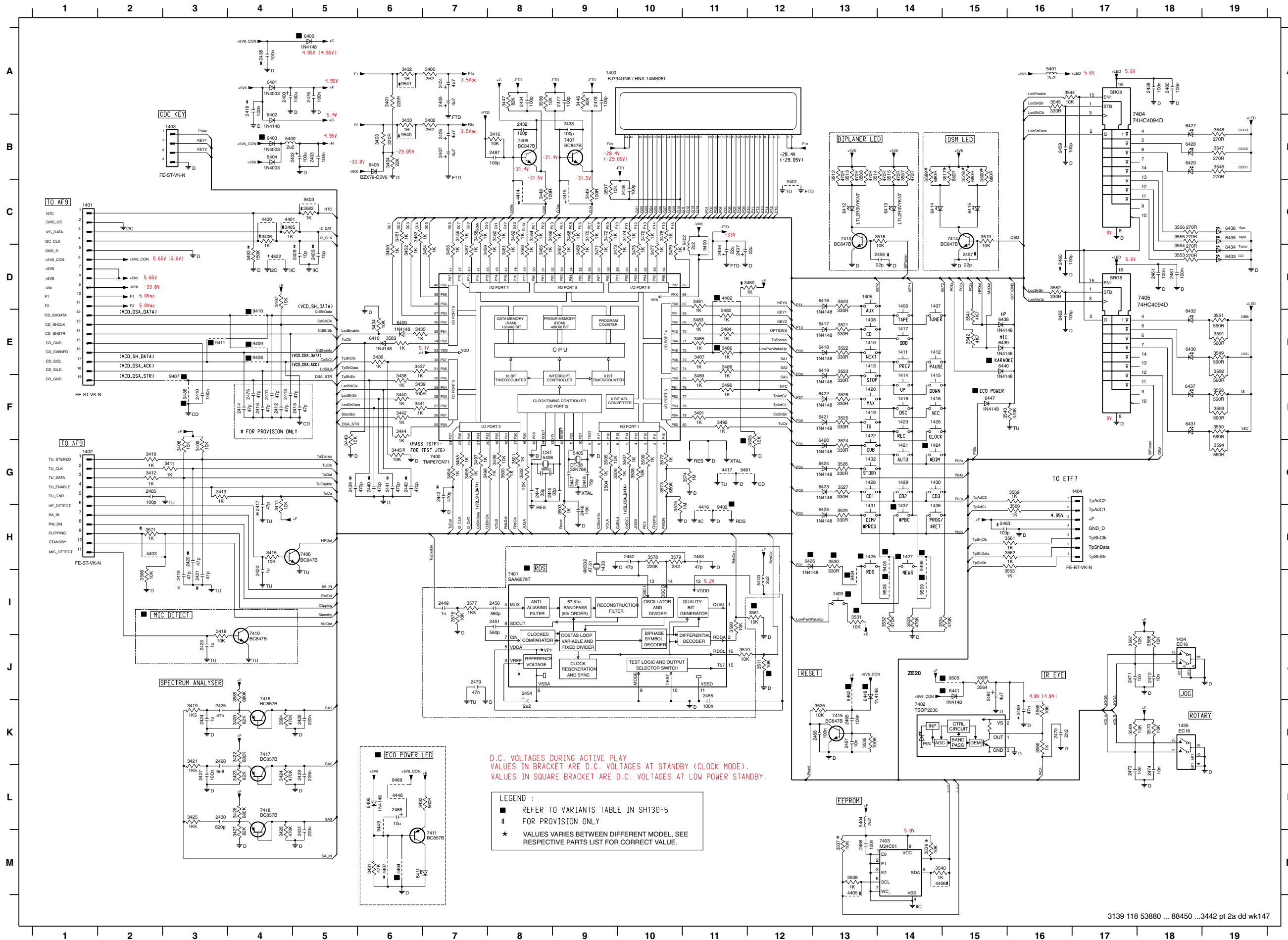
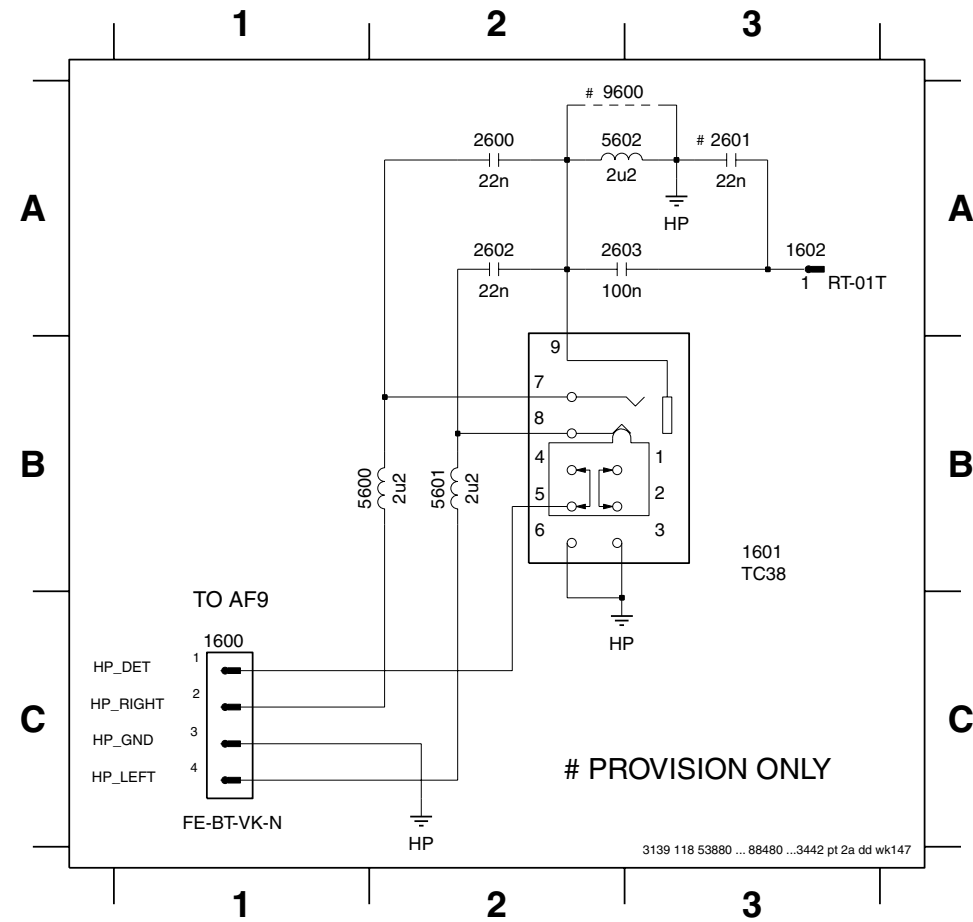


