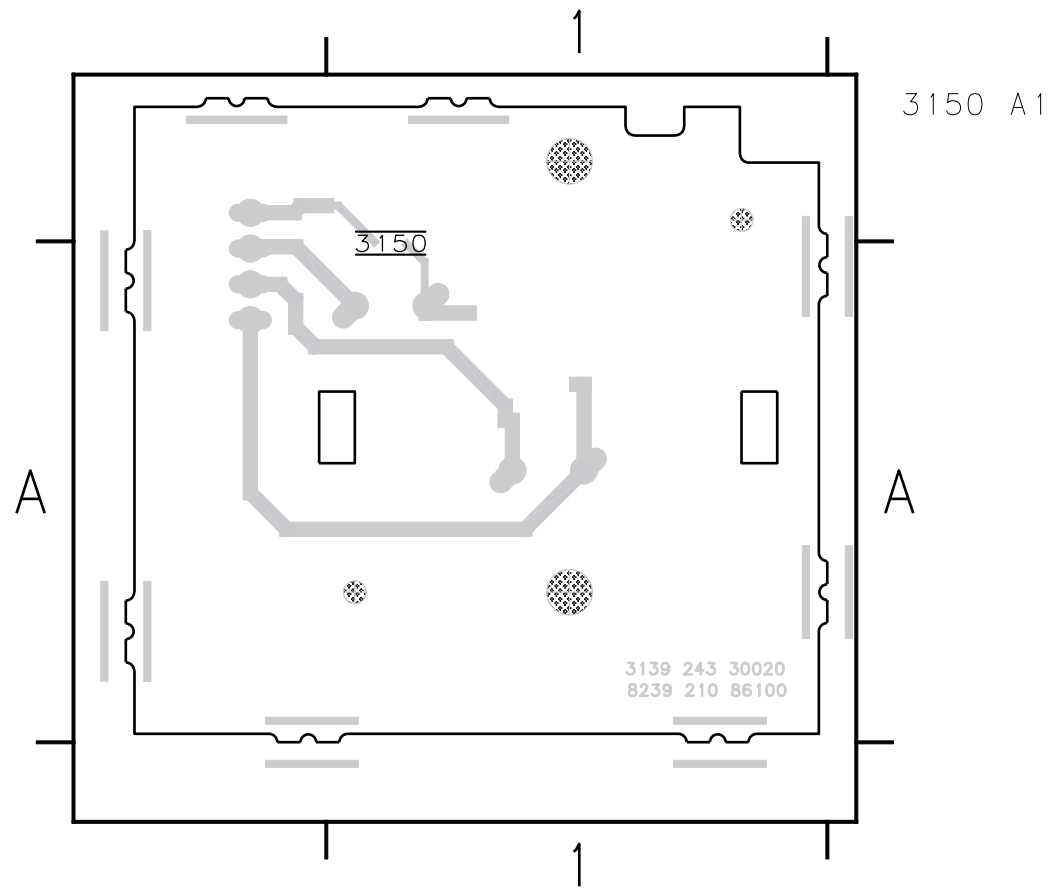
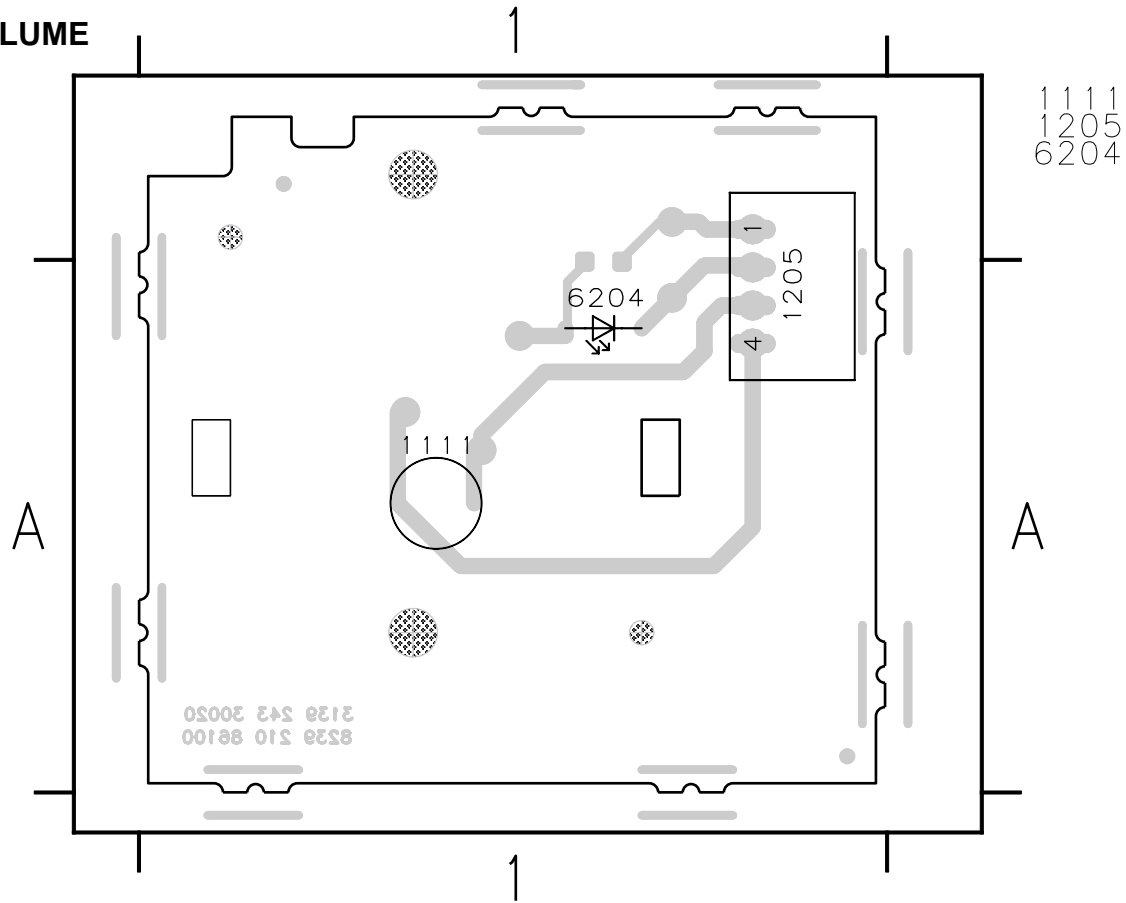


