the "7" appears and then press key (42) "PROGRAM". The bar after the digit will now light up continuously and will be replaced by a "P" (for "PROGRAM") indicating that this track has been programmed; you will then read "7P".
You then return to "3" with key (38) "PREVIOUS" and press key (42) "PROGRAM" again; you will now read "3P".
You also display the remaining desired numbers with key (37) "NEXT" or (38) "PREVIOUS" and you program them with key (42) "PROGRAM". Once the last number has been programmed, you will read "10 P". This will remain until playback starts.
In after programming a track number you notice that you have made a mistake, you can remedy this by displaying the previous or the next number, going back to the wrong one and then pressing again key (42) "PROGRAM". To indicate that the wrong track number has been deleted, the "P" after it is replaced by a "C" (for "Clear").
In our example: You have programmed "4" instead of "5". You then move to "3" with key (38) "PREVIOUS", then to "4" again with key (37) "NEXT" and then you press key (42) "PROGRAM"; you will now read "4 C". You then proceed to program "5". During programming or after you have ended it, you can check the contents of the program by pressing key (42) "PROGRAM". All the track numbers will then appear in the programmed order, after which the last programmed number is shown again. In our example: "-7-" "–" "-3-" "–""-9-" "–" "-5-" "–""-12-" "–" "-10-" "–" "10 P".
If you come to the conclusion that the program contains a track number which you do not want, you can still delete this by displaying it with key (37) "NEXT" or (38) "PREVIOUS" and then pressing key (42) "PROGRAM".
If you wish to delete the whole program, press key (39) "STOP/CLEAR".

If the "ERROR" indication appears after pressing key (42) "PROGRAM", this means that the memory is empty and that therefore no number has been programmed. All the functions of the player remain operational when a stored program is being played back, except beginning with a specific track or index number. You begin playback by pressing key (35) "PLAY"; the first track number of the program then appears on the display. How playback proceeds can be seen from the way in which the digits on the display move on. You can see how many tracks are still left at a given moment if you press key (42) "PROGRAM": first the number of the track being played appears, then all the remaining track numbers are shown in succession.

For returning to the beginning of a track you press key (35) "PLAY". If you wish to move on to the next track number of a program, you press key (37) "NEXT". If you do this during the last track, the "ERROR" indication appears and playback of the last track is continued.
If you want to return to the previous track number of a program, you press key (38) "PREVIOUS". If you do this during the first track, the "ERROR" indication appears and playback of the first track is continued.

To move on to another index number you press key (37) "NEXT", (38) "PREVIOUS" and (40) "TIME/TRACK". If you choose an index number that is too high, the "ERROR" indication appears and playback begins with the beginning of the track.

Searching for a specific passage with key (43) ">>" and (44) "<<" is restricted to the area between the beginning and end of the track being played; you cannot move the laser pick-up outside this area, so as to prevent you from moving to another track, programmed or otherwise, and thus disturbing the program sequence. If you exceed these limits the "ERROR" indication appears and the laser pick-up stops until you release the key. It then continues the program.

To hold a passage or to interrupt the program, you press key (36) "PAUSE". When all the tracks of the program have been played, the disc stops. The program remains stored in the memory, however, until the disc holder is opened; only then it is deleted.
The program is likewise deleted if you press key (39) "STOP/CLEAR" during playback.

SERVICING HINTS

1. General

- For servicing hints for CD mechanism see Service Manual C.D.M.-2.
- For servicing hints for tape-deck mechanism see Service Manual SER-1 version SER 1/5602.
- Before using the set for the first time, or before repairs, the transit screw must be removed. This screw should be remounted after repair.
- Several chip components have been applied in this set. For mounting or demounting of chip components see Fig. 1-4.
- The set consists of several MOS ICs. As MOS ICs are generally very susceptible to overload and too high voltage, the greatest possible care should be exercised during servicing. For further instructions see the instruction leaflet in the package of ICs.

– ESD

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can drastically reduce life expectancy.
When repairing, make sure that you are connected via a wrist wrap with resistance to the same potential as the chassis of the set. Keep components and aids also at the same potential.

Attention:
- When the mains switch has been demounted, battery on/off switch SK12 will also be inoperative. The supply voltages A to E then are absent.
- If the set is switched on in decased state, the back should be screwed onto the cooling fin again. The back forms part of the cooling fin.

2. Disassembly (Fig. 1-5)

- Remove the screws of the backcover (A).
- Remove the two screws between the terminal sockets (B).
- Remove the screw in the aerial holder (C).
- Remove the screw in the left-hand and right-hand side (D).
- Remove the screws in the bottom (E).
- Now the entire set can be slid out of the cabinet.

3. Separating front from frame (Fig. 1-6)

- Disassembly according to item 2.
- Take out recorder PCB (5 screws F).
- Remove cover with mains switch (screw G).
- Remove 4 screws H.
- Disconnect connectors B501-B508 to microprocessor PCB.
- Take out belt guide.
- Now front with cassette mechanism and CD mechanism can be separated from the frame.

Note:
Ensure during assembly of the recorder PCB that the recording handle engages with the R/P switch.

4. Removal of cassette mechanism (Fig. 1-7)

- Disassembly according to item 2.
- Separating front from frame according to item 3.
- Loosen 3 screws J.
- Now the mechanism can be removed downwards.

Note:
Ensure during assembly of the mechanism that the belt is mounted correctly.
The cover plate, item no. 448 in the Exploded View, has been mounted with a snap-in connection.

5. Removal of CD mechanism (Fig. 1-8)

- Disassembly according to item 2.
- Separating front from frame according to item 3.
- Loosen 2 screws K and remove both brackets.
- Slide the entire mechanism slightly upwards and lift it out of its suspension springs.

6. Disassembly CD cover (Fig. 1-9)

- Disassembly according to item 2.
- Separating front from frame according to item 3.
- Removal of CD mechanism according to item 5.
- Disconnecting connectors B501-B508 on microprocessor PCB.
- Remove shaft by sliding it to the side of the front. To achieve this push aside blocking lug 1.

Note:
Ensure that spring item no. 468 between cover and side of front does not jump away.

- Remove the 2 screws L in the cover plate at the rear.
- Slide the cover plate downwards and hook the plate out of the lower side of the PCB.
- Now PCB and push-button plate can be disassembled (snap-in connection).

7. Disassembly display (Fig. 1-10)

- Disassembly according to item 2.
- Take out recorder PCB (screws A, see Fig. 1-6).
- Bend the two hooks 2 slightly outwards and pull PCB forwards.
- Slightly lift PCB so that it can be lifted over the bosses on bearing faces B.
- Bend connector 3 outwards until the LCD glass plate emerges from the connector.
  Next slightly lift it and pull it out of the opposite connector.
- Light guide D is kept in place by the two snap-in connections 3
- After removal the two ICs P315 and P316 as well as the pilot lamps are accessible for replacement.

SERVICE TOOLS

Audio test disc	4822 397 30085
Disc without defects + disc with defects, D0 faults, black spots and finger prints	4822 397 30096
Disc hold-down	4822 532 60906
7th order filter	4822 395 30204
Test cassette	4822 397 30069
Torx screwdrivers	4822 395 50145

HANDLING CHIP COMPONENTEN

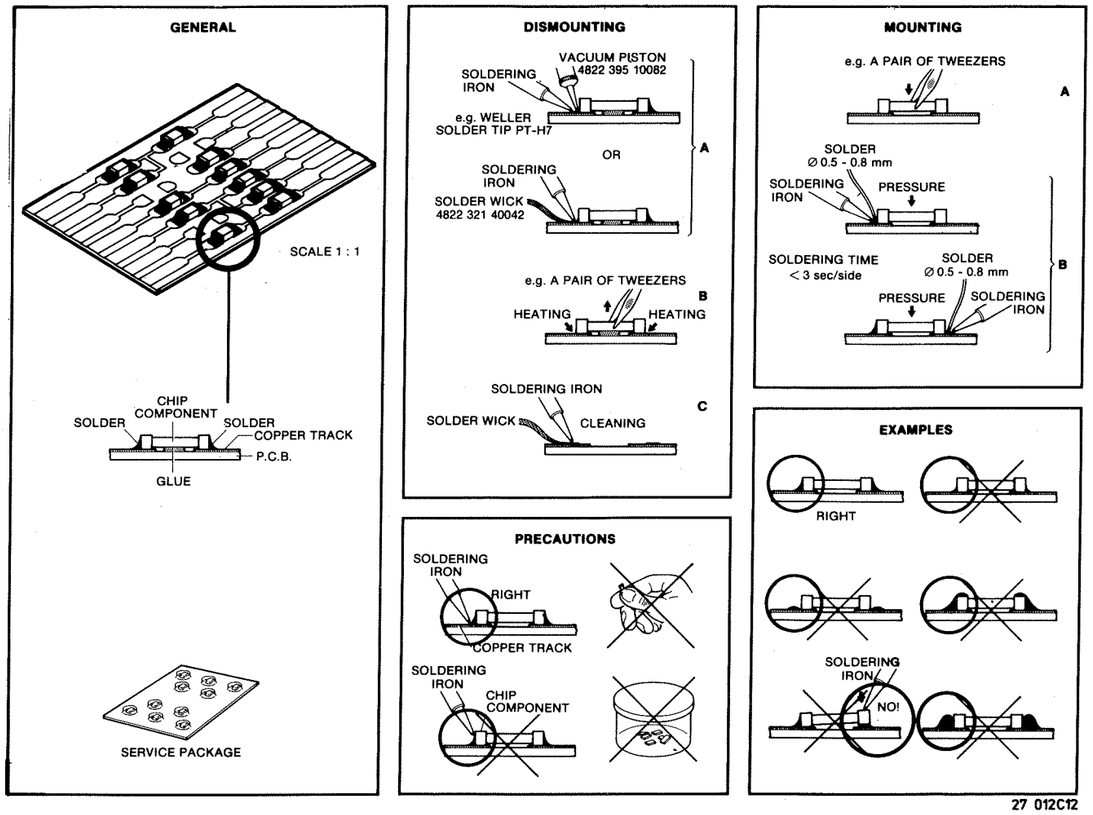


Fig. 1-4

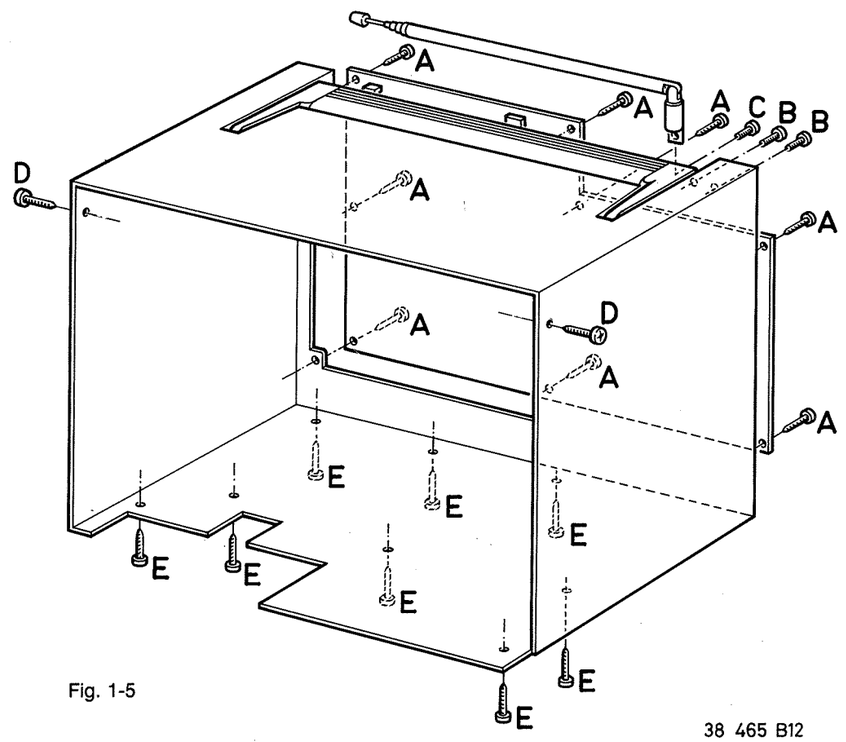


Fig. 1-5

38 465 B12

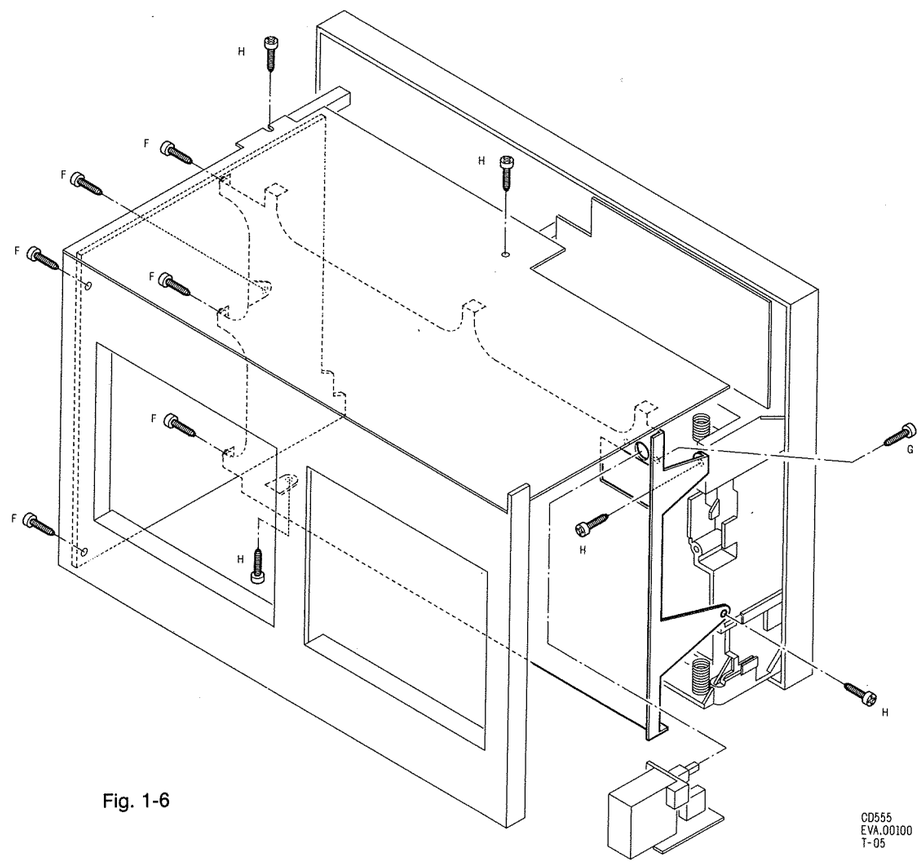


Fig. 1-6

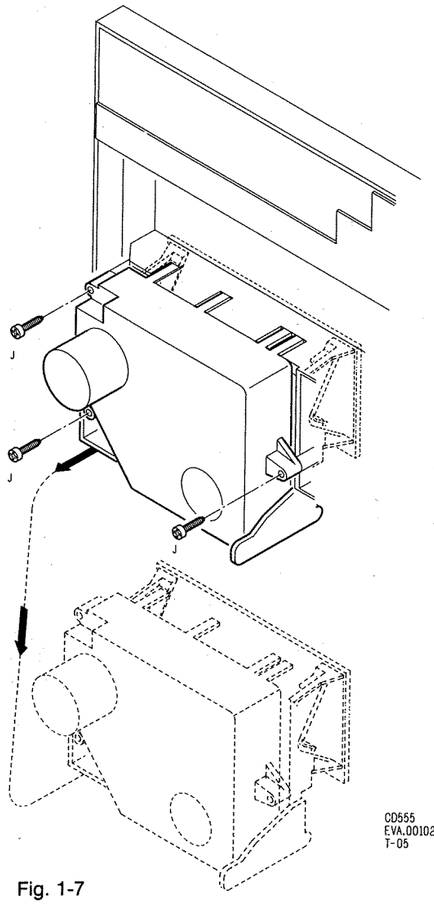


Fig. 1-7

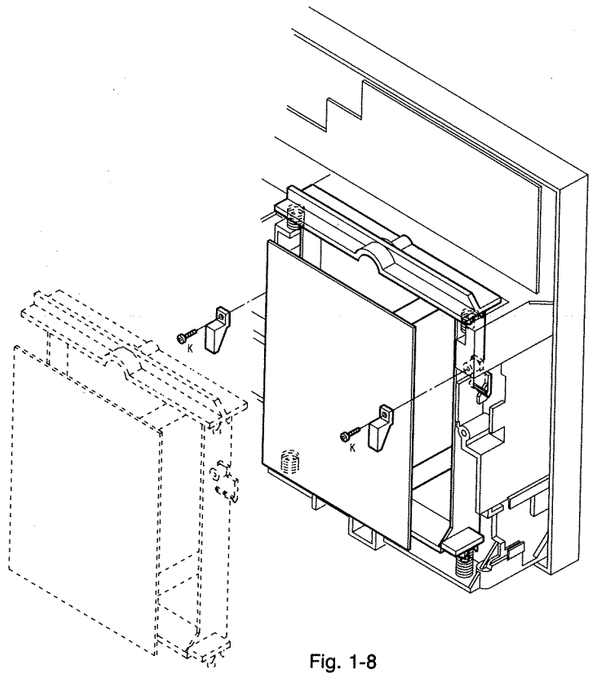
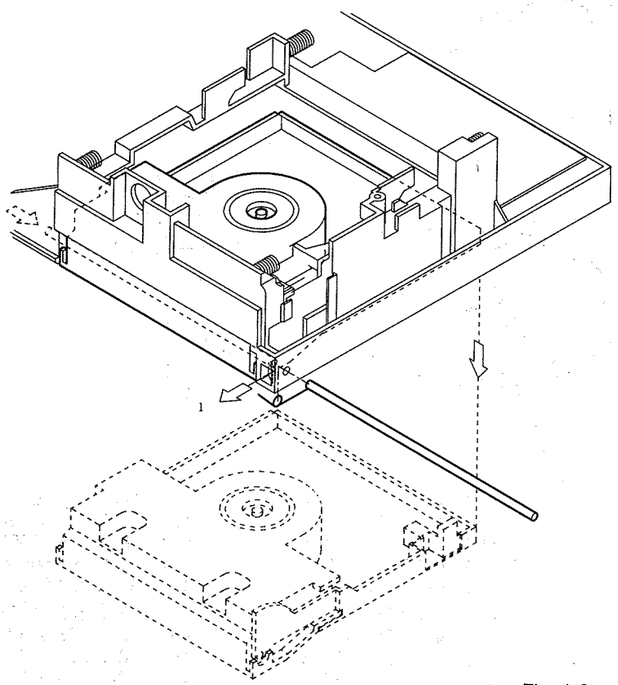


Fig. 1-8



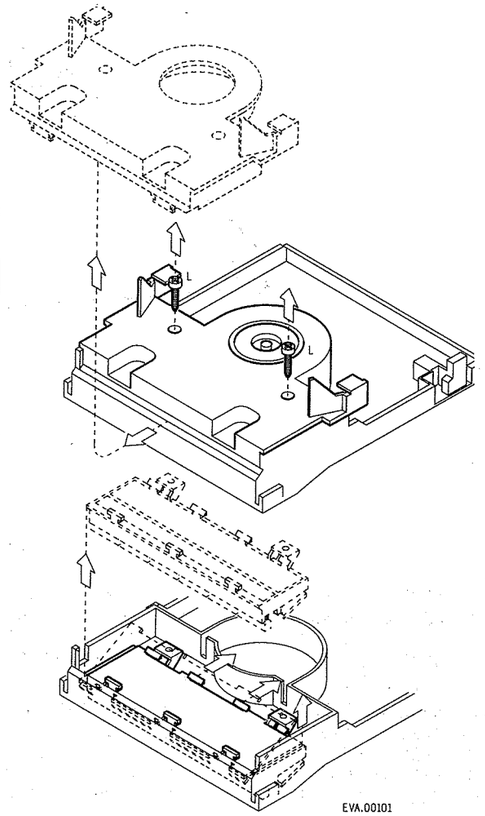


Fig. 1-9

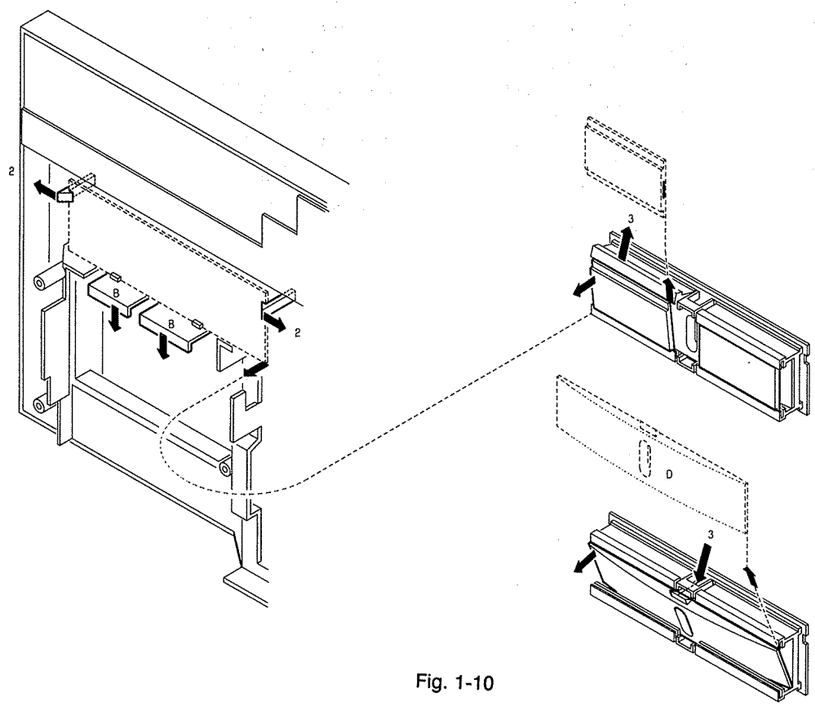


Fig. 1-10

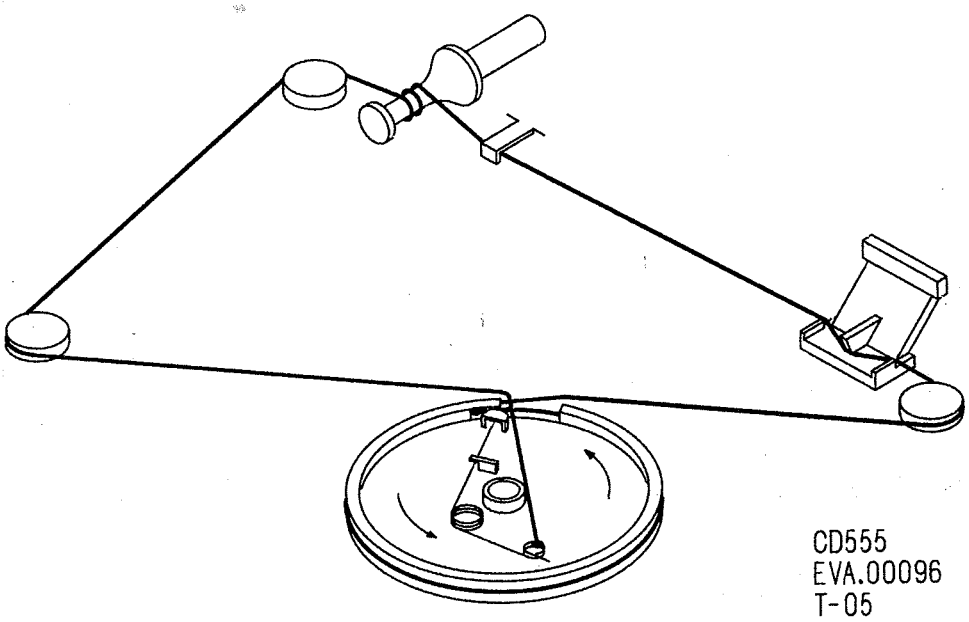


Fig. 1-11

401	4822 532 80783	434	4822 321 30213	464	4822 498 40534	491	4822 255 40181
402	4822 450 60608	436	4822 450 80963	466	4822 303 30248	492	4822 267 30662
403	4822 492 51772	437	4822 410 24325	467	4822 466 91385	493	4822 276 11562
404	4822 410 24326	438	4822 410 24324	468	4822 492 41338	494	4822 290 60579
407	4822 426 60338	439	4822 413 70206	470	4822 290 60577	495	5822 277 60232
408	4822 450 60607	441	4822 535 50094	471	4822 267 30377	496	4822 277 21037
409	4822 528 81055	442	4822 528 81054	472	4822 255 40179	497	4822 267 50586
411	4822 426 50735	443	4822 410 90072	473	4822 255 40128	498	4822 321 10374
412	4822 450 60606	444	4822 410 90071	474	4822 532 51476	406	4822 410 90073
413	4822 532 11051	446	4822 413 70205	475	4822 276 50306		
414	4822 417 50166	447	4822 410 30436	476	4822 276 50307		
416	4822 276 11277	448	4822 426 60335	477	4822 255 40494		
417	4822 492 51771	449	4822 462 71328	478	4822 267 10168		
418	4822 411 61162	451	4822 492 51769	479	4822 267 40585		
419	4822 402 50211	452	4822 325 80265	480	4822 325 20139		
421	4822 492 63256	453	4822 277 10855	481	4822 256 90809		
422	4822 402 60931	454	4822 276 11263	482	4822 380 20183		
423	4822 522 31741	454	4822 276 11263	483	4822 290 60578		
424	4822 492 60268	456	4822 492 31667	484	4822 265 20262		
426	4822 413 41284	457	4822 528 40258	485	4822 276 11562		
427	4822 411 61163	458	4822 358 10087	486	4822 276 11563		
428	4822 413 31343	459	4822 349 50217	487	4822 276 11564		
429	4822 413 70204	461	4822 528 20429	488	4822 276 11565		
431	4822 402 30145	462	4822 492 63029	489	4822 255 40496		
433	4822 410 30435	463	4822 459 50376	490	4822 255 40179		

50	4822 240 30312
51	4822 240 50256
52	4822 445 30116
53	4822 458 20111
54	4822 401 10908
55	4822 124 21395
56	4822 157 51425
57	4822 462 40416