FRONT BOARD - CIRCUIT DIAGRAM



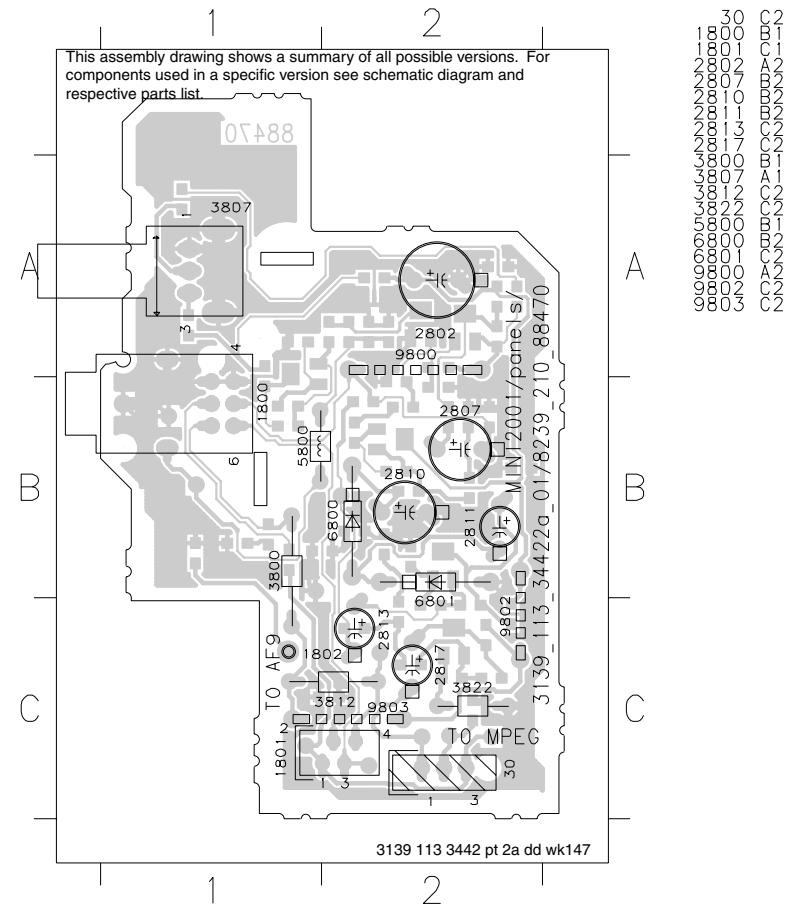
1400 A9	3445 G6	4532 D4
1401 C1	3446 A9	5400 B4
1402 G1	3447 A8	5401 A16
1403 B3	3448 C8	5402 C11
1404 G16	3449 C9	5403 I12
1405 D13	3450 D6	5404 L13
1406 D14	3451 C6	5405 G9
1407 D14	3452 D6	5406 G8
1408 E13	3453 C6	6400 A5
1409 F13	3454 D7	6401 A4
1410 E13	3455 D7	6402 B4
1411 E14	3456 C7	6403 B4
1412 E14	3457 D7	6404 B4
1413 E13	3458 C7	6405 B6
1414 F14	3459 D7	6406 L6
1415 F14	3460 C8	6409 E6
1416 F14	3461 D8	6410 E6
1417 E14	3462 C8	6411 M6
1418 F14	3463 D8	6412 C13
1419 F13	3464 C8	6413 C14
1420 F13	3465 D8	6414 C14
1421 G14	3466 C8	6415 C15
1422 F13	3467 D9	6416 D13
1423 F14	3468 C9	6417 E13
1424 G14	3469 D9	6418 E13
1425 H13	3470 C9	6419 E13
1426 F14	3471 D9	6420 G13
1427 H14	3472 C9	6421 F13
1428 G13	3473 D9	6422 F13
1429 G14	3474 C10	6423 G13
1430 G14	3475 D10	6424 G13
1431 H13	3476 C10	6425 H13
1432 G13	3477 D10	6426 H12
1433 H9	3478 C10	6427 H10
1434 J18	3479 D10	6428 B18
1435 K18	3480 D12	6429 B18
1437 H14	3481 D11	6430 B18
1438 H14	3482 E11	6431 F18
2400 A4	3483 E11	6432 E18
2401 A4	3484 E11	6433 D19
2402 A4	3485 E11	6434 D19
2403 B5	3486 E11	6435 C19
2404 A7	3487 E11	6436 F19
2405 A7	3488 E11	6437 F18
2406 B7	3489 F11	6438 E15
2407 B7	3490 F11	6439 E15
2408 D5	3491 F11	6440 E15
2409 D5	3492 F11	6441 J15
2410 F3	3493 F11	6442 J15
2411 F4	3494 G7	6443 J13
2412 F4	3495 G7	6444 J13
2413 F4	3496 G7	7402 G14
2414 F4	3497 G7	7403 M14
2415 F5	3498 G7	7404 B17
2416 F4	3499 G7	7405 D18
2417 H4	3500 G8	7406 B8
2418 A4	3501 G8	7407 B9
2419 B3	3502 G8	7408 H5
2420 H3	3503 H9	7410 J4
2421 I3	3504 H9	7411 M7
2422 I4	3505 H9	7412 C13
2423 J3	3506 G9	7414 C15
2424 K3	3507 G10	7415 K13
2425 K3	3508 G10	7416 L4
2426 K5	3509 G10	7417 K4
2427 L3	3510 G10	7418 L4
2428 K3	3511 J11	7419 D11
2429 L5	3512 J12	9401 C12
2430 L3	3513 B13	9402 H11
2431 M5	3514 B13	9403 C5
2432 B8	3515 B13	9404 H13
2433 B9	3516 B14	9405 H14
2434 A8	3517 B14	9406 E4
2435 C10	3518 B15	9407 E3
2436 D11	3519 B15	9408 E4
2437 D11	3520 D13	9409 E4
2438 A4	3521 D13	9410 D4
2439 G5	3522 E13	9411 E3
2440 G5	3523 E13	9410 L6
2441 G6	3524 G13	9409 L6
2442 G6	3525 F13	9412 J13
2443 G7	3526 F13	9408 F3
2444 G8	3527 G13	9505 J15
2445 G8	3528 G13	9409 L6
2446 H9	3529 H13	9509 H14
2447 G9	3530 H13	9509 B6
2448 G9	3531 H13	9510 B6
2449 I7	3532 I14	9511 A6
2450 H7	3533 I14	
2451 H8	3534 I14	
2452 H10	3535 K13	
2453 H11	3536 K13	
2454 J8	3537 M13	
2455 J11	3538 M13	
2456 D14	3539 M14	
2457 D15	3540 M14	
2458 A16	3541 E15	
2459 B16	3542 E15	
2460 D16	3543 E15	
2461 D16	3544 F15	
2462 E16	3545 A16	
2463 H15	3546 A16	
2464 M13	3547 B19	
2465 K13	3548 B19	
2466 M13	3549 E19	
2467 K13	3550 F19	
2468 M13	3551 E19	
2469 K16	3552 D16	
2470 K16	3553 D18	
2471 J17	3554 D18	
2472 J18	3555 D18	
2473 L17	3556 D18	
2474 L18	3557 C18	
2475 F4	3558 C18	
2476 A5	3559 G16	
2477 A9	3560 G16	
2478 A9	3561 H16	
2479 J7	3562 H16	
2480 A16	3563 H16	
2481 D18	3564 J16	
2482 J15	3565 J16	
2483 G16	3566 K16	
2484 J15	3567 J17	
2485 G2	3568 J18	
2486 L6	3569 K17	
2487 B8	3570 K18	
2488 A7	3571 H2	
3401 A6	3572 G10	
3402 B7	3573 G10	
3403 B6	3574 G11	
3404 B6	3575 H10	
3405 C4	3576 I7	
3406 C4	3577 I7	
3407 C4	3578 H10	
3408 G3	3579 H10	
3409 G3	3580 H11	
3410 G2	3581 H12	
3411 G3	3582 C5	
3412 G2	3583 E6	
3413 G3	3584 K4	
3414 H4	3585 J4	
3415 H4	3586 I2	
3416 B8	3587 B14	
3417 B3	3588 B13	
3418 B3	3589 B14	
3419 K3	3590 B15	
3420 K4	3591 E19	
3421 K3	3592 E19	
3422 L4	3593 F19	
3423 L4	3594 G19	
3424 L4	3595 G12	
3425 L3	3596 A8	
3426 L4	3597 C8	
3427 M4	3598 C8	
3428 M4	3599 C4	
3429 L6	3600 C4	
3430 L6	3601 C4	
3431 M6	3602 D11	
3432 A6	3603 H2	
3433 B6	3604 C4	
3434 E6	3605 D11	
3435 E6	3606 H2	
3436 E6	3607 M6	
3437 E6	3608 M13	
3438 F6	3609 M14	
3439 F6	3610 M6	
3440 F6	3611 C8	
3441 F6	3612 C9	
3442 F6	3613 H11	
3443 G5	3614 G11	
3444 F6	3615 L6	

HEADPHONE PART - CIRCUIT DIAGRAM



- 1600 C1
- 1601 B3
- 1602 A3
- 2600 A2
- 2601 A3
- 2602 A2
- 2603 A2
- 5600 B2
- 5601 B2
- 5602 A2
- 9600 A2

KARAOKE BOARD - COMPONENT & CHIP LAYOUT

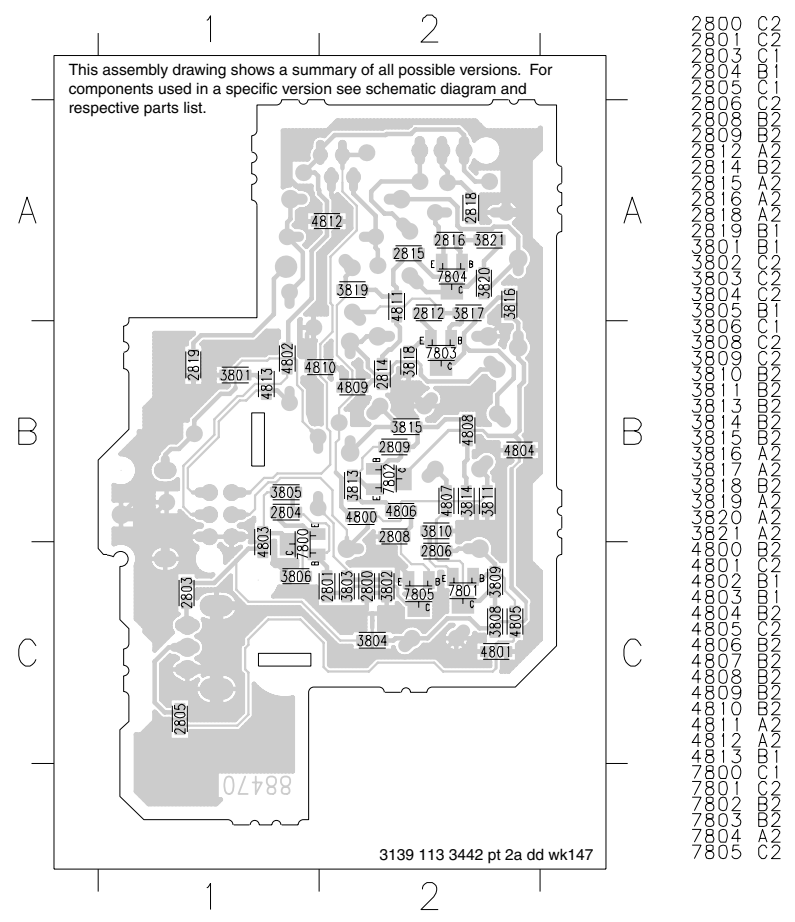
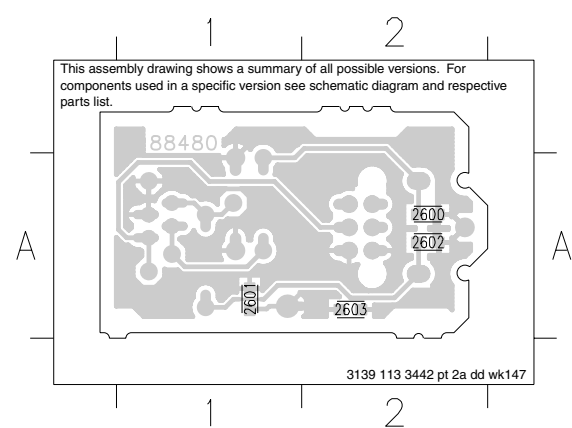
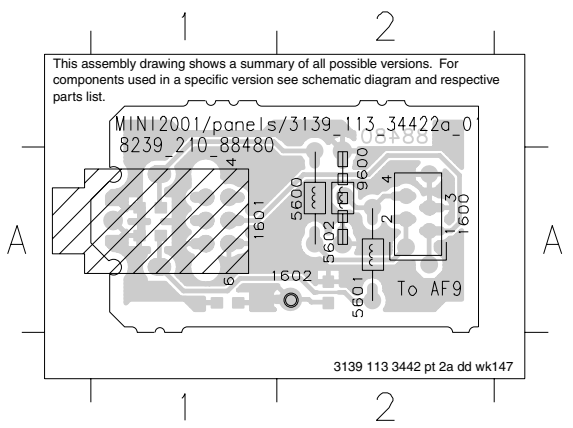