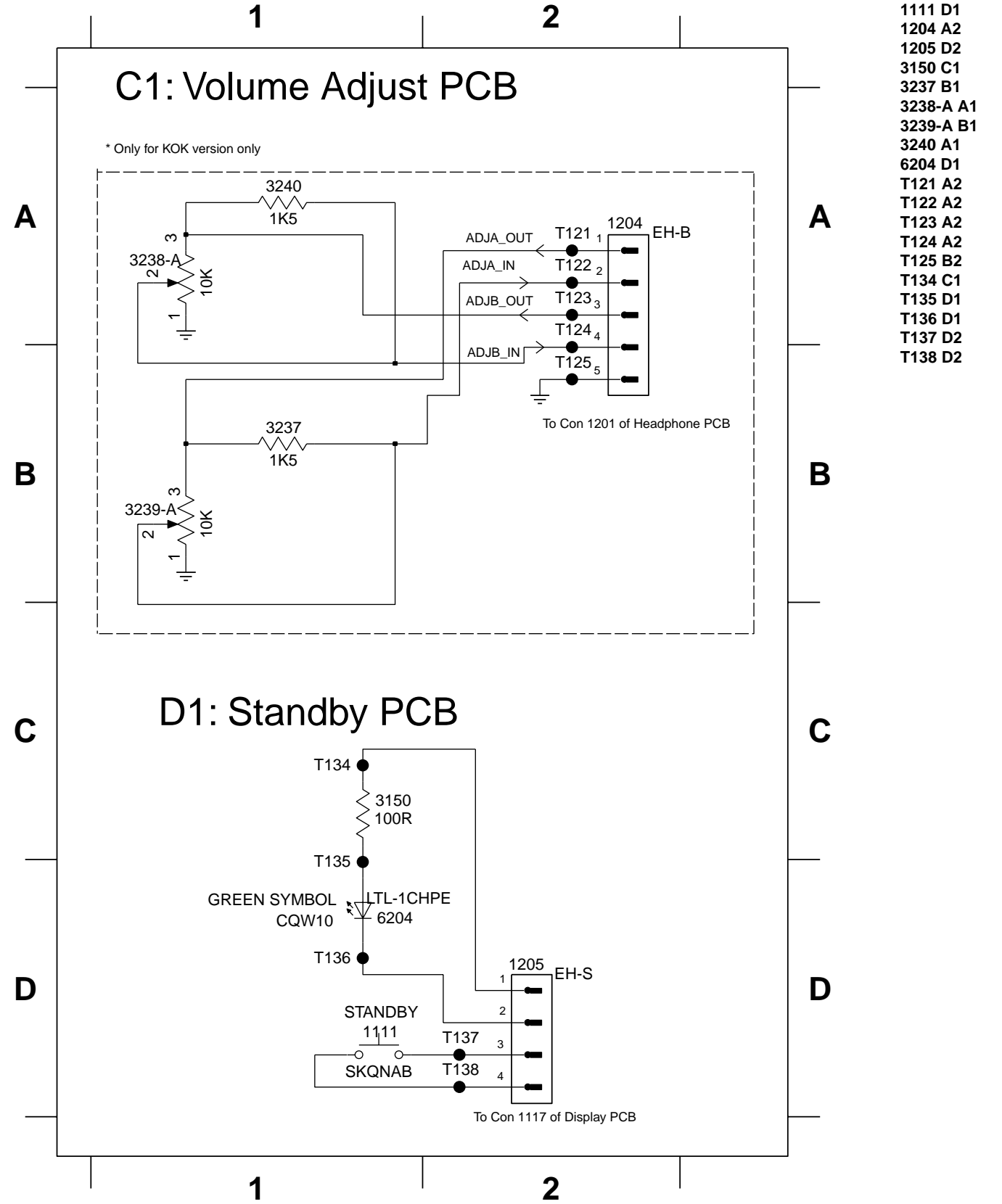
■ PRINTED CIRCUIT BOARD

VOLUME



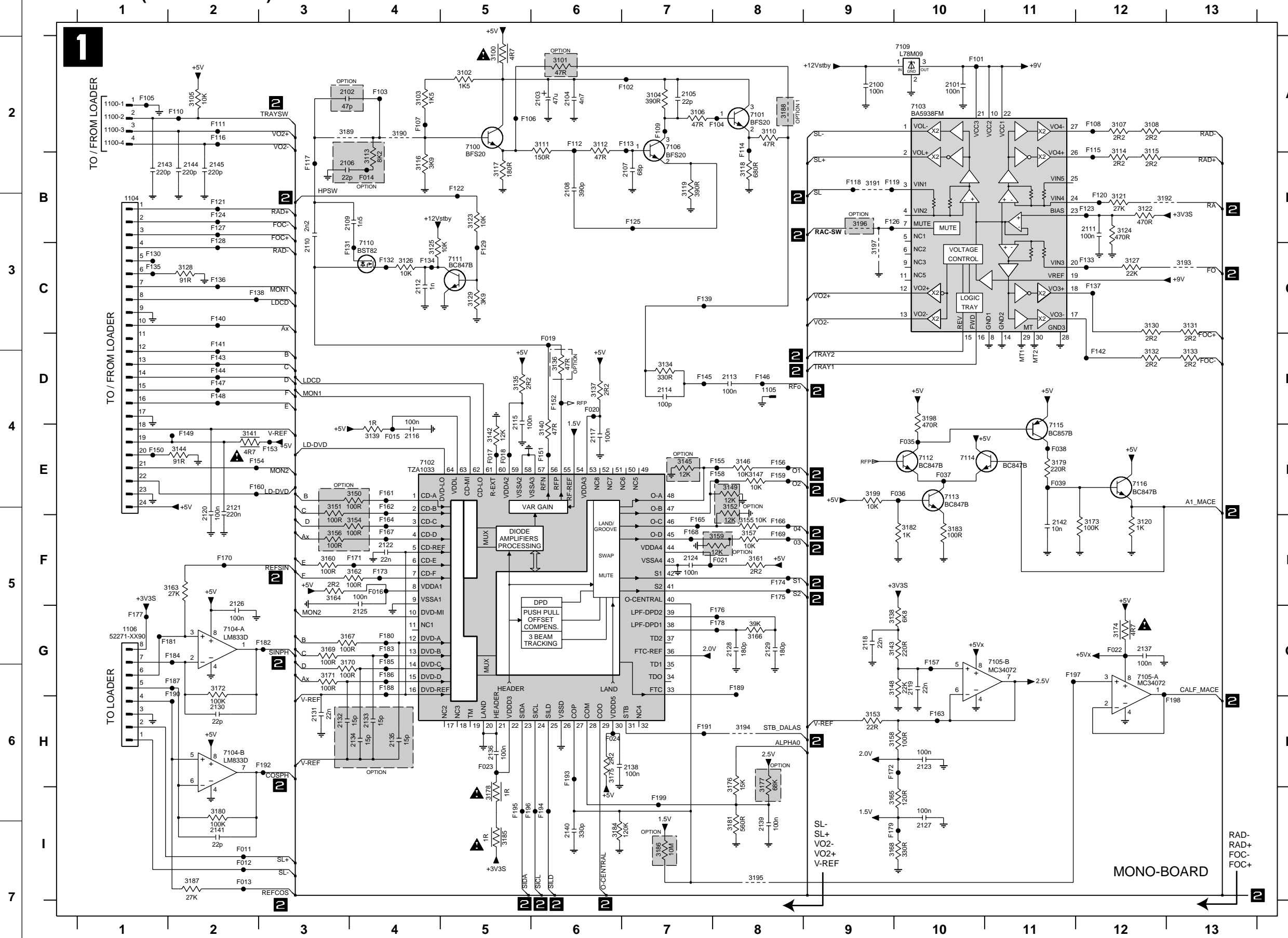
■ SCHEMATIC DIAGRAM

VOLUME



- 1111 D1
- 1204 A2
- 1205 D2
- 3150 C1
- 3237 B1
- 3238-A A1
- 3239-A B1
- 3240 A1
- 6204 D1
- T121 A2
- T122 A2
- T123 A2
- T124 A2
- T125 B2
- T134 C1
- T135 D1
- T136 D1
- T137 D2
- T138 D2