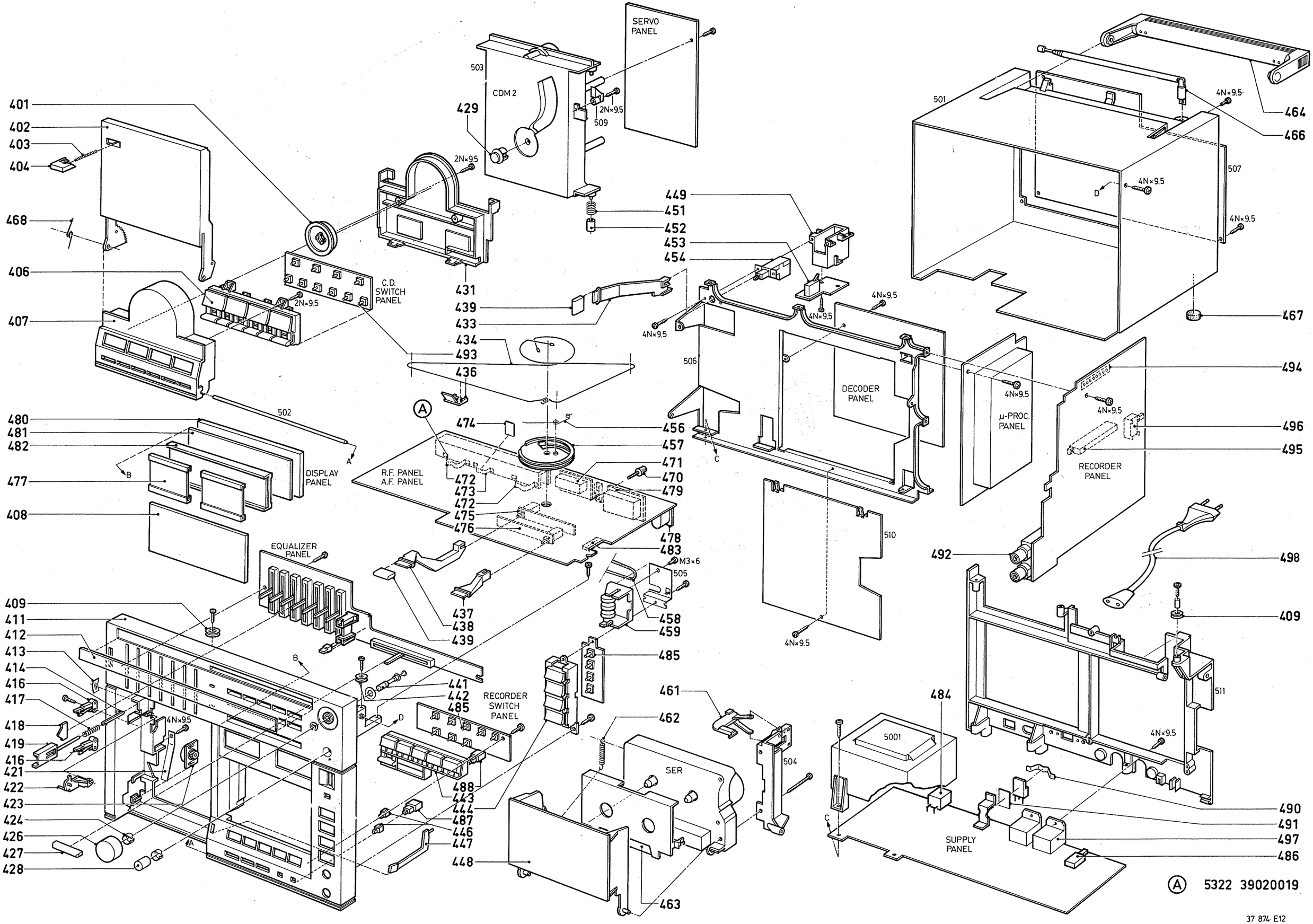


Fig. 1-12

CS 1 727

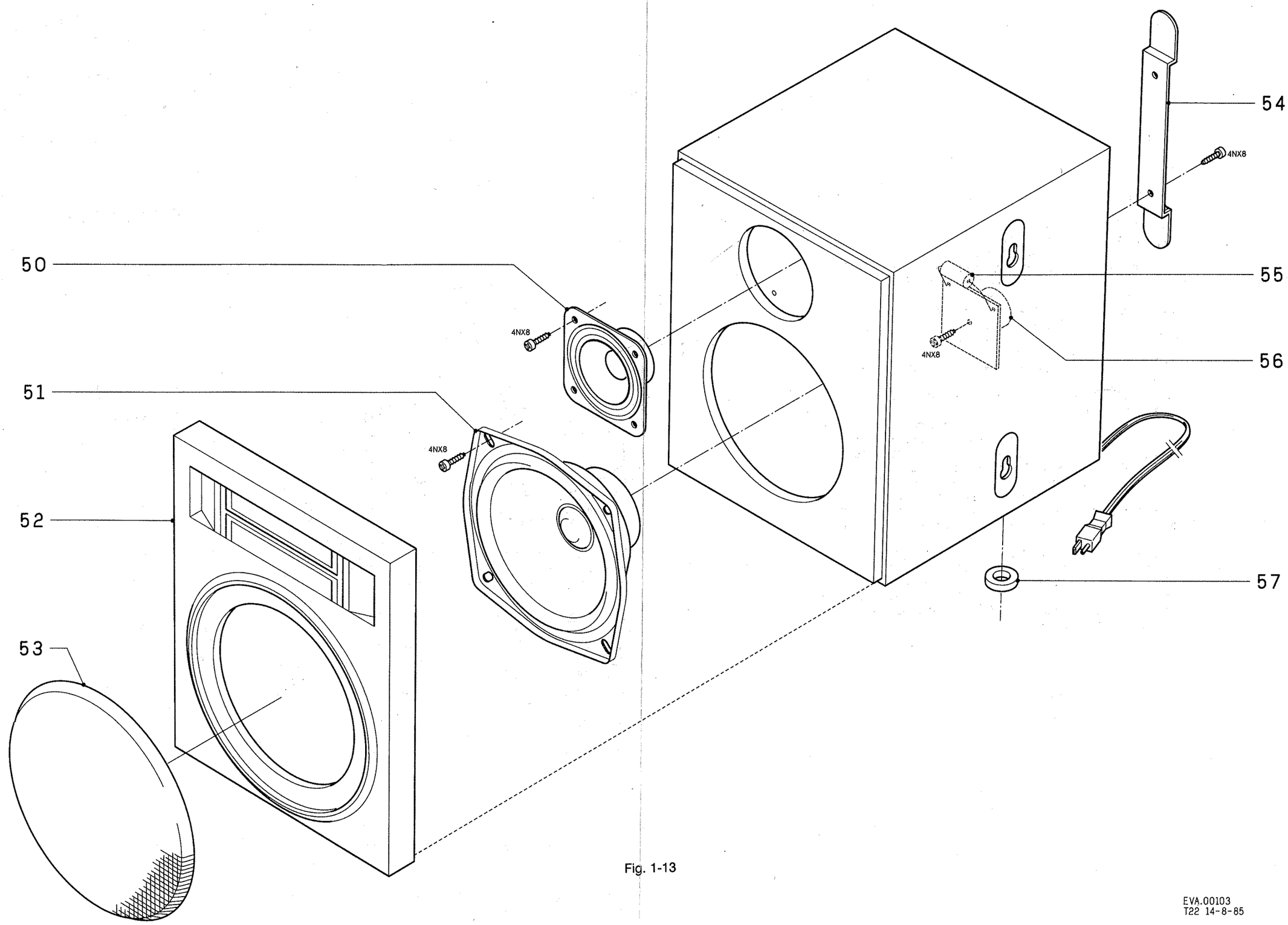


Fig. 1-13

EVA.00103
T22 14-8-85

BLOCK DIAGRAM

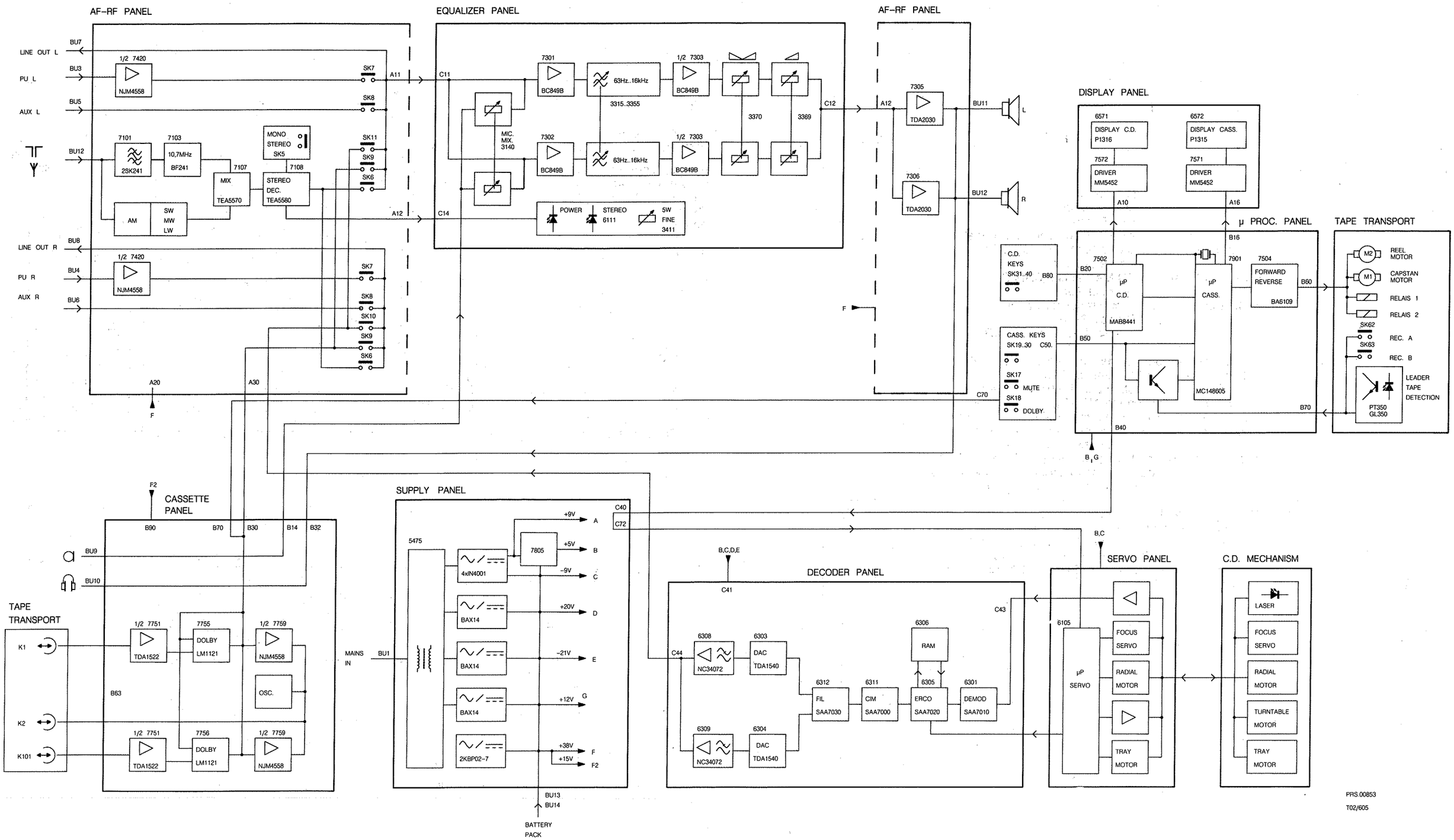


fig. 2-1

INTRODUCTION

The CD 555 consists of 6 parts:

1	Power supply	: Supply Panel
2	RF section	: AF-RF Panel
3	AF section	: AF-RF Panel, Equalizer Panel
4	Cassette Recorder	: Cassette Mechanism SER Cassette Panel
5	Compact Disk	: CD Mechanism CDM-2 Decoder Panel
6	Control	: Microprocessor Panel Display Panel Control Keys Cass. + C.D.

The above-mentioned parts can be looked up in the following chapters of the Service Manual.
The low-frequency section and the high-frequency section are situated on the AF-RF panel. Tone, volume and balance control are situated on the equalizer panel. The terminal sockets for the microphone and the headphones are situated on the cassette panel. The cassette recorder and compact disk player are fully programmable. (Note: CD track I cannot be obtained with the previous key, as mentioned already in the directions for use).
They are controlled from the microprocessor panel. The control lines of the microprocessor from the CD (7501) to the servo panel run via the supply panel. Microprocessors 7901 and 7501 on the microprocessor panel and microprocessor 6105 on the servo panel are provided with test software.

SERVICE TEST PROGRAMS

General

For the microprocessors in the CD555 test software has been provided. This software serves to test different parts of the processor and part of the periphery.
The following conditions should have been met here:
- The power supply voltages should be present.
- The reset circuit should be intact.
- The interrupt input should be high.

CASSETTE SERVO AND SYSTEM CONTROL PROCESSOR MC6805G2 (7901)

The test program can be started in two different manners and consists of two parts: a self test and a periphery test. With the self test the following parts of the µP are tested:
- RAM
- data ROM
- Stack
- Timer

Simultaneously depress keys PLAY, << and >> (20, 21 and 24 in Fig. 1). Keep these three keys depressed while the mains voltage is switched on. The "PLAY" key should not be depressed too long after switching on because the next test is started with this key. As a result of this operation the self test is started in the microprocessor.
If the set does not go into the testmode, it can be started in another way. Mount a resistor of 33 kΩ between the points 7 and 8 of connector C40 on the supply printed panel. Upon depressing the button POWER ON the self test will start. At the end of the test, the resistor has to be removed, so that the set can be operated normally again.
A favourable outcome of the self test is indicated on the display by lighting up of all fields (Fig. 2).

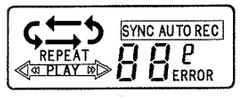


Fig. 2-2 Display cassetterecorder (6572)

If nothing appears on the display and neither on the clock and data line (pins 8 and 9 resp.) a signal is present, the µP is defective. If there is a signal, there will be a defect in the Display Driver (7571) or the LCD (6572).

If the result of the self test is positive, the "full" display is the starting point for the periphery test. Here the start is a test for the keyboard. Keys 20 to 23, 25 to 28 and 31 to 33 shown in Fig. 2 can be tested for their functioning. In case of a good working, when one of these keys is depressed, the display will extinguish completely. If the key is released, all fields will light up again. The PLAY key (24) will be used later.

In this test the following measurements can be performed:
- At the output gates D0.....D7 (pins 29 to 36) a square-wave voltage is present. If not, the µP is defective.
- At the input gates C5, C6 and C7 (pins 21, 22 and 23) the same square-wave voltage appears dependent on the depressed key. If during normal operation the function is nevertheless not performed, the µP will be defective.
  If square-wave voltage is present, the keyboard will be completely or partly defective. Because only one line is allowed to be active if one key is depressed, it will be easy to detect indirect short-circuits.

The PLAY key (24) should be the last one to be depressed, because this is the command to start the next test. Here some fuctions of the cassette mechanism can be tested according to points (1) through (4).

(1) **Depress the PLAY key (24).**
µP: Brings mechanism in record mode.
If this is the case, proceed to (2).

The record switch is not operated;
- If the display does **not** extinguish when other keys are actuated, it is certain that the PLAY key **is** read.
- Check the mechanical transfer between mechanism and record switch on the record PCB.
- Measure on the µP: pin 10 "high", pin 11 "low" and pin 13 "low". If the levels are not present, the µP is defective.
- Measure the reel motor voltage.
  If it is not present, BA6109 (7504) or the reel motor is defective.
- Check the mechanism.

The record switch is constantly switched on and off as long as the PLAY key (24) remains depressed;
- Check the mechanical transfer between mechanism and record switch on the record PCB.
- Measure on the µP,at pin 34 "high" level. If this is not the case the µP will be defective.
- Measure on the µP, at pin 22 "high" level. If it is not present, record switch contaminated, transistor 7506 on diode 6503 defective. (Gate 22 has been tested and can therefore not be defective.)

(2) **Depress the PLAY key (24).**
µP: Turns the head.
If the head has been turned, proceed to (3).
If the head does not turn:
- Measure on the µP: pin 10 "low" and pin 11 "high". If not, the µP will be defective.
- Measure the reel motor voltage.
  If it is not present, BA6109 (7504) or the reel motor will be defective.
- Check the mechanism.

If the head turns continuously:
- Measure on the µP at pin 34 "high" level. If it is not present, the µP will be defective.
- Measure on the µP at pin 22 a "high" level. If it is not present, Head Servo Switch (SK61) of the mechanism contaminated, transistor 7507 or diode 6514 defective.

③ **Depress the PLAY key (24).**
µP: Energizes servo relays 1 and 2.
Ⓐ If the slide goes up, check point Ⓑ.
The slide does not move:
– Check if the capstan motor is running.
If not: – Measure on the µP pin 15 a "high" level.
If not: µP, transistors 7514 or 7815 defective.
– Measure voltage across relay 1.
Not present: transistors 7516 or 7523 or relay defective.
The slide moves up and down as lang as the PLAY key is depressed:
– Measure on the µP at pin 34 a "high" level. If not present, the µP will be defective.
– Measure on the µP pin 23 a "high" level. If not present, the Slide Servo Switch (SK 60) may be contaminated, transistor 7505 or diode 6502 may be defective.

Ⓑ The slide is at the half position, check point Ⓒ.
The slide is in the play mode.
Leave the test routine by switching off the set.
(Remove the resistor of 33 kOhm.)
Switch the set on again.

Measure at pin 14 of the µP and depress the WIND key (20 or 21).
A positive pulse should appear here.
If there is no pulse, the µP will be defective.
If there is a pulse, check transistors 7520 and 7513 and relay 2.
In order to continue the test, repeat the start-procedure.

Ⓒ The right-hand reel turns slowly, proceed to ④.
The right-hand reel is turning rapidly:
– Measure at pin 13 of the µP a "high" level. If not, the µP will be defective.
– Measure the voltage at pin 4 of BA6109 (7504).
If 3V is present: check BA6109 (7504).
If this voltage is not present, check transistor 7510 and zener diodes 6507 and 6508.

④ **Depress the PLAY key (24).**
µP: Returns to the application program.

If all the preceding tests have been passed well, the set can be used in the normal operation.

AUTOTEST FOR COMPACT DISC CONTROL AND DISPLAY PROCESSOR MAB8440P (7501)

With this autotest the following parts of the µP are tested:
– RAM
– ROM
– Timer
– Serial I/O interface
– I/O gates

The self test is started via performance of the following operations:
– Interrupt the I^2C connection to connector B404 on the µ-PROC PCB.
– Render pin 2 of the Control+Display µP "low" (mass) and switch on the power supply voltage.
– The test starts if pin 2 is rendered "high" again (disonnect mass connection).
– If all tests are positive, pin 1 of the Control+Display µP will go "low" within 1 second.

COMPACT DISC SERVO PROCESSOR MAB8440P (6105)

The test program consists of two parts:
1. The self test (starting by hardware adaptations)
2. The service program (soft-touch start).

1. With the selftest the following parts of the µP are tested:
– RAM
– ROM
– Timer
– Serial I/O interface
– I/O gates

The autotest is started through performance of the following operations:
– Interrupt the I^2C connection to connector 35-2 on the Servo PCB.
– Unsolder pins 1, 7, 26 and 27 of the servo µP.
– Render pin 2 of the servo µP "low" (mass) and switch on the power supply voltage.
– The test starts if pin 2 is rendered "high" again (disconnect mass connection).
– If all tests are positive, pin 1 of the servo µP will go low within 1 second.

2. The service program is started as follows:
– Service position "0".
Simultaneously depress the PREVIOUS, NEXT and TIME/TRACK (37, 38 and 40) keys.
Keep these keys depressed while the mains voltage is switched on.

This is the stand-by mode, on the display appears "0".

In this mode it is possible to move by means of the F.FORW. (43) and F.REV. (44) keys the arm with a minimum torque outwards and inwards resp.
In this way the free motion of the arm across the disc can be checked.

– Service position "1".
From service position "0" the player can be brought to service position "1" by depressing the NEXT key (37).

In this mode the **laser** emits **light** and the objective starts to **focus**.
When the focal point has been reached, "1" appears on the display.

When **no** disc has been inserted, the objective goes 16× to and fro.
Then the player reassumes service position "0".

As in service position "0" the arm can be moved across the diameter of the disc by means of the F.FORW. (43) and F.REV. (44) keys.

– Service position "2".
To be reached by depressing the NEXT key (37) after service position "1" has been reached.
The **turntable motor** starts to **run**.

On the display appears "2".

In preparation of the transition to service position "3" the arm is sent to the centre of the disc.

– Service position "3".
To be reached by depressing the NEXT key (37) after service position "2" has been reached.

The radial control is **switched on**. The **subcode information** is **generated**, mute is high so that **music information** is **released**.

On the display appears "3".

(Dependent on the length of the run-in track music will be played after approx 1 min.)

In this mode it is possible to move the arm by means of the F.FORW. (43) and F.REV. (44) keys outwards and inwards resp.

The movement is checked by the µP now and the arm moves by steps of 64 tracks, as long as the key is operated.

If one of the service positions 1, 2 or 3 is disturbed (e.g. braking or removing cover plate), the player reassumes service position "0".

The service program can be left by switching off and on again the mains switch (POWER ON/OFF).

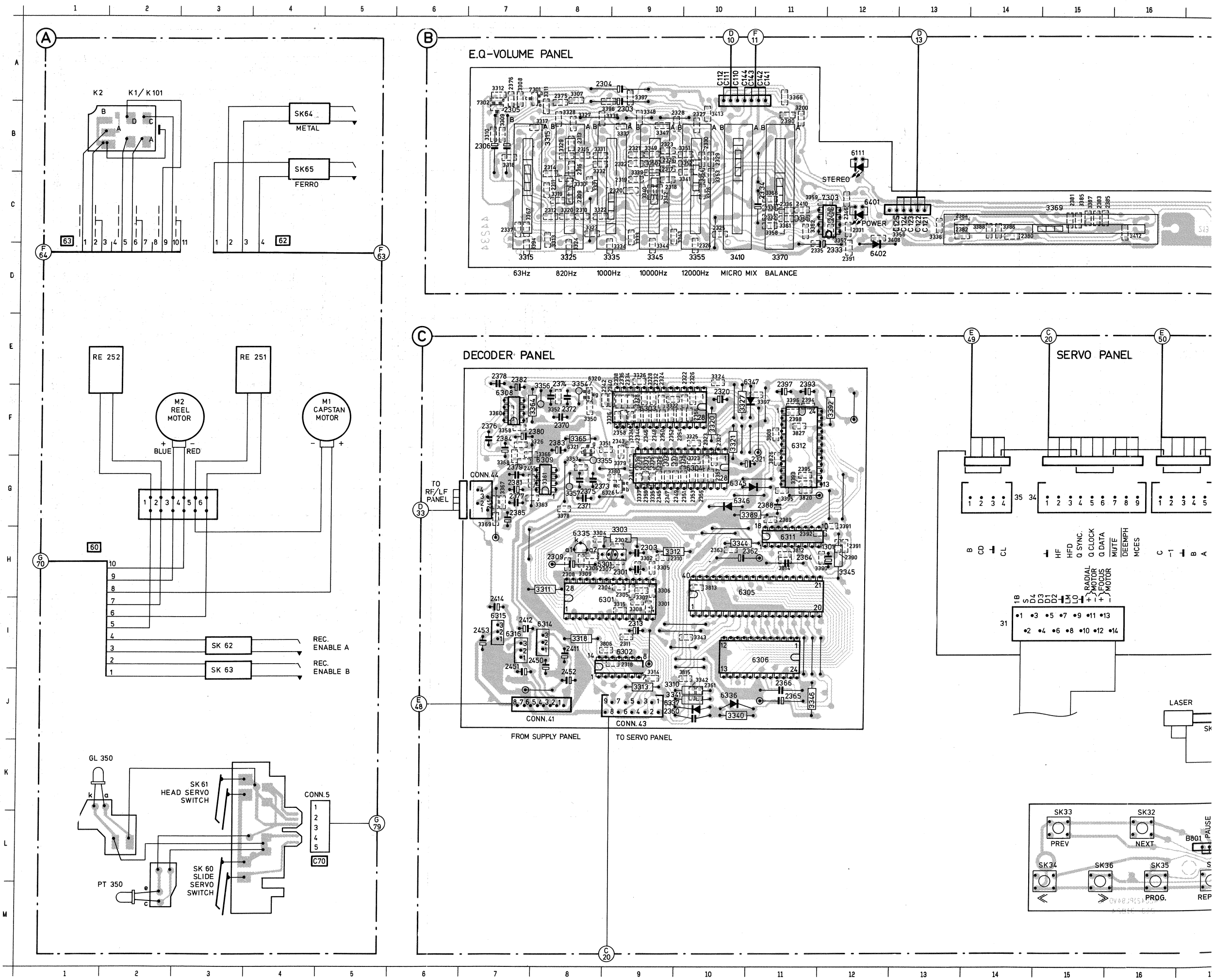
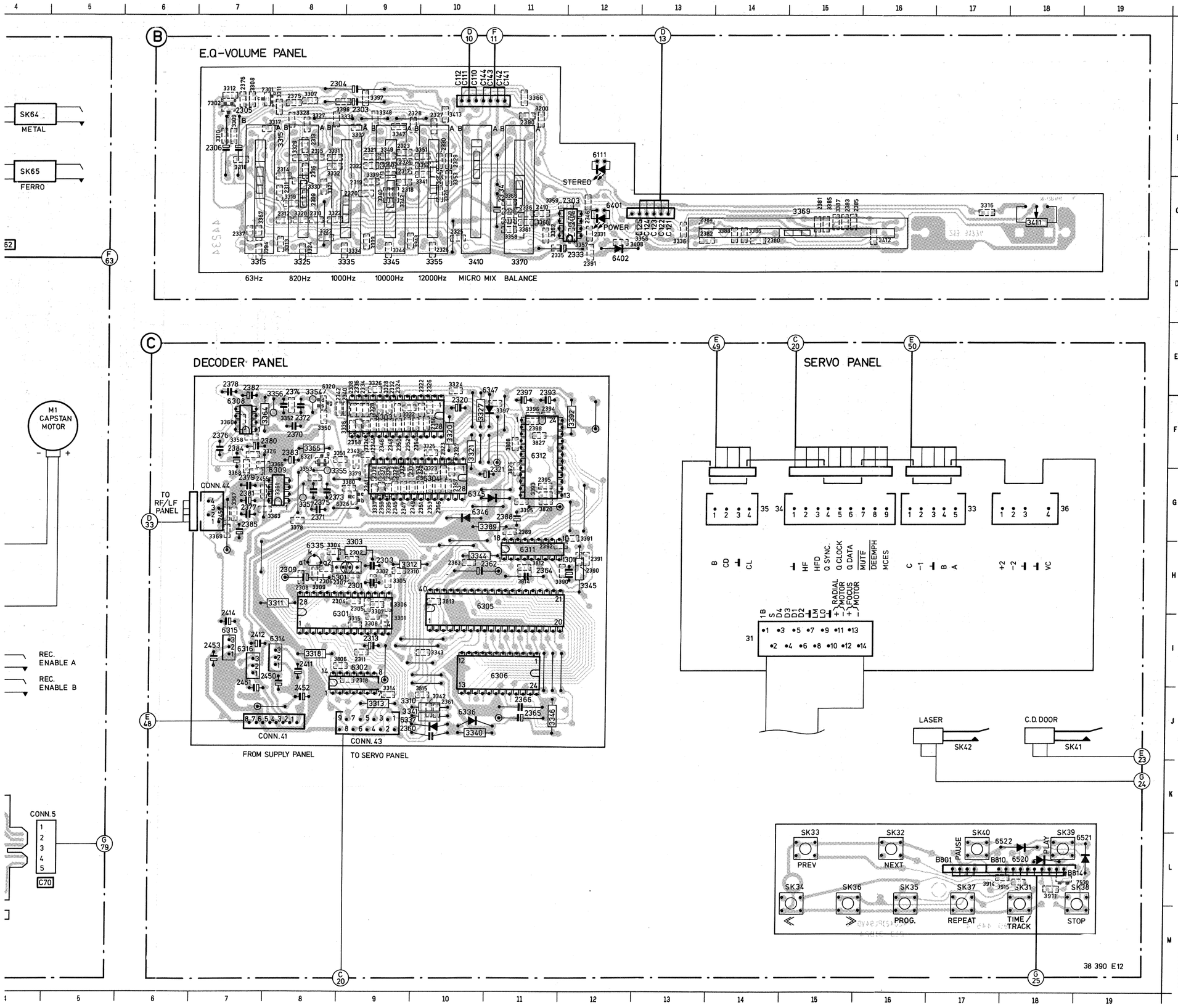

A
K2
K1/ K101
B
D
C
A
SK64
METAL
SK65
FERRO
63
1 2 3 4 5 6 7 8 9 10 11
1 2 3 4
62
F 64
F 63
RE 252
RE 251
M2
REEL
MOTOR
+
BLUE
−
RED
M1
CAPSTAN
MOTOR
− +
1 2 3 4 5 6
60
G 70
10
9
8
7
6
5
4
3
2
1
SK 62
REC.
ENABLE A
SK 63
REC.
ENABLE B
GL 350
k
a
SK 61
HEAD SERVO
SWITCH
CONN.5
1
2
3
4
5
C70
G 79
PT 350
e
c
SK 60
SLIDE
SERVO
SWITCH
B
E.Q-VOLUME PANEL
D 10
F 11
D 13
C112
C111
C110
C144
C143
C142
C141
2304
2305
2303
2306
6111
STEREO
6401
POWER
6402
3315
3325
3335
3345
3355
3410
3370
63Hz
820Hz
1000Hz
10000Hz
12000Hz
MICRO MIX
BALANCE
C
DECODER PANEL
TO
RF/LF
PANEL
D
33
CONN. 44
E
48
CONN. 41
FROM SUPPLY PANEL
CONN. 43
TO SERVO PANEL
6301
6302
6303
6304
6305
6306
6308
6309
6311
6312
6315
6316
6335
6336
6345
6346
6347
E
49
C
20
E
50
SERVO PANEL
1 2 3 4
35 34
1 2 3 4 5 6 7 8 9
1 2 3 4 5
B
CD
CL
HF
HFD
Q SYNC.
Q CLOCK
Q DATA
MUTE
DEEMPH
MCES
C
−1
B
A
RADIAL
MOTOR
FOCUS
MOTOR
1B
S
D4
D3
D1
D2
LM
LO
31
•1 •3 •5 •7 •9 •11 •13
•2 •4 •6 •8 •10 •12 •14
LASER
SK
SK33
PREV
SK32
NEXT
B801
PAUSE
SK34
SK36
SK35
PROG.
REP
C
20

fig. 2-3



	1301	H12	2397	E11	3369	G 7
	2301	H 9	2398	F11	3370	D11
	2302	H 9	2409	C12	3378	G 8
	2303	B 9	2410	C11	3379	G 9
	2303	H 9	2411	I 8	3380	G 9
	2304	A 8	2412	I 7	3385	C15
A	2304	H 9	2414	H 7	3386	C14
	2305	B 7	2450	I 8	3387	C15
	2305	H 9	2451	I 7	3388	C14
	2306	B 7	2452	J 8	3389	G11
	2306	H 8	2453	I 7	3390	H12
	2307	H 9	2455	G 7	3391	G12
	2308	H 8	2456	G 7	3392	F12
	2309	C 8	3200	B11	3393	G11
	2309	H 8	3301	I 9	3394	C 7
B	2310	C 8	3302	H 9	3395	G11
	2310	H10	3303	H 9	3396	B 9
	2311	C 8	3304	H 8	3396	F11
	2311	I 9	3305	H 9	3397	A 9
	2312	C 8	3306	H 9	3397	F11
	2313	B 8	3307	A 8	3408	C13
	2313	I 9	3307	H 9	3410	D10
	2314	B 8	3308	A 7	3411	C18
	2315	B 8	3308	I 9	3412	C16
	2316	B 8	3309	B 7	3413	B10
C	2317	B 9	3309	H 8	3806	I 9
	2318	C 9	3310	B 7	3808	F11
	2318	I 9	3310	J 9	3812	H11
	2319	C 9	3311	A 8	3813	H10
	2320	C 9	3311	H 8	3814	H11
	2320	F10	3312	A 7	3815	J10
	2321	B 9	3312	H 9	3820	G11
	2321	G11	3313	C 8	3826	F11
	2322	B 9	3313	J 9	3827	F11
	2322	E10	3314	J 9	3911	L18
D	2323	B 9	3315	D 7	3914	L17
	2323	F10	3315	B 8	3915	L18
	2324	B 9	3315	I 9	5301	H 9
	2324	E 9	3316	C17	6111	B12
	2325	C10	3317	B 8	6301	I 9
	2325	G10	3318	B 7	6302	I 9
	2326	C10	3318	I 8	6303	F 9
	2326	E10	3319	C 8	6304	G10
	2327	B10	3320	C 8	6305	H11
E	2327	F10	3320	F10	6306	I11
	2328	B 9	3321	C 8	6308	F 7
	2328	F 9	3321	F10	6309	G 8
	2329	B10	3322	C 8	6311	H11
	2329	G 9	3322	F 9	6312	F11
	2330	B10	3323	C 8	6314	I 8
	2331	C12	3323	G10	6315	I 7
	2332	C11	3324	C 8	6316	I 7
	2332	E 9	3324	E10	6320	E 8
	2333	D12	3325	D 8	6321	F 8
F	2333	F10	3325	F10	6326	G 9
	2334	C11	3326	C10	6335	H 8
	2334	E 9	3326	E 9	6336	J10
	2335	D11	3326	F 8	6337	J 9
	2335	G 9	3327	B 8	6345	G10
	2336	C11	3327	F10	6346	G10
	2336	E 9	3328	B 8	6347	E11
	2337	C 7	3328	E 9	6401	C12
	2337	G 9	3329	B 8	6402	D12
G	2338	C11	3329	F 9	6520	L18
	2338	E 9	3330	C 8	6521	L19
	2339	G 9	3331	B 8	6522	L18
	2340	E 9	3332	B 8	7301	A 8
	2341	G 9	3333	C 9	7302	A 7
	2342	E 9	3334	C 9	7303	C12
	2343	F 9	3334	F 9	7530	L19
	2344	F 9	3335	D 9	SK31	L18
	2345	G 9	3335	G 9	SK32	L16
	2346	C12	3336	C13	SK33	L15
H	2346	F 9	3336	F 9	SK34	L15
	2347	G 9	3337	B 9	SK35	L16
	2348	F 9	3337	G 9	SK36	L16
	2349	G10	3338	B 9	SK37	L17
	2350	F 9	3339	B 9	SK38	L19
	2351	G10	3340	C 9	SK39	L18
	2352	F 9	3340	J10	SK40	L17
	2353	G10	3341	C10	SK41	J18
	2354	F10	3341	J 9	SK42	J17
	2355	G10	3342	C 9	SK60	L 3
I	2356	F10	3342	J10	SK61	K 3
	2357	G10	3343	C10	SK62	I 3
	2358	F 9	3343	I10	SK63	I 3
	2359	G 9	3344	C 9	SK64	B 4
	2360	J 9	3344	H10	SK65	B 4
	2361	J10	3345	D 9		
	2362	H11	3345	H12		
	2363	H10	3346	J11		
	2364	H11	3347	B 9		
J	2365	J11	3348	B 9		
	2366	J11	3349	B 9		
	2370	F 8	3350	B 9		
	2371	G 8	3350	F 8		
	2372	F 8	3351	B10		
	2373	G 8	3351	F 9		
	2374	E 8	3352	B10		
	2375	A 8	3352	F 8		
	2375	G 8	3353	B10		
	2376	A 7	3353	F 8		
K	2376	F 7	3354	B10		
	2377	G 7	3354	E 8		
	2378	E 7	3355	D10		
	2379	G 7	3355	G 9		
	2380	C14	3356	C13		
	2380	F 8	3356	E 8		
	2381	C15	3357	C12		
	2381	G 7	3357	G 8		
	2382	C13	3358	C11		
L	2382	E 7	3358	F 7		
	2383	C15	3359	C11		
	2383	F 8	3360	C11		
	2384	C13	3360	F 7		
	2384	F 7	3361	C11		
	2385	C16	3361	G 8		
	2385	G 7	3362	C11		
	2388	G11	3363	G 8		
	2389	G11	3364	F 8		
	2390	B11	3365	F 8		
M	2390	H12	3366	A11		
	2391	D12	3366	F 8		
	2391	H12	3367	C 7		
	2392	H11	3367	G 7		
	2393	E11	3368	C11		
	2394	F11	3368	G 7		
	2395	G11	3369	C15		