- 1600 C1
- 1601 B3
- 1602 A3
- 2600 A2
- 2601 A3
- 2602 A2
- 2603 A2
- 5600 B2
- 5601 B2
- 5602 A2
- 9600 A2

HEADPHONE BOARD - COMPONENT & CHIP LAYOUT

- 1600 A2
- 1601 A1
- 5600 A2
- 5601 A2
- 5602 A2
- 9600 A2

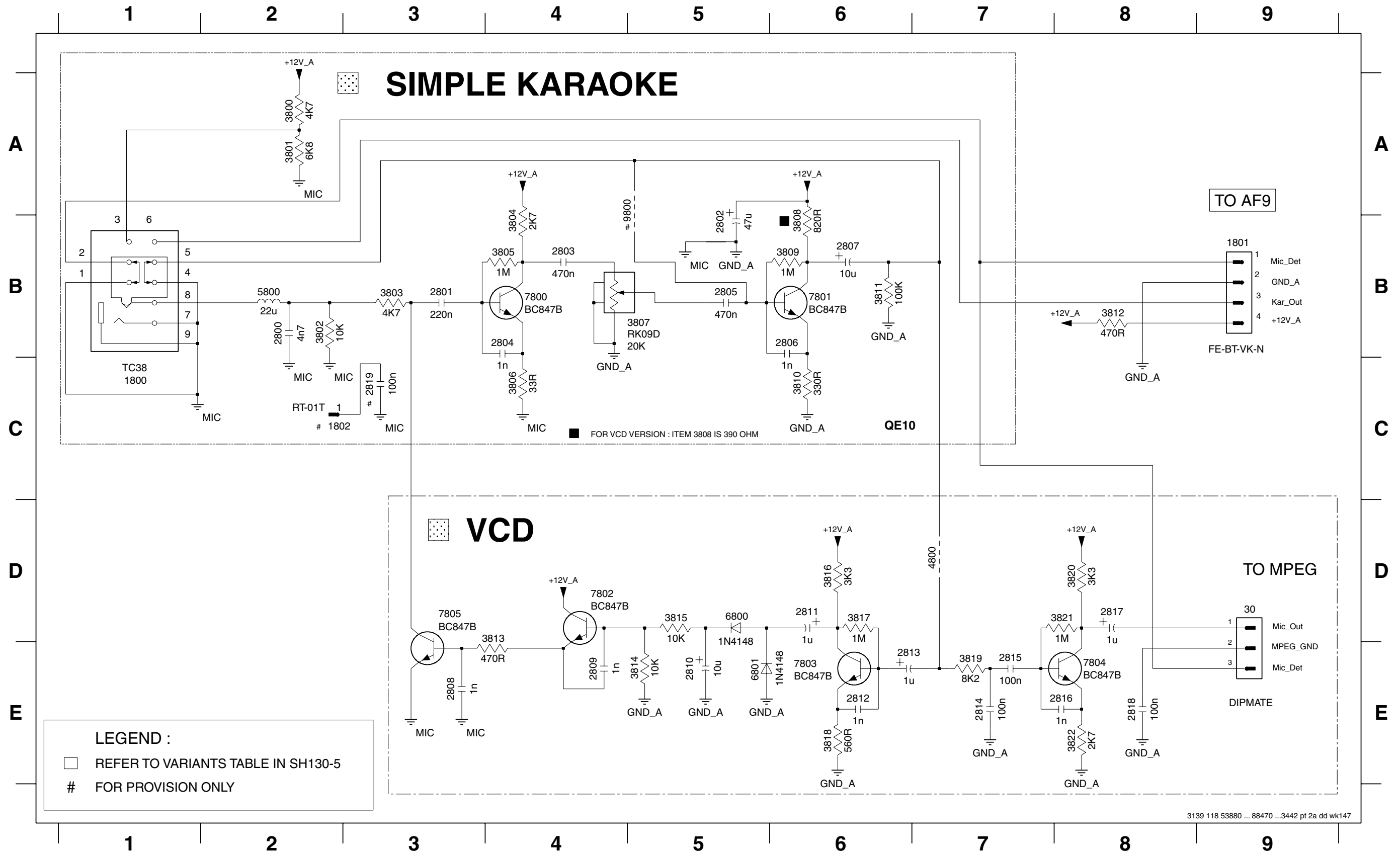
- 2600 A2
- 2601 A1
- 2602 A2
- 2603 A2



- 1600 C1
- 1601 B3
- 1602 A3
- 2600 A2
- 2601 A3
- 2602 A2
- 2603 A2
- 5600 B2
- 5601 B2
- 5602 A2
- 9600 A2

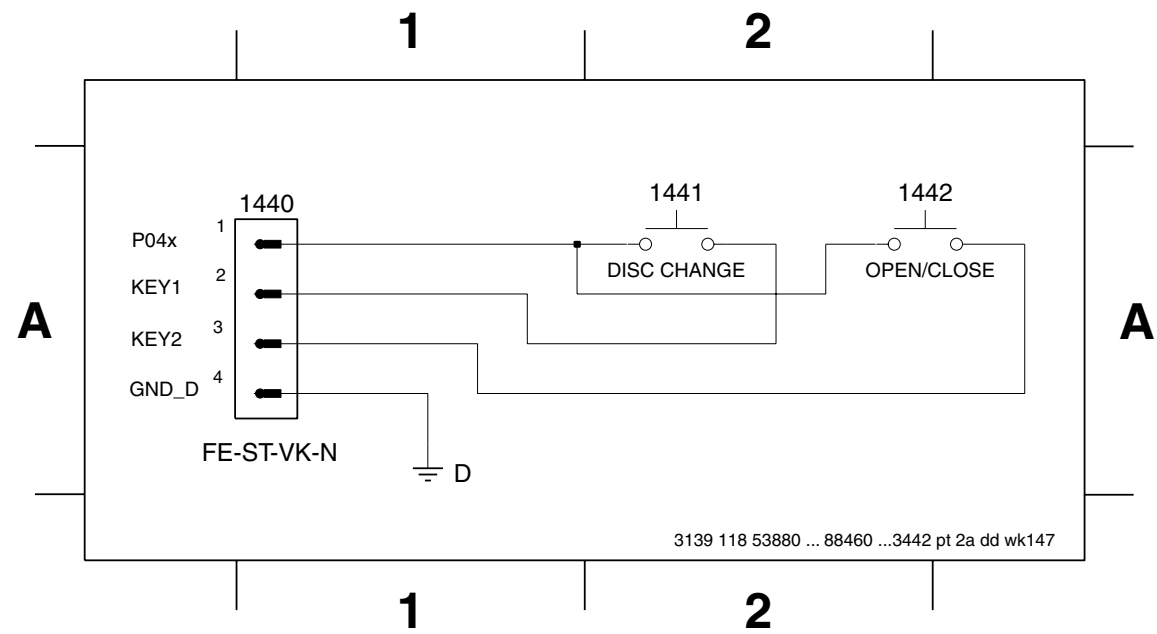
KARAOKE PART - CIRCUIT DIAGRAM

30 D9	1802 C2	2802 B5	2805 B5	2808 E3	2811 D6	2814 E7	2817 D8	3800 A2	3803 B3	3806 C4	3809 B6	3812 B8	3815 D5	3818 E6	3821 D8	5800 B2	7800 B4	7803 E6	9800 A5
1800 C1	2800 B2	2803 B4	2806 B6	2809 E4	2812 E6	2815 E7	2818 E8	3801 A2	3804 B4	3807 B4	3810 C6	3813 D4	3816 D6	3819 E7	3822 E8	6800 D5	7801 B6	7804 E8	
1801 B9	2801 B3	2804 B4	2807 B6	2810 E5	2813 E6	2816 E8	2819 C3	3802 B2	3805 B4	3808 B6	3811 B6	3814 E5	3817 D6	3820 D8	4800 D7	6801 E5	7802 D4	7805 D3	