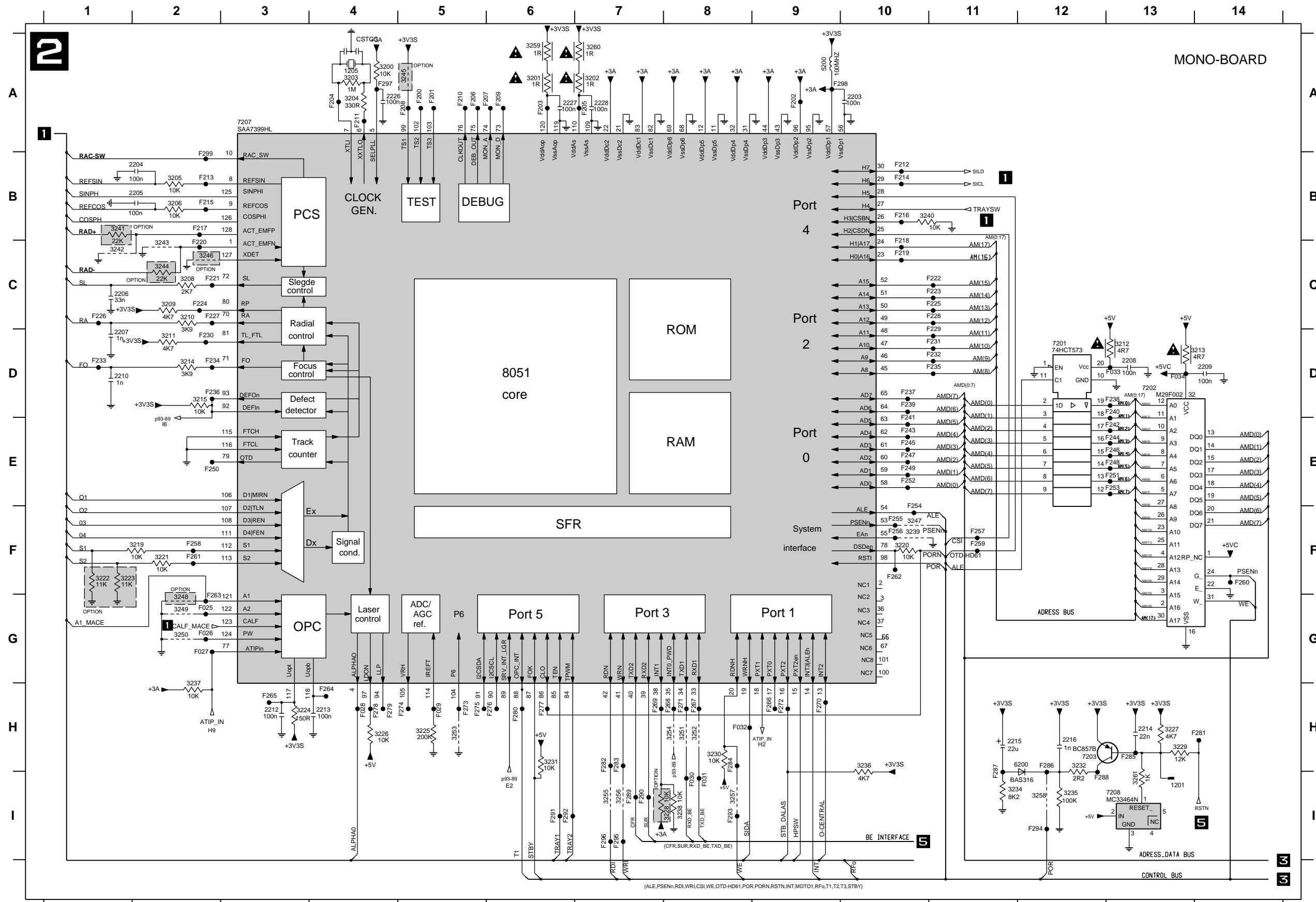
SCHEMATIC DIAGRAM MONO 1/6 (SERVO DALAS)



1100-1 A1	3165 I9	F147 D2
1100-2 A1	3166 G8	F148 D2
1100-3 A1	3167 G3	F149 E2
1100-4 A1	3168 I9	F150 E1
1104 B1	3169 G3	F151 E6
1105 D8	3170 G3	F152 D6
1106 G1	3171 G3	F153 E3
2100 A9	3172 G2	F154 E2
2101 A10	3173 F12	F155 E8
2102 A3	3174 G12	F156 E8
2103 A6	3175 H6	F157 G10
2104 A6	3176 H6	F158 E8
2105 A7	3177 H6	F159 E8
2106 B3	3178 I5	F160 E2
2107 B7	3179 E11	F161 E4
2108 B6	3180 I2	F162 A4
2109 B4	3181 I8	F163 H10
2110 C3	3182 F10	F164 F4
2111 B12	3183 F10	F165 F7
2112 C4	3184 I6	F166 F8
2113 D8	3185 I5	F167 F4
2114 D7	3186 I7	F168 F7
2115 D5	3187 I2	F169 F8
2116 E4	3188 A8	F170 F2
2117 E6	3189 A3	F171 F4
2118 G9	3190 A4	F172 H9
2119 G10	3191 B9	F173 F4
2120 E2	3192 B12	F174 H8
2121 E2	3193 C13	F175 H8
2122 F4	3194 H8	F176 G8
2123 H10	3195 I8	F177 G1
2124 F7	3196 B9	F178 G8
2125 G4	3197 C9	F179 I9
2126 G2	3198 D10	F180 G4
2127 H10	3199 E9	F181 G2
2128 G8	7100 A5	F182 G3
2129 G8	7101 A8	F183 G4
2130 H2	7102 E4	F184 G2
2131 H3	7103 A10	F185 G4
2132 H3	7104 A G2	F186 G4
2133 H4	7104-B H2	F187 G2
2134 H4	7105-A G12	F188 G4
2135 H4	7105-B G11	F189 G8
2136 H5	7106 A7	F190 H2
2137 G12	7109 A10	F191 H7
2138 H7	7110 C4	F192 H3
2139 I8	7111 C5	F193 H6
2140 I6	7112 E10	F194 I6
2141 I2	7113 E10	F195 I5
2142 F11	7114 E10	F196 I5
2143 B1	7115 D11	F197 G11
2144 B2	7116 E12	F198 H13
2145 B2	F011 I2	F199 I7
3100 A5	F012 I2	
3101 A6	F013 I2	
3102 A5	F014 B4	
3103 A4	F015 E4	
3104 A7	F016 F4	
3105 A2	F017 E5	
3106 A7	F018 E5	
3107 A12	F019 D6	
3108 A12	F020 D6	
3110 A8	F021 F8	
3111 A8	F022 G12	
3112 A6	F023 H5	
3113 B4	F024 H6	
3114 B12	F025 E10	
3115 B12	F026 E10	
3116 B4	F027 E10	
3117 B5	F028 E11	
3118 B8	F029 E11	
3119 B7	F030 E11	
3120 F12	F102 A7	
3121 B12	F103 A4	
3122 B12	F104 A8	
3123 B5	F105 A1	
3124 B12	F106 A5	
3125 C4	F107 A4	
3126 C4	F108 A12	
3127 C12	F109 A7	
3128 C2	F110 A2	
3129 C5	F111 A2	
3130 C12	F112 A6	
3131 C13	F113 A7	
3132 D12	F114 A8	
3133 D13	F115 B12	
3134 D7	F116 A2	
3135 D5	F117 B3	
3136 D6	F118 B9	
3137 D6	F119 B9	
3138 G9	F120 B12	
3139 E4	F121 B2	
3140 E6	F122 B5	
3141 E2	F123 B12	
3142 E5	F124 B2	
3143 G9	F125 B7	
3144 E2	F126 B9	
3145 E7	F127 B2	
3146 E8	F128 C2	
3147 E8	F129 C5	
3148 G9	F130 C1	
3149 E8	F131 C4	
3150 E4	F132 C4	
3151 E3	F133 C12	
3152 E8	F134 C4	
3153 H9	F135 C1	
3154 F4	F136 C2	
3155 F8	F137 C12	
3156 F3	F138 C2	
3157 F8	F139 C7	
3158 H9	F140 C2	
3159 F8	F141 D2	
3160 F3	F142 D12	
3161 F8	F143 D2	
3162 F4	F144 D2	
3163 F2	F145 D7	
3164 F3	F146 D8	