fig. 2-3

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DRA AAO
T12/605

CS 1 732

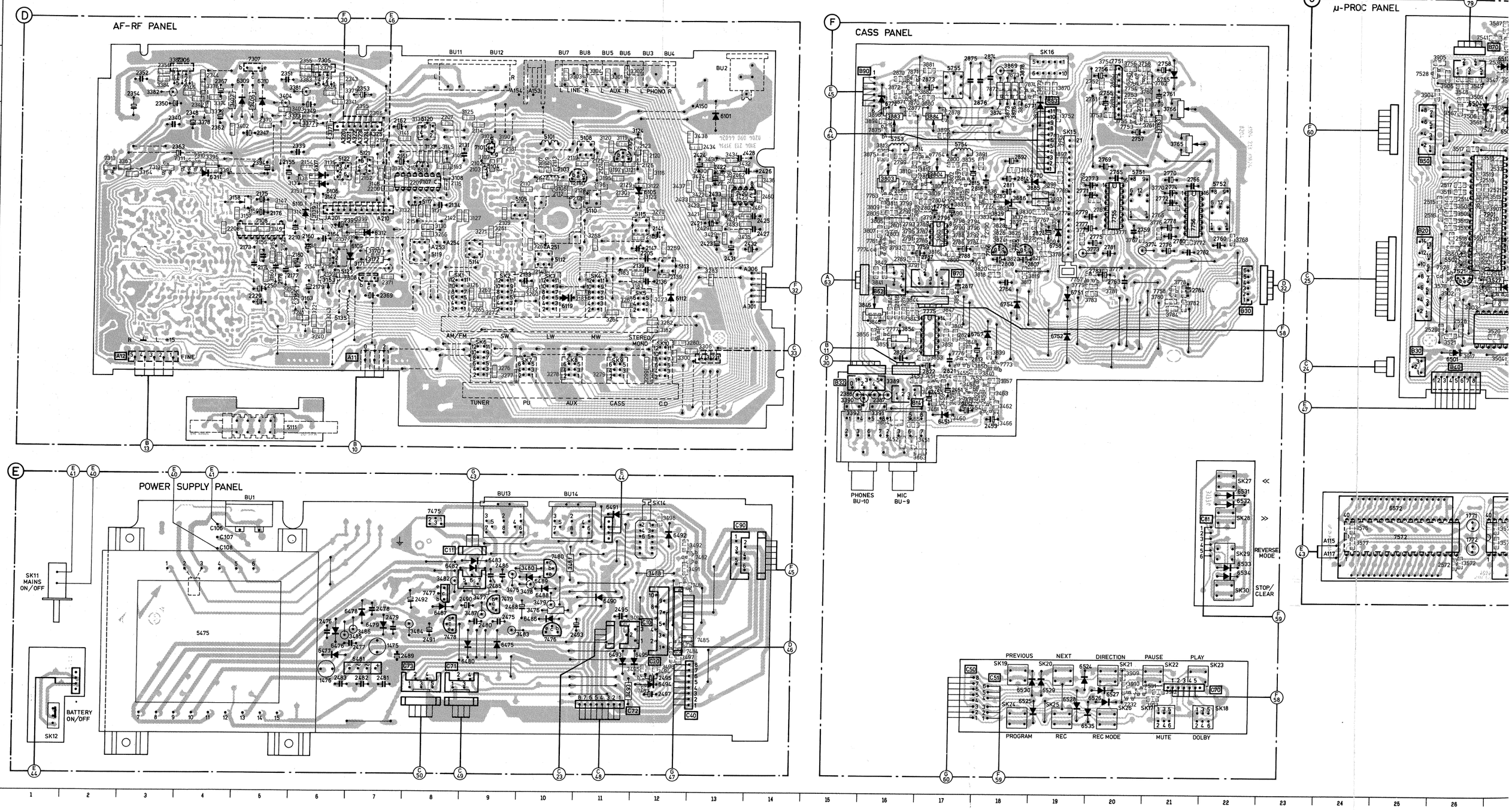
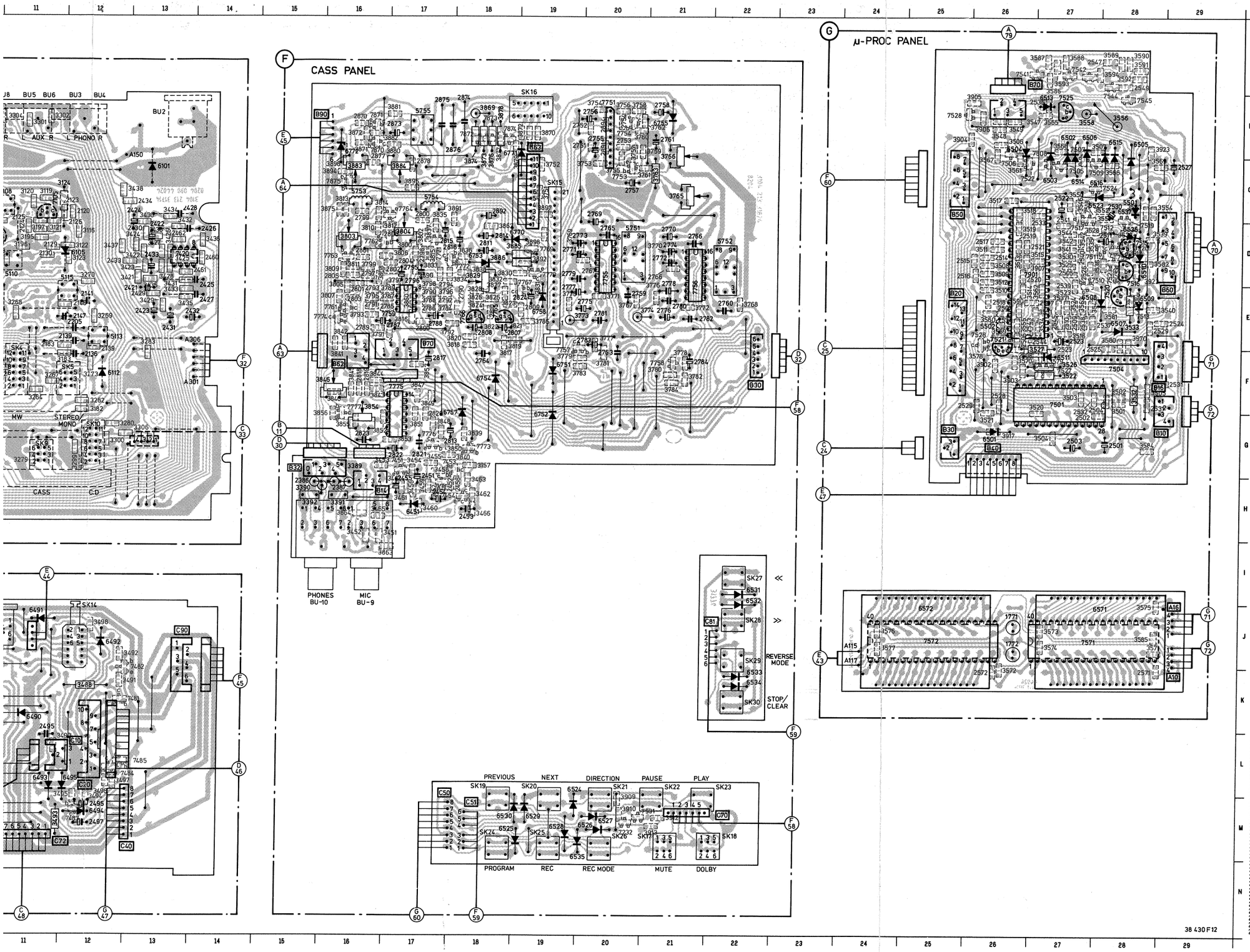

AF-RF PANEL
CASS PANEL
μ-PROC PANEL
POWER SUPPLY PANEL
PHONES BU-10
MIC BU-9
SK11 MAINS ON/OFF
SK12 BATTERY ON/OFF
REVERSE MODE
STOP/ CLEAR
PREVIOUS
NEXT
DIRECTION
PAUSE
PLAY
PROGRAM
REC
REC MODE
MUTE
DOLBY
AM/FM
SW
LW
MW
STEREO MONO
TUNER
PU
AUX
CASS
CD
L LINE R
L AUX R
L PHONO R
FINE

Fig. 2-4



1475	L 7	2479	L 7	2822	G17	3407	B 4	3580	E28	3875	C16	6757	G18
1476	M 6	2480	L 9	2823	G16	3421	D13	3581	E28	3876	C18	6758	E19
1771	J27	2481	M 7	2824	E19	3422	D13	3582	D29	3877	B18	6770	D19
1772	J27	2482	M 7	2870	B16	3423	D13	3585	J29	3878	B18	6772	B16
2102	D 9	2483	M 6	2871	B16	3424	D13	3586	A27	3879	C19	7101	C 9
2103	D 9	2485	K 9	2873	B17	3425	D13	3587	A27	3880	B17	7103	D10
2109	E 9	2486	K 9	2874	B18	3426	D13	3588	A27	3881	B17	7105	C11
2110	D10	2488	L 9	2875	B18	3427	D13	3589	A28	3882	B17	7107	D 8
2111	D10	2489	L 8	2876	B18	3428	D13	3590	A28	3883	C16	7108	E 5
2112	D10	2490	K 9	2877	B16	3429	E13	3590	E27	3884	C17	7232	M21
2113	C10	2491	L 8	2878	C17	3430	C13	3591	A28	3885	D19	7305	B 6
2114	C 9	2492	K 8	2890	D17	3431	E13	3592	A28	3886	D18	7306	B 3
2116	D 8	2493	L11	2890	E17	3432	D13	3593	A27	3891	C18	7307	B 5
2119	C10	2495	L11	2891	B20	3433	E13	3594	A28	3892	D19	7308	F 6
2120	C12	2495	M12	2892	C18	3434	C13	3751	C19	3894	C16	7310	C 4
2121	D10	2497	M12	2894	B20	3435	E13	3752	C19	3895	C17	7311	D 3
2123	C12	2501	G28	3102	C 9	3436	D14	3753	C20	3896	C16	7312	D 3
2124	D11	2502	G28	3103	C 9	3437	D12	3754	B20	3897	C19	7313	D 2
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2128	D11	2505	D27	3108	D 8	3452	L16	3757	B21	3903	F26	7451	G17
2129	D11	2506	E27	3109	D10	3453	G17	3758	B21	3904	B26	7452	H17
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2131	F 8	2507	E27	3119	C11	3455	G17	3760	B21	3906	B26	7454	H18
2132	F10	2508	F27	3120	C11	3456	H17	3761	C21	3907	D27	7475	J 8
2133	F10	2509	E28	3121	D11	3458	G18	3762	B21	3909	M21	7476	L10
2134	D 8	2510	E27	3122	D12	3460	H17	3762	B21	3910	M21	7477	K 8
2136	F12	2511	D28	3123	D12	3461	H17	3763	C21	3912	M21	7478	L 8
2138	E12	2514	D25	3124	C12	3462	H18	3785	C21	3913	M21	7479	K 8
2139	F12	2515	D26	3125	C 8	3463	H18	3786	B21	3917	D26	7480	K10
2141	E12	2516	D26	3126	F 9	3464	H17	3767	E20	3918	D28	7481	K13
2142	E 8	2517	D26	3127	E 9	3465	H17	3768	E22	3920	D28	7482	K13
2143	F10	2518	E26	3130	E 8	3466	H18	3769	D20	3922	D29	7483	M12
2146	E12	2519	D27	3131	D 8	3475	K 9	3770	D21	3923	B29	7484	L13
2147	E12	2520	D27	3132	D 7	3476	L10	3771	E20	3924	E27	7485	L13
2150	E 8	2521	D27	3133	C 8	3477	K 9	3772	E22	3970	E28	7501	F27
2151	D 8	2522	C27	3134	C 8	3478	K10	3773	E20	5101	C10	7504	F28
2152	D 7	2523	E28	3135	D 7	3479	L10	3774	E21	5104	D 9	7505	C27
2153	D 7	2523	F27	3136	D 6	3480	K10	3775	E21	5105	D10	7506	C28
2154	D 6	2524	E29	3137	D 5	3481	K11	3776	E21	5108	C11	7507	B27
2154	E 6	2525	F28	3138	D 6	3482	K 8	3777	E20	5110	D11	7508	B27
2155	D 5	2526	D28	3139	D 6	3483	L10	3778	F21	5111	H 5	7509	C28
2156	C 7	2527	C29	3141	C 7	3484	L 8	3779	F19	5112	E10	7510	D28
2156	C 7	2528	F28	3142	D 6	3485	L 7	3780	F21	5113	E 9	7511	D28
2157	E 6	2529	E29	3143	D 5	3486	L 7	3781	F20	5114	E 9	7512	D28
2158	E 6	2529	F26	3145	C 8	3487	L 9	3782	F22	5115	D12	7513	E29
2159	F 6	2530	C28	3146	C 8	3488	K12	3783	F20	5117	D 8	7514	D28
2160	F 6	2531	F29	3147	D 8	3490	L12	3784	E18	5118	E 8	7515	D29
2161	C 7	2531	F29	3148	D 7	3491	K13	3784	F21	5120	C 8	7516	D28
2162	C 7	2532	G28	3149	E 5	3492	J13	3785	E19	5121	C 7	7517	D28
2163	D 8	2533	C27	3153	F 6	3493	M12	3787	E17	5122	C 6	7518	C28
2164	E 6	2534	E26	3157	G18	3494	M12	3788	E17	5123	F 6	7519	D29
2165	E 6	2536	B27	3157	E 5	3495	M12	3789	E17	5135	F 6	7520	D28
2174	E 5	2537	E28	3158	D 4	3496	M12	3790	E17	5384	G29	7521	E26
2175	D 5	2538	E28	3159	D 5	3497	L13	3791	E17	5475	L 4	7522	C27
2176	D 5	2539	E27	3160	F 5	3498	J12	3792	E18	5501	C28	7523	D28
2177	F 5	2540	D28	3161	E 6	3501	F28	3793	E16	5502	E26	7524	C28
2178	F 5	2541	C27	3162	E 5	3502	F28	3795	E16	5751	D21	7525	B27
2179	F 6	2543	E27	3163	F 6	3503	F27	3796	E18	5752	D22	7526	E26
2180	E 6	2544	E27	3164	F 6	3504	G27	3797	D17	5753	C16	7527	F27
2181	C 9	2545	E27	3165	E 5	3505	F29	3798	D17	5754	C17	7528	B26
2182	F11	2547	A28	3170	C 7	3506	B27	3799	D16	5755	B17	7531	M21
2183	F11	2549	A28	3171	E 7	3507	B28	3800	D17	5771	J28	7541	A27
2190	D10	2571	K29	3172	E 7	3508	D26	3802	D17	6101	C13	7542	A27
2201	D 8	2572	K26	3182	G12	3509	D26	3803	D16	6105	D12	7544	A28
2205	E12	2751	B20	3183	F12	3510	E26	3804	D17	6106	D 6	7545	B29
2207	C 8	2752	B20	3190	C 9	3511	D26	3805	E16	6107	D 6	7572	C25
2208	E 4	2753	B20	3195	D11	3512	D26	3806	D17	6109	E 7	7751	B20
2209	D 7	2754	B20	3196	D11	3513	D27	3807	E16	6110	D 6	7753	C20
2210	E 5	2755	B20	3197	D11	3514	E27	3808	D17	6112	F12	7754	B20
2229	F 5	2756	B20	3221	F 6	3515	D27	3809	D16	6118	D 8	7755	D20
2250	F 5	2757	C21	3240	D 6	3516	E28	3810	D16	6119	F10	7756	E22
2339	C 6	2758	B21	3241	F 6	3517	C26	3811	D16	6309	B 4	7757	F19
2340	C 3	2759	E21	3243	F 6	3518	C27	3812	D17	6310	B 5	7758	F21
2341	B 6	2760	E22	3250	F 5	3519	D27	3813	C16	6311	D 4	7759	E17
2342	C 4	2761	B21	3260	F10	3520	F27	3814	C17	6312	E 7	7761	E16
2343	B 6	2763	F20	3261	E 9	3521	G26	3815	D17	6451	H17	7762	D16
2344	B 4	2764	F18	3262	E10	3522	F27	3816	E17	6475	L 9	7763	D16
2345	B 6	2765	D20	3263	F 9	3523	E27	3817	F19	6476	L 6	7764	C17
2346	B 3	2766	D22	3264	F11	3524	E28	3818	E18	6477	L 6	7765	E18
2347	C 5	2766	D21	3265	F 9	3525	D27	3818	F16	6478	L 7	7766	E18
2348	C 4	2767	D20	3266	E 8	3526	F27	3819	E19	6479	L 7	7767	D19
2349	C 6	2769	C20	3267	F11	3527	F27	3819	F16	6480	M 9	7769	D19
2350	C 3	2770	D21	3268	E11	3528	D28	3820	E18	6481	M 7	7770	D19
2351	B 5	2771	D20	3269	E12	3530	D27	3821	E19	6482	K 8	7771	D17
2352	B 3	2772	D21	3270	D12	3531	E27	3822	E18	6483	K 9	7772	D18
2353	B 7	2773	D20	3271	E 9	3532	F29	3823	E19	6486	L10	7773	G18
2354	B 3	2774	D21	3272	F 9	3533	E28	3824	E18	6487	L 8	7774	E16
2355	B 6	2775	E20	3273	F12	3534	E27	3825	E18	6488	K10	7775	E17
2356	B 3	2776	E21	3276	G 9	3535	D28	3826	E18	6489	K10	7776	G17
2362	C 4	2777	E20	3277	D 9	3536	D28	3827	E18	6490	K11	7777	F16
2363	C 3	2778	E21	3278	G10	3537	E27	3828	E18	6491	J11	7870	B16
2367	B 4	2779	D20	3279	G11	3538	D28	3829	D18	6492	J12	7871	B16
2369	F 7	2780	E21	3280	G13	3539	D29	3830	D18	6493	L11	7872	B18
2370	C 5	2781	E20	3282	F12	3540	E29	3831	E19	6494	M12	7873	B18
2371	F 7	2782	E22	3283	E13	3541	D27	3832	D18	6495	L12	7874	B19
2386	H15	2783	E20	3288	E 6	3542	D28	3833	D17	6501	G26	7875	C16
2387	H16	2784	F22	3289	G12	3542	D27	3834	D18	6502	B27	7901	D27
2394	D 5	2785	E17	3300	G12	3543	E28	3835	C17	6503	C27	SK 1	F 8
2395	C 7	2786	E17	3301	B11	3544	D27	3836	D18	6504	B27	SK 2	F 9
2395	E 6	2787	E17	3302	B11	3545	D28	3837	D17	6505	B29	SK 3	F10
2396	C 7	2788	E17	3303	B10	3546	C28	3838	D18	6506	B28	SK 4	F11
2421	E13	2789	E16	3304	B11	3547	B27	3839	G18	6507	E28	SK 5	F12
2422	D13	2790	E18	3305	G12	3548	B26	3840	G18	6508	E28	SK 6	G 9
2423	E13	2791	E16	3306	G13	3549	B26	3841	F16	6509	E29	SK 7	G10
2424	C13	2792	E18	3363	D 2	3550	C27	3842	E16	6510	D29	SK 8	G10
2425	E14	2793	E16	3364	D 3	3551	C28	3843	F17	6511	F27	SK 9	G11
2426	D14	2794	E18	3371	C 6	3552	C28	3844	F16	6513	B27	SK10	G12
2427	E14	2795	D17	3372	C 4	3553	C28	3845	F16	6514	C28	SK11	K 1
2428	C14	2796	D17	3373	C 5	3554	C29	3846	F16	6515	B28	SK12	N 1
2429	E13	2797	D16	3374	B 4	3555	E27	3846	F16	6516	C28	SK14	J12
2430	D13	2798	D17	3375	B 6	3556	B28	3847	F17	6523	C28	SK15	C19
2431	E13	2799	C16	3376	B 4	3558	B28	3848	G18	6524	M20	SK16	A19
2432	E14	2800	C17	3377	C 6	3559	E26	3849	F17	6525	M19	SK17	M21
2433	D12	2801	D16	3378	C 4	3560	E26	3850	G18	6526	M20	SK18	M22
2433	D13	2801	E16	3379	B 6	3561	C27	3851	G17	6527	M20	SK19	M18
2434	C13	2802	D17	3380	B 3	3562	E27	3852	G17	6528	M19	SK20	M19
2435	E13	2803	E16	3381	B 5	3563	E28	3853	G17	6529	M19	SK21	M20
2436	D13	2804	D17	3382	B 3	3565	B27	3854	G16	6530	M19	SK22	M21
2451	H17	2805	D16	3383	B 6	3566	C28	3855	G16	6531	I23	SK23	M22
2452	H18	2806	D17	3384	B 3	3567	B26	3856	G16	6532	J22	SK24	M18
2453	H18	2807	E19	3389	G16	3568	B27	3857	F17	6533	K23	SK25	M19
2454	H18	2808	E18	3390	H15	3569	B29	3860	E17	6534	K23	SK26	M20
2455	H17	2809	E19	3391	H16	3570	F27	3862	D18	6535	N20	SK27	I22
2456	H18	2810	E18	3392	H15	3571	J29	3863	I17	6536	D28	SK28	J22
2459	H17	2811	D18	3394	D 4	3572	K27	3864	H16	6537	C28	SK29	K22
2460	D14	2813	G18	3395	C 4	3573	J27	3869	B18	6571	J28	SK30	K22
2461	D14	2814	D18	3398	E 6	3574	J27	3870	B19	6572	J25		
2462	D13	2815	D18	3399	E 7	3575	J29	3871	B19	6751	F19		
2475	L 9	2816	D18	3402	C 4	3576	J25	3872	B19	6752	G19		
2476	L 6	2817	F18	3403	C 5	3577	J25	3872	B16	6753	D18		
2477	L 7	2820	G17	3404	B 5	3578	F26	3873	C18	6754	F18		
2478	L 7	2821	G17	3406	B 5	3579	F27	3874	C18	6755	B21		

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DRA AA0
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Fig. 2-4

CHAPTER 3. SUPPLY

DESCRIPTION

The power supply of the CD555 consists of 7 main power supplies; A, B, C, D, E, F and G.
The main supplies A, B, C, D and E feed the CD mechanism and the decoder PCB. B and G feed the microprocessor PCB. F feeds the RF-AF section. The CD power supplies are turned off when the CD is not used. This switching off takes place when the lid of the CD is openend (CD by SK41) or when the CD MUTE switching voltage is absent.
CD MUTE is switched by SK10 on the AF section.
Therefore the supply voltages should be measured in position CD (SK10) and with closed CD lid.
During switching, switching voltage F6 is grounded via transistors 7484 and 7485. The Mute circuit on the LF section arranges that switching plops do not reach the inputs of the output amplifiers.
When the mains-switch key has been demounted, SK12 (Battery ON/OFF) will not be operated anymore. This switch should then be fixed in closed state. If SK12 is not closed, voltages A through E will drop out.
SK14 (Battery Pack) is automatically operated when the battery pack is mounted on the set. In that case, the power supply enters the set via BU13 and BU14. The values of the supply voltages differ, however, from those when the set is fed from the mains. The test values stated do not apply, therefore, when the Battery Pack is used.

ELECTRICAL MEASUREMENTS

Required test equipment

- Multimeter
- Oscilloscope

General conditions

- Selector in position C.D.
- Mains voltage 220 V~ ±2% 50 Hz

SK POSITION	SIGNAL	VOLUME	POWER SUPPLY	RIPPLE (Vpp)	OUTPUT
CD SK10		MIN	A = + 9 V B = + 5 V C = − 9 V D = + 20 V E = − 21 V F = + 38 V G = + 12 V	1 Vpp 20 mVpp 1 Vpp 1,2 Vpp 3 Vpp 350 mVpp 300 mVpp	
AUX SK8	1 kHz	MAX	F = + 31 V G = + 12 V	3,5 Vpp 500 mVpp	BU11 (BU12) 6,5 V~ 10,5 W

SUPPLY PART

ALL VOLTAGES MEASURED IN POSITION CD

Fig. 3-1

1475	D 8	2478	C 8	2483	D 8	2490	C 6	2496	D 3	3478	C 5	3483	C 5	3488	B 3	3494	D 3	5475	C11	6479	C 8	6486	C 5	6491	A 3	7475	A 7	7480	B 5	7485	C 2
1476	D 9	2479	C 8	2485	B 6	2491	C 7	2497	D 3	3479	C 5	3484	C 7	3490	C 4	3495	D 3	6475	D 5	6480	D 6	6487	C 7	6492	B 3	7476	C 5	7481	B 2	SK14	A 3
2475	C 5	2480	C 6	2486	B 6	2492	C 7	3475	C 5	3480	B 5	3485	C 8	3491	B 3	3496	D 3	6476	C 9	6481	D 8	6488	C 5	6493	D 4	7477	C 7	7482	B 2		
2476	C 9	2481	D 8	2488	C 5	2493	C 4	3476	C 5	3481	B 4	3486	C 8	3492	A 2	3497	D 2	6477	D 9	6482	B 7	6489	B 5	6494	D 3	7478	C 7	7483	D 3		
2477	D 8	2482	D 8	2489	D 7	2495	C 3	3477	C 6	3482	B 7	3487	C 6	3493	D 3	3498	A 3	6478	C 8	6483	B 6	6490	C 4	6495	D 3	7479	C 6	7484	C 3		

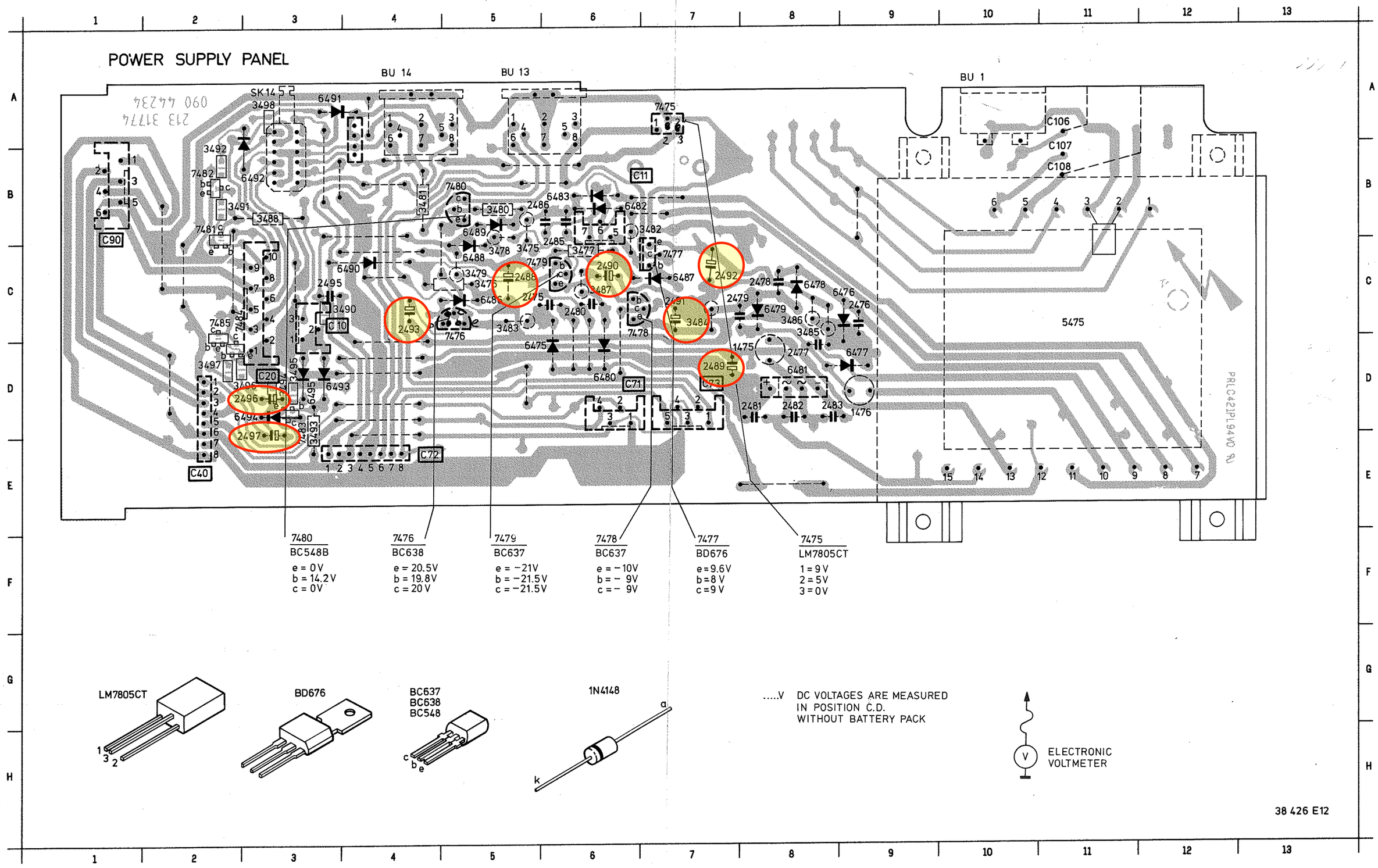

Fig. 3-2

PRS.00992
BEH. BIJ 38426E
DRA AA-1
T12/605

CS 1 736

SUPPLY for non active chip components and separate list

3475		
3485, 3486	NFR25 – 1E	4822 116 53074
3487, 3488		
3482	NFR25 – 4E7	4822 111 30499
2383	NFR25 – 15E	4822 111 30513
3484	NFR25 – 1E8	4822 111 30489
3489	NFR25 – 6E8	4822 111 30504

2492	ELCO 4700 µF/16V	4822 124 21745
2496, 2497	LL ELCO 4µ7/25V	4822 124 40322

6481,	2KBP02 – 7001	4822 130 50363
6476, 6477	1N4001	4822 130 31438
6478, 6479		
6475, 6480	BAX14	4822 130 34193
6482, 6483		
6486, 6487		
6488, 6489	1N4148	4822 130 30621
6490, 6495		
6402	BZX79/6V8	4822 130 34278

7476	BC638	4822 130 41087
7477	BD676	5322 130 44695
7478, 7479	BC637	4822 130 41041
7480	BC548 B	4822 130 40937
7482, 7484	BC848 B ©	5322 130 41982
7485		
7481, 7483	BC858 B ©	5322 130 41983

7475	LM 7805 CT	5322 209 86445

Miscellaneous

5475	Mains Transformer	4822 146 21066
1475	Fuse 3,15 AT	4822 255 40181
1476	Fuse 1,6 AT	4822 253 10046
DIN Plug	BU13, BU14	4822 267 50586
Mains Inlet	BU1	4822 265 20262
Switch Battery on	SK12	4822 276 11563
Switch Battery	SK14	4822 277 10855
Power Switch	SK11	4822 276 11263
491	Insulating plate	4822 255 40181

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1 pF	5%	4822 122 32279
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 32267
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947

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0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90338
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392
4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394

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6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
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18 E	2%	5322 111 90139
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43 E	2%	5322 116 90125
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51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
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91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
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360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545
6,8 k	2%	4822 111 90544

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7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
150 k	2%	5322 111 90099
160 k	2%	5322 111 90264
180 k	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428

HOOFDSTUK 4. H.F. PART

CHAPTER 4. R.F. PART

CHAPITRE 4. SECTION R.F.