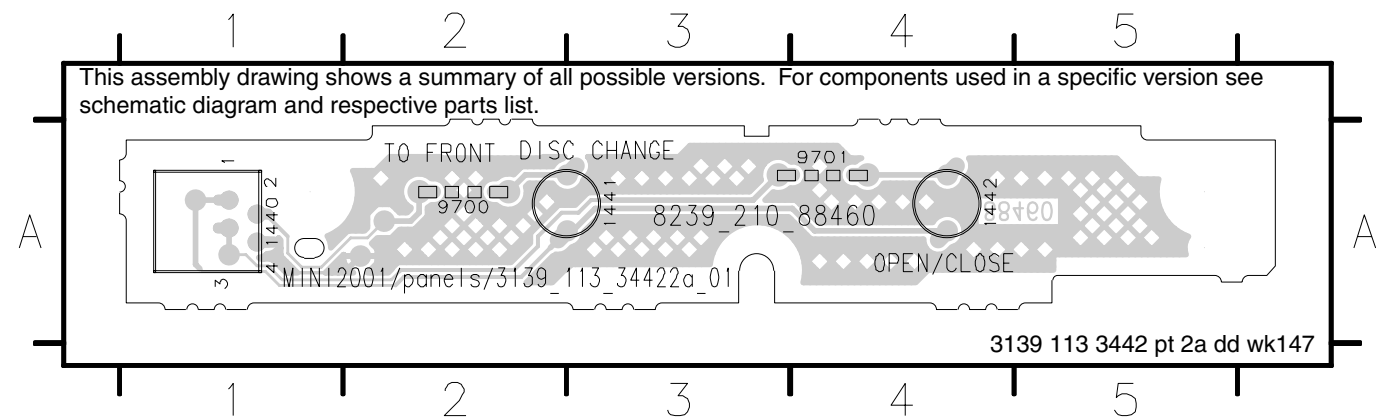
KEY-CDC PART - CIRCUIT DIAGRAM

1440 A1 1441 A2 1442 A2

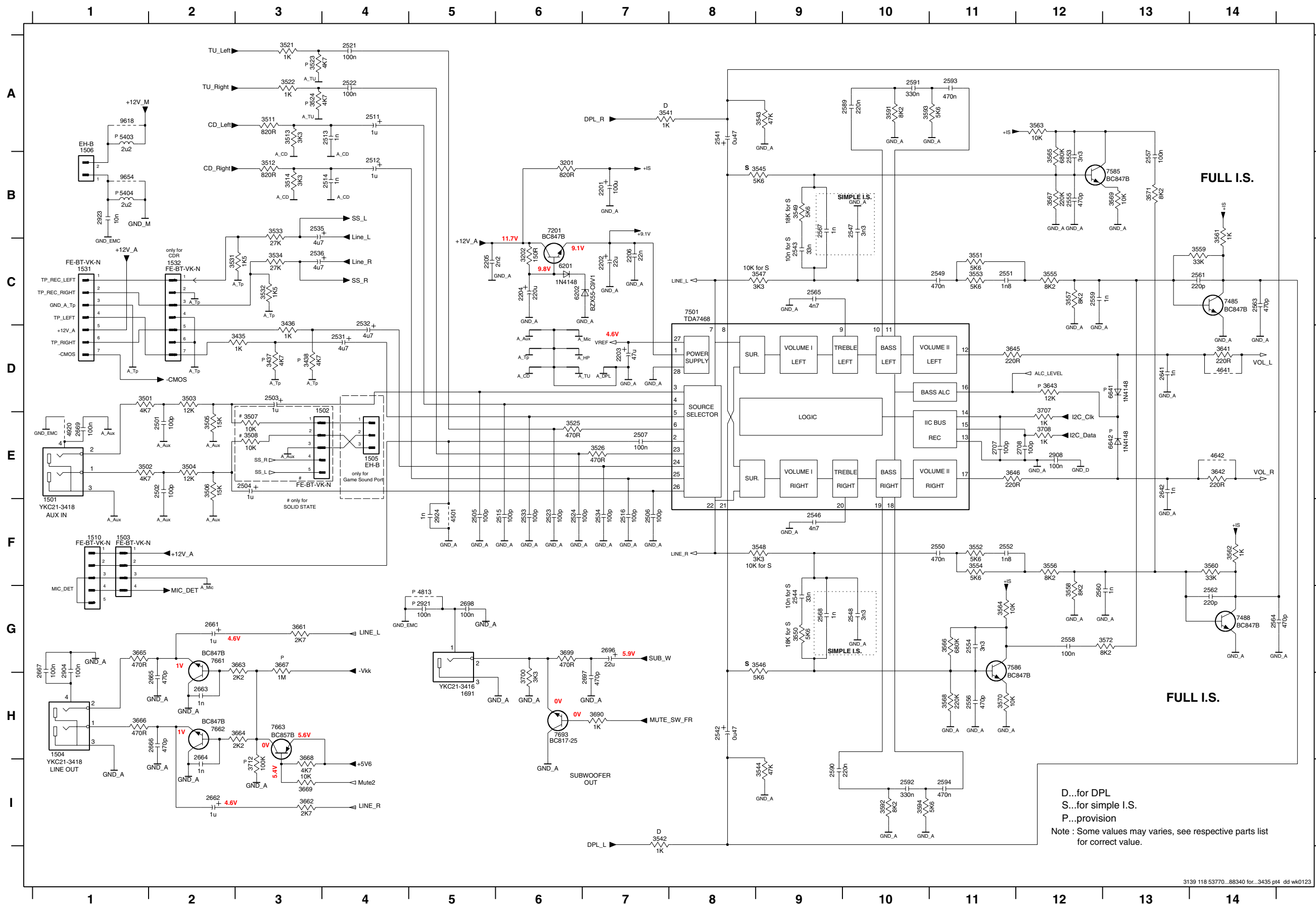


KEY-CDC BOARD - COMPONENT LAYOUT

1440 A1 1441 A3 1442 A4 9700 A2 9701 A4

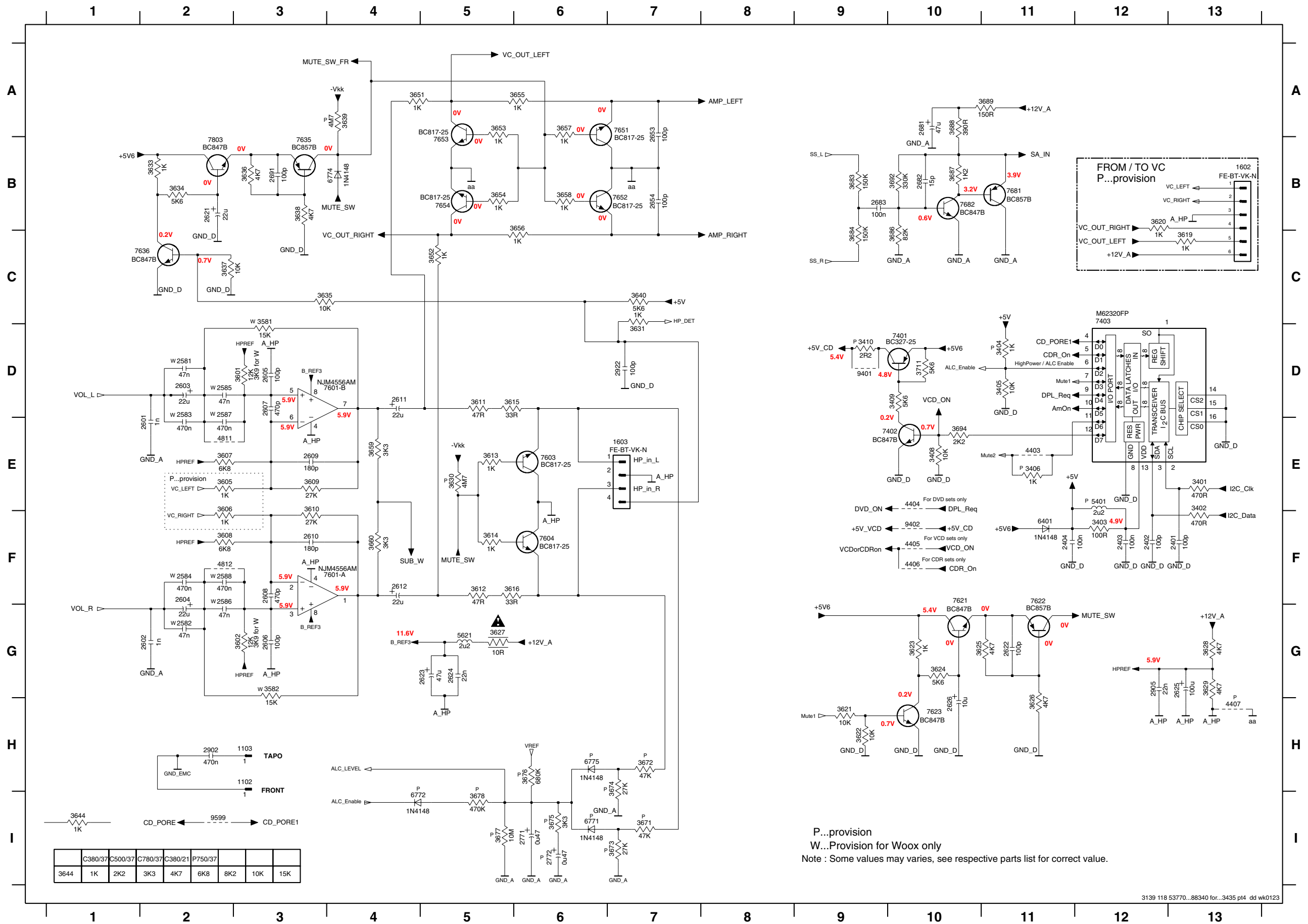


AF9 BOARD - CIRCUIT DIAGRAM (PART 1)