SCHEMATIC DIAGRAM

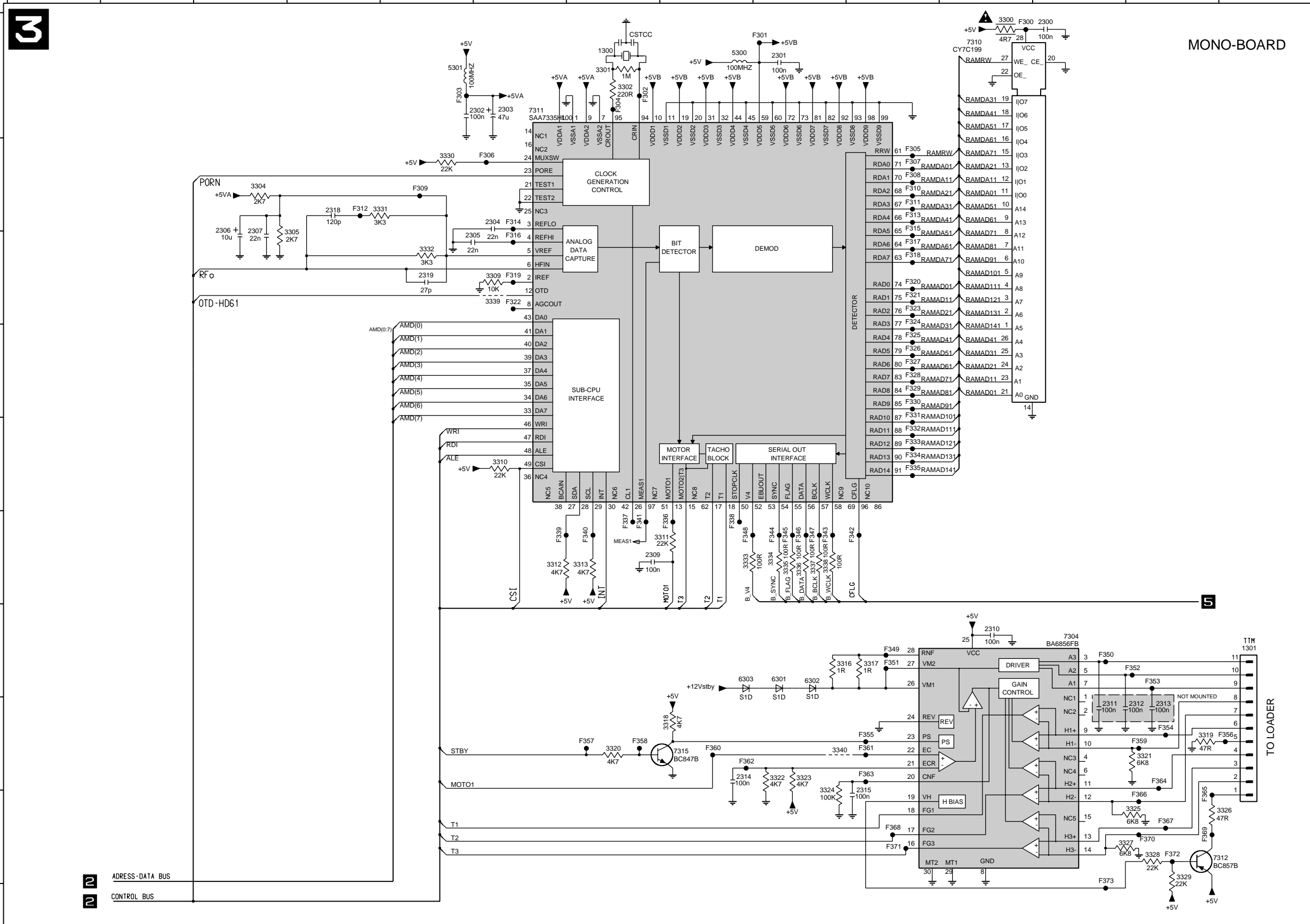
MONO 2/6 (SERVO MACE)