ABSCHNITT 4. H.F.-TEIL

CAPITOLO 4. SEZIONE R.F

© Chips 50 V NP0 S1206		
1 pF	5%	4822 122 32279
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 32267
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947

© Chips 0,125 W S1206		
0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90338
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392
4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394

© Chips 0,125 W S1206		
6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
15 E	2%	4822 111 90344
16 E	2%	4822 111 90347
18 E	2%	5322 111 90139
20 E	2%	4822 111 90352
22 E	2%	4822 111 90186
24 E	2%	4822 111 90355
27 E	2%	5322 111 90375
30 E	2%	4822 111 90356
33 E	2%	4822 111 90357
36 E	2%	4822 111 90359
39 E	2%	4822 111 90361
43 E	2%	5322 116 90125
47 E	2%	4822 111 90217
51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
75 E	2%	4822 111 90371
82 E	2%	4822 111 90124
91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
330 E	2%	5322 111 90106
360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545
6,8 k	2%	4822 111 90544

© Chips 0,125 W S1206		
7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
150 k	2%	5322 111 90099
160 k	2%	5322 111 90264
180 k	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428

HF for non active chip components see separate list

3171	NFR25 - IE	4822 116 53074
3158	TRIM LIN 10K	4822 100 10035

2136	PS CAP 365pF/530 V	4822 121 50531
2137	PS CAP 309pF/630 V	4822 121 50628
2147	Cap trimmer	4822 125 60101
2121	Varco	4822 125 50172

6101	BA220	4822 130 34221
6105, 6119	BB809	5322 130 31684
6106, 6107	BA317	4822 130 30847
6109	BZX79/C6V8	4822 130 34278
6110	DA99	4822 130 31482
6112	1N4148	4822 130 30621

7101	2SK 241GR	4822 130 42217
7103	BF241	4822 130 40898
7105	BF494	4822 130 44195
7308	BD135	4822 130 40823

7107	TEA5570	4822 209 81563
7108	TEA5580	4822 209 81996

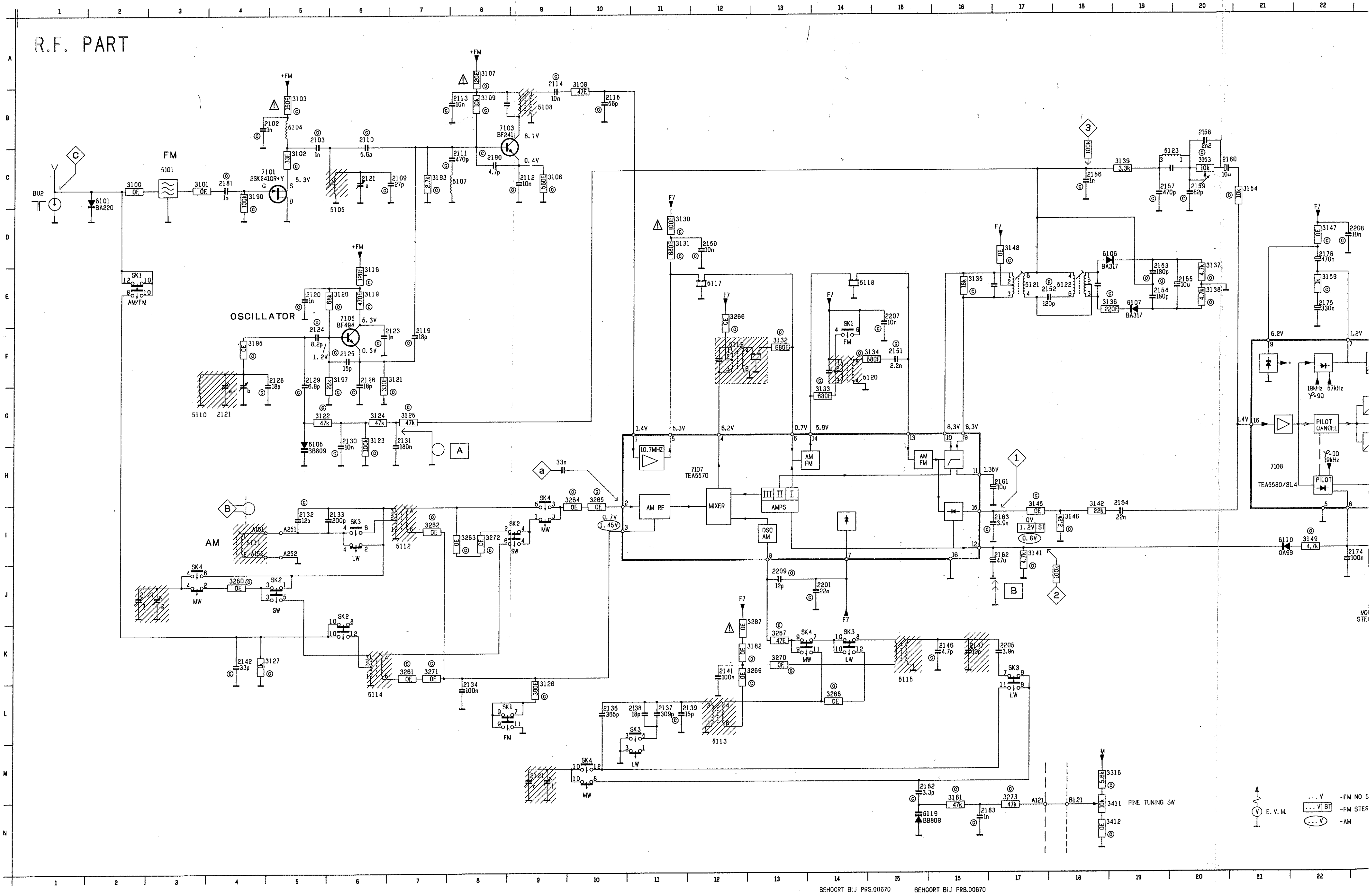
5101	Aerial filter	4822 157 52335
5104	Absorb coil	4822 156 10641
5105	RF coil	4822 157 51693
5107	Coil 0,47 µH	4822 157 50967
5108	IF coil 10,7 MHz	4822 153 50206
5110	Osc. coil	4822 157 51171
5111	Ferroceptor	4822 158 60512
5112	Aerial trafo LW	4822 156 30564
5113	Osc. coil AM	4822 157 51616
5114	RF coil SW	4822 152 10107
5115	Osc. coil SW	4822 156 21386
5117, 5118	Resonator 10,7 MHz	4822 242 70249
5119	IF filter 450 kHz	4822 242 71197
5120	IF coil AM 460 kHz	4822 157 51708
5121	Coil	4822 157 51615
5122	Detector coil FM	4822 153 50208
5123	Coil adjustment	4822 158 60509

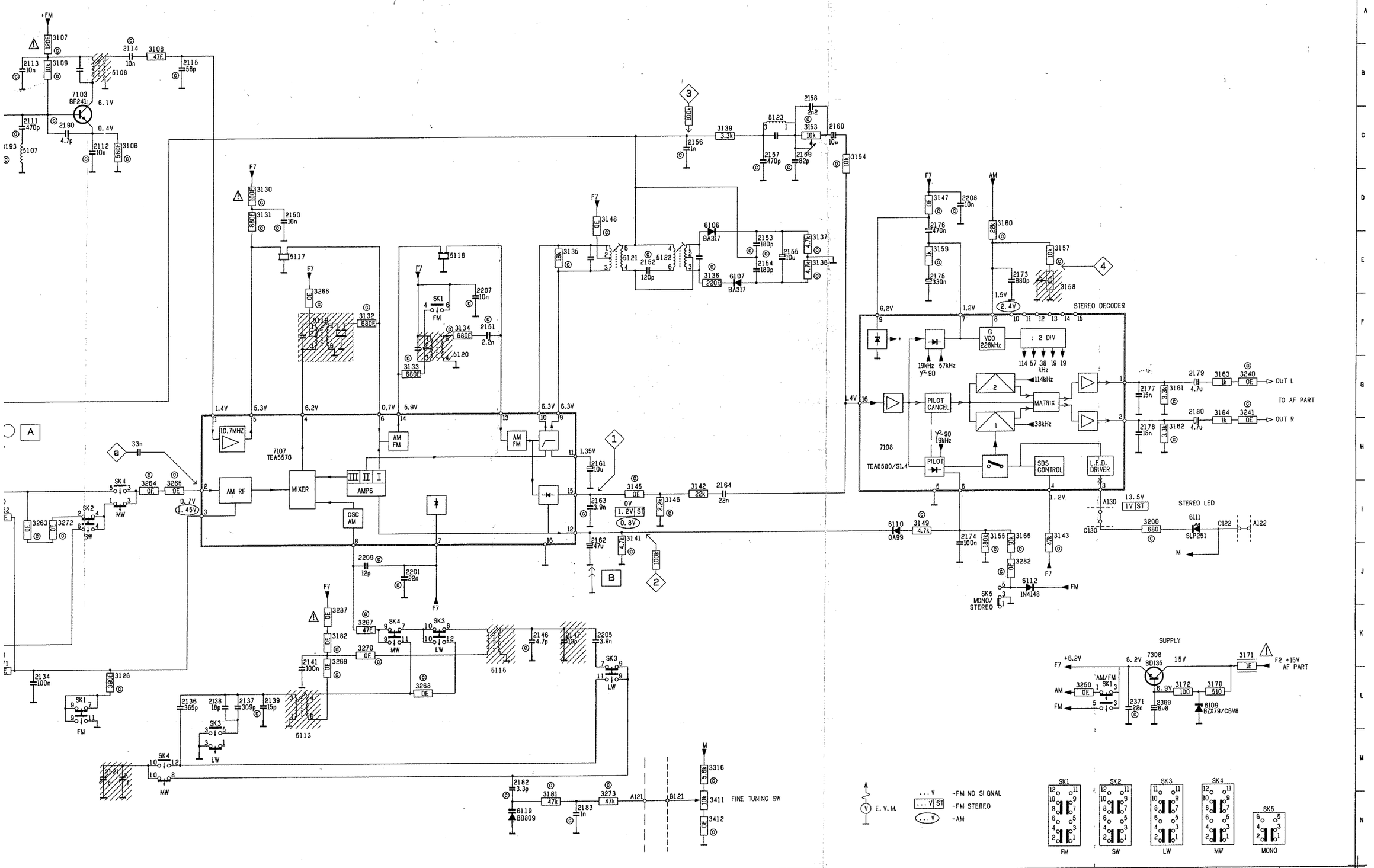
Miscellaneous

478	Antenna bus	4822 267 10168
475	Switch assy	4822 267 50306
476	Switch assy	4822 267 50307

2102	B 5	2112	C 9	2120	E 5	2123	F 7	2129	F 5	2134	L 8	2141	K12	2151	F15	2156	C18	2161	H17	2174	I23	2179	G26	2190	C 8	2209	J13	3102	C 5	3109	B 8	3122	G 5	3127	K 5	3134	F15	3139	C19	3146	I18	3154	C21	3160	D23	3165	I23	3182	K13	3200	I25	3261	K 7	3266	E12	3271	K 7	3316	M19	5105	D 6
2103	B 5	2113	B 8	2121	C 6	2124	F 5	2130	G 6	2136	L10	2142	K 4	2152	E17	2157	C19	2162	I17	2175	E22	2180	G26	2201	J14	2369	K26	3103	B 5	3116	E 6	3123	G 6	3130	D11	3135	E16	3141	I17	3147	D22	3155	I23	3161	G26	3170	K27	3190	C 4	3240	G27	3262	I 7	3267	K13	3272	I 8	3411	N19	5107	C 8
2109	C 7	2114	A 9	2121	G 4	2125	F 6	2131	G 7	2137	L11	2146	K16	2153	E19	2158	B20	2163	I17	2176	D22	2181	C 4	2205	K17	2371	K26	3106	C 9	3119	E 6	3124	G 6	3131	D11	3136	E18	3142	I18	3148	D17	3157	E24	3162	H26	3171	J27	3193	C 7	3241	G27	3263	I 8	3268	L14	3273	M17	3412	N19	5108	B 9
2110	B 6	2115	B10	2121	J 3	2126	F 6	2132	I 5	2138	L11	2147	K16	2154	E19	2159	C20	2164	I19	2177	G25	2182	M15	2207	E15	3100	C 2	3107	A 8	3120	E 6	3125	G 7	3132	F13	3137	E20	3143	I24	3149	I22	3158	F24	3163	G27	3172	K26	3195	F 4	3250	K25	3264	H10	3269	K13	3282	J23	5101	C 3	5110	G 3
2111	C 8	2119	F 7	2121	M 9	2128	F 5	2133	I 6	2139	L12	2150	D12	2155	E20	2160	C20	2173	E23	2178	H25	2183	N17	2208	D23	3101	C 3	3108	A10	3121	F 7	3126	L 9	3133	G14	3138	E20	3145	I17	3153	C20	3159	E22	3164	G27	3181	M16	3197	F 6	3260	J 4	3265	H10	3270	K13	3287	J13	5104	B 5	5111	I 4

R.F. PART





BEHOORT BIJ PRS.00670 BEHOORT BIJ PRS.00670

PRS. 00670
T31/602
DRA AAD

2102	C 8	2128	D10	2150	D 7	2175	D 4	2207	C 8	2351	B 5	2397	B 6	2434	C12	3122	D11	3141	C 7	3162	E 5	3250	F 5	3278	G 9	3364	D 2	3395	C 4	3429	E12	5110	D10	6107	C 5	7306	B 3	SK 8	G10
2103	D 8	2128	D10	2151	D 7	2176	D 5	2208	E 4	2352	B 2	2398	C 6	2435	D12	3123	D11	3142	D 6	3163	F 5	3260	F 9	3279	G10	3371	C 6	3398	E 6	3430	C12	5112	E10	6109	E 6	7307	B 4	SK 9	G11
2109	D 9	2129	D11	2152	D 6	2177	E 5	2209	D 6	2353	C 7	2421	D12	2436	D12	3124	C11	3143	D 5	3164	F 5	3261	E 9	3280	G12	3372	C 4	3399	D 6	3431	D13	5113	E12	6110	D 5	7308	E 6	SK10	G11
2110	D 9	2130	D11	2153	D 5	2178	E 5	2210	E 5	2353	B 6	2422	C12	2460	D13	3125	D 8	3145	C 8	3165	E 5	3262	E 9	3282	F11	3373	C 5	3402	C 4	3432	C13	5114	E 8	6112	F12	7310	C 3		
2111	D 9	2131	C 8	2154	C 5	2179	F 5	2339	C 5	2354	B 2	2423	E12	2461	D13	3126	F 8	3146	C 8	3170	E 6	3263	F 8	3283	E12	3374	B 4	3403	B 5	3433	D13	5115	D11	6118	D 7	7311	C 3		
2112	D10	2132	F 9	2155	C 5	2180	E 5	2340	C 3	2355	B 3	2424	C12	2462	D13	3127	D 8	3147	D 5	3171	E 6	3264	F10	3287	E 7	3375	B 6	3404	B 5	3434	C13	5117	D 7	6119	F10	7312	C 3		
2113	C 9	2133	E 9	2156	C 6	2181	E11	2341	B 6	2356	B 3	2425	D13	3102	C 8	3130	E 7	3148	D 6	3172	E 6	3265	F 8	3288	E 5	3376	B 3	3406	B 4	3435	E13	5119	E 7	6309	B 4	7314	E 6		
2114	C 8	2134	D 8	2157	E 6	2181	C 9	2342	B 3	2362	C 4	2426	D13	3103	C 8	3131	D 7	3149	E 5	3182	F11	3266	E 7	3299	G11	3377	C 5	3407	B 4	3436	D13	5120	C 7	6310	B 4	7343	C 2		
2115	D 8	2136	E11	2158	E 5	2182	F10	2343	B 6	2363	C 4	2427	E13	3106	D10	3132	D 7	3153	F 6	3183	F11	3267	F11	3300	G12	3378	C 3	3421	D12	3437	D12	5121	C 6	6311	D 3	7420	D13		
2119	C10	2136	F11	2159	F 6	2183	E11	2344	B 3	2367	B 4	2428	C13	3107	C 9	3133	D 7	3154	E 5	3190	C 9	3268	E10	3301	B11	3379	B 5	3422	D12	3438	C12	5122	C 6	6312	E 6	SK 1	E 8		
2120	C11	2139	E12	2160	E 5	2185	D 8	2345	B 6	2369	F 7	2429	E12	3108	D 8	3134	C 7	3155	E 4	3195	D10	3269	E12	3302	B11	3380	B 3	3423	D12	5101	C 9	5123	E 6	7101	C 8	SK 2	E 9		
2121	D10	2141	E12	2161	C 7	2187	D 9	2346	B 3	2370	D11	2430	D12	3109	C 9	3135	D 7	3157	D 4	3197	D11	3271	E 8	3303	B10	3381	B 5	3424	D12	5102	C10	5131	D11	7103	D10	SK 3	E 9		
2123	C11	2142	D 8	2163	C 8	2189	D 9	2347	C 4	2370	C 4	2431	E13	3116	D11	3136	C 6	3158	D 4	3240	G 5	3272	F 8	3304	B10	3382	B 3	3425	D13	5104	C 8	5135	F 6	7105	C11	SK 4	E10		
2124	C10	2143	E 9	2164	E 6	2190	D10	2348	C 3	2371	F 7	2432	E13	3119	C11	3137	D 5	3159	D 4	3241	F 5	3273	F11	3305	G11	3383	B 5	3426	D13	5105	D 9	6101	C12	7107	D 7	SK 5	F11		
2125	C10	2146	E11	2173	E 4	2201	D 7	2349	C 5	2394	D 5	2433	D12	3120	C10	3138	D 5	3160	E 5	3242	F 5	3276	G 9	3306	G12	3384	B 3	3427	D12	5107	D 9	6105	D11	7108	D 4	SK 6	G 8		
2126	C11	2147	E11	2174	E 4	2205	E11	2350	B 3	2395	D 6	2433	D12	3121	D11	3139	D 5	3161	E 5	3243	F 6	3277	G 9	3363	C 2	3394	D 4	3428	D12	5108	C10	6106	D 6	7305	B 5	SK 7	G 9		

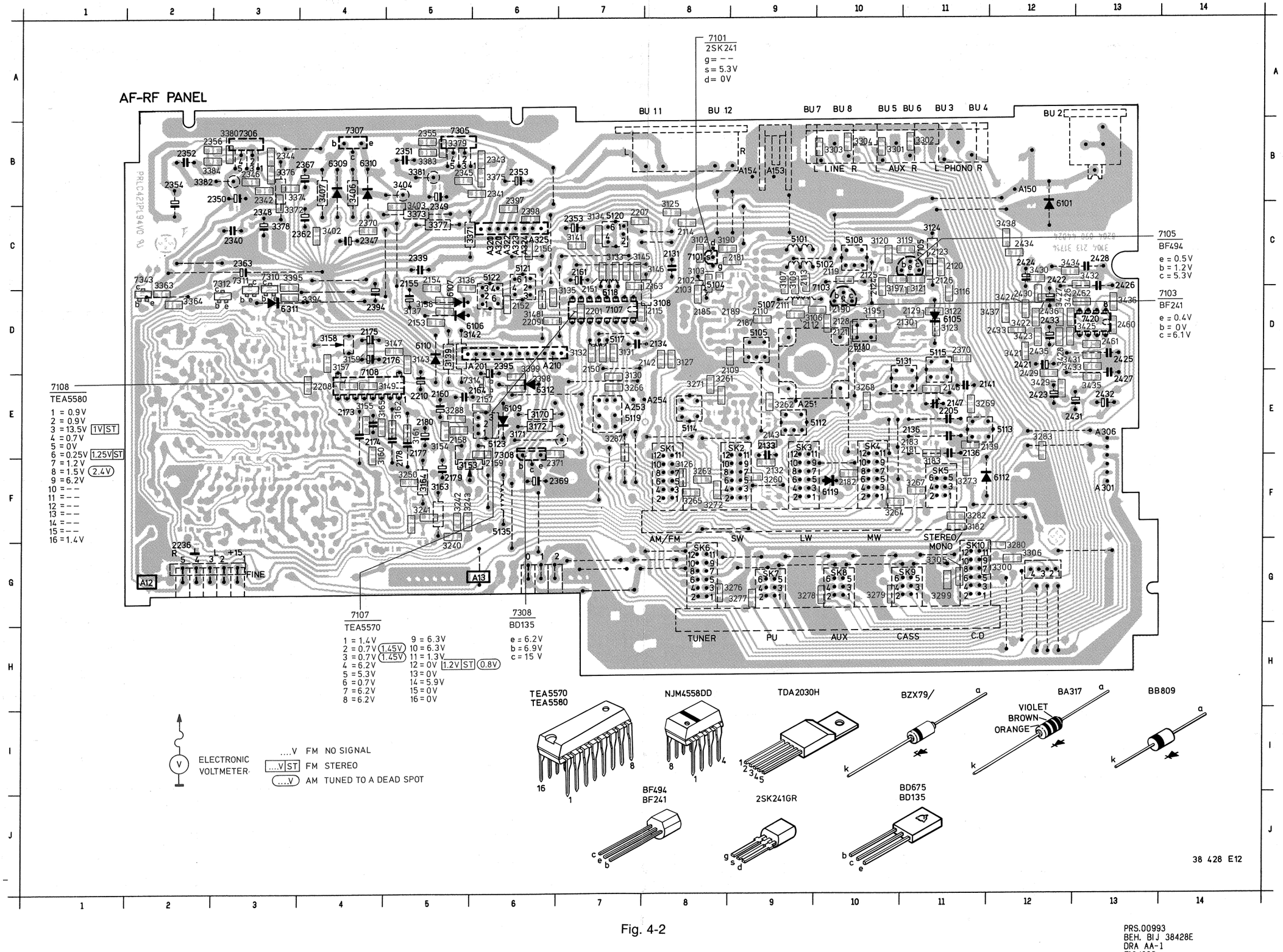


Fig. 4-2

MEASUREMENTS AND ADJUSTMENTS RF

Required test instruments

- RF generator
- Oscilloscope
- DC millivoltmeter
- AC millivoltmeter
- Frequency counter

General

- During the RF adjustments, the injected signals should be kept as small as possible.
- The IF adjustment is effected with a sweep signal. For FM this is a 10.7 MHz signal with a sweep of 300 kHz in a frequency of 50 Hz. For AM this is a 450 kHz signal with a sweep of 10 kHz in a frequency of 50 Hz.
- Switch SK5 in stereo position.
- Switch SK6 in tuner position.

SK switch	signal	to	tune in	adjust	oscilloscope	AC mV
AM – IF						
MW SK-4	450 kHz △ f = 10 kHz (50 Hz)	A			① 1 fo	
	fo = f gen. △ f = 10 kHz (50 Hz)			5119 5120	symm. MAX. ① 2	
AM-RF oscillator						
LW SK-3	147 kHz mod. 1 kHz 30%	B	max. cap.	5113	max. ①	
MW SK-4	1635 kHz mod. 1 kHz 30%		min. cap.	2121F Varco		
SW SK-2	595 kHz mod. 1 kHz 30%	B	max. cap.	5115	max. ①	
	1790 kHz mod. 1 kHz 30%		min. cap.	2147		

SK switch	signal	to	and tune in	adjust	oscilloscope	DC mV

AM-RF antenna

SK switch	signal	to	tune in	adjust	oscilloscope	AC mV
MW SK-4	560 kHz mod. 1 kHz 30%	B		5111	max. ①	
	1500 kHz mod. 1 kHz 30%			2121g		
LG SK-3	155 kHz mod. 1 kHz 30%			5112		
SW SK-2	600 kHz mod. 1 kHz 30%			5114		

↕ Repeat - Herhalen - Répéter - Wiederholen - Ricomminciare

1 Position the top of the response curve in the centre of the screen by changing the sweep frequency.

2 Adjust at maximum height and symmetry.

3 Adjust at linearity and symmetry of the S-curve.

FM-IF

FM SK-1	10,7 MHz △ f = 300 kHz (50 Hz)	C	A		fo ② 1	
	fo = f.gen. △ f = 300 kHz (50 Hz)		B c pad open	5108 5121 5122	MAX. ② 2	
					③ 3	
	10,7 MHz No sweep			5122		③ 0 V ± 30 mV

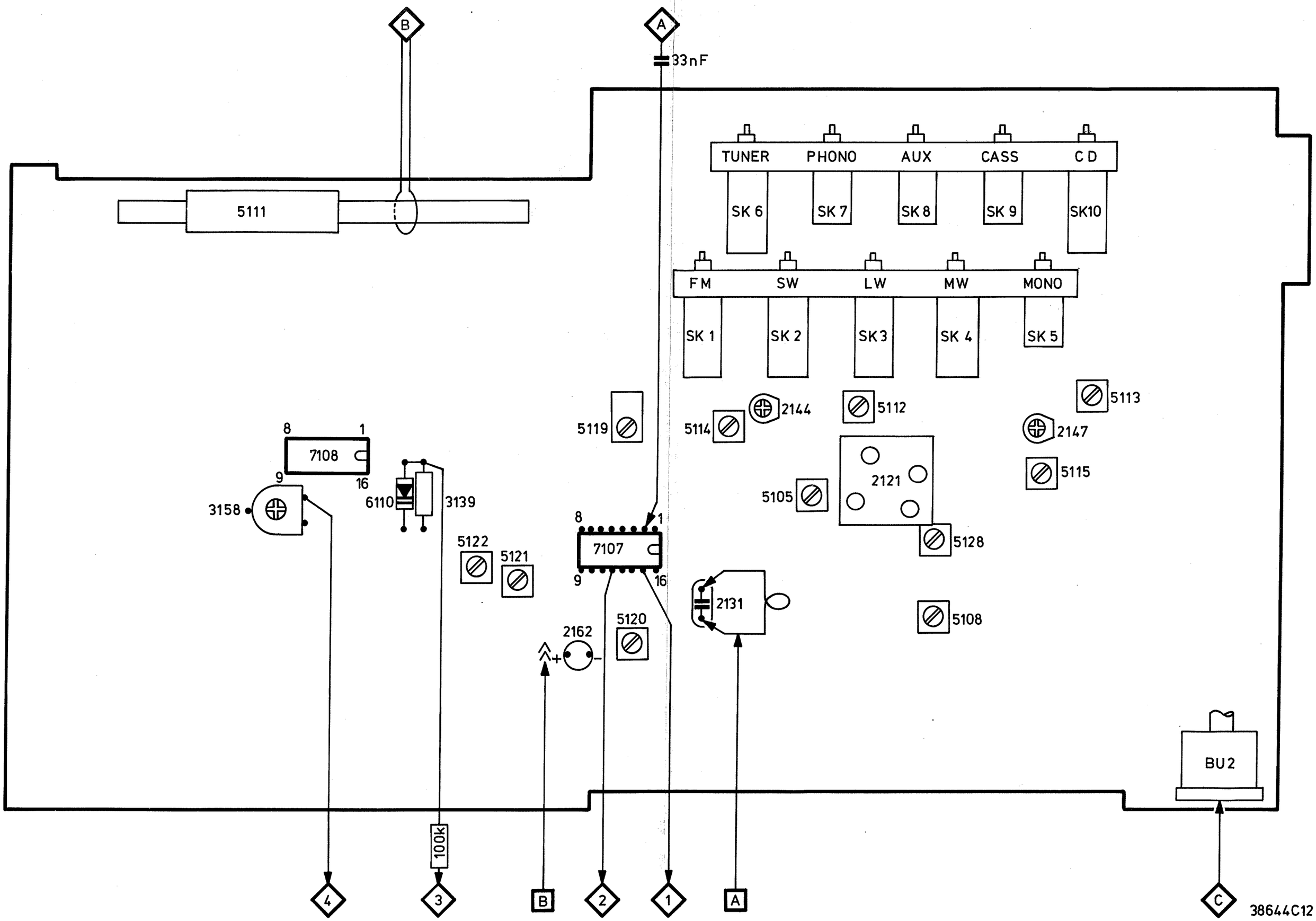


Fig. 4-3

CS 1 742

SK switch	signal	to	tune in	adjust	oscilloscope	AC mV
FM-oscillator						
FM SK-1	87,540 MHz mod. 1 kHz △ f = 22,5 kHz	◇C	max. cap A	5110	◇3 max.	
	108,3 MHz mod. 1 kHz △ f = 22,5 kHz		min. cap. A	2121E		
FM-antenna						
FM SK-1	87,540 MHz mod. 1 kHz △ f = 22,5 kHz	◇C	A	5105	◇3 max.	
	108,3 MHz mod 1 kHz △ f = 22,5 kHz			2121h		
Stereo decoder						
FM SK-1	no signal			3158	Counter ◇4 ± 300 Hz 228 kHz	

HOOFDSTUK 5. L.F. PART

CHAPTER 5. A.F. PART

CHAPITRE 5. SECTION A.F.