1501 E1	3511 A3
1502 E3	3512 B3
1503 F1	3513 A3
1504 H1	3514 B3
1505 E4	3521 A3
1506 A1	3522 A3
1510 F1	3523 A3
1531 C1	3524 A3
1532 C2	3525 E6
1691 H5	3526 E7
2201 B7	3531 C2
2202 C7	3532 C3
2203 D7	3533 B3
2204 C6	3534 C3
2205 C5	3541 A7
2206 C7	3542 I7
2501 E2	3543 A9
2502 E2	3544 I9
2503 D3	3545 B9
2504 E3	3546 G9
2505 F5	3547 C9
2506 F7	3548 F9
2507 E7	3549 B9
2511 A4	3550 G9
2512 B4	3551 C11
2513 A4	3552 F11
2514 B4	3553 C11
2515 F6	3554 F11
2516 F7	3555 C12
2521 A4	3556 F12
2522 A4	3557 C12
2523 F6	3558 G12
2524 F6	3559 C14
2531 D4	3560 F14
2532 C4	3561 B14
2533 F6	3562 F14
2534 F7	3563 A12
2535 B3	3564 G11
2536 C3	3565 B12
2541 A8	3566 G11
2542 H8	3567 B12
2543 G9	3568 H11
2544 C9	3569 B13
2546 F9	3570 H11
2547 B10	3571 B13
2548 G10	3572 G13
2549 C11	3591 A10
2550 F11	3592 I10
2551 C11	3593 A10
2552 F11	3594 I10
2553 B12	3641 D14
2554 G11	3642 E14
2555 B12	3643 D12
2556 H11	3645 D11
2557 B13	3646 E11
2558 G12	3661 G3
2559 C12	3662 I3
2560 G12	3663 G3
2561 C14	3664 H3
2562 G14	3665 G1
2563 C14	3666 H1
2564 G14	3667 G3
2565 C9	3668 I3
2567 B9	3669 I3
2568 G9	3690 H7
2589 A10	3699 G6
2590 I9	3700 H6
2591 A10	3707 E12
2592 I10	3708 E12
2593 A11	3712 I3
2594 I11	4501 F5
2641 D13	4641 D14
2642 E13	4642 E14
2661 G2	4813 G5
2662 I2	4920 E1
2663 H2	5403 A1
2664 I2	5404 B1
2665 H2	6201 C6
2666 H2	6202 C6
2667 G1	6641 D13
2669 E1	6642 E13
2696 G7	7201 B6
2697 H7	7488 C14
2698 G5	7489 G14
2707 E11	7501 C8
2708 E12	7585 B13
2904 G1	7586 G11
2908 E12	7661 G2
2921 G5	7662 H2
2923 B1	7663 H3
2924 F5	7693 H6
3201 B6	9618 A1
3202 C6	9654 B1
3435 D3	
3436 D3	
3437 D3	
3438 D3	
3501 D1	
3502 E1	
3503 D2	
3504 E2	
3505 E2	
3506 E2	
3507 E3	
3508 E3	

AF9 BOARD - CIRCUIT DIAGRAM (PART 2)

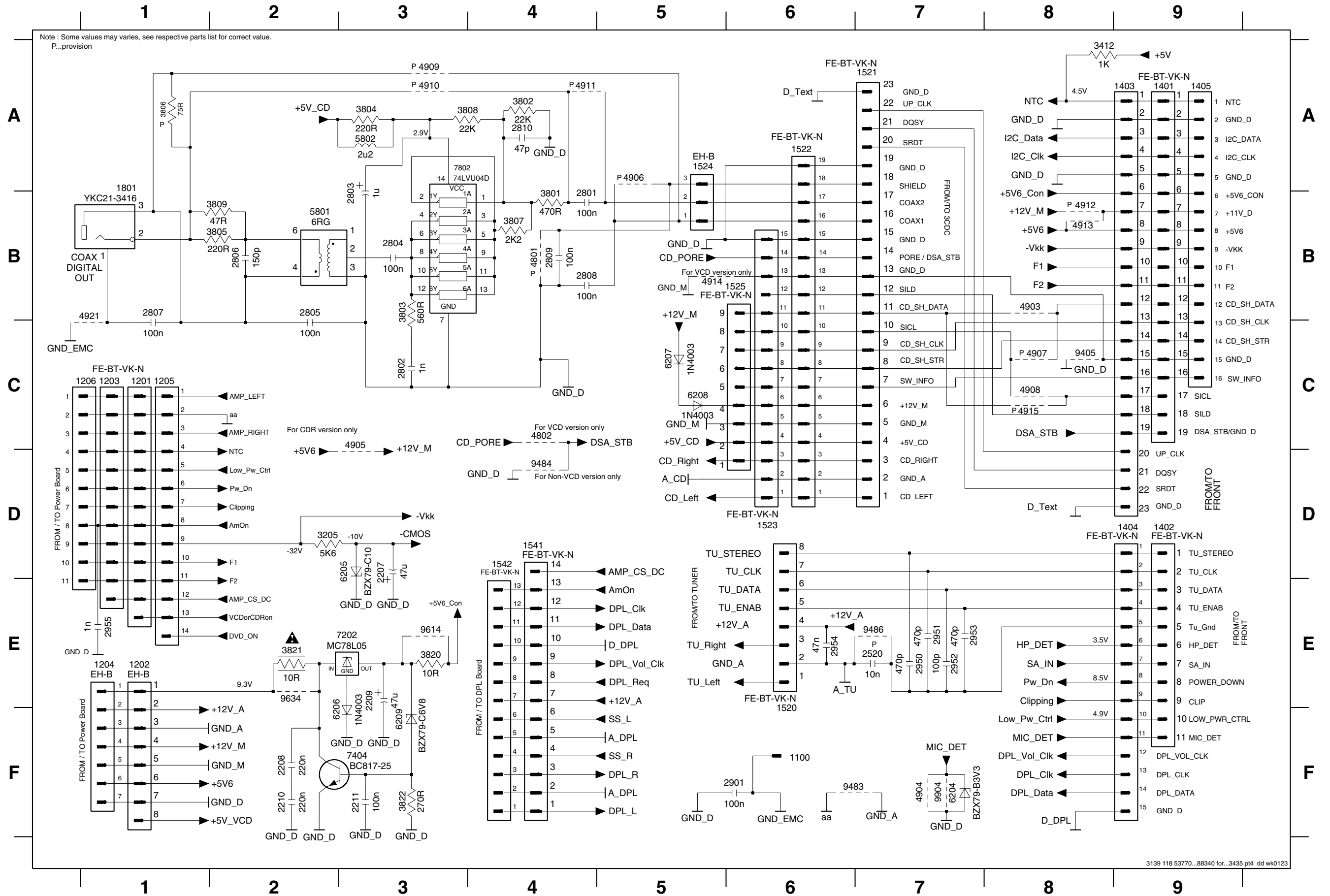


- 1102 H3
- 1103 H3
- 1602 B13
- 1603 E7
- 2401 F13
- 2402 F12
- 2403 F12
- 2404 F11
- 2581 D2
- 2582 G2
- 2583 D2
- 2584 F2
- 2585 D2
- 2586 F2
- 2587 D2
- 2588 F2
- 2601 E2
- 2602 G2
- 2603 D2
- 2604 F2
- 2605 D3
- 2606 G3
- 2607 D3
- 2608 F3
- 2609 E3
- 2610 F3
- 2611 D4
- 2612 F4
- 2621 B2
- 2622 G11
- 2623 G5
- 2624 G5
- 2625 G13
- 2626 H10
- 2653 A7
- 2654 B7
- 2681 A10
- 2682 B10
- 2683 B9
- 2691 B3
- 2711 I6
- 2721 I6
- 2902 H2
- 2905 G12
- 2922 D7
- 3401 E13
- 3402 E13
- 3403 F12
- 3404 D11
- 3405 D11
- 3406 E11
- 3408 E10
- 3409 D10
- 3410 D9
- 3581 D3
- 3582 G3
- 3601 D3
- 3602 G3
- 3605 E2
- 3606 F2
- 3607 E2
- 3608 F2
- 3609 E3
- 3610 F3
- 3611 D5
- 3612 F5
- 3613 E5
- 3614 F5
- 3615 D5
- 3616 F5
- 3619 C13
- 3620 B12
- 3621 H9
- 3622 H9
- 3623 G10
- 3624 G10
- 3625 G10
- 3626 H11
- 3627 G5
- 3628 G13
- 3629 G13
- 3630 E5
- 3631 D7
- 3633 B2
- 3634 B2
- 3635 C3
- 3636 B3
- 3637 C2
- 3638 B3
- 3639 A4
- 3640 C7
- 3644 I1
- 3651 A4
- 3652 C5
- 3653 A5
- 3654 B5
- 3655 A6
- 3656 C6
- 3657 A6
- 3658 B6
- 3659 E4
- 3660 F4
- 3671 I7
- 3672 H7
- 3673 I7
- 3674 H7
- 3675 I6
- 3676 H6
- 3677 I5
- 3678 I5
- 3683 B9
- 3684 C9
- 3686 C10
- 3687 B10
- 3688 A10
- 3689 A11
- 3692 B10
- 3694 E10
- 3711 D10
- 4403 E11
- 4404 E10
- 4405 F10
- 4406 F10
- 4407 H13
- 4811 E2
- 4812 F2
- 5401 E12
- 5621 G5
- 6401 F11
- 6771 I6
- 6772 I4
- 6774 B4
- 6775 H6
- 7401 D10
- 7402 E10
- 7403 C12
- 7601-A G3
- 7601-B D3
- 7603 E6
- 7604 F6
- 7621 F10
- 7622 F11
- 7623 H10
- 7635 B3
- 7636 C2
- 7651 A7
- 7652 B7
- 7653 B5
- 7654 B5
- 7681 B11
- 7682 B10
- 7803 B2
- 9401 D9
- 9599 I2

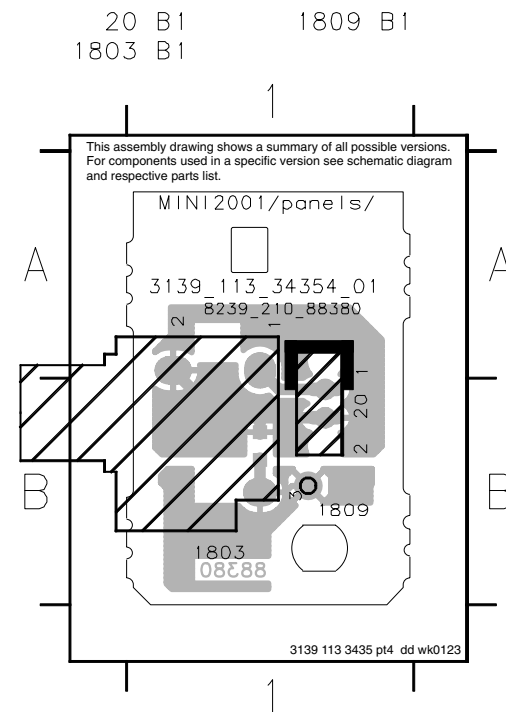
P...provision
W...Provision for Woox only
Note : Some values may varies, see respective parts list for correct value.