1201 I13	F226 C1
1205 A4	F227 C2
2203 A10	F228 C11
2204 B2	F229 D11
2205 B2	F230 D2
2206 C1	F231 D11
2207 D1	F232 D11
2208 D13	F233 D1
2209 D14	F234 D2
2210 D1	F235 D11
2212 H3	F236 D2
2213 H4	F237 D10
2214 H13	F238 D13
2215 H11	F239 D10
2216 H12	F240 D13
2226 A4	F241 E10
2227 A6	F242 E13
2228 A7	F243 E10
3200 A4	F244 E13
3201 A6	F245 E10
3202 A7	F246 E13
3203 A4	F247 E10
3204 A4	F248 E13
3205 B2	F249 E10
3206 B2	F250 E2
3208 C2	F251 E13
3209 C2	F252 E10
3210 C2	F253 E13
3211 D2	F254 F10
3212 D13	F255 F10
3213 D14	F256 F10
3214 D2	F257 F11
3215 D2	F258 F11
3219 F2	F259 F11
3220 F10	F260 F14
3221 F2	F261 F2
3222 F1	F262 F10
3223 F1	F263 G2
3224 H3	F264 H4
3225 H5	F265 H3
3226 H4	F266 H9
3227 H13	F267 H8
3228 I8	F268 H8
3229 H13	F269 H7
3230 H8	F270 H9
3231 H6	F271 H8
3232 H12	F272 H9
3234 H1	F273 H5
3235 I12	F274 H5
3236 H10	F275 H5
3237 H2	F276 H6
3238 I8	F277 H6
3239 F10	F278 H4
3240 B10	F279 H4
3241 B1	F280 H6
3242 C1	F281 H14
3243 C2	F282 H7
3244 C2	F283 H7
3245 A5	F284 H8
3246 C2	F285 H13
3247 F10	F286 H12
3248 G2	F287 I11
3249 G2	F288 I12
3250 G2	F289 I7
3251 H8	F290 I7
3252 H8	F291 I6
3253 H5	F292 I6
3254 H8	F293 I8
3255 I7	F294 I12
3256 I7	F295 I7
3257 I8	F296 I7
3258 I12	F297 A4
3259 A6	F298 A10
3260 A7	F299 B2
3261 I13	
5200 A9	
6200 H12	
7201 D12	
7202 D13	
7203 H12	
7207 A3	
7208 I13	
F025 G2	
F026 G2	
F027 G2	
F028 H4	
F029 H5	
F030 I8	
F031 I8	
F032 H8	
F033 D13	
F034 D13	
F200 A5	
F201 A5	
F202 A9	
F203 A6	
F204 A4	
F205 A7	
F206 A5	
F207 A6	
F208 A5	
F209 A6	
F210 A5	
F211 A4	
F212 B10	
F213 B2	
F214 B10	
F215 B2	
F216 B10	
F217 B2	
F218 C10	
F219 C10	
F220 C2	
F221 C2	
F222 C11	
F223 C11	
F224 C2	
F225 C11	

SCHEMATIC DIAGRAM

MONO 3/6 (Decoder & Turntable motor control)



- 1300 A7
- 1301 G14
- 2300 A12
- 2301 A9
- 2302 A6
- 2303 A6
- 2304 B6
- 2305 C5
- 2306 C3
- 2307 C3
- 2309 F7
- 2310 G11
- 2311 H12
- 2312 H13
- 2313 H13
- 2314 H8
- 2315 I10
- 2318 B4
- 2319 C5
- 3300 A11
- 3301 A7
- 3302 A7
- 3304 B3
- 3305 C4
- 3309 C6
- 3310 E6
- 3311 F8
- 3312 F6
- 3313 F7
- 3316 G9
- 3317 G10
- 3318 H8
- 3319 H13
- 3320 H7
- 3321 H13
- 3322 H9
- 3323 H9
- 3324 I9
- 3325 I13
- 3326 I14
- 3327 I13
- 3328 I13
- 3329 I13
- 3330 B5
- 3331 B5
- 3332 C5
- 3333 F8
- 3334 F9
- 3335 F9
- 3336 F9
- 3337 F9
- 3338 F9
- 3339 C6
- 3340 H9
- 5300 A8
- 5301 A5
- 6301 G9
- 6302 G9
- 6303 G8
- 7304 G12
- 7310 A11
- 7311 A6
- 7312 I13
- 7315 H8
- F300 A11
- F301 A9
- F302 A7
- F303 A5
- F304 A7
- F305 B10
- F306 B6
- F307 B10
- F308 B10
- F309 B5
- F310 B10
- F311 B10
- F312 B4
- F313 B10
- F314 B6
- F315 B10
- F316 C6
- F317 C10
- F318 C10
- F319 C6
- F320 C10
- F321 C10
- F322 C6
- F323 C10
- F324 C10
- F325 D10
- F326 D10
- F327 D10
- F328 D10
- F329 D10
- F330 D10
- F331 D10
- F332 E10
- F333 E10
- F334 E10
- F335 E10
- F336 F8
- F337 F7
- F338 F8
- F339 F6
- F340 F7
- F341 F7
- F342 F10
- F343 F9
- F344 F9
- F345 F9
- F346 F9
- F347 F9
- F348 F8
- F349 G10
- F350 G12
- F351 G10
- F352 G13
- F353 G13
- F354 H13
- F355 H10
- F356 H14
- F357 H7
- F358 H7
- F359 H13
- F360 H8
- F361 H10
- F362 H8
- F363 H10
- F364 H13
- F365 I13
- F366 I13
- F367 I13
- F368 I10
- F369 I13
- F370 I13
- F371 I10
- F372 I13
- F373 I12