ABSCHNITT 5. L.F.-TEIL

CAPITOLO 5. SEZIONE A.F

AF for non-active chip components see separate list

3381, 3382	NFR25 - IE	4822 116 53074
3404	NFR30 - 4E7	4822 116 52448
2395	LL CAP 1 µF/50 V	4822 124 20808
2363	Elco 3300 µ/40 V	4822 124 21744
6309	BZX79/C16	4822 130 34268
6310	BZX79/C20	4822 130 34499
6311, 6312	IN 4148	4822 130 30621
7310, 7312 7313, 7314	BC 848 B ©	5322 130 41982
7311	BC 858 B ©	5322 130 41983
7307	BD675	5322 130 44786
7305, 7306	TDA 2030AV	4822 209 83322
7420	NJM 4558DD	4822 209 81054

Miscellaneous

470	Phono ground	4822 290 60577
471	Double LS-conn.	4822 267 30377
472	Clip	4822 492 63051
473	Clip	4822 255 40128
474	Insulating bush	4822 532 40179
475	Switch assy	4822 276 50306
476	Switch assy	4822 276 50307
479	Cinch assy	4822 267 40585
483	Socket	4822 290 60578

Equalizer for non-active chip components see separate list

3315, 3325 3335, 3345 3355	Slide potm. 2x100k	4822 105 10666
3369	Slide potm. 2x100k	4822 105 10665
3370	Slide potm. 2x10k	4822 105 10668
3410	Slide potm. 2x10k	4822 105 10667
3411	Potm. 10k	4822 100 20161
6401	Power LED	4822 130 32323
6111	Stereo LED	4822 130 32057
6402	BZX79 IC6V8	4822 130 34278
7301, 7302	BC 848 B ©	5322 130 41982
7303	NJM 4560 DD	4822 209 70157

Miscellanous

489	LED holder	4822 255 40496

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1 pF	5%	4822 122 32279
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 32267
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947

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0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90338
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392
4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394

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6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
15 E	2%	4822 111 90344
16 E	2%	4822 111 90347
18 E	2%	5322 111 90139
20 E	2%	4822 111 90352
22 E	2%	4822 111 90186
24 E	2%	4822 111 90355
27 E	2%	5322 111 90375
30 E	2%	4822 111 90356
33 E	2%	4822 111 90357
36 E	2%	4822 111 90359
39 E	2%	4822 111 90361
43 E	2%	5322 116 90125
47 E	2%	4822 111 90217
51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
75 E	2%	4822 111 90371
82 E	2%	4822 111 90124
91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
330 E	2%	5322 111 90106
360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545
6,8 k	2%	4822 111 90544

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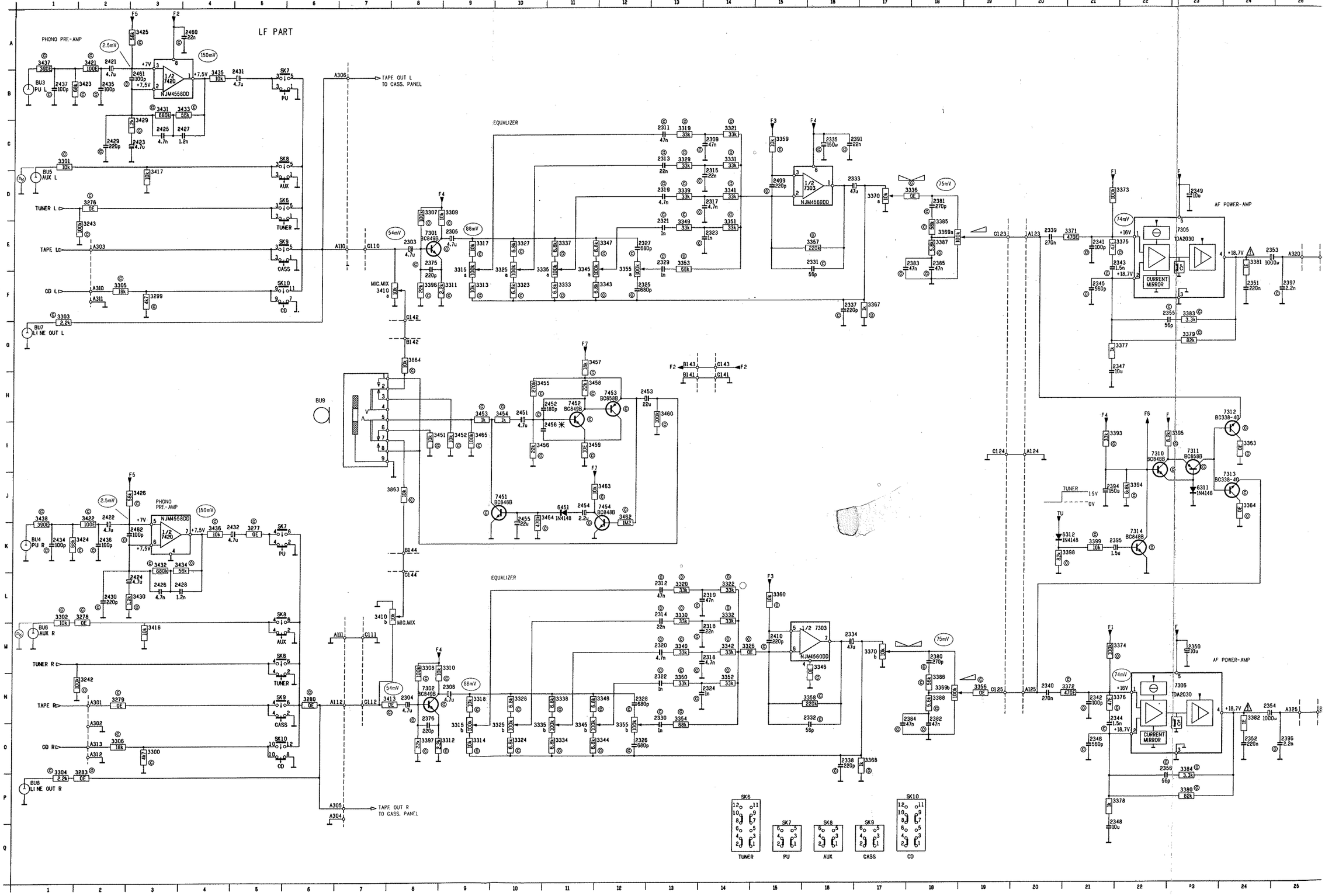
7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
150 k	2%	5322 111 90099
160 k	2%	5322 111 90264
180 k	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428



CS 1 745

Fig. 5-1

EQUALIZER

NJM4560DD

CURRENT MIRROR

TDA2030

AF POWER-AMP

TUNER

PU

AUX

CASS

CD

TO POWER SUPPLY PANEL

TO RF PART 3171

TO 6312 TU

CD MUTE

POWER LED

PRS. 00871 T28/605

Fig. 5-1

EQUALIZER PANEL

63Hz 820Hz 1000Hz 10000Hz 12000Hz MICRO MIX BALANCE

POWER

VOLUME

FINE TUNING

STEREO

AF-RF PANEL

7306 TDA2030
1 = 16 V
2 = 18.7 V
3 = 0 V
4 = 18.7 V
5 = 38 V

7307 BD675
e = 15V
b = 16V
c = 38V

7305 TDA2030
1 = 16 V
2 = 18.7 V
3 = 0 V
4 = 18.7 V
5 = 38 V

BU 11 BU 12 BU7 BU 8 BU 5 BU 6 BU 3 BU 4 BU 2

L LINE R AUX R PHONO R

FINE

AM/FM SW LW MW STEREO MONO

TUNER PU AUX CASS CD

ELECTRONIC VOLTMETER

7420 NJM4558DD
1 = 7,5 V
2 = 7,5 V
3 = 7 V
4 = 0 V
5 = 7 V
6 = 7,5 V
7 = 7,5 V
8 = 15 V

TEA5570
TEA5580

NJM4558DD

BF494
BF241

2SK241GR

BD675
BD135

TDA2030H

BZX79/

BA317

VIOLET
BROWN
ORANGE

BB809

38 429 F12

PRS.00994
BEH. BIJ 38429F
DRA AA0
T12/605

2102	G 9	2355	E 6	3273	J12	3424	G13								
2103	G 9	2356	E 4	3276	K10	3425	H14								
2109	H12	2362	G 5	3277	K10	3426	G14								
2110	H10	2363	G 4	3278	K11	3427	G14								
2111	H10	2367	F 5	3279	K11	3429	H13								
2112	H11	2369	J 8	3280	J13	3430	G13								
2113	G11	2370	F 5	3282	J13	3431	H14								
2114	G 9	2371	I 8	3283	I13	3432	G14								
2116	H 9	2375	C 4	3287	I 8	3433	H14								
2119	G11	2376	C 3	3288	I 6	3434	G14								
2120	G12	2380	A11	3299	K12	3435	H14								
2121	H11	2381	B11	3300	K13	3436	H14								
2123	G12	2382	A10	3301	F12	3437	H13								
2124	G11	2383	B12	3302	F12	3438	G13								
2125	G11	2384	B10	3303	F11	5101	G11								
2126	G12	2385	B12	3304	F11	5104	G10								
2128	H11	2390	C 7	3305	K12	5105	H10								
2128	H11	2391	A 8	3306	J13	5107	G10								
2129	H12	2394	H 5	3307	C 4	5108	G11								
2130	H12	2395	H 7	3308	D 3	5110	H11								
2131	G 9	2397	F 7	3309	C 3	5112	I11								
2132	I10	2398	F 7	3310	B 4	5113	I13								
2133	I10	2408	B 8	3310	C 3	5114	I 9								
2134	H 9	2410	B 7	3311	C 4	5115	H12								
2136	I12	2421	H13	3312	C 3	5117	H 8								
2136	I13	2422	G14	3315	B 4	5119	I 9								
2139	I13	2423	I13	3316	B14	5120	F 8								
2141	H13	2424	G13	3317	C 4	5121	G 7								
2142	H 9	2425	H14	3318	C 3	5122	G 7								
2143	I10	2426	G14	3319	B 4	5123	I 7								
2146	H12	2427	H14	3320	B 5	5130	H10								
2147	I12	2428	G14	3320	B 4	5135	J 7								
2147	I 6	2429	H13	3321	B 4	6101	F14								
2150	H 8	2430	G13	3323	A 5	6105	H12								
2151	G 8	2431	I14	3324	A 4	6106	H 7								
2152	G 7	2432	I14	3325	A 4	6107	G 6								
2153	H 6	2433	H13	3326	B 6	6109	I 7								
2154	G 6	2434	G13	3327	C 4	6110	H 6								
2155	G 6	2435	H13	3328	C 4	6111	B 8								
2155	I 5	2436	H13	3329	C 4	6112	J13								
2156	G 8	2437	H13	3330	B 4	6118	G 8								
2157	I 7	2460	H14	3331	C 5	6119	J11								
2158	I 7	2461	H14	3332	B 5	6309	F 5								
2159	I 7	2462	G14	3333	A 5	6310	F 5								
2160	H 6	3102	G 9	3334	A 5	6311	G 5								
2161	G 8	3103	G 9	3335	B 5	6312	G 5								
2162	F 8	3106	H11	3336	A 9	6401	B 8								
2163	G 9	3107	G10	3337	C 5	6402	A 9								
2164	H 7	3108	G 9	3338	C 5	7101	G 9								
2173	I 5	3109	G11	3339	B 5	7103	G11								
2175	H 5	3116	G12	3340	B 5	7105	G12								
2176	H 6	3119	G12	3341	B 6	7107	H 8								
2177	I 6	3120	G12	3342	B 6	7108	H 5								
2178	I 6	3121	G12	3343	A 6	7301	C 4								
2179	I 6	3122	H12	3344	A 5	7302	C 3								
2180	I 6	3123	H12	3345	B 5	7303	A 8								
2181	G10	3124	G12	3346	B 8	7305	E 7								
2182	J11	3125	F 9	3347	C 5	7306	E 4								
2183	I12	3126	I 9	3348	C 5	7307	E 5								
2190	H11	3127	H 9	3349	B 6	7308	I 7								
2192	H12	3130	H 9	3350	B 5	7310	G 4								
2193	H12	3131	H 8	3351	C 6	7311	G 4								
2194	H12	3132	H 8	3352	B 6	7312	G 4								
2201	H 8	3133	G 8	3353	B 6	7314	H 7								
2205	I12	3134	F 8	3354	B 6	7343	G 3								
2207	F 9	3135	G 8	3355	B 6	7420	H14								
2208	H 5	3136	G 7	3356	A 9	SK 1	I 9								
2209	H 7	3137	H 6	3357	A 8	SK 2	I10								
2210	I 6	3138	G 6	3358	A 7	SK 3	I11								
2303	C 5	3139	H 6	3359	B 8	SK 4	I11								
2304	C 5	3141	G 8	3360	A 7	SK 5	I12								
2305	B 3	3142	H 7	3361	B 7	SK 6	J 9								
2306	C 3	3143	C 6	3362	A 7	SK 7	K10								
2309	B 4	3143	H 6	3363	G 3	SK 8	K11								
2311	B 4	3145	G 9	3364	G 3	SK 9	K12								
2312	B 4	3146	G 9	3366	G 7	SK10	J13								
2313	C 4	3147	H 6	3367	B 4										
2314	B 4	3148	H 7	3368	B 7										
2315	B 4	3149	H 6	3369	A11										
2316	B 4	3153	I 7	3370	B 7										
2317	B 6	3154	I 6	3371	G 7										
2318	B 6	3157	H 5	3372	F 5										
2319	B 5	3158	H 5	3373	F 6										
2320	B 5	3159	H 5	3374	F 5										
2321	C 5	3160	I 6	3375	F 7										
2322	B 5	3161	I 6	3376	F 4										
2323	C 6	3162	I 6	3377	F 6										
2324	B 6	3163	J 6	3378	F 4										
2325	A 6	3164	I 6	3379	F 6										
2326	A 6	3165	I 6	3380	F 4										
2327	C 6	3170	I 7	3381	F 6										
2328	C 6	3171	I 7	3382	F 4										
2329	C 6	3172	I 7	3383	F 6										
2330	C 6	3182	J13	3384	F 4										
2331	B 8	3183	I12	3385	B11										
2332	B 7	3190	G10	3386	B10										
2333	A 8	3195	G12	3387	A12										
2334	A 7	3196	H11	3388	A10										
2335	A 8	3197	G12	3394	A 4										
2336	B 7	3200	C 7	3394	G 5										
2337	B 3	3240	J 6	3395	G 5										
2338	B 7	3241	J 6	3396	C 5										
2339	G 6	3242	J 7	3397	C 5										
2340	G 4	3243	J 7	3398	H 7										
2341	F 7	3250	I 6	3399	H 7										
2342	F 4	3260	J10	3402	G 5										
2343	F 7	3261	H10	3403	F 6										
2344	F 4	3262	I10	3404	F 6										
2345	F 7	3263	I 9	3406	F 5										
2346	F 4	3264	J12	3407	F 5										
2347	G 5	3265	J 9	3408	A 9										
2348	F 4	3266	H 9	3410	B 7										
2349	F 6	3267	J12	3411	B14										
2350	F 4	3268	I11	3412	A12										
2351	F 6	3269	I13	3421	H13										
2352	F 3	3270	H12	3422	H13										
2353	F 7	3271	H 9	3423	H14										
2354	F 3	3272	J 9	3423	H13										

Fig. 5-2

MEASUREMENTS AND ADJUSTMENTS AF

Required test instruments

- Universal meter
- AC millivoltmeter
- AF generator
- Oscilloscope
- Distortion meter

General conditions

The measurements below apply to the left channel. The test points for the right channel are placed between brackets.

Unless otherwise stated, the electrical measurements and adjustments should be carried out under the following conditions:

- Mains voltage 220 V ± 2%
- Ambient temperature 15 to 35°C
- Load resistances of 4 Ohm 1% 25 Watt
- Volume control to maximum
- Tone and balance controls in mid-position
- PCBs in their proper places

P.U. versterker (RIAA)

SK position	signal	input	terminating resistor	volume	E.Q. equalizer	output
Phono SK7	Via 2.2 kΩ 1 kHz	BU3 (BU4)	22 kΩ BU5 (BU6)	max.	mid.	BU11 (BU12) 0,775 V ≈ 0 dB
	63 Hz					BU5 (BU6) 150 mV 16 dB ± 3 dB
	250 Hz					6,8 dB ± 3 dB
	1 kHz					0 dB
	4 kHz					− 6 dB ± 3 dB
	16 kHz					−16,5 dB ± 3 dB

Uitgangsvermogen

SK position	signal	input	output	Output	Distortion
Aux SK8	1 kHz 165 mV	BU5 (BU6)	BU11 (BU12)	6,5 V~ (10,5 W)	0,7%
	1 kHz 200 mV			8 V~ (16 W)	≦ 10%

Band level controle equalizer

SK position	input			20 Hz	63 Hz	250 Hz	1 kHz	4 kHz	10 kHz	16 kHz
AUX SK8	BU5 (BU6)	3315 (63 Hz)	max.	+7 dB	+6 dB	+3,5 dB	0 dB	−0,5 dB	−0,5 dB	− 0,5 dB
			min.	−8 dB	−7 dB	−4 dB	−0,3 dB	−0 dB	0 dB	− 0 dB
		3325 (250 Hz)	max.	+3 dB	+5 dB	+6,5 dB	+1,5 dB	−0,5 dB	−0,5 dB	− 0,5 dB
			min.	−3 dB	−6 dB	−7,5 dB	−2 dB	0 dB	0 dB	− 0 dB
		3335 (1 kHz)	max.	+1 dB	+1 dB	+3 dB	+7 dB	+2 dB	+0,5 dB	0 dB
			min.	−1 dB	−1 dB	−3,5 dB	−8,5 dB	−3 dB	−0,5 dB	0 dB
		3345 (4 kHz)	max.	−0,1 dB	−0,1 dB	+0,1 dB	+3 dB	+6,5 dB	+5 dB	+ 3,5 dB
			min.	−0,1 dB	−0,1 dB	−0,1 dB	−3,8 dB	−8 dB	−5,5 dB	− 3,5 dB
		3355 (12,5 kHz)	max.	0 dB	0 dB	0 dB	+0,4 dB	0 dB	+6 dB	+10 dB
			min.	0 dB	0 dB	0 dB	−0,8 dB	0 dB	−4,5 dB	− 7 dB

— Apply a 1 kHz signal via 1 kΩ, for an output voltage of 0,15 V = 0 dB.
— Each frequency band is checked separately; the other control one in mid-position.
— Tolerance ± 1 dB.

SK position	output	input	Terminating resistor	volume	bass	treble	Loudness	output

Overspraak kanalen

AUX SK-8	BU11 (BU12) 6,5 V~ (10,5 Watt)	1 kHz 500 mV	22 kΩ BU5					BU12 −40 dB
			22 kΩ BU6					BU11 −40 dB
		250 Hz 500 mV	22 kΩ BU5					BU12 −45 dB
			22 kΩ BU6					BU11 −45 dB
		10 kHz 500 mV	22 kΩ BU5					BU12 −25 dB
			22 kΩ BU6					BU11 −25 dB

Rec for non-active chip components see separate list

Resistors		
3765, 3766	Trimpot Lin. 10k	4822 100 10035
3803, 3804		
3773, 3774	MRS 25 –3k3	4822 116 53105
3829	Trimpot Lin. 4M7	5322 101 14277
3846, 3854	Trimpot Lin. 1M	4822 100 10089
3883, 3884	Trimpot Lin. 100k	4822 100 10052
Diodes		
6751, 6752		
6754, 6755	IN 4148	4822 130 30621
5756, 6758		
6759		
6753	BZX79 IC3V9	4822 130 31981
6757	BZX79 IC5V1	4822 130 34233
Transistors ©		
7753, 7754	BC 858 B ©	5322 130 41983
7777		
7757, 7758		
7761, 7762		
7763, 7764		
7767, 7769		
7770, 7771		
7772, 7773	BC 848 B ©	5322 130 41982
7774, 7776		
7778, 7779		
7874, 7875		
7872, 7873		
7870, 7871	BC 848 C ©	5322 130 42136
7765, 7766	BC 264 A	5322 130 44476

ICs		
7751	TDA 1522	4822 209 81178
7755, 7756	LM 1121	4822 209 81621
7759	NJM 4558 DP	4822 209 81054
7775	HEF 4069 UBP	4822 209 10185
Coils		
5751, 5752	MPX filter	4822 156 10642
5753, 5754	Coil	4822 156 20811
5755	Osc. coil	4822 156 20946
Miscellaneous		
496	SK16 – RIF	4822 277 21037
492	Twin phono jack	4822 267 30662
495	SK15 – Rec/Pb	4822 277 60232
487	SK18 – Dolby	4822 276 11564
488	SK17 – Mute	4822 276 11565
494	Socket	4822 290 60579

© Chips 50 V NP0 S1206		
1 pF	5%	4822 122 32279
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 32267
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947

© Chips 0,125 W S1206		
0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90338
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392
4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394

© Chips 0,125 W S1206		
6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
15 E	2%	4822 111 90344
16 E	2%	4822 111 90347
18 E	2%	5322 111 90139
20 E	2%	4822 111 90352
22 E	2%	4822 111 90186
24 E	2%	4822 111 90355
27 E	2%	5322 111 90375
30 E	2%	4822 111 90356
33 E	2%	4822 111 90357
36 E	2%	4822 111 90359
39 E	2%	4822 111 90361
43 E	2%	5322 116 90125
47 E	2%	4822 111 90217
51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
75 E	2%	4822 111 90371
82 E	2%	4822 111 90124
91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
330 E	2%	5322 111 90106
360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545
6,8 k	2%	4822 111 90544

© Chips 0,125 W S1206		
7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
[illegible]	[illegible]	5322 111 90099
[illegible]	[illegible]	5322 111 90264
[illegible]	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428

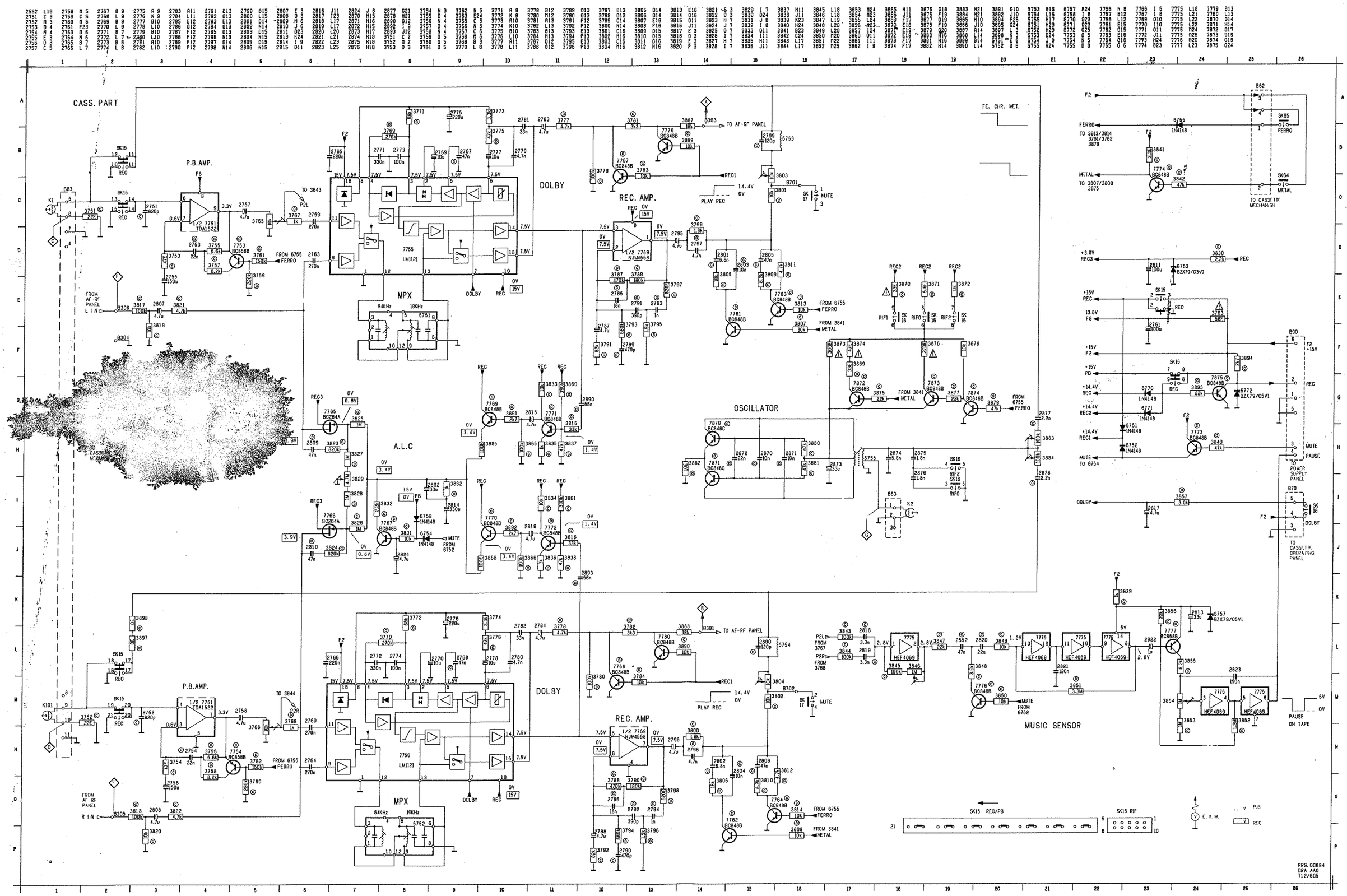

CASS. PART
P.B.AMP.
DOLBY
REC. AMP.
MPX
A.L.C
OSCILLATOR
MUSIC SENSOR
TO AF-RF PANEL
TO CASSETTE MECHANISM
TO CASS.TTE OPERATING PANEL
TO POWER SUPPLY PANEL
FROM AF RF PANEL L IN
FROM AF RF PANEL R IN
PLAY REC
FE. CHR. MET.
PAUSE ON TAPE
PRS. 00684
DRA AAO
T12/805

Fig. 6-1

CASS PANEL

7751
TDA1522
1=3.3V
2=2.1V
3=0.6V
4=0V
5=0V
6=0V
7=0.6V
8=13.5V
9=3.3V

7755/7756
TEA5580
1 = 0V
2 = 7.5V
3 = 7.5V
4 = 7.5V
5 = 7.5V
6 = 7.5V
7 = 11V
8 = 7.5V
9 = 7.5V [6.1V / 15V]
10 = 0V
11 = 7.5V
12 = 7.5V
13 = 7.5V
14 = 7.5V
15 = 7.5V
16 = 15V

7765/7766
BC264A
g = 0V [0.8V]
s = 0V [3.9V]
d = -- [3.9V]

7759
NJM4558
1 = 0V [7.5V]
2 = 0V [7.5V]
3 = 7.5V
4 = 0V
5 = 7.5V
6 = 0V [7.5V]
7 = 0V [7.5V]
8 = 0V [15V]

7775
HEF4069UBP
1 = 2.8V
2 = 2.8V
3 = 0V
4 = 5.1V
5 = 5.1V
6 = 0V
7 = 0V
8 = 2.8V
9 = 2.8V
10 = 2.8V
11 = 2.8V
12 = 2.8V
13 = 1.2V
14 = 5.1V

MIC BU 10
PHONES BU 9

.....V PLAY
[.....V] REC

LM1121
NJM4558DD
HEF4069UBD
BZX79/
1N4148

38 875 E12

PRS.00995
BFH. BIJ 38875F.
DRA AA-1
T12/606

Fig. 6-2

2386	H	9	3756	B	4	3883	C	8									
2387	H	8	3757	C	4	3884	C	7									
2451	H	7	3758	B	3	3885	E	5									
2452	H	6	3759	C	3	3886	E	6									
2453	I	6	3760	C	3	3889	D	6									
2454	H	6	3761	C	3	3892	E	6									
2455	H	7	3762	C	3	3894	C	8									
2456	H	6	3763	C	3	3895	D	7									
2751	C	4	3766	C	3	3896	C	8									
2752	C	4	3767	F	4	3897	D	5									
2753	C	4	3768	F	2	3898	D	5									
2754	C	4	3769	D	5	5751	D	3									
2755	C	4	3771	E	4	5752	E	2									
2756	C	4	3772	F	2	5753	D	8									
2757	D	4	3773	F	4	5754	D	7									
2758	B	3	3774	F	3	5755	C	7									
2759	E	3	3775	E	5	6451	I	7									
2760	E	2	3776	E	3	6751	F	5									
2761	C	3	3777	F	4	6752	G	5									
2763	F	4	3778	F	3	6753	E	6									
2764	F	6	3779	F	5	6754	G	6									
2765	D	4	3780	G	3	6755	C	3									
2766	D	3	3781	F	4	6757	G	6									
2767	E	3	3782	G	2	6758	F	5									
2769	D	4	3783	G	4	6770	E	5									
2770	D	3	3784	G	3	6771	C	5									
2771	E	4	3785	F	6	6772	C	8									
2772	E	3	3787	F	5	7370	E	3									
2773	D	4	3788	E	7	7451	H	7									
2774	E	3	3789	E	7	7452	I	7									
2775	F	4	3790	E	7	7453	H	6									
2776	F	3	3791	D	6	7454	I	6									
2777	E	5	3791	F	7	7751	B	4									
2778	E	3	3792	F	6	7753	C	4									
2779	E	5	3793	F	8	7754	C	4									
2780	F	3	3795	E	8	7755	E	3									
2781	F	4	3796	E	6	7755	E	4									
2782	F	2	3797	E	7	7757	F	5									
2783	F	4	3798	E	7	7758	F	3									
2784	F	2	3799	E	8	7759	F	7									
2785	F	7	3800	E	7	7762	E	8									
2786	F	7	3801	E	8	7763	E	8									
2787	F	8	3802	D	7	7764	D	7									
2788	F	7	3803	D	8	7765	F	6									
2789	F	8	3804	D	7	7766	F	6									
2790	E	6	3805	E	8	7767	E	5									
2791	F	8	3806	E	7	7769	E	5									
2792	E	6	3807	E	8	7770	E	5									
2793	E	8	3808	E	8	7771	E	7									
2794	E	6	3809	E	8	7772	E	6									
2795	E	7	3810	D	8	7773	H	6									
2796	E	7	3811	E	8	7774	F	8									
2797	E	8	3812	D	7	7775	G	7									
2798	E	7	3813	D	8	7776	H	7									
2799	D	8	3814	D	7	7777	G	8									
2800	D	7	3815	E	7	7791	F	8									
2801	E	8	3816	F	7	7870	C	8									
2803	E	8	3817	F	5	7871	C	8									
2804	E	7	3818	F	6	7872	C	6									
2805	E	8	3819	F	5	7873	C	6									
2806	D	7	3820	F	6	7874	C	6									
2807	F	5	3821	F	5	7875	D	8									
2808	F	6	3822	F	6	SK15	D	5									
2808	E	7	3823	E	5	SK16	B	5									
2809	F	5	3824	F	6												
2810	F	6	3825	E	6												
2813	H	6	3826	E	6												
2814	D	6	3827	E	6												
2815	E	6	3828	E	6												
2815	E	6	3829	E	6												
2816	E	6	3830	E	6												
2817	F	7	3831	E	5												
2818	G	8	3832	E	6												
2819	G	8	3833	E	7												
2820	G	7	3834	E	6												
2821	H	7	3835	D	7												
2822	H	7	3836	E	6												
2823	H	8	3837	D	7												
2824	E	5	3838	E	6												
2846	G	8	3839	H	6												
2870	C	8	3840	H	6												
2871	C	8	3841	F	8												
2873	C	7	3842	F	8												
2874	B	6	3843	G	8												
2875	B	7	3844	G	8												
2876	C	6	3845	G	8												
2877	C	8	3846	G	8												
2878	C	7	3847	G	7												
2890	F	7	3848	G	6												
2890	E	7	3849	G	7												
2891	C	4	3850	H	6												
2892	D	6	3851	G	7												
2894	C	4	3852	H	7												
3157	H	6	3853	H	7												
3389	I	8	3854	G	8												
3390	I	9	3855	G	8												
3391	I	8	3856	G	8												
3392	H	9	3857	G	7												
3451	I	7	3860	E	7												
3452	I	8	3863	I	7												
3453	H	7	3864	I	8												
3454	H	7	3869	B	6												
3455	H	7	3870	C	5												
3456	H	7	3871	C	5												
3458	H	6	3872	C	5												
3459	H	7	3872	C	8												
3460	I	7	3873	C	6												
3461	I	7	3874	C	6												
3462	H	6	3875	D	8												
3463	H	6	3876	C	6												
3465	I	7	3877	C	6												
3466	I	6	3878	C	6												
3751	D	5	3879	C	5												
3752	C	5	3880	C	7												
3753	C	4	3881	B	7												
3754	B	4	3882	C	7												
3755	C	4	3882	D	6												

MEASUREMENTS AND ADJUSTMENTS REC

Required test instruments

- Universal meter
- AC millivoltmeter
- AF generator
- Wow and flutter meter
- Frequency counter
- Universal test cassette SBC 419Cr - 4822 397 30069

General conditions

Unless explicitly stated otherwise, the electrical measurements and adjustments should be carried out under the following conditions:

- Mains voltage 220 V ± 5%, 50 Hz
- Ambient temperature 20 to 25°C
- Dolby, RIF, switched off
- The measurements below apply to the left channel, those for the right channel are stated between brackets
- For all measurements and adjustments with running tape, the heads and tape guides should be degaussed and clean

[1] Max. permissible speed deviation is 2%.
The wow-and-flutter value can also be read with this measurement.
This value should not exceed 0.18%.