AF9 BOARD - CIRCUIT DIAGRAM (PART 3)

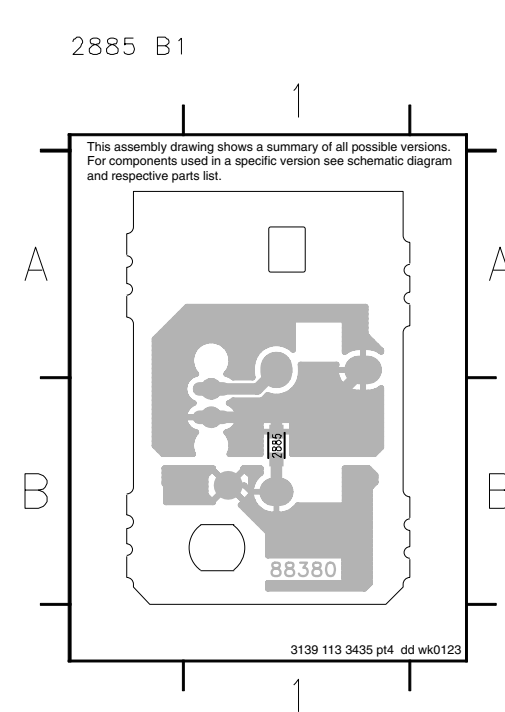
1100 F6 1203 C1 1206 C1 1403 A9 1520 E6 1523 D6 1541 D4 2207 D3 2210 F2 2801 B4 2804 B3 2807 B1 2810 A4 2951 E7 2954 E6 3412 A8 3803 B3 3806 A1 3809 B2 3822 F3 4903 B8 4906 A5 4909 A3 4912 B8 4915 C8 5802 A3 6206 F3 6209 F3 7802 A3 9484 D4 9634 E2
 1201 C1 1204 E1 1401 A9 1404 D9 1521 A7 1524 A5 1542 D4 2208 F2 2211 F3 2802 C3 2805 B2 2808 B4 2901 F6 2952 E7 2955 E1 3801 B4 3804 A3 3807 B4 3820 E3 4801 B4 4904 F7 4907 C8 4910 A3 4913 B8 4921 B1 6204 F7 6207 C5 7202 E3 9405 C8 9486 E7 9904 F7
 1202 E1 1205 C1 1402 D9 1405 A9 1522 A6 1525 B5 1801 A1 2209 E3 2520 E7 2803 B3 2806 B2 2809 B4 2950 E7 2953 E7 3205 D2 3802 A4 3805 B2 3808 A3 3821 E2 4802 C4 4905 C3 4908 C8 4911 A4 4914 B5 5801 B2 6205 D3 6208 C5 7404 F3 9483 F6 9614 E3



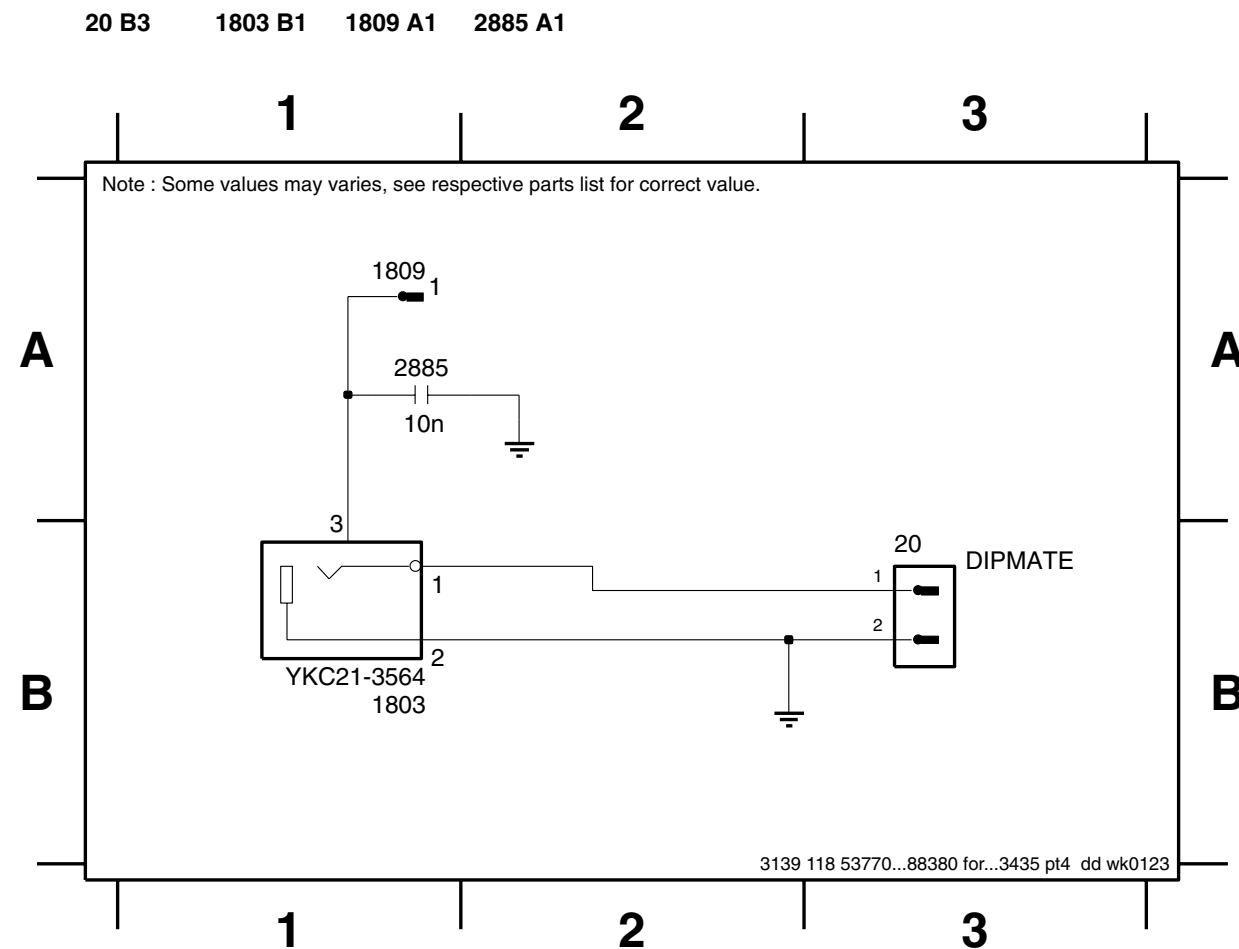
VIDEO OUT CINCH BOARD - COMPONENT LAYOUT



VIDEO OUT CINCH BOARD - CHIP LAYOUT



VIDEO OUT CINCH PART - CIRCUIT DIAGRAM



TAPE ADJUSTMENT & CHECK TABLE

	TEST CASSETTE	RECORDER MODE	MEASURE ON	READ ON	ADJUST	
					with	to
ADJUST MOTOR SPEED						
NORMAL SPEED	SBC420 3150Hz	PLAY B	1 or 2	frequency counter	3620	3150Hz +/- 0.5%
		PLAY A	LEFT RIGHT		check	3150Hz -0.8/+1.8%
CHECK WOW & FLUTTER						
DECK A & B	SBC420 3150Hz	PLAY	1 or 2 LEFT RIGHT	W&F-meter	check	<0.4 % DIN
ADJUST AZIMUTH						
DECK A & B	SBC420 10kHz	PLAY FWD	1 or 2	mV-meter	left hand screw	max. output level & left=right
		PLAY REV #	LEFT RIGHT		right hand screw	
CHECK PLAYBACK FREQUENCY RESPONSE						
DECK A & B	SBC420	PLAY	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig.1
ADJUST BIAS CURRENT						
DECK B	SBC419A^	RECORD	5 or 6 LEFT RIGHT	mV-meter	3773	995mV
	SBC420				check	750mV +/- 1.5dB
CHECK OVERALL FREQUENCY RESPONSE AND DISTORTION						
Inject 3mV signals 100Hz, 250Hz, 1kHz, 10kHz, 12.5kHz via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	mV-meter	check	limits see fig. 2 *
Inject 1kHz 8.85mV via 3 or 4	SBC419A^ or SBC420	RECORD B				
	RECORDED CASSETTE	PLAY B	1 or 2 LEFT RIGHT	THD-meter	check	<3% *

SBC419A^ : 4822 397 30069
SBC420 : 4822 397 30071

For Auto-reverse version only
* If high frequencies are not within limits, decrease bias and re-measure.
If distortion is too high, increase bias and re-measure
^ Not applicable for Ferro version