MONO-BOARD

TO LOADER

ADDRESS-DATA BUS
CONTROL BUS

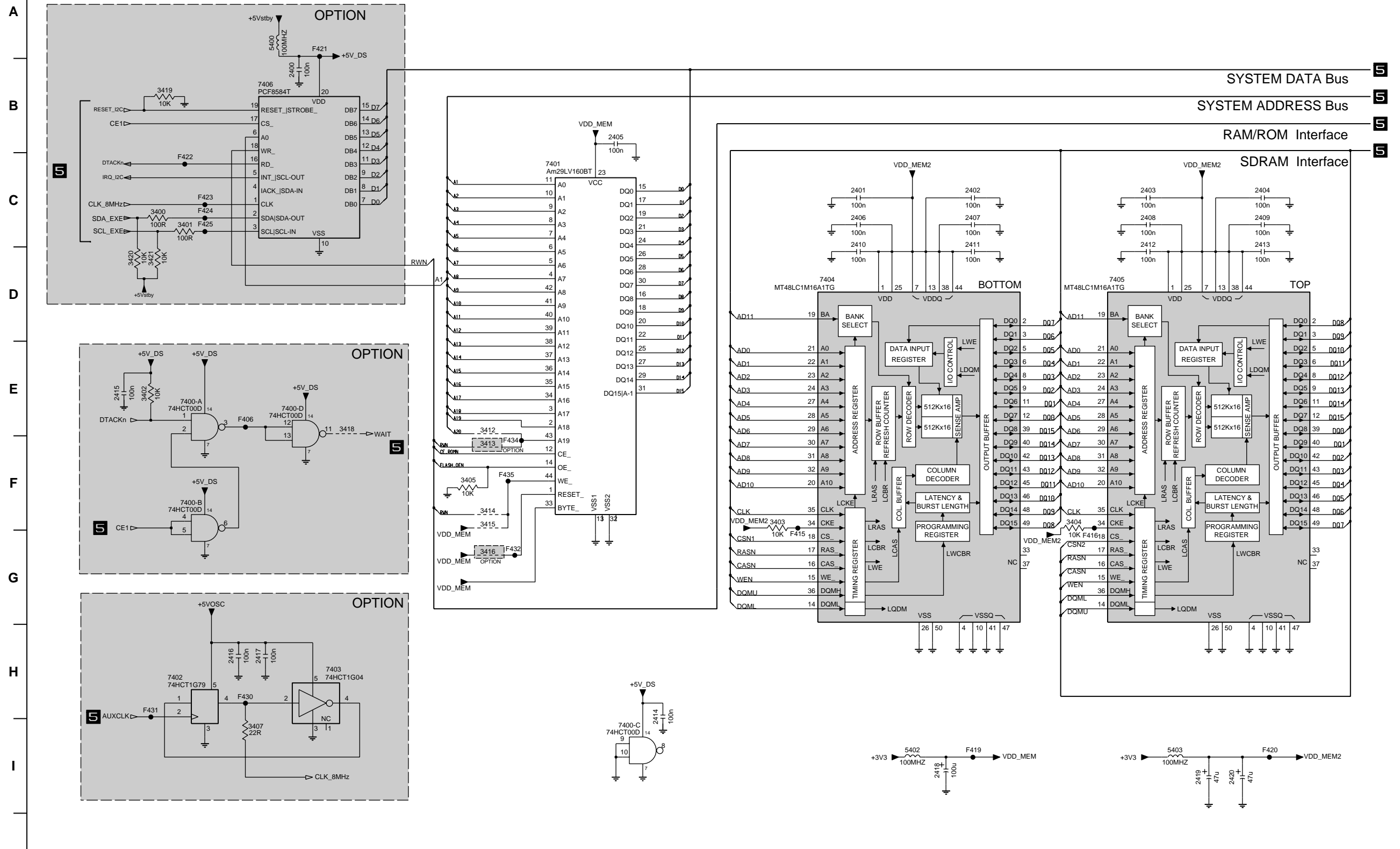
SCHEMATIC DIAGRAM

MONO 4/6 (Memory)

4

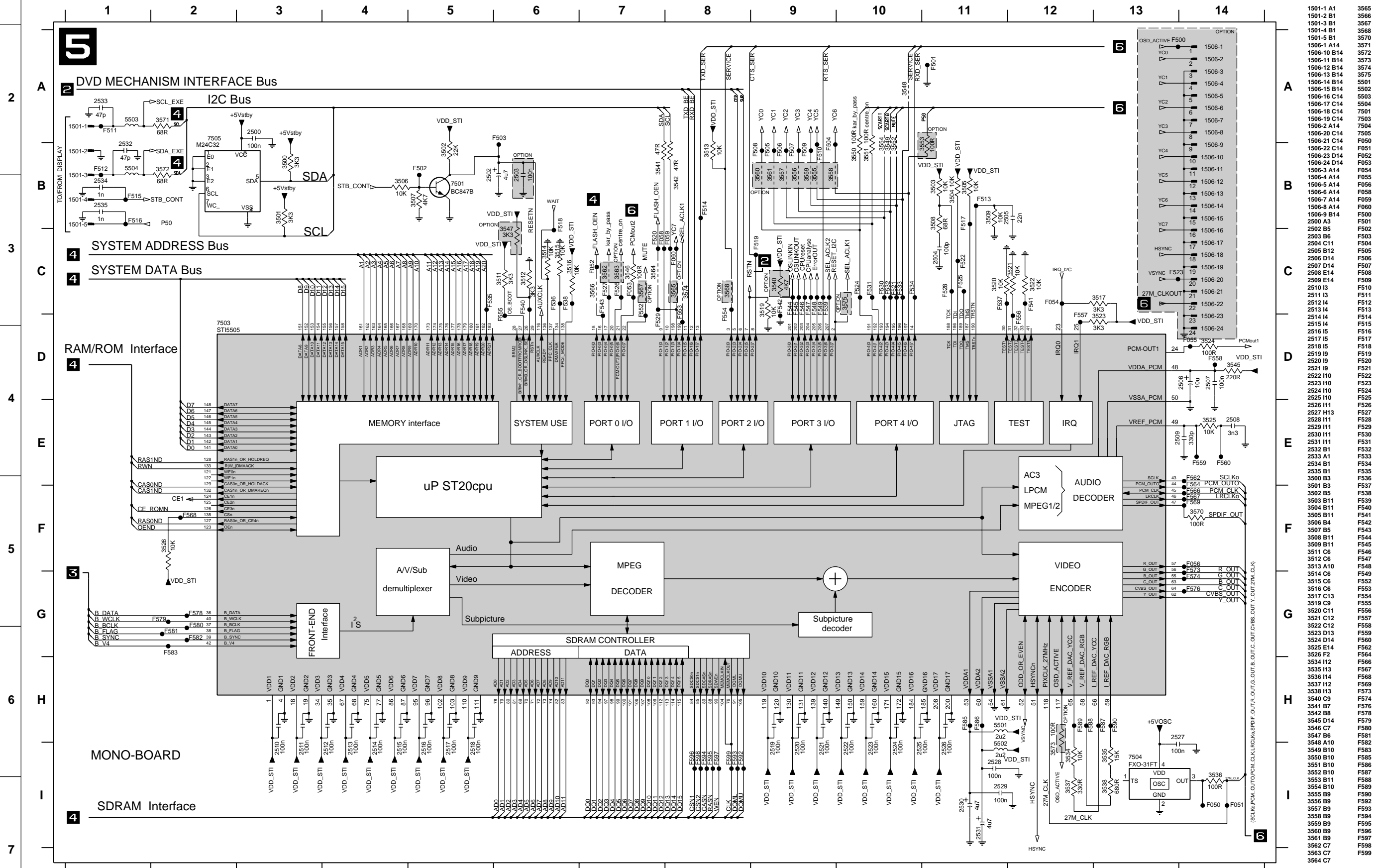
MEMORY PART

MONO-BOARD



- 2400 B3
- 2401 C9
- 2402 C10
- 2403 C12
- 2404 C13
- 2405 B6
- 2406 C9
- 2407 C10
- 2408 C12
- 2409 C13
- 2410 C9
- 2411 C10
- 2412 C12
- 2413 C13
- 2414 H7
- 2415 E1
- 2416 H2
- 2417 H3
- 2418 I10
- 2419 I13
- 2420 I13
- 3400 C2
- 3401 C2
- 3402 E1
- 3403 F8
- 3404 F11
- 3405 F5
- 3407 I3
- 3412 E5
- 3413 F5
- 3414 F5
- 3415 F5
- 3416 G5
- 3418 E4
- 3419 B2
- 3420 D1
- 3421 D2
- 5400 A3
- 5402 I10
- 5403 I10
- 7400-A E2
- 7400-B F2
- 7400-C I6
- 7400-D E3
- 7401 C6
- 7402 H2
- 7403 H3
- 7404 D9
- 7405 D12
- 7406 B3
- F406 E3
- F415 G8
- F416 G11
- F419 I10
- F420 I13
- F421 A3
- F422 C2
- F423 C2
- F424 C2
- F425 C2
- F430 H3
- F431 H2
- F432 G5
- F434 F5
- F435 F5