[2] If the accuracy requirements are less stringent, a high-quality chromium cassette may be used as an alternative.

[3] Switch off ALC by short-circuiting capacitor 2814.

[4] Disable the bias by disconnecting diode 6771.

[5] Remove short-circuit 2814 and solder 6771 again. Make a recording and play it back.

[6] If the output voltage at B30-pin 3 is not 245 mV ± 1 dB, adjust 3803 (3804) until the AF signal (bias disabled) is so many dB lower or higher as the meter reading is too high or too low.

[7] When one channel is adjusted, this may slightly affect the adjustment of the other channel.
If the adjustment is correct, the frequency response curve will be similar to curve b in figure 6-4.
Distortion ⩽ 3%.
If the bias is too small, the distortion will increase.
The frequency response will then be as shown in fig.. 6-4, curve a.
If the bias level is too high, this will result in excessive treble attenuation, see curve c in fig. 6-4.

Adjustment	Cassette	Recorder in position	Apply signal to	Measure on	Read on	Adjust with	Adjust to
Playback speed motor M1	SBC419 3150 Hz	PLAY	–	BU6 (BU7)	Wow-and-flutter meter (Filter on)	Variable resistor at the back of motor M1	[1]
Playback sensitivity	SBC419 315 Hz-0 dB	PLAY	–	B30-pt3 (B30-pt1) Ⓐ (Ⓑ)	mV-meter	3765 (3766)	580 mV
Playback frequency response	SBC419 40Hz;250Hz; 6.3 kHz; 12.5 kHz	PLAY	–	B30-pt3 (B30-pt1) Ⓐ (Ⓑ)	mV-meter	–	See graph Fig. 6-2 frequency response
Target value BIAS	Chromium cassette	REC	–	B63-pt6 Ⓒ (B63-pt10 Ⓓ)	mV-meter	3883 (3884)	8 mV (8 mV)
Recording sensitivity	SBC419 side 2 [2]	REC + PLAY	315 Hz, to B30-pt6 Ⓔ (B30-pt5 Ⓕ)	Switch off ALC by short-circuiting 2814 [3]			
				B30-pt3 Ⓐ (B30-pt1 Ⓑ)	mV-meter	LF generator	245 mV
				Disable the bias by removing (or interrupting) 6771 [4]			
				B63-pt6 Ⓒ (B63-pt10 Ⓓ)	mV-meter	3803 (3804)	1,8 mV
				Connect 2814, 6771 make a recording and play it back [5]			
		PLAY	–	B30-pt3 Ⓐ (B30-pt1 Ⓑ)	mV-meter	–	245 mV [6]
BIAS	SBC419 side 2 [2]	REC + PLAY	–	B63-pt Ⓒ (B63-pt10 Ⓓ)	mV-meter	3883 (3884)	8 mV (target value)
			315 Hz, to B30-pt6 Ⓔ (B30-pt5 Ⓕ)	B30-pt3 Ⓐ (B30-pt1 Ⓑ)	mV-meter	LF-generator	25 mV
			40 Hz-6.3 kHz 10 kHz-12 kHz 14 kHz-15 kHz to B30-pt6 Ⓔ (B30-pt5 Ⓕ)	Record a number of frequencies with the same input voltage and play them back			
		PLAY	–	B30-pt3 Ⓐ (B30-pt1 Ⓑ)	mV-meter		See graph Fig. 6-4 if necessarye repeat BIAS adjust-ment [7]
f-osc.	Arbitrary cassette	REC	–	K 2 Ⓖ	Frequency counter	5755	67 kHz
19/64 kHz suppression	Arbitrary cassette	REC MPX	315 Hz, to B30-pt6 Ⓔ (B30-pt5 Ⓕ)	B30-pt3 Ⓐ (B30-pt1 Ⓑ)	mV-meter	LF-generator	775 mV
			19 kHz, to B30-pt6 Ⓔ (B30-pt5 Ⓕ) (same input voltage)	B30-pt3 Ⓐ (B30-pt1 Ⓑ)	mV-meter	5751 (5752) 19 kHz part	⩽ 25 mV
			64 kHz, to B30-pt6 Ⓔ (B30-pt5 Ⓕ) (same input voltage)	B30-pt3 Ⓐ (B30-pt1 Ⓑ)	mV-meter	5751 (5752) 64 kHz part	Min output ⩽ 2,35 mV
ALC	Arbitrary cassette	REC	315 Hz, to B30-pt6 Ⓔ (B30-pt5 Ⓕ)	B30-pt3 Ⓐ (B30-pt1 Ⓑ)	mV-meter	R3829	L = R mV

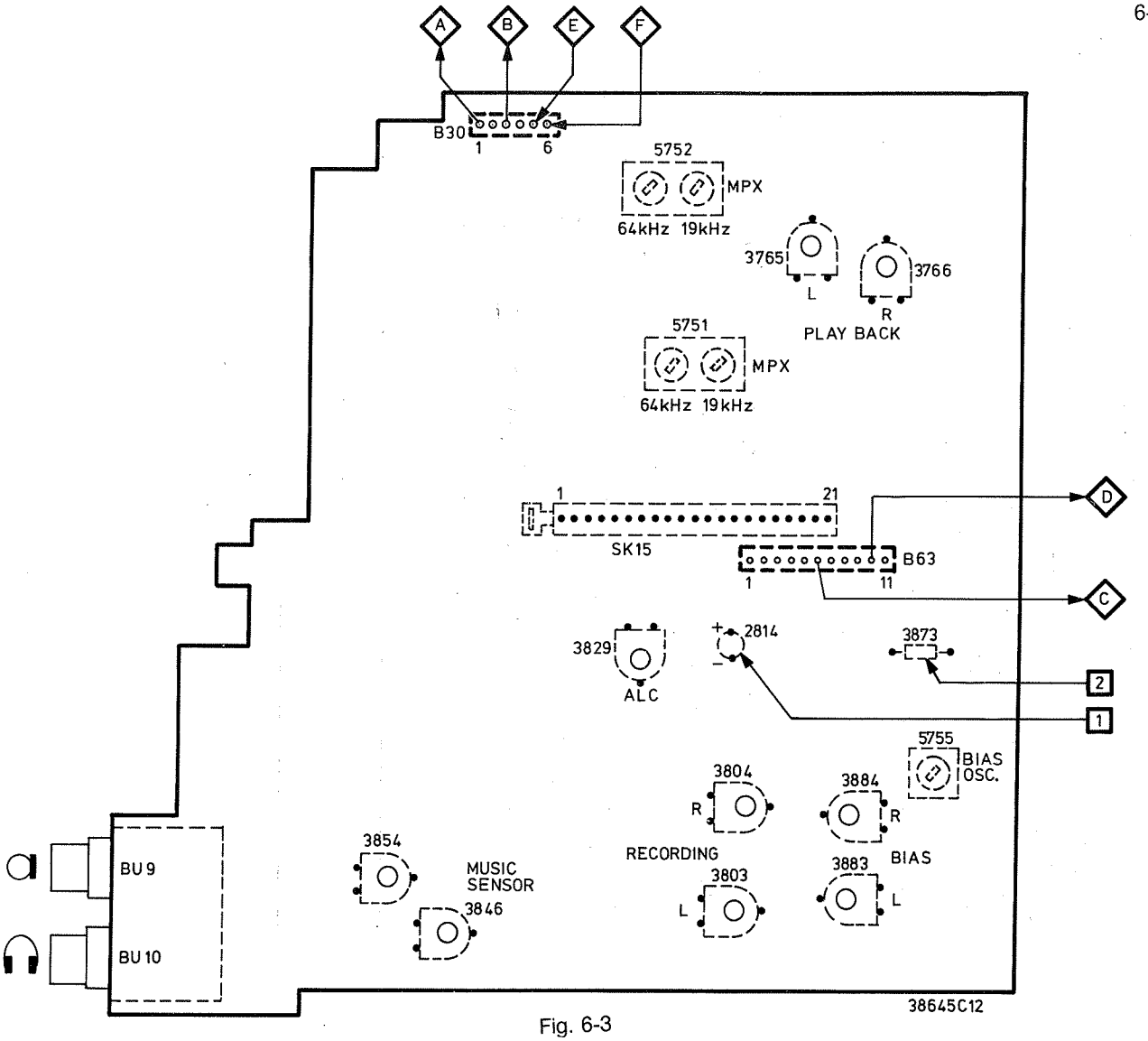


Fig. 6-3

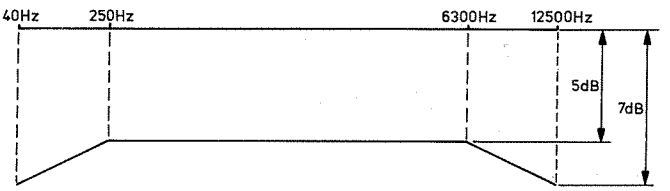


Fig. 6-4

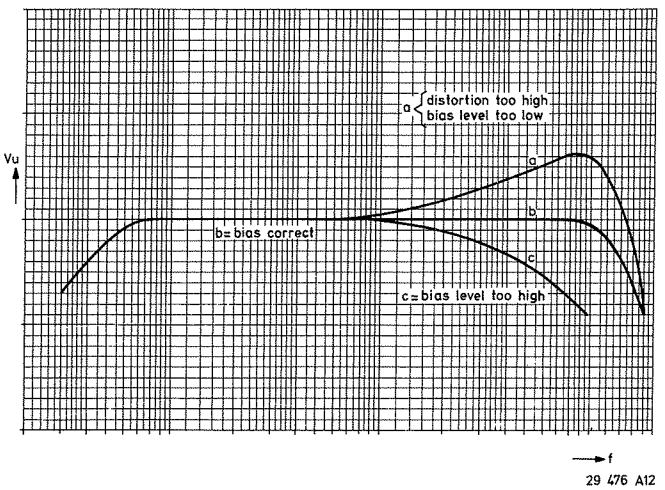
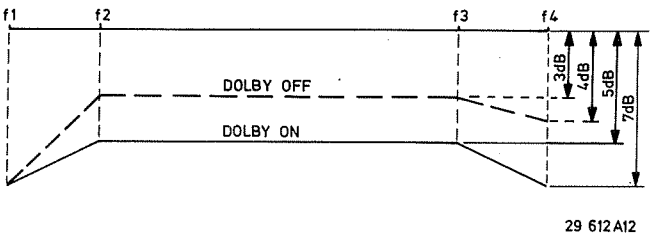


Fig. 6-6



	f1	f2	f3	f4
Metal	40 Hz	250 Hz	6300 Hz	14.000 Hz
Cr	40 Hz	250 Hz	6300 Hz	14.000 Hz
Normal	40 Hz	250 Hz	6300 Hz	13.000 Hz

Fig. 6-5

ADJUSTMENT OF THE NEXT/PREVIOUS SEARCH CIRCUIT

The Next/Previous system searches automatically the following/previous recording on the tape during playback. Silent intervals of at least 4 sec. must be present between the recordings. The silent interval should be suppressed at least 30 dB relative to a 0 dB signal. For the adjustment you need a specific test cassette.

a. **Realisation of the test cassette**

- Use a C90 - chromium cassette.
- Select Aux.
- Select Rec + Pause
- Apply a 1 kHz signal to BU5 and BU6 until 580 mV appears at pin 14 of 7755 (and 7756).
- Reduce the signal to 18,5 mV (equivalent to -30 dB relative to 580 mV) at pin 14 of 7755 (and 7756).
- Make a recording of ± 20 sec. Then make a Pause of 4 sec. by switching to PU for 4 sec. Switch back to Aux and make a second recording. Repeat this a few times.

b. **Adjustment**

During the following adjustment, use is made of test cassette (a). The recorder should be able to detect silent intervals in the Next and Previous mode.
The adjustment must be carried out employing the -30 dB signal containing the 4 sec. pauses.

- Set 3846 in mid-position.
- Turn 3854 fully clockwise.
- Connect an oscilloscope to pin 6 of 7775.
- Select Play.
- When a Pause on the tape is passed, the DC-level on the oscilloscope will go from 5V to 0V and then back to 5V again.
  If this is not the case, turn 3854 counter clockwise until these values are displayed on the oscilloscope.
- Leave 3854 in this position and turn 3846 fully counter clockwise.
- Turn 3846 clockwise until the intervals are still just displayed on the oscilloscope.

c. **Check**

- Insert test cassette C90 and search the beginning of the signal.
- Depress the next key and check if the recorder adapts the Play mode after the first pause.
- When using Next or Previous, the recorder must find the Next or Previous recording.
- If this is not the case, repeat adjustment b.

CHAPTER 7. µP-PART

DESCRIPTION

- Cassette deck and Compact Disc player are controlled from the microprocessor panel. µP 7501 controls the Compact Disc and µP 7901 the cassette-deck.
  The states in which CD and cassette deck find themselves are shown on both displays. µProcessor 7501, display driver 7572 and display 6571 are only provided with a supply voltage in the CD mode.
- It is possible to make recordings with the cassette deck synchronously with the CD (sync. rec.) and to insert automatically 4-second pauses between the recordings (auto rec.).
  For this reason, the CD function keys CD Stop, CD Play and CD Pause are controlled via the microprocessor of the cassette deck and both microprocessors are connected with one another by means of the signal lines Pause CD, Stop CD, Play CD and Auto Pause. When recording synchronously from Compact Disc, the function keys Play and Pause of the recorder are rendered inoperative by transistors 7526, 7531 and 7532. Transistor 7524 causes the recording to stop automatically at the end of a disc.
- In order to make the operation of Compact Disc and Recorder unambiguous, the toggle function of the CD Pause key can be eliminated by transistor 7530. For resumption of the music the play key should be depressed.
- The output gates, 29 through 36, and the input gates, 21 through 23, of microprocessor 7901 are connected with an 8 x 3 function key matrix. A number of function keys have been constructed as soft-touch switches (SK19 through SK30); a number as transistors.
- Motor control IC 7504 drives the Reel Motor of the cassette recorder. In order to stop the tape fast after fast forward or fast reverse, a short correction pulse is given in reverse direction after the motor voltage has dropped out.
  The circuit around transistors 7541 through 7544 removes a wrong correction pulse, generated by the microprocessor, after the motor voltage for turning clockwise has dropped out.
- The Tape Leader signal is used for automatic shut-off at the end of the tape. The Tape Reader signal (T) switches this function off during Wind and Rewind actions, because the false light incidence through the cassette lid can then put the Tape Leader Detection into action, which is unwanted.

For inactive chip components see separate list

3532	NFR25-27E	4822 111 30519
6501,6502 6503,6504 6505,6506 6509,6510 6511,6514 6515,6516	BA317	4822 130 30847
6520,6521 6522,6523 6524	1N4148	4822 130 30621
6507	BZX79/C3V0	4822 130 31881
6508	BZX79/C6V2	4822 130 34167
6513	BZX79/C5V6	4822 130 34173
7510,7514 7518,7526 7527,7528	BC848Bⓒ	5322 130 41982
7505,7506 7507.7508 7509,7517 7519,7522 7523,7524 7530,7531	BC858ⓒ	5322 130 41983
7532		
7511	BC848Cⓒ	5322 130 42136
7515,7525	BC338	5322 130 44779
7516,7520	BC328	4822 130 41715
7521	2SK241GR	4822 130 42217

7501	µ-proc. 8440	4822 209 11063
7504	BA6109	4822 209 82059
7901	µ-proc. MC146805G2	4822 209 11321
5501	Coil 0.47 µH	4822 157 50967

Miscellaneous

5502	X-tal	4822 242 70932
493	Tact switch	4822 276 11562

DISPLAY PART

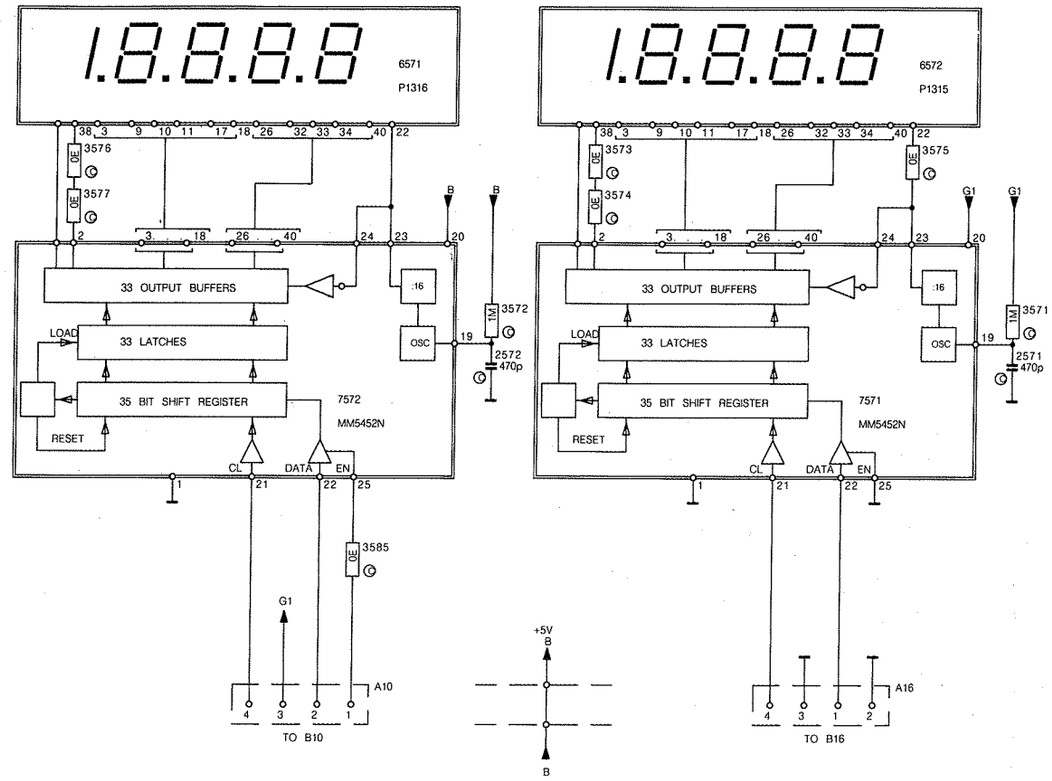


Fig. 7-1

PRS.00891
DRA CS1
T28-602

For inactive chip components see separate list

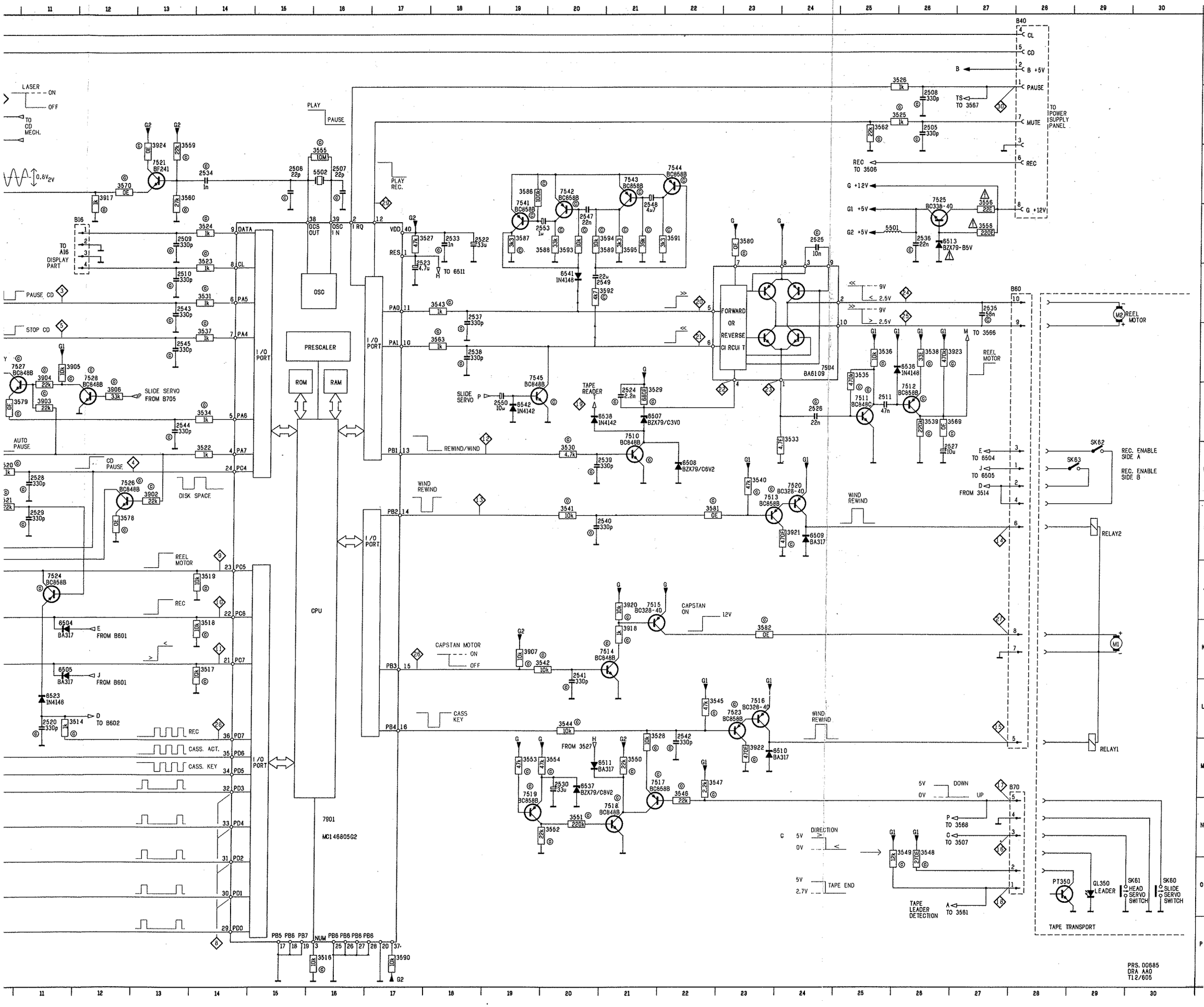
7571,7572	MM5452N	4822 209 11093
6571	P1316	4822 130 90269
6572	P1315	4822 130 90268

Miscellaneous

1771,1772	Lamp HRS-4160	4822 134 40634
480	Insulating plate	4822 325 20139
481	Reflector holder	4822 256 90809
482	Reflector assy	4822 380 20183

μP PART

Fig. 7-2



2501	A10	6506	J 9		
2502	A 8	6507	G21		
2503	A 8	6508	H22		
2504	C 6	6509	I24		
2505	B26	6510	M24		
2506	C15	6511	M21		
2507	C16	6513	D26		
2508	B26	6514	L 6		
2509	D13	6515	K 9		
2510	E13	6516	L 9		
2511	G25	6520	I 2		
2514	D 6	6521	J 2		
2515	O 6	6522	I 3		
2516	N 6	6523	L11		
2517	P 6	6524	P 4		
2518	N 6	6525	N 4		
2519	L 6	6526	N 3		
2520	L11	6527	O 2		
2521	L 8	6528	P 3		
2522	D18	6529	N 2		
2523	D17	6530	N 3		
2524	G21	6531	O 3		
2525	D24	6532	O 4		
2526	G24	6533	P 2		
2527	H26	6534	O 2		
2528	H11	6535	O 4		
2529	I11	6536	F26		
2530	M20	6537	M20		
2531	C 6	6538	G21		
2532	D 6	6541	E20		
2533	D18	6542	G19		
2534	C14	7501	D 9		
2535	E27	7504	F24		
2536	D26	7505	J 7		
2537	E18	7506	K 7		
2538	F18	7507	K 7		
2539	H21	7508	J 9		
2540	I21	7509	K 9		
2541	K20	7510	G21		
2542	L22	7511	G25		
2543	F13	7512	G26		
2544	G13	7513	M23		
2545	F13	7514	K21		
2547	D20	7515	J21		
2548	D21	7516	L23		
2549	E21	7517	M22		
2550	D19	7518	N21		
2553	D19	7519	M19		
3501	D 6	7520	H24		
3502	C 6	7521	C13		
3503	A 9	7522	K 9		
3504	A 9	7523	L23		
3505	B 6	7524	J11		
3506	K 7	7525	C26		
3507	L 7	7526	H13		
3508	O 6	7527	F11		
3509	N 6	7528	F12		
3510	N 6	7530	I 3		
3511	P 6	7531	D 1		
3512	M 6	7532	N 2		
3513	L 7	7541	C19		
3514	L12	7542	C20		
3515	L 9	7543	C21		
3516	P16	7544	C22		
3517	K14	7545	F19		
3518	K14	7901	N16		
3519	J14	SK60	O30		
3520	H10	SK61	O30		
3521	H10				
3522	H14				
3523	D14				
3524	D14				
3525	B26				
3526	A26				
3527	D17				
3528	L22				
3529	G21				
3530	H20				
3531	E14				
3533	G24				
3534	G14				
3535	F25				
3536	F25				
3537	F14				
3538	F26				
3539	O26				
3540	H23				
3541	I20				
3542	K20				
3543	E18				
3544	L20				
3545	L22				
3546	M22				
3547	M22				
3548	N26				
3549	N26				
3550	M21				
3551	N20				
3552	N20				
3553	M19				
3554	M20				
3555	C16				
3556	C27				
3558	D27				
3559	C13				
3560	C13				
3561	K 9				
3562	B25				
3563	F18				
3565	L 8				
3566	L 9				
3567	J 9				
3568	J 7				
3569	G27				
3570	C12				
3578	I13				
3579	G11				
3580	O23				
3581	I22				
3582	K23				
3584	D 5				
3586	C19				
3587	D19				
3588	D19				
3589	D21				
3590	P17				
3591	D22				
3592	E21				
3593	D20				
3594	D21				
3595	D21				
3902	H13				
3903	G11				
3904	F11				
3905	F11				
3906	G12				
3907	K19				
3909	O 3				
3910	O 3				
3911	I 4				
3912	L 1				
3913	L 2				
3914	F 3				
3915	F 4				
3917	C12				
3918	K21				
3920	J21				
3921	I24				
3922	M23				
3923	F27				
3924	C13				
5501	D25				
5502	C16				
6501	B 8				
6502	J 6				
6503	K 6				
6504	K11				
6505	K11				