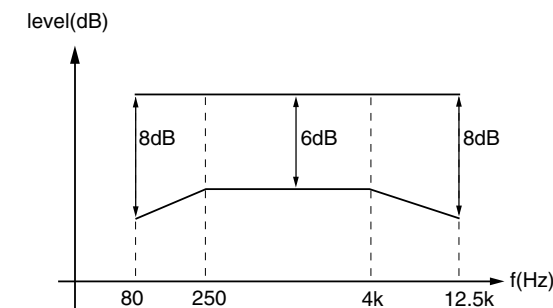


figure. 1

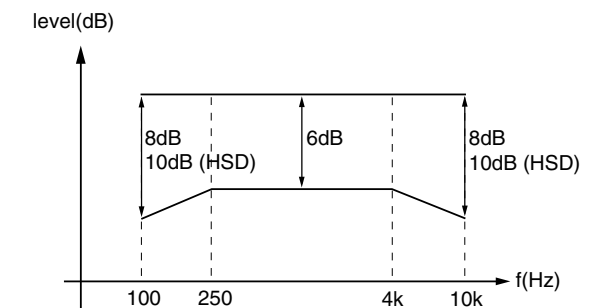
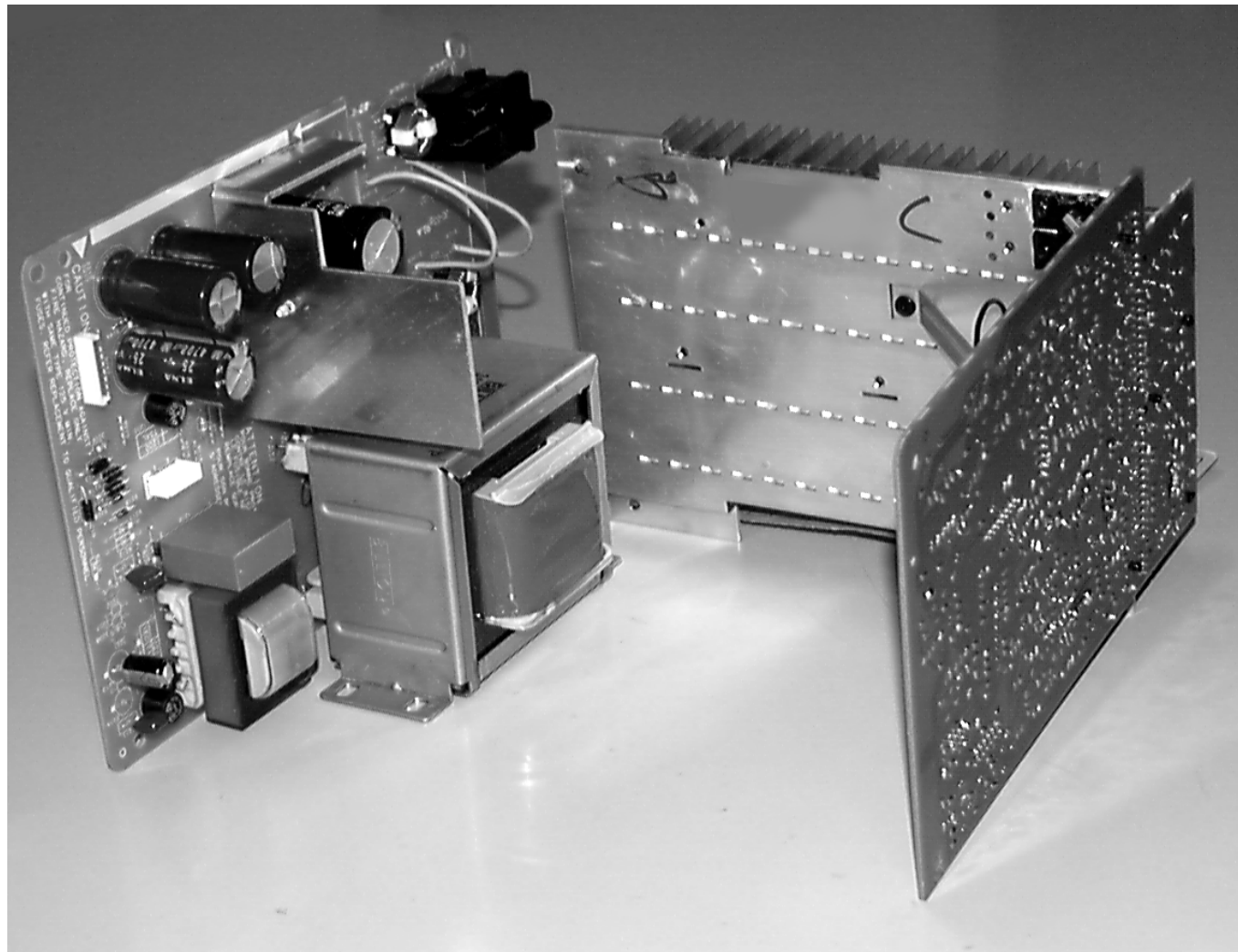


figure. 2



POWER 2001 Module

(30 - 70W Version)

stage .9

TABLE OF CONTENTS

Brief Circuit Description.....11-1
 Block Diagram.....11-3
 Component Layout *Mains part*.....11-4
 Circuit Diagram *Mains part*.....11-5
 Component Layout *Power part*.....11-6
 Circuit Diagram *Power part*.....11-7
 Partslist11-8

Circuit details:

Amplifier:

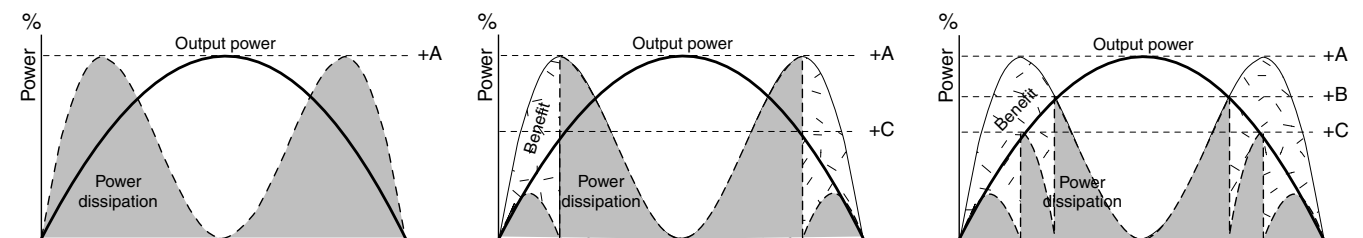
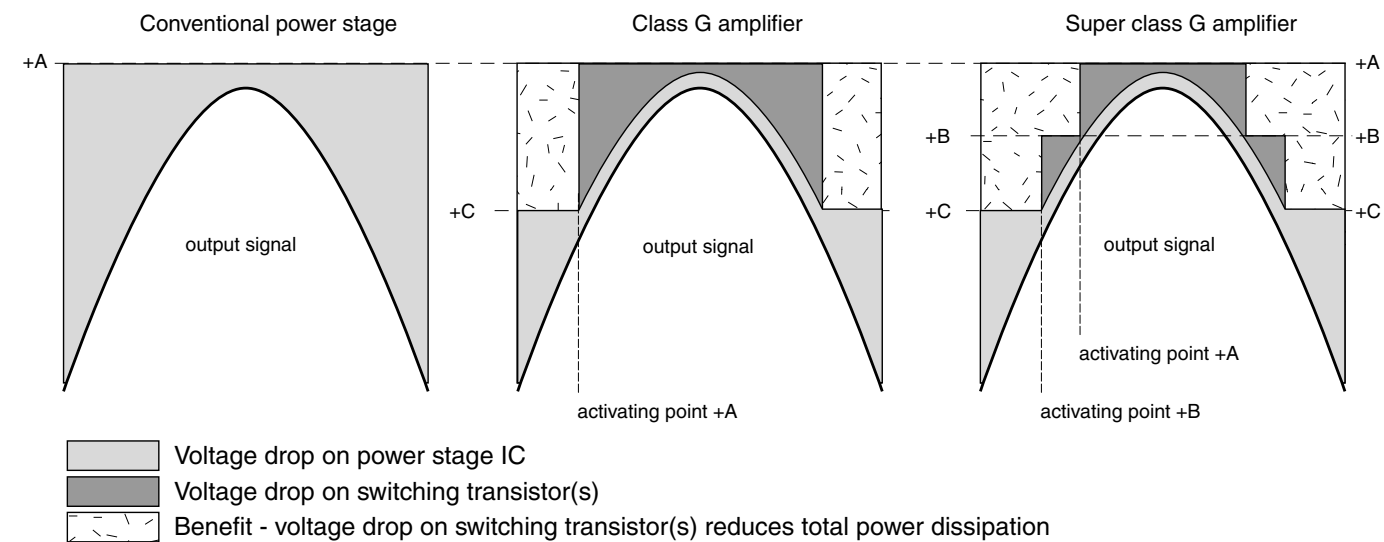
Attention: In the POWER 2001 module the power amplifier IC AN7591 is used as a bridge-amplifier.
 Any connection from output to ground will destroy the output stages!

- Via the AMP_ON control line, connected to pins 6 (Stby), the power amplifiers are switched on/off by the μ P.
 High level (approx. 4,5V): power amplifiers switched on
 Low level (approx. 0V): power amplifiers switched off

- Super class G - operation

The power amplifiers operate as so-called super class G - amplifiers:
 The supply pins 12 (Vcc) are not just connected to one fixed DC-supply as in conventional amplifiers.
 Dependent on the output power there are three different DC-voltages supplied to the power amplifiers:
 => +C1 (+20V) for low output power
 => +B1 (+29V) for medium output power
 => +A1 (+41V) for high output power

Principle / benefit of Super Class G



Circuit details continued:

• **Low power standby feature**

An additional small standby transformer, reduces power consumption in standby-mode. In case power is switched on, the control line ECO is low → relay 1210 is activated → contacts 1 and 2 are closed → transformer 5001 is connected to mains. When the set is switched off (standby) the control line ECO is high → relay 1210 is not activated → main transformer is disconnected. Via standby transformer and rectifiers 6210-6214 the supply voltage LOW_PWR_SUP is substituted. This voltage is always available and so the microprocessor is kept running.