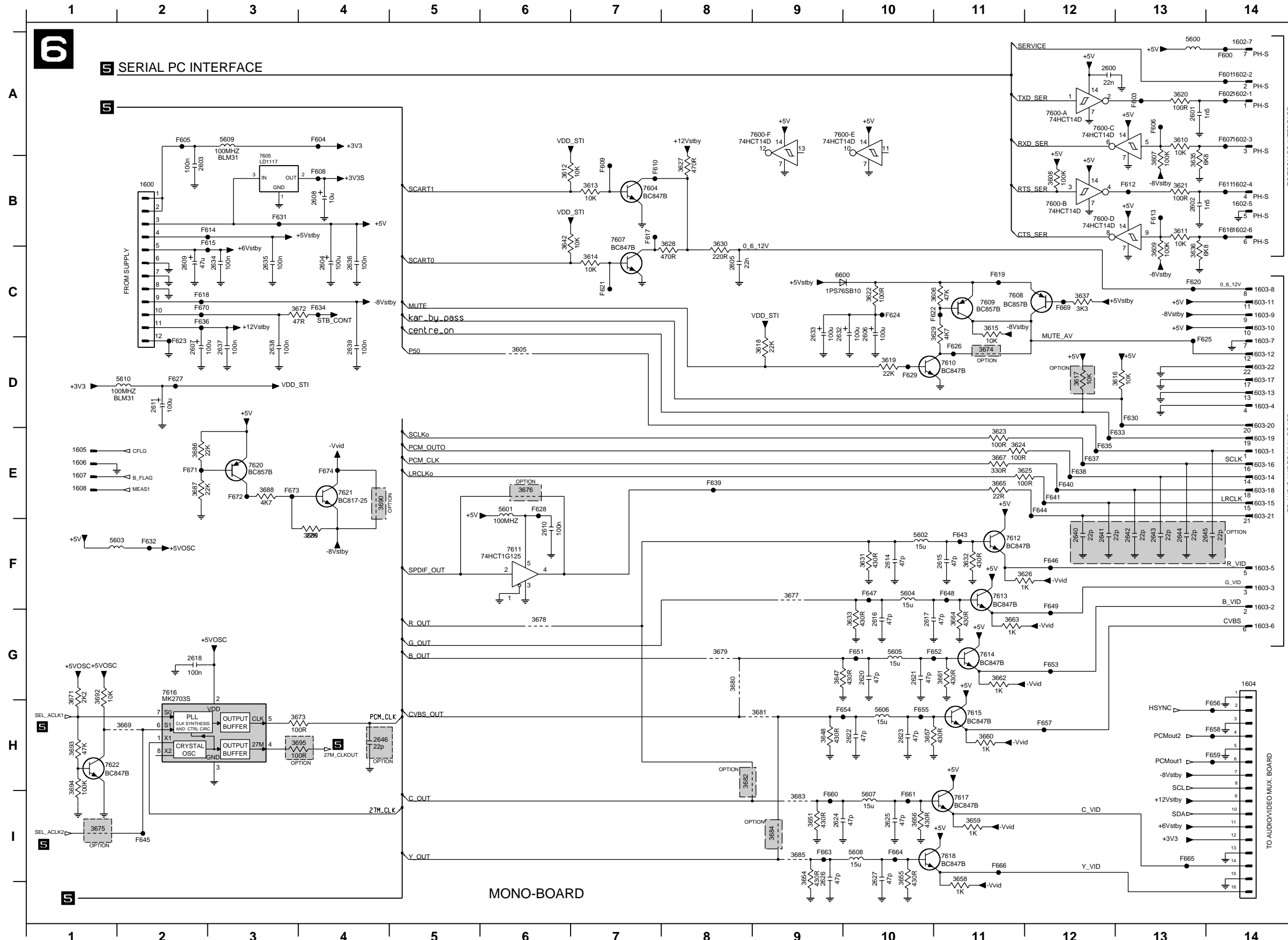
SCHEMATIC DIAGRAM MONO 5/6 (DVD Decoder STI 5505)



1501-1 A1	3565 C8
1501-2 B1	3566 C7
1501-3 B1	3567 C7
1501-4 B1	3568 C8
1501-5 B1	3570 F14
1506-1 A14	3571 A2
1506-1 B14	3572 B2
1506-11 B14	3573 H2
1506-12 B14	3574 C8
1506-13 B14	3575 C10
1506-14 B14	5501 H11
1506-15 B14	5502 H1
1506-16 C14	5503 A1
1506-17 C14	5504 B1
1506-18 C14	7501 B5
1506-19 C14	7503 D2
1506-2 A14	7504 H3
1506-20 C14	7505 A2
1506-21 C14	F050 H4
1506-22 C14	F051 H4
1506-23 D14	F052 C7
1506-24 D14	F053 C7
1506-3 A14	F054 C12
1506-4 A14	F055 D14
1506-5 A14	F056 F14
1506-6 A14	F058 C7
1506-7 A14	F059 C8
1506-8 A14	F060 C8
1506-9 B14	F500 A13
2500 A3	F501 A11
2502 B5	F502 B5
2503 B6	F503 A6
2504 C11	F504 B9
2505 B12	F505 B9
2506 D14	F506 B9
2507 D14	F507 B9
2508 E14	F508 B9
2509 E14	F509 B9
2510 I3	F510 B9
2511 I3	F511 A1
2512 I4	F512 B1
2513 I4	F513 B11
2514 I4	F514 B8
2515 I4	F515 B1
2516 I5	F516 B1
2517 I5	F517 B11
2518 I5	F518 B6
2519 I9	F519 B9
2520 I9	F520 C7
2521 I9	F521 C10
2522 H10	F522 C11
2523 H10	F523 C13
2524 H10	F524 C10
2525 H10	F525 C11
2526 H11	F526 C7
2527 H13	F527 C7
2528 H11	F528 C11
2529 H11	F529 D7
2530 H11	F530 C10
2531 H11	F531 C10
2532 B1	F532 B1
2533 A1	F533 C10
2534 B1	F534 C10
2535 B1	F535 C5
3500 B3	F536 C6
3501 B3	F537 C11
3502 B5	F538 C6
3503 B11	F539 C9
3504 B11	F540 C6
3505 B11	F541 C12
3506 B4	F542 C9
3507 B5	F543 C7
3508 B11	F544 C9
3509 B11	F545 C9
3511 C6	F546 C9
3512 C6	F547 C9
3513 A10	F548 C9
3514 C6	F549 C9
3515 C6	F552 C7
3516 C6	F553 C8
3517 C13	F554 D8
3519 C9	F555 D9
3520 C11	F556 D12
3521 C12	F557 D12
3522 C12	F558 D14
3523 D13	F559 E14
3524 D14	F560 E14
3525 E14	F561 E14
3526 F2	F564 F14
3534 H12	F566 F14
3535 H13	F567 F14
3536 H14	F568 F2
3537 H12	F569 F14
3538 H13	F573 G14
3540 C9	F574 G14
3541 B7	F576 G14
3542 B8	F578 G2
3545 D14	F579 G2
3546 C7	F580 G2
3547 B6	F581 G2
3548 A10	F582 G2
3549 B10	F583 G2
3550 B10	F585 H11
3551 B10	F586 H11
3552 B10	F587 H11
3553 B11	F588 H12
3554 B10	F589 H12
3555 B9	F590 H13
3556 B9	F592 I8
3557 B9	F593 I8
3558 B9	F594 I8
3559 B9	F595 I8
3560 B9	F596 I8
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3562 C7	F598 I8
3563 C7	F599 I8
3564 C7	F599 I8