Fig. 7-2

1771	K 4
1772	J 4
2501	H 2
2502	G 3
2503	G 3
2504	G 3
2505	E 3
2506	F 4
2506	F 3
2507	E 5
2507	E 4
2508	F 4
2510	F 3
2511	D 3
2515	E 5
2516	E 5
2517	D 5
2518	E 4
2519	D 4
2520	E 4
2521	D 4
2522	D 3
2524	F 2
2525	F 3
2526	E 3
2527	C 1
2528	G 4
2529	F 2
2529	G 5
2530	D 3
2531	F 2
2532	F 3
2532	G 3
2533	D 4
2534	F 4
2536	B 4
2537	F 3
2538	F 3
2539	E 3
2540	B 2
2540	E 3
2541	E 4
2541	D 3
2543	F 4
2544	F 4
2545	F 3
2546	A 3
2547	A 3
2549	B 2
2550	B 3
2571	J 6
2572	J 3
2723	F 3
2732	H 9
3093	B 5
3501	G 2
3502	G 2
3503	G 3
3504	H 4
3505	G 2
3506	C 4
3507	C 3
3508	E 4
3509	E 4
3510	E 4
3511	D 5
3512	E 4
3513	E 4
3514	E 4
3515	E 4
3516	F 3
3517	D 4
3518	D 4
3519	D 4
3520	G 4
3521	G 4
3522	F 3
3523	E 3
3525	E 3
3526	F 3
3526	F 4
3528	E 2
3528	D 3
3530	E 3
3531	E 4
3532	G 2
3533	E 2
3534	F 4
3535	D 3
3537	E 3
3537	E 3
3538	D 2
3539	D 2
3540	E 2
3541	D 3
3542	D 3
3542	D 3
3542	E 3
3543	E 3
3544	D 3
3545	E 2
3546	D 3
3547	B 4
3548	C 4
3548	H 2
3549	C 4
3550	D 3
3551	D 3
3552	D 3
3553	D 2
3554	D 2
3555	F 4
3556	B 2
3558	B 3
3560	F 4
3561	C 4
3562	E 4
3563	E 3
3565	B 4
3566	C 3
3567	C 5
3568	C 3
3569	C 2
3570	F 4
3571	J 6
3572	J 4
3573	J 4
3574	J 4
3575	K 6
3576	J 2
3577	J 2
3578	F 5
3579	F 3
3580	F 3
3581	F 3
3585	J 6
3586	B 4
3587	A 4
3588	A 3
3589	A 2
3590	A 2
3590	E 4
3591	B 2
3592	B 2
3593	B 4
3594	B 3
3595	F 4
3610	H 9
3902	F 4
3903	G 4
3904	C 5
3906	C 5
3907	E 4
3911	C 8
3913	H 8
3914	B 8
3915	C 8
3917	G 5
3918	D 2
3920	D 3
3921	H 8
3922	E 2
3923	C 2
3970	F 2
3999	H 9
5432	H 8
5502	F 4
6501	G 4
6502	C 3
6503	C 4
6504	C 4
6505	C 2
6507	F 2
6508	E 3
6509	E 2
6510	E 2
6511	F 3
6513	B 4
6514	C 3
6515	C 3
6515	C 3
6520	B 8
6521	B 7
6522	B 8
6523	D 3
6524	H10
6525	H11
6527	H 9
6528	H10
6529	H10
6530	H11
6531	E 9
6532	E 9
6533	F 9
6534	F 9
6535	I 9
6536	D 2
6537	D 2
6541	A 4
6542	B 2
6560	C 3
6562	H 9
6571	K 5
6572	K 3
7501	G 4
7504	F 2
7505	C 3
7506	C 4
7507	C 3
7508	C 4
7509	C 3
7510	E 3
7511	E 3
7513	E 2
7514	E 2
7515	D 2
7516	E 2
7517	D 3
7518	D 3
7519	D 2
7520	E 3
7521	F 4
7521	D 3
7522	C 4
7523	E 3
7524	C 3
7525	B 3
7526	F 5
7527	F 3
7528	B 5
7530	C 8
7531	H 9
7541	B 4
7542	B 3
7543	B 3
7544	B 3
7545	B 3
7571	J 5
7572	J 3
7601	E 4
SK17	I 8
SK18	I 7
SK19	H11
SK20	H10
SK21	H 9
SK22	H 8
SK23	H 7
SK24	I11
SK25	I10
SK26	I 9
SK27	D 9
SK28	E 9
SK29	F 9
SK30	F 9
SK31	C 8
SK32	B10
SK33	B11
SK34	C11
SK35	C10
SK36	C11
SK37	C 9
SK38	C 7
SK39	B 8
SK40	B 9

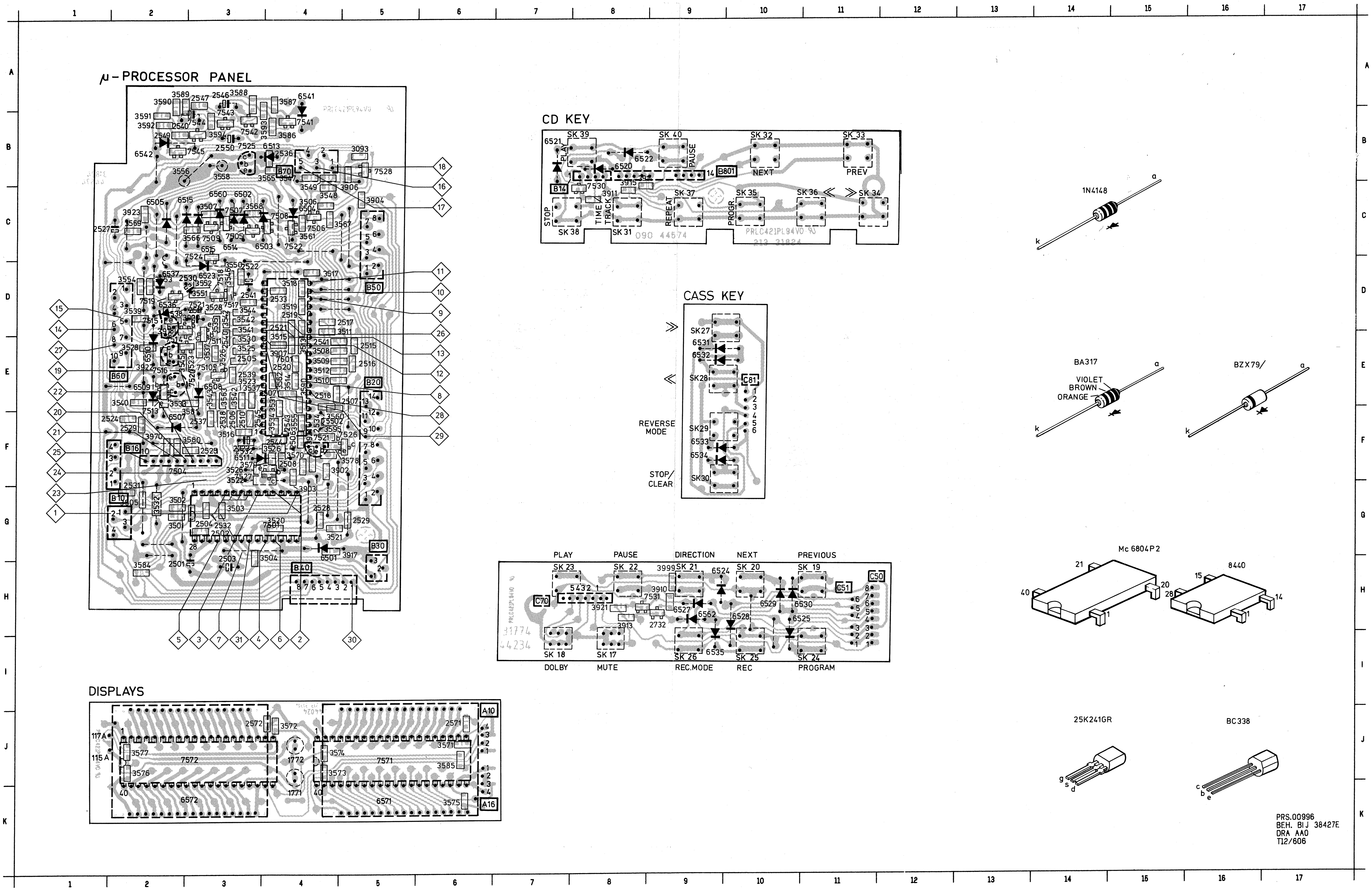


Fig. 7-3

MEASUREMENTS AND ADJUSTMENTS

General points of inspection

- Check that all supply voltages are present and that they have the correct value.
- Check the good functioning of the microprocessors by means of their built-in test programme (see Chapter 2).

Indication of test points

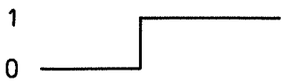
- In the circuit diagram and the PCB drawing, the test points are stated with a number (e.g. ◇5◇), to which the fault-finding method refers.
  In the following test method, the symbol ◇ has been left out.
- Signal levels are indicated with "0" and "1".
  "0" corresponds to 0V; "1" corresponds to 5V.

Checking the Compact Disc functions

- Check the working of function keys SK31 through SK37.
  Place a disc on the turntable.
  Check if the signal at these point(s) 1 become(s) "0" during operation of the relevant function key.
- Check the Play CD signal at test point 2.
  When the Play key is operated, a simple pulse will appear.

- Check the Pause CD signal at test point 3.
  When the Pause key is operated, a simple pulse will appear.

- Check the CD Pause signal at test point 4.
  After the Pause key has been operated, the signal becomes "1".

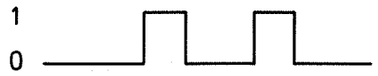


- When a disc is played, the signal will become "1" when a pause between two pieces of music passes. The toggle function of the Pause key, which is originally present, is suppressed by transistor 7530. In order to resume the music, the Play key should be operated.
- Check the Stop CD signal at test point 5.
  When the Stop key is operated, a simple pulse will occur.

- Check the Disc End signal at test point 6.
  After the last track on a disc, this signal becomes "1".
- Check the Laser On/Off signal at test point 7.
  The laser burns when the signal is "1".

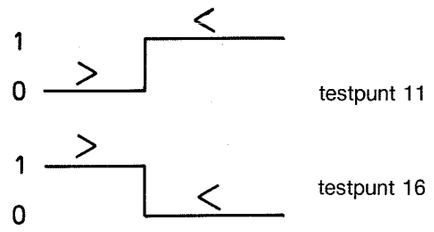
Checking the Cassette functions

- Check Output gates PD0 through PD4 of 7901 at test point 8.
  Check if pulse trains are present.

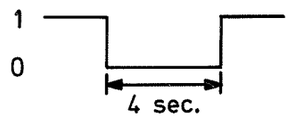


- Check the Reel Motor Signal at test point 9.
  When Play, >>, <<, Next or Previous are operated, the signal will become "1".
- Check the REC signal at test point 10.
  During the making of a recording, the signal becomes "1".
  Output gate PD7 then gives a pulse train (test point 28).
  In the Recording and Play modes, the signal at test point 29 becomes "0".

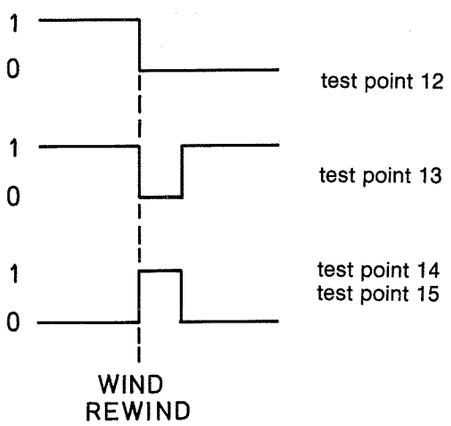
- Check the Direction signals at test points 11 and 16.



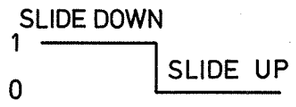
- Check the Auto Pause signal at test point 31. In the Auto Recording position, pauses of 4 seconds each are automatically inserted between two recordings for the benefit of the Next/Previous function.
  During this pause, the Auto Pause signal is "0".
  If a recording is made from the Compact Disc, the Auto Pause signal ensures that the CD player waits with the next track until the 4-second pause has been inserted.



- Check the Wind/Rewind signals at test points 12, 13, 14 and 15.

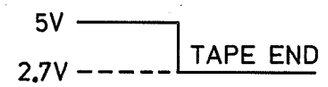


- Check the Slide signal at test point 17.



Checking the Tape Leader Detection

- Check the Tape End signal at test point 18.



The tape reader signal switches this function off during Wind and Rewind actions. The false light incidence through the cassette lid can then render the Tape Leader Detection operative, which is unwanted.

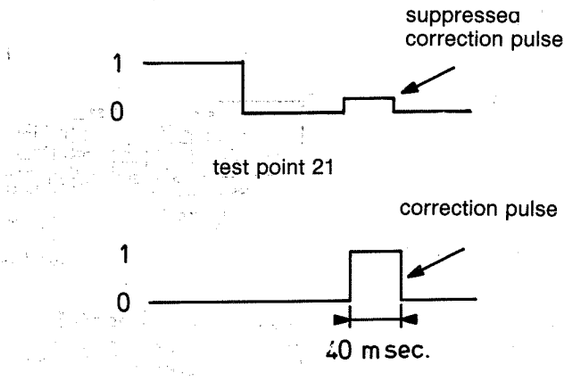
- Check the Tape Reader signal at test point 19.

Checking the Reel Motor

- Check the motor control signals round IC 7504.

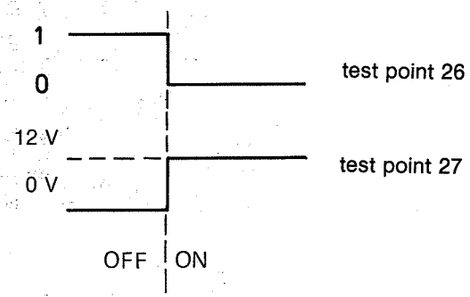
	STOP	>>	<<	>	<
test point 20	0 V	5 V	0 V	0 V	0 V
test point 21	0 V	0 V	5 V	0 V	0 V
test point 22	3.6 V	9.6 V	9.6 V	3.6 V	3.6 V
test point 23	70 mV	350 mV	350 mV	240 mV	240 mV
test point 24	0 V	0 V	9 V	0 V	2.5 V
test point 25	0 V	9 V	0 V	2.5 V	0 V

In order to stop the tape fast after fast forward or fast rewind, a correction pulse (40 msec) is given after the motor voltage has dropped out.
The circuit round transistors 7541 through 7544 suppwrong correction pulse, generated by the microcomputer, after the motor voltage for turning clockwise has dropped out.



Checking the Capstan Motor

- Check the Capstan Motor signals at test points 26 and 27.



1771	K 4	2508	F 4	2524	F 2	2533	D 4	2544	F 4	3501	G 2	3512	E 4	3523	E 3
1772	J 4	2510	F 3	2525	F 3	2534	F 4	2545	F 3	3502	G 2	3513	E 4	3525	E 3
2501	H 2	2511	D 3	2526	E 3	2536	B 4	2546	A 3	3503	G 3	3514	E 4	3526	F 3
2502	G 3	2515	E 5	2527	C 1	2537	F 3	2547	A 3	3504	H 4	3515	E 4	3526	F 4
2503	G 3	2516	E 5	2528	G 4	2538	F 3	2549	B 2	3505	G 2	3516	F 3	3528	E 2
2504	G 3	2517	D 5	2529	F 2	2539	E 3	2550	B 3	3506	C 4	3517	D 4	3528	D 3
2505	E 3	2518	E 4	2529	G 5	2540	B 2	2571	J 6	3507	C 3	3518	D 4	3530	E 3
2506	F 4	2519	D 4	2530	D 3	2540	E 3	2572	J 3	3508	E 4	3519	D 4	3531	E 4
2506	F 3	2520	E 4	2531	F 2	2541	E 4	2723	F 3	3509	E 4	3520	G 4	3532	G 2
2507	E 5	2521	D 4	2532	F 3	2541	D 3	2732	H 9	3510	E 4	3521	G 4	3533	E 2
2507	E 4	2522	D 3	2532	G 3	2543	F 4	3093	B 5	3511	D 5	3522	F 3	3534	F 4

3535	D 3	3544	D 3	3554	D 2	3568	C 3	3579	F 3	3592	B 2	3913	H 8	5432	H 8
3537	E 3	3545	E 2	3555	F 4	3569	C 2	3580	F 3	3593	G 4	3914	B 8	5502	F 4
3537	E 3	3546	D 3	3556	B 2	3570	F 4	3581	F 3	3594	B 3	3915	C 8	6501	G 4
3538	D 2	3547	B 4	3559	B 3	3571	J 6	3585	J 6	3595	F 4	3917	G 5	6502	C 3
3539	D 2	3548	C 4	3560	F 4	3572	J 4	3586	B 4	3610	H 9	3918	D 2	6503	C 4
3540	E 2	3548	H 2	3561	C 4	3573	J 4	3587	A 4	3902	F 4	3920	D 3	6504	C 4
3541	D 3	3549	C 4	3562	E 4	3574	J 4	3588	A 3	3903	G 4	3921	H 8	6505	C 2
3542	D 3	3550	D 3	3563	E 3	3575	K 6	3589	A 2	3904	C 5	3922	E 2	6507	F 2
3542	D 3	3551	D 3	3565	B 4	3576	J 2	3590	A 2	3906	C 5	3923	C 2	6508	E 3
3542	E 3	3552	D 3	3566	C 3	3577	J 2	3590	E 4	3907	E 4	3970	F 2	6509	E 2
3543	E 3	3553	D 2	3567	C 5	3578	F 5	3591	B 2	3911	C 8	3999	H 9	6510	E 2

6511	F 3	6527	H 9	6541	A 4	7508	C 4	7520	E 3	7531	H 9	SK19	H11	SK30	F 9
6513	B 4	6528	H10	6542	B 2	7509	C 3	7521	F 4	7541	B 4	SK20	H10	SK31	C 8
6514	C 3	6529	H10	6560	C 3	7510	E 3	7521	D 3	7542	B 3	SK21	H 9	SK32	B10
6515	C 3	6530	H11	6562	H 9	7511	E 3	7522	C 4	7543	B 3	SK22	H 8	SK33	B11
6515	C 3	6531	E 9	6571	K 5	7513	E 2	7523	E 3	7544	B 3	SK23	H 7	SK34	C11
6520	B 8	6532	E 9	6572	K 3	7514	E 2	7524	C 3	7545	B 3	SK24	I11	SK35	C10
6521	B 7	6533	F 9	7501	G 4	7515	D 2	7525	B 3	7571	J 5	SK25	I10	SK36	C11
6522	B 8	6534	F 9	7504	F 2	7516	E 2	7526	F 5	7572	J 3	SK26	I 9	SK37	C 9
6523	D 3	6535	I 9	7505	C 3	7517	D 3	7527	F 3	7601	E 4	SK27	D 9	SK38	C 7
6524	H10	6536	D 2	7506	C 4	7518	D 3	7528	B 5	SK17	I 8	SK28	E 9	SK39	B 8
6525	H11	6537	D 2	7507	C 3	7519	D 2	7530	C 8	SK18	I 7	SK29	F 9	SK40	B 9

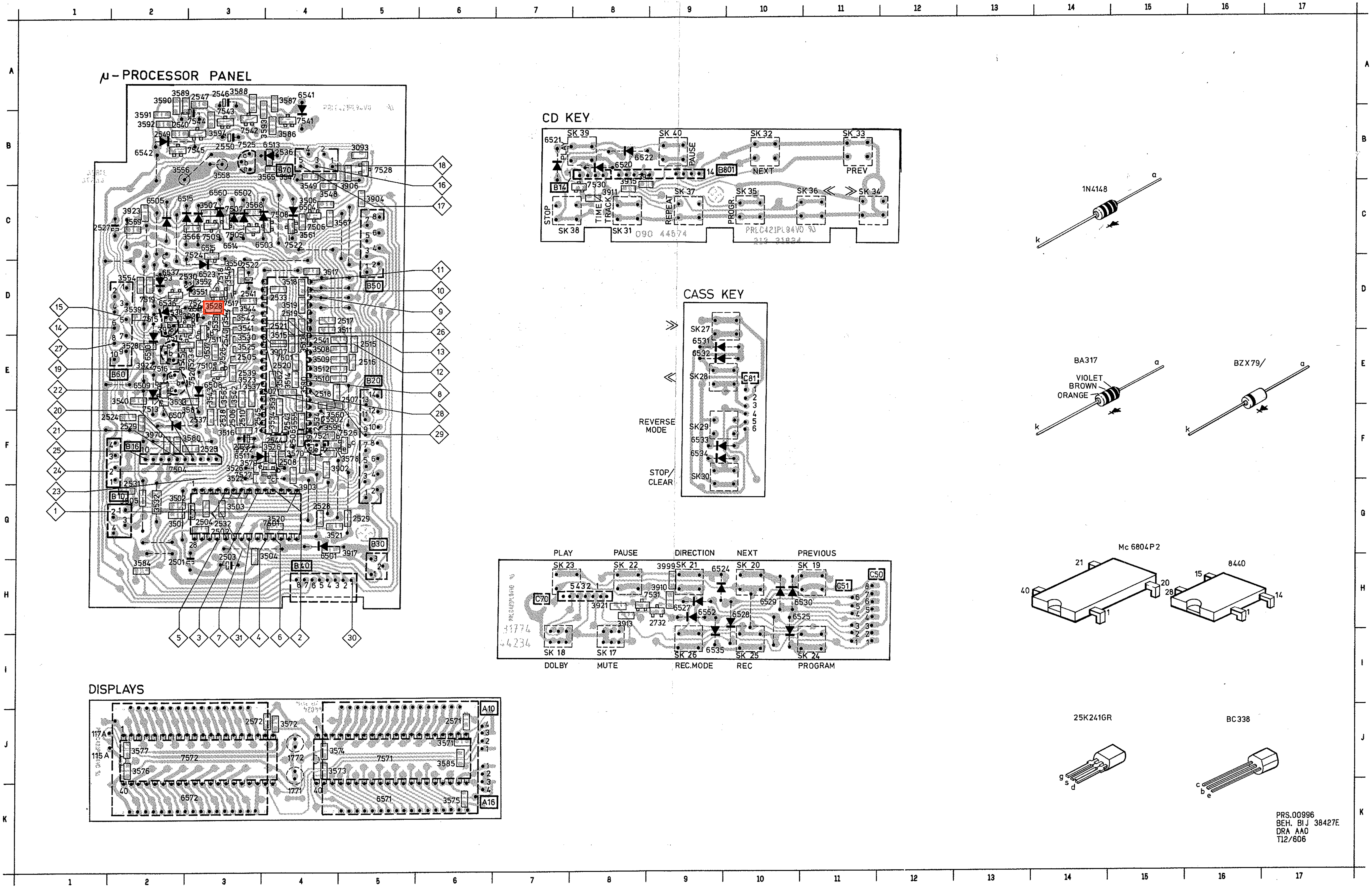


Fig. 7-3

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1 pF	5%	4822 122 32279
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 32267
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947

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0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90338
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392
4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394

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6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
15 E	2%	4822 111 90344
16 E	2%	4822 111 90347
18 E	2%	5322 111 90139
20 E	2%	4822 111 90352
22 E	2%	4822 111 90186
24 E	2%	4822 111 90355
27 E	2%	5322 111 90375
30 E	2%	4822 111 90356
33 E	2%	4822 111 90357
36 E	2%	4822 111 90359
39 E	2%	4822 111 90361
43 E	2%	5322 116 90125
47 E	2%	4822 111 90217
51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
75 E	2%	4822 111 90371
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91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
330 E	2%	5322 111 90106
360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545
6,8 k	2%	4822 111 90544

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7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
150 k	2%	5322 111 90099
160 k	2%	5322 111 90264
180 k	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428

CHAPTER 8. DECODER PART

DECODER For inactive chip components see separate list

3311,3318 3320,3321 3346,3389	1.8 Ω-NFR25	4822 111 30489
3344,3392	1 Ω-NFR25	4822 111 30483

2301,2303	22 nF-2%	4822 121 50609
2370,2371	5.1 nF-2%	4822 121 50976
2372,2373	1.5 nF-2%	4822 121 50432
2374÷2377	2.2 nF-2%	4822 121 50841
2378,2379	1.2 nF-2%	5322 121 54135

1N4148	4822 130 30621
BAX18	4822 130 34121
BB212	4822 130 31129

BC858BR©	4822 130 42134
BSR58©	5322 130 42432

1301	X-tal 4.2336 MHz	4822 242 70663

5301	4822 156 21155

SAA7000	CIM	4822 209 10375
SAA7010	DEMOD	4822 209 10857
SAA7020	ERCO	4822 209 10377
SAA7030	FIL	4822 209 10378
TDA1540	DAC	4822 209 81453
MSM2128-20RS	RAM	4822 209 10379
MC34072P		4822 209 11081
SN74LS74AN		4822 209 80782
MC7805CT		4822 209 80891
MC78M12CT		5322 209 86176
MC79M05CT		4822 209 83164
MC7912CT		4822 209 82065
MC7918CT		4822 209 83165

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1 pF	5%	4822 122 32279
1,5 pF	5%	4822 122 31792
1,8 pF	5%	4822 122 32087
2,2 pF	5%	4822 122 32425
3,3 pF	5%	4822 122 32079
3,9 pF	5%	4822 122 32081
4,7 pF	5%	4822 122 32082
8,2 pF	5%	4822 122 32083
10 pF	5%	4822 122 31971
12 pF	5%	4822 122 32139
18 pF	5%	4822 122 31769
22 pF	10%	4822 122 31837
27 pF	5%	4822 122 31966
33 pF	5%	4822 122 31756
39 pF	5%	4822 122 31972
47 pF	5%	4822 122 31772
56 pF	5%	4822 122 31774
68 pF	5%	4822 122 32267
82 pF	10%	4822 122 31839
100 pF	5%	4822 122 31765
120 pF	5%	4822 122 31766
150 pF	5%	4822 122 31767
180 pF	2%	4822 122 31794
220 pF	5%	4822 122 31965
270 pF	5%	4822 122 32142
330 pF	10%	4822 122 31642
390 pF	5%	4822 122 31771
470 pF	5%	4822 122 31727
560 pF	5%	4822 122 31773
680 pF	5%	4822 122 31775
820 pF	5%	4822 122 31974
1 nF	10%	5322 122 31647
1,2 nF	5%	4822 122 31807
1,5 nF	10%	4822 122 31781
2,2 nF	10%	4822 122 31644
2,7 nF	10%	4822 122 31783
3,3 nF	10%	4822 122 31969
3,9 nF	10%	4822 122 32566
4,7 nF	10%	4822 122 31784
5,6 nF	10%	4822 122 31916
6,8 nF	10%	4822 122 31976
10 nF	10%	4822 122 31728
12 nF	10%	5322 122 31648
15 nF	10%	4822 122 31782
18 nF	10%	4822 122 31759
22 nF	10%	4822 122 31797
27 nF	10%	4822 122 32541
33 nF	10%	4822 122 31981
47 nF	10%	4822 122 32542
56 nF	10%	4822 122 32183
100 nF	10%	4822 122 31947

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0 E	jumper	4822 111 90163
1 E	5%	4822 111 90184
1,1 E	5%	4822 111 90377
1,2 E	5%	4822 111 90378
1,3 E	5%	4822 111 90379
1,5 E	5%	4822 111 90381
1,6 E	5%	4822 111 90382
1,8 E	5%	4822 111 90383
2 E	5%	4822 111 90384
2,2 E	5%	5322 111 90104
2,4 E	5%	4822 111 90385
2,7 E	5%	4822 111 90386
3 E	5%	4822 111 90387
3,3 E	5%	4822 111 90338
3,6 E	5%	4822 111 90389
3,9 E	5%	4822 111 90391
4,3 E	5%	4822 111 90392
4,7 E	5%	5322 111 90376
5,1 E	5%	4822 111 90393
5,6 E	5%	4822 111 90394

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6,2 E	5%	4822 111 90395
6,8 E	5%	4822 111 90254
7,5 E	5%	4822 111 90396
8,2 E	5%	4822 111 90397
9,1 E	5%	4822 111 90398
10 E	2%	5322 111 90095
11 E	2%	4822 111 90338
12 E	2%	4822 111 90341
13 E	2%	4822 111 90343
15 E	2%	4822 111 90344
16 E	2%	4822 111 90347
18 E	2%	5322 111 90139
20 E	2%	4822 111 90352
22 E	2%	4822 111 90186
24 E	2%	4822 111 90355
27 E	2%	5322 111 90375
30 E	2%	4822 111 90356
33 E	2%	4822 111 90357
36 E	2%	4822 111 90359
39 E	2%	4822 111 90361
43 E	2%	5322 116 90125
47 E	2%	4822 111 90217
51 E	2%	4822 111 90365
56 E	2%	4822 111 90239
62 E	2%	4822 111 90367
68 E	2%	4822 111 90203
75 E	2%	4822 111 90371
82 E	2%	4822 111 90124
91 E	2%	4822 111 90375
100 E	2%	5322 111 90091
110 E	2%	4822 111 90335
120 E	2%	4822 111 90339
130 E	2%	4822 111 90164
150 E	2%	5322 111 90098
160 E	2%	4822 111 90345
180 E	2%	5322 111 90242
200 E	2%	4822 111 90348
220 E	2%	4822 111 90178
240 E	2%	4822 111 90353
270 E	2%	4822 111 90154
300 E	2%	4822 111 90156
330 E	2%	5322 111 90106
360 E	1%	4822 111 90288
360 E	2%	4822 111 90358
390 E	2%	5322 111 90138
430 E	2%	4822 111 90362
470 E	2%	5322 111 90109
510 E	2%	4822 111 90245
560 E	2%	5322 111 90113
620 E	2%	4822 111 90366
680 E	2%	4822 111 90162
750 E	2%	5322 111 90306
820 E	2%	4822 111 90171
910 E	2%	4822 111 90372
1 k	2%	5322 111 90092
1,1 k	2%	4822 111 90336
1,2 k	2%	5322 111 90096
1,3 k	2%	4822 111 90244
1,5 k	2%	4822 111 90151
1,6 k	2%	5322 111 90265
1,8 k	2%	5322 111 90101
2 k	2%	4822 111 90165
2,2 k	2%	4822 111 90248
2,4 k	2%	4822 111 90289
2,7 k	2%	4822 111 90569
3 k	2%	4822 111 90198
3,3 k	2%	4822 111 90157
3,6 k	2%	5322 111 90107
3,9 k	2%	4822 111 90571
4,3 k	2%	4822 111 90167
4,7 k	2%	5322 111 90111
5,1 k	2%	5322 111 90268
5,6 k	2%	4822 111 90572
6,2 k	2%	4822 111 90545
6,8 k	2%	4822 111 90544