• **DC voltages +A1, +B1, +C1**

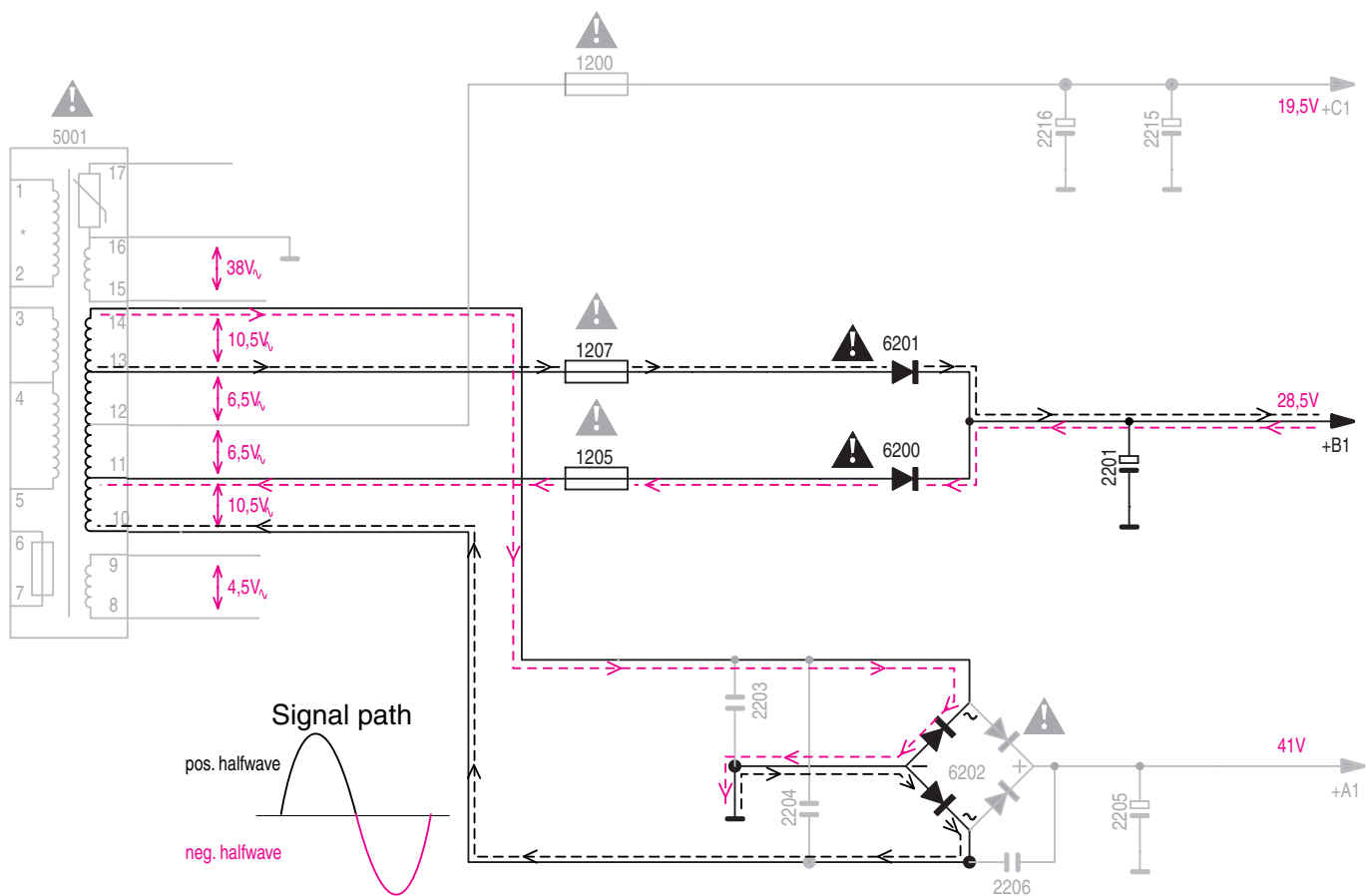
These voltages supply the Super Class G amplifier, described on previous page. The whole power supply is optimized for the special characteristic of this type of amplifier. For that reason several “tricky” details have been applied to ensure optimal efficiency and symmetrical load to the mains transformer.

Generation of +A1

Common full wave rectifying with bridge rectifier 6202, using 100% secondary winding of mains transformer (pin 10-14).

Generation of +B1

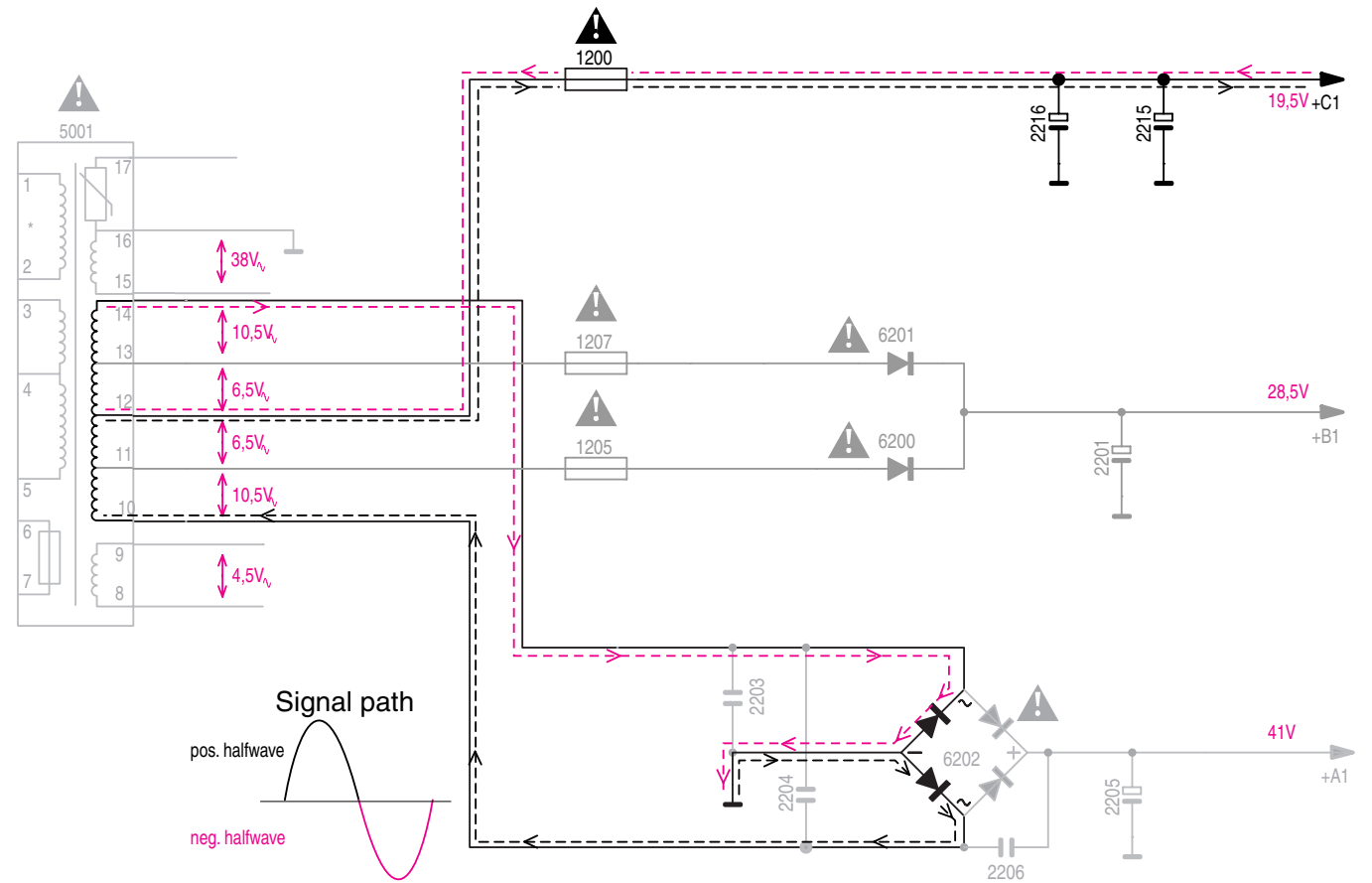
The supply for +B1 consists of one full wave rectifier: – 2 diodes of bridge rectifier 6202, with 6200(6220 in parallel) 6201(6221 in parallel) for generation of +B1 using approx. 70% secondary winding of mains transformer (pin 10-13 respectively pin 11-14). As example for generation of +B1 see picture 1.



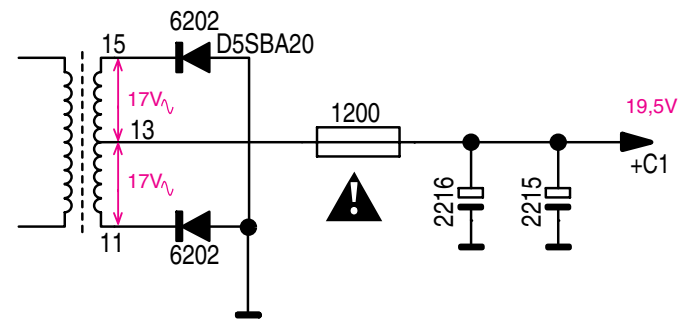
picture 1

Generation of +C1

Full wave rectifying with 2 diodes of bridge rectifier 6202, using 50% secondary winding of mains transformer (pin 13-15/13-11). See picture 2 below.



simplified:



picture 2

SET BLOCK DIAGRAM