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7,5 k	2%	4822 111 90276
8,2 k	2%	5322 111 90118
9,1 k	2%	4822 111 90373
10 k	2%	4822 111 90249
11 k	2%	4822 111 90337
12 k	2%	4822 111 90253
13 k	2%	4822 111 90509
15 k	2%	4822 111 90196
16 k	2%	4822 111 90346
18 k	2%	4822 111 90238
20 k	2%	4822 111 90349
22 k	2%	4822 111 90251
24 k	2%	4822 111 90512
27 k	2%	4822 111 90542
30 k	2%	4822 111 90216
33 k	2%	5322 111 90267
36 k	2%	4822 111 90514
39 k	2%	5322 111 90108
43 k	2%	4822 111 90363
47 k	2%	4822 111 90543
51 k	2%	5322 111 90274
56 k	2%	4822 111 90573
62 k	2%	5322 111 90275
68 k	2%	4822 111 90202
75 k	2%	4822 111 90574
82 k	2%	4822 111 90575
91 k	2%	5322 111 90277
100 k	2%	4822 111 90214
110 k	2%	5322 111 90269
120 k	2%	4822 111 90568
130 k	2%	4822 111 90511
150 k	2%	5322 111 90099
160 k	2%	5322 111 90264
180 k	2%	4822 111 90565
200 k	2%	4822 111 90351
220 k	2%	4822 111 90197
240 k	2%	4822 111 90215
270 k	2%	4822 111 90302
300 k	2%	5322 111 90266
330 k	2%	4822 111 90513
360 k	2%	4822 111 90515
390 k	2%	4822 111 90182
430 k	2%	4822 111 90168
470 k	2%	4822 111 90161
510 k	2%	4822 111 90364
560 k	2%	4822 111 90169
620 k	2%	4822 111 90213
680 k	2%	4822 111 90368
750 k	2%	4822 111 90369
820 k	2%	4822 111 90205
910 k	2%	4822 111 90374
1 M	2%	4822 111 90252
1,1 M	5%	4822 111 90408
1,2 M	5%	4822 111 90409
1,3 M	5%	4822 111 90411
1,5 M	5%	4822 111 90412
1,6 M	5%	4822 111 90413
1,8 M	5%	4822 111 90414
2 M	5%	4822 111 90415
2,2 M	5%	4822 111 90185
2,4 M	5%	4822 111 90416
2,7 M	5%	4822 111 90417
3 M	5%	4822 111 90418
3,3 M	5%	4822 111 90191
3,6 M	5%	4822 111 90419
3,9 M	5%	4822 111 90421
4,3 M	5%	4822 111 90422
4,7 M	5%	4822 111 90423
5,1 M	5%	4822 111 90424
5,6 M	5%	4822 111 90425
6,2 M	5%	4822 111 90426
6,8 M	5%	4822 111 90235
7,5 M	5%	4822 111 90427
8,2 M	5%	4822 111 90237
9,1 M	5%	4822 111 90428

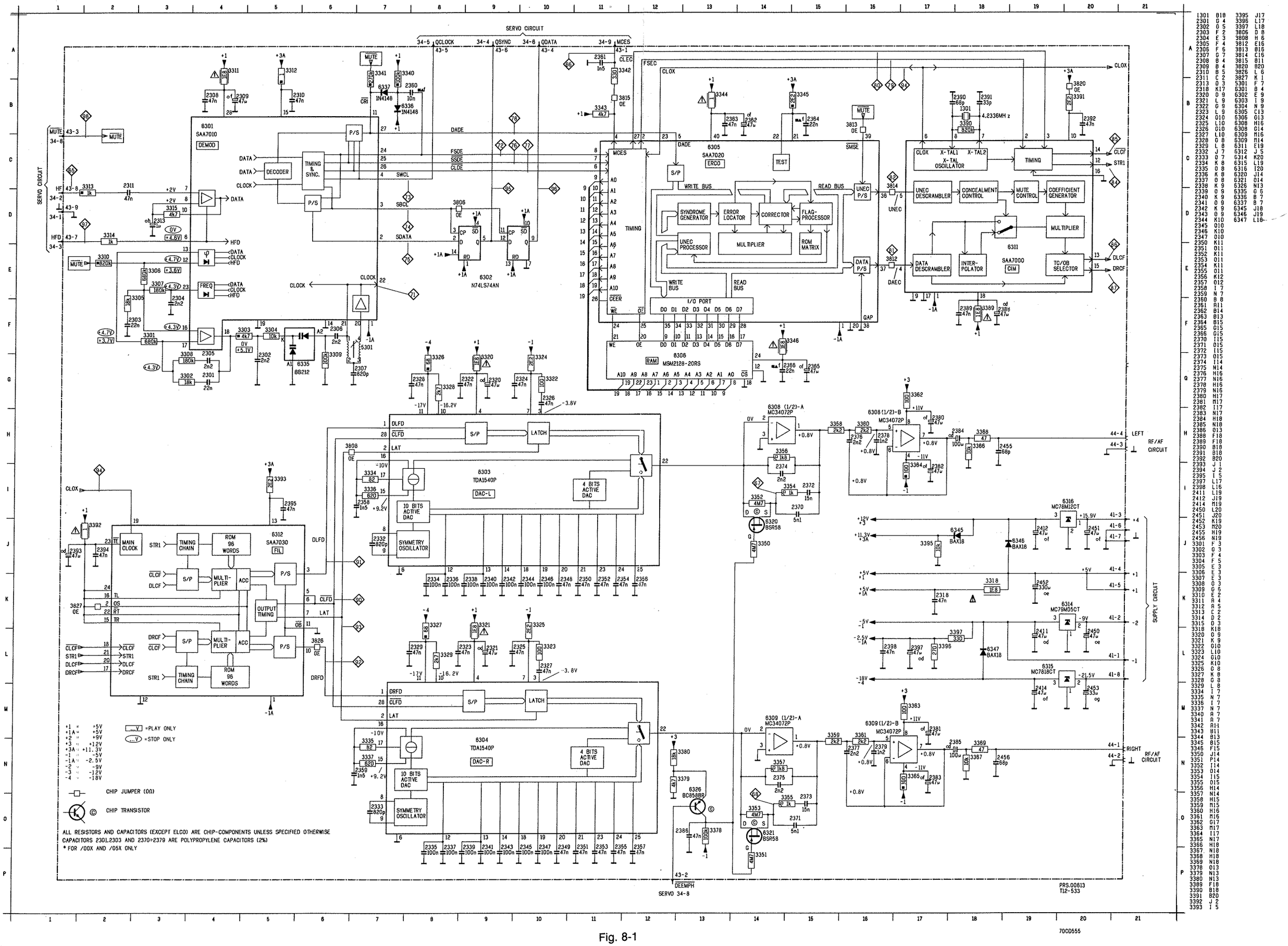

SERVO CIRCUIT
6301 SAA7010 DEMOD
6312 SAA7030 FIL
6305 SAA7020 ERCO
6306 MSM2128-20RS RAM
6302 N74LS74AN
6303 TDA1540P DAC-L
6304 TDA1540P DAC-R
6316 MC78M12CT
6314 MC79M05CT
6315 MC7818CT
6309 (1/2)-A MC34072P
6309 (1/2)-B MC34072P
6308 (1/2)-A MC34072P
6308 (1/2)-B MC34072P
6311 SAA7000 CIM
X-TAL OSCILLATOR
TIMING
UNEC DESCRAMBLER
CONCEALMENT CONTROL
MUTE CONTROL
COEFFICIENT GENERATOR
MULTIPLIER
DATA DESCRAMBLER
INTER-POLATOR
TC/OB SELECTOR
SYNDROME GENERATOR
ERROR LOCATOR
CORRECTOR
FLAG-PROCESSOR
UNEC PROCESSOR
ROM MATRIX
WRITE BUS
READ BUS
I/O PORT
4 BITS ACTIVE DAC
10 BITS ACTIVE DAC
SYMMETRY OSCILLATOR
LATCH
MAIN CLOCK
TIMING CHAIN
ROM 96 WORDS
MULTI-PLIER
OUTPUT TIMING
4.2336MHz
RF/AF CIRCUIT
SUPPLY CIRCUIT
DEEMPH
CHIP JUMPER (0Ω)
CHIP TRANSISTOR
ALL RESISTORS AND CAPACITORS (EXCEPT ELCO) ARE CHIP-COMPONENTS UNLESS SPECIFIED OTHERWISE
CAPACITORS 2301,2303 AND 2370÷2379 ARE POLYPROPYLENE CAPACITORS (2%)
* FOR /00X AND /05X ONLY
PRS.00613
T12-533
70CD555

Fig. 8-1

1301	E 2	2320	B 4	2336	B 6	2350	B 5	2363	E 4	2380	B 9	2398	B 3	3305	F 6	3322	B 5	3342	H 5	3359	D 6	3386	D 3	3820	D 2	6314	G 8
2301	E 6	2321	C 3	2337	C 6	2351	C 5	2364	E 2	2381	D 9	2411	G 8	3306	F 6	3323	C 5	3343	G 5	3360	B 9	3390	E 2	3826	C 3	6315	G 9
2302	E 6	2322	B 5	2338	B 6	2352	B 5	2365	H 3	2382	A 9	2412	G 8	3307	F 6	3324	A 4	3344	E 4	3361	C 9	3391	D 2	3827	B 2	6316	G 9
2303	E 6	2323	C 4	2339	C 6	2353	C 5	2366	H 3	2383	C 8	2414	F 9	3308	F 6	3325	C 5	3345	E 1	3362	C 9	3392	B 2	5301	E 7	6320	B 7
2304	F 6	2324	B 6	2340	B 7	2354	B 5	2370	B 8	2384	C 9	2450	H 8	3309	E 7	3326	A 6	3346	H 2	3363	D 8	3393	D 2	6301	F 7	6321	C 7
2305	F 6	2325	C 5	2341	C 6	2355	C 5	2371	D 7	2388	D 3	2451	H 8	3310	H 5	3327	B 4	3350	B 7	3364	B 8	3395	D 3	6302	H 6	6326	C 6
2306	E 7	2326	B 5	2342	B 7	2356	B 5	2372	B 8	2389	D 3	2452	H 7	3311	F 8	3328	B 6	3351	C 7	3365	C 7	3396	B 3	6303	B 5	6335	E 7
2307	E 6	2327	C 4	2343	C 6	2357	C 4	2373	D 7	2390	E 2	2453	G10	3312	E 5	3329	C 5	3352	B 8	3366	C 8	3397	B 3	6304	C 5	6337	H 5
2308	E 8	2328	B 6	2344	B 6	2358	B 6	2374	A 8	2391	E 1	2455	C 9	3313	H 6	3334	B 6	3353	C 7	3367	D 9	3806	G 7	6305	F 3	6345	C 3
2309	E 7	2329	C 6	2345	C 6	2358	D 9	2375	D 7	2392	E 2	2456	D 9	3314	H 6	3335	C 6	3354	A 7	3368	C 9	3808	B 3	6306	G 3	6346	D 4
2310	E 5	2332	B 6	2346	B 6	2359	C 6	2376	B 9	2393	A 2	3301	F 6	3315	F 6	3336	B 6	3355	C 7	3369	D 9	3812	E 3	6308	B 9	6347	B 3
2311	G 6	2333	C 5	2360	I 5	2377	D 9	2394	B 2	3302	E 6	3318	G 7	3337	C 6	3356	B 8	3378	D 8	3813	F 5	6309	C 8	6366	H 4		
2313	G 6	2334	B 6	2348	B 6	2361	H 5	2378	A 9	2395	C 2	3303	E 6	3320	B 4	3340	I 4	3357	D 7	3379	C 6	3814	E 3	6311	E 3		
2318	G 7	2335	C 6	2349	C 5	2362	E 4	2379	C 9	2397	A 3	3304	E 7	3321	C 4	3341	H 5	3358	B 9	3380	C 7	3815	H 5	6312	C 2		

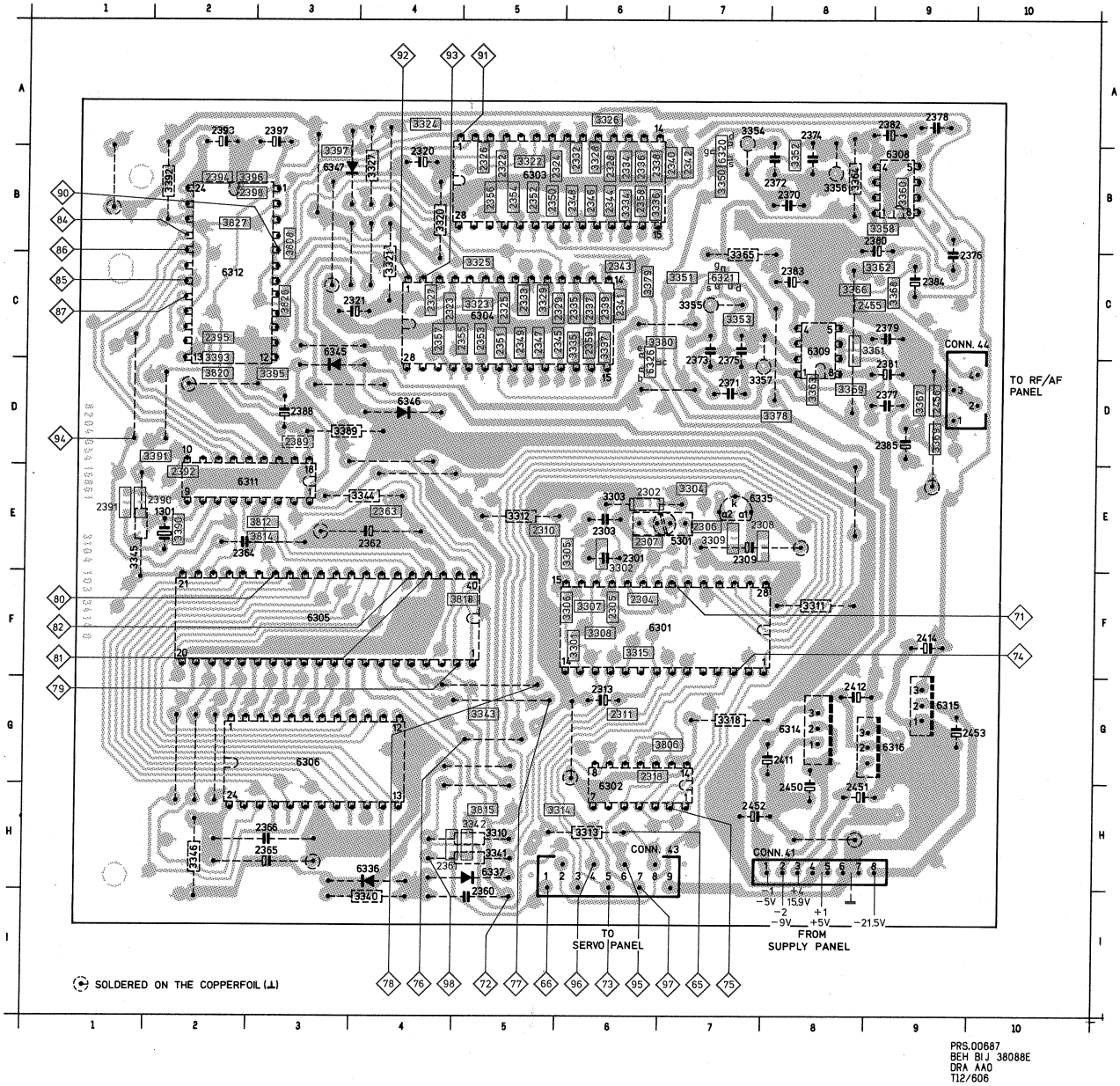


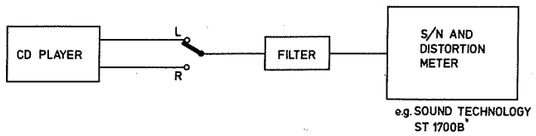
Fig. 8-2

ELECTRICAL MEASUREMENTS AND ADJUSTMENTS

For measurements and adjustments on the CD mechanism and the servo + preampl. PCB see the CDM-2 Service Manual.

The disc should always bed down well on the turntable. To this end, a disc hold-down has been built into the lid. When, in case of repairs, the CD mechanism must be demounted, use a separate disc hold-down.
The set then can function normally.
Code number of the hold-down disc is 4822 532 60906.

Specification measurement



To measure the specification use can be made of audio test disc 4822 397 30085.
Use 7th order filter 4822 395 30204 to measure:
- Total harmonic distortion (THD)
- Intermodulation distortion
- Signal-to-noise ratio (S/N)

Indication of test points

In the drawings of the diagrams and the PCBs the test points have been indicated by a number (e.g. ◇12◇) to which the measuring method refers. In the measuring method below, the symbol (◇) has been omitted for the test points indicated.

GENERAL CHECKPOINTS

In the detailed measuring method below a number of general conditions, required for a properly functioning set, will not be mentioned. Before the detailed measuring method is started, these general points should first be checked.

a. Ensure that disc and objective are clean (remove dust, fingerprints, etc.) and work with undamaged discs.
b. Check if all supply voltages are present and if they have the correct values.
c. Check the good working of the two microprocessors by means of their built-in test programme and servicing programme.

DETAILED MEASURING METHOD FOR THE DECODER CIRCUIT

1 HINTS

Test discs

It is important to treat the test discs with great care. The disorders on the discs (black spots, fingerprints, etc.) are exclusive and unambiguously positioned. Damage may cause additional drop-outs etc. rendering the intentional errors no longer exclusive. In that case it will no longer be possible to check e.g. the good working of the track detectors.

Measurements on op-amps

In the electronic circuits op-amps have been used frequently. Some of the applications are amplifiers, filters, inverters and buffers.

In those cases where in one way or the other feedback has been applied the voltage difference at the differential inputs converges to zero. This applies to both DC and AC signals. The cause can be traced to the properties of an ideal op-amp ($Z_i = \infty$, $G = \infty$, $Z_o = 0$). If one input of an op-amp is directly connected to ground it will be virtually impossible to measure at the inverting and the non-inverting inputs. In such cases only the output signal will be measurable.

That is why in most cases the AC voltage at the inputs will not be given. The DC voltages at the inputs are equal.

Stimulation with "0" and "1"

During troubleshooting sometimes certain points should be connected to ground or supply voltage. As a result certain circuits can be brought in a desired state thus shortening the diagnosis time. In a number of cases the related points are outputs of op-amps. These outputs are short-circuit-resistant, i.e. they can be brought to "0" or ground without problems.
The output of an op-amp, however, should never be connected directly to the power supply voltage.

Measurements on microprocessors

Inputs and outputs of microprocessors should **never** be connected directly to the power supply voltage. The inputs and outputs should only be brought to "0" or ground if this is stated explicitly.

Measurements with an oscilloscope

During measurements with an oscilloscope it is recommended to measure with a 1:10 test probe, since a 1:10 probe has a considerably smaller input capacitance than a 1:1 probe.

Selection of ground potential

It is very important to select a ground point that is as close as possible to the test point.

Conditions for injection

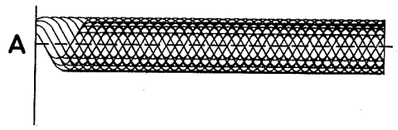
- Injection of levels or signals from an **external** source should **never** take place if the related circuit has no supply voltage.
- The injected levels or signals should **never** be greater than the supply voltage of the related circuit.

2 DEMOD IC

- Check the **motor speed.**
  See "turntable motor control" in C.D.M.-2 Service Manual, section III.
- Check the **HF signal** on **test point 65 (eye pattern)**
- Insert a disc.
- The HF signal should be present and be stable in the PLAY mode and in:
  SERVICING POSITION 3 after the run-in track has been read.
- In SERVICING POSITION 2 and during reading of the lead-in track the RF signal is not stable.

Position of oscilloscope 0,5 µs/DIV

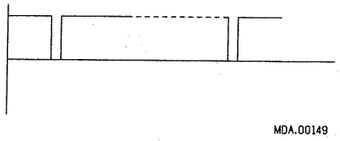
Amplitude ≈ 1,5 V_{pp}



- Check the **HFD signal** on **test point 97**

- Insert a disc.
- In the PLAY mode and in SERVICING POSITION 3 the HFD signal is "high"; however, minor pulses may be present and in cause of disorders on the disc.
- In SERVICING POSITION 2 and during playback of track no. 15 of test disc 5A HFD pulses are visible.

Position of the osciloscope 5ms/DIV



- Check the **$\overline{\text{MUTE}}$ signal** on **test point 98**
- Insert a disc.
- In the PLAY mode or in SERVICING POSITION 3 the $\overline{\text{MUTE}}$ signal is "high".
- The $\overline{\text{MUTE}}$ signal is "low" in SERVICING POSITIONS 0, 1 and 2, in the STAND-BY (only mains switch depressed) and PAUSE modes and during jumping to a track after command NEXT or PREVIOUS.

- Check the **clock signal** on **test point 71**
- Insert a disc.
- In the Stand-by mode (only mains switch depressed) the frequency of the clock signal is 1,88 MHz.
- In the PLAY mode or in SERVICING POSITIONS 2 or 3 the frequency of the clock signal is 4,32 MHz.

Remark: In SERVICING POSITION 2 the clock signal is unstable.

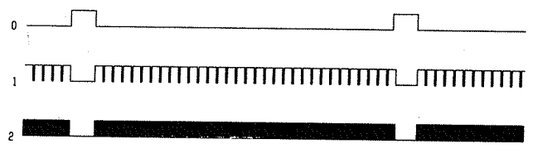
- Check the **timing signals** destined for **ERCO IC**
- Insert a disc.
- Bring the player in one of the following positions: SERVICING POSITION 2 or 3 or the PLAY mode.

Remark: In SERVICING POSITION 2 the timing signals are unstable.

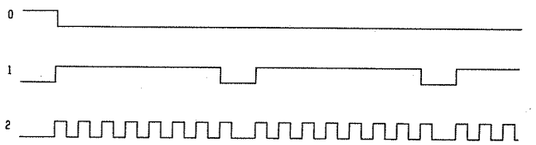
- Trigger an oscilloscope with the **FSDE signal** on test point 72.
- Check signals.

$\overline{\text{FSDE}}$ on test point 72
$\overline{\text{SSDE}}$ on test point 76
$\overline{\text{CLDE}}$ on test point 77

Position of the oscilloscope 20 µs/DIV
0 = FSDE, tp 72; 1 = $\overline{\text{SSDE}}$, tp 76; 2 = $\overline{\text{CLDE}}$, tp 77



Position of the oscilloscope 1 µs/DIV
0 = FSDE, tp 72; 1 = $\overline{\text{SSDE}}$, tp 76; 2 = $\overline{\text{CLDE}}$, tp 77



Remark: The repetition time of the SFDE signal on tp 72 is in the Stand-by and in SERVICING POSITIONS 0 and 1: 312 µs in the PLAY mode and in SERVICING POSITIONS 2 and 3: 136 µs.

- Check the **DADE signal** on **test point 78**
- Insert a disc.
- In the PLAY mode or in SERVICING POSITION 3 activity should be present at test point 78 after the lead-in track has been read.

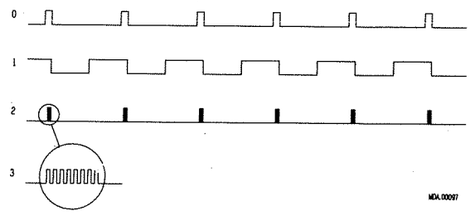
- Check the **subcode clock signals**
- Insert a disc.
- Bring the player in one of the following positions: SERVICING POSITION 3 or PLAY mode.
- Trigger an oscilloscope with the FSDE signal on test point 72.
- Check signals

FSDE	on test point 72
SWCL/Q CLOCK	on test point 73
SBCL	on test point 74

and measure their interrelations.

Positions of the oscilloscope 0,1 ms/DIV

0 = FSDE	tp 72
1 = SWCL/Q CLOCK	tp 73
2 = SBCL	tp 74
3 = SBCL	tp 74



Remark: The repetition of the FSDE signal on tp 72 is:
in the STAND-BY mode and in SERVICING POSITIONS 0 and 1: 312 µs.
in the PLAY mode and in SERVICING POSITIONS 2 and 3: 136 µs.

– Check the **subcode data signals**
- Insert a disc.
- In the PLAY mode or in SERVICING POSITION 3 activity should be present at the following test points

S-DATA test point 75
Q-SYNC test point 95
Q-DATA test point 96

3 ERCO IC

– Check the **timing signals coming** from the **DEMOD IC**
- See sub "I DEMOD IC"
  'Check the timing signals destined for the ERCO IC'

– Check the **DADE signal** on **test point 78**
- See sub "I DEMOD IC"
  'Check the DADE signal on test point 78'

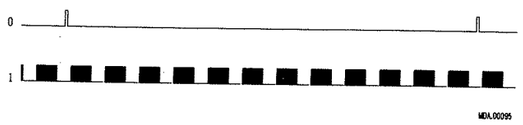
– Check the **CLOX signal** on **test point 94**
- In Stand-by mode (only mains switch depressed) the frequency of the CLOX signal should be 4,2336 MHz.

– Check the **timing signals** destined for the **CIM IC**
- Bring the player in the Stand-by mode (only mains switch depressed).
- Trigger an oscilloscope with the FSEC signal on test point 79.
- Check signals

$\overline{\text{FSEC}}$ on test point 79
$\overline{\text{CLEC}}$ on test point 80
and their interrelations.

Position of the oscilloscope 20 µs/DIV

0 = $\overline{\text{FSEC}}$ tp 79
1 = $\overline{\text{CLEC}}$ tp 80



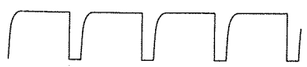
Remark: The repetition time of the FSEC signal is 136 µs.

– Check the **$\overline{\text{MUTE}}$ signal** on **test point 98**
- See sub "I DEMOD IC"
  'Check the $\overline{\text{MUTE}}$ signal on test point 98'

– Check the **DAEC signal** on **test point 81**
- Insert a disc.
- In the PLAY MODE or in SERVICING POSITION 3 activity should be present at test point 81 after reading of the lead-in track.

– Check the **MCES signal** on **test point 66**
- In the Stand-by mode the MCES signal is as indicated in the figure below.

Position of the oscilloscope 50 µs/DIV



Remark: The repetition time of the MCES signal is 140 µs.

- Insert a disc.
- In the PLAY mode or in SERVICING POSITION 3 the MCES signal is as indicated in the figure below.

Remark: The repetition time of the MCES signal is 140 µs.
Duty cycle is 50%.
Also see "Measurement of turntable motor control" in C.D.M.-2 Service Manual, section III.

– Check the **UNEC signal** on **test point 82**
- Insert test disc 5A.
- During playback of track no. 17 UNEC flags should briefly be present at test point 82.
  The UNEC flags are also present in case of soft braking of the disc and during fast forward or fast reverse (SEARCH FORW., SEARCH REV.).

Remark: If the UNEC signal at test point 82 remains continuously "high", either the DEMOD IC or the ERCO IC or the RAM IC is defective.

4 CIM IC

– Check the **CLOX signal** on **test point 94**
- See sub "II ERCO IC"
  'Check the CLOX signal on test point 94'

– Check the **timing signals coming from the ERCO IC**
- See sub "II ERCO IC"
  'Check the timing signals destined for the CIM IC'

– Check the **DAEC signal** on **test point 81**
- See sub "II ERCO IC"
  'Check the DAEC signal on test point 81'

– Check the **UNEC signal** on **test point 82**
- See sub "II ERCO IC"
  'Check the UNEC signal on test point 82'

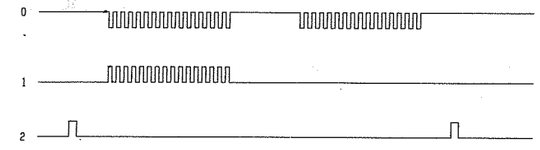
– Check the **timing signals** destined for the **FIL IC**
- Bring the player in the Stand-by mode (only mains switch depressed).
- Trigger an oscilloscope with the STR1 signal on test point 84.
- Check signals

$\overline{\text{CLEC}}$ on test point 80
$\overline{\text{CLCF}}$ on test point 85
STR1 on test point 84
and their interrelations.

Position of the oscilloscope 5 µs/DIV

0 = $\overline{\text{CLEC}}$ tp 80
1 = $\overline{\text{CLCF}}$ tp 85
2 = STR1 tp 84

Remark: The repetition time of the STR1 signal is 22 µs (f = 44,1 kHz).



– Check the **DLCF signal** on **test point 86** and the **DRCF signal** on **test point 87**
- Insert a disc.
- In the PLAY mode and in SERVICING POSITION 3 activity should be present at test points 86 and 87 after reading of the lead-in track.

5 FIL IC

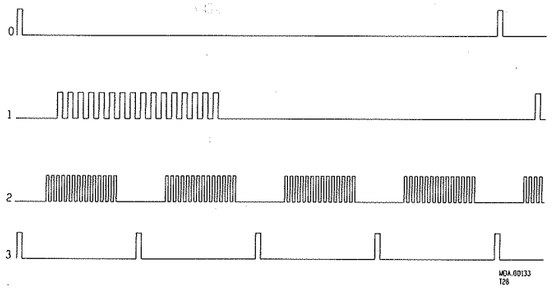
– First check all signals round the CIM IC (see "III").

– Check the timing signals.
- Bring the player in the Stand-by mode (only the mains switch depressed).
- Trigger an oscilloscope with the STR1 signal at test point 84.
- Check signals

$\overline{\text{STR1}}$ on test point 84
$\overline{\text{CLCF}}$ on test point 85
$\overline{\text{CLFD}}$ on test point 90
LAT on test point 83
and their interrelations.

Position of the oscilloscope 5 µs/DIV

0 = $\overline{\text{STR1}}$ tp 84
1 = $\overline{\text{CLCF}}$ tp 85
2 = $\overline{\text{CLFD}}$ tp 90
3 = LAT tp 93



Remark: The repetition time of the LAT signal is 5,5 µs (f = 176,4 kHz).

– Check the **DLFD signal** on **testpoint 91** and the **DRFD signal** on **test point 92**
- Insert a disc.
- In the PLAY mode and in SERVICING POSITION 3 activity should be present at test point 91 and 92 after reading of the lead-in track.

6 DAC IC

– First check all signals round the FIL IC, see IV.

– Check the output of the OP-AMP after the DAC IC.
- Insert a disc.
- In the PLAY mode and in SERVICING POSITION 3 the analog (= music) signal should be present on the output of the OP-AMP after reading of the run-in track.

7 DEEMPH CIRCUIT

- Insert test disc 5.
- During playback of track no. 14 (recorded with PREEMPH) the $\overline{\text{DEEMPH}}$ signal on connector 43-2 should be "high").
- During playback of track no. 15 (recorded with PREEMPH) the $\overline{\text{DEEMPH}}$ signal on connector 43-2 should be "low").
- During playback of track no. 14 the analog signal should be present at the source of 6320 (to be measured at resistor 3354, tp 67) and 6321 (to be measured at resistor 3355, tp 68).
- During playback of track no. 15 the analog signal should be 0 V at the source of 6320 (to be measured at resistor 3354) and 6321 (to be measured at resistor 3355).