SCHEMATIC DIAGRAM

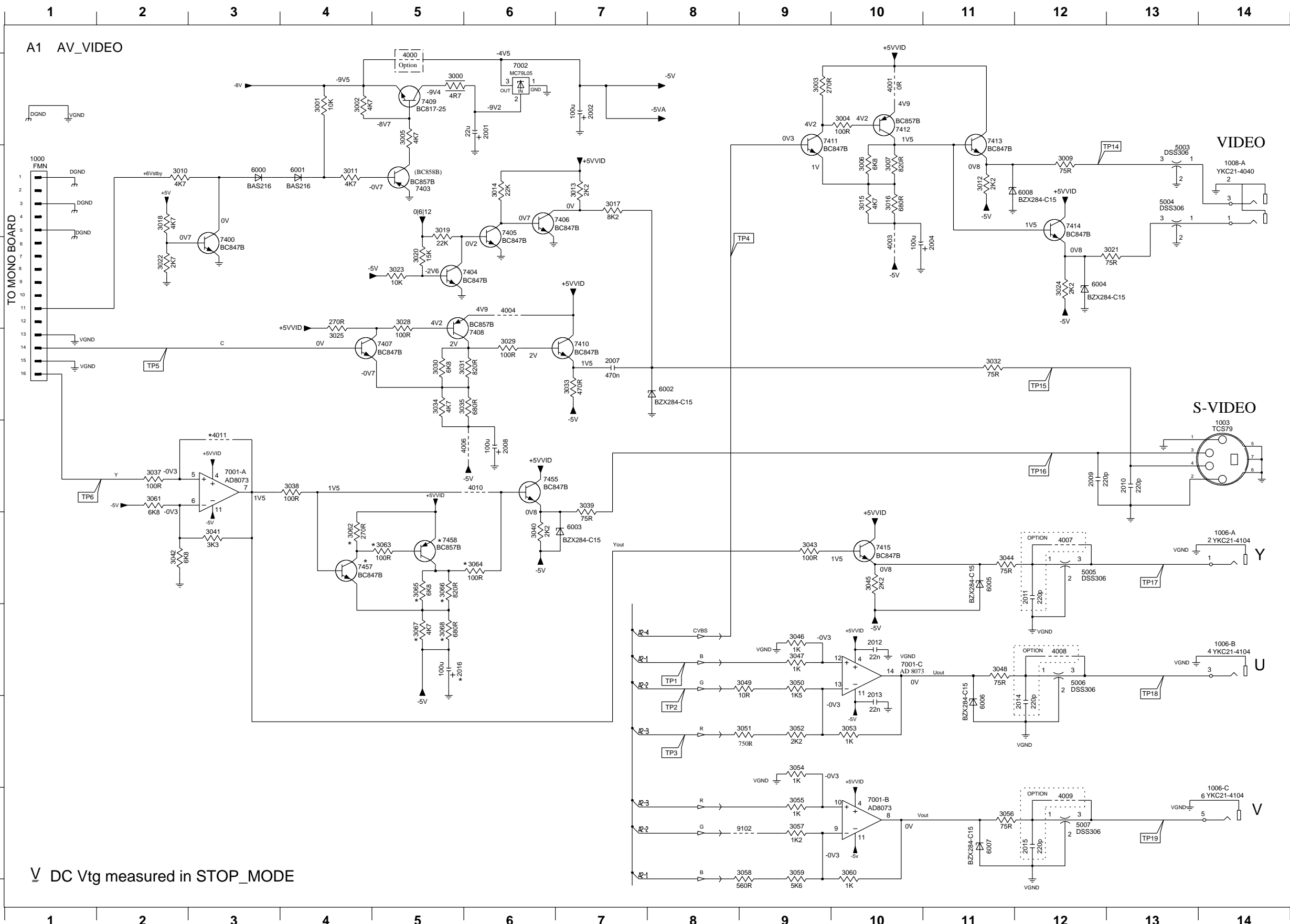
MONO 6/6 (Back-end & Service interface)



- | | | |
|-------------|------------|----------|
| 1600 B2 | 3661 G11 | F654 H10 |
| 1602-1 A14 | 3662 G11 | F655 H10 |
| 1602-2 A14 | 3663 G11 | F656 H10 |
| 1602-3 A14 | 3664 G11 | F657 H12 |
| 1602-4 B14 | 3665 E11 | F658 H14 |
| 1602-5 B14 | 3667 E11 | F659 H14 |
| 1602-6 B14 | 3668 H2 | F660 I9 |
| 1602-7 A14 | 3671 G1 | F661 H10 |
| 1603-1 E14 | 3672 C4 | F663 I9 |
| 1603-10 C14 | 3673 H3 | F664 H10 |
| 1603-11 C14 | 3674 D11 | F665 I13 |
| 1603-12 D14 | 3675 I1 | F666 H11 |
| 1603-13 E14 | 3676 E6 | F669 C12 |
| 1603-14 E14 | 3677 F9 | F670 C2 |
| 1603-15 E14 | 3678 G6 | F671 E2 |
| 1603-16 E14 | 3679 G8 | F672 E3 |
| 1603-17 D14 | 3680 G8 | F673 E3 |
| 1603-18 E14 | 3681 H9 | F674 E4 |
| 1603-19 E14 | 3682 H8 | |
| 1603-2 F14 | 3683 I9 | |
| 1603-20 D14 | 3684 I9 | |
| 1603-21 E14 | 3685 I9 | |
| 1603-22 D14 | 3686 E2 | |
| 1603-3 F14 | 3687 E2 | |
| 1603-4 D14 | 3688 E3 | |
| 1603-5 F14 | 3689 F4 | |
| 1603-6 G14 | 3690 E4 | |
| 1603-7 D14 | 3692 G1 | |
| 1603-8 C14 | 3693 H1 | |
| 1603-9 C14 | 3694 H1 | |
| 1604 G14 | 3695 H4 | |
| 1605 E1 | 5600 A13 | |
| 1606 E1 | 5601 E6 | |
| 1607 E1 | 5602 F10 | |
| 1608 E1 | 5603 F1 | |
| 2600 A12 | 5604 F10 | |
| 2601 A13 | 5605 G10 | |
| 2602 B13 | 5606 H10 | |
| 2603 B2 | 5607 I10 | |
| 2604 C4 | 5608 I10 | |
| 2605 C8 | 5609 A3 | |
| 2606 C10 | 5610 D2 | |
| 2607 D2 | 5611 D2 | |
| 2608 B4 | 7600-A A12 | |
| 2609 C2 | 7600-B B12 | |
| 2610 F6 | 7600-C A12 | |
| 2611 D2 | 7600-D B12 | |
| 2614 F10 | 7600-E A10 | |
| 2615 F11 | 7600-F A9 | |
| 2616 G10 | 7604 B7 | |
| 2617 G10 | 7605 B3 | |
| 2618 G2 | 7607 B7 | |
| 2620 G10 | 7608 C11 | |
| 2621 C10 | 7609 C11 | |
| 2622 H10 | 7610 D11 | |
| 2623 H10 | 7611 F6 | |
| 2624 I9 | 7612 F11 | |
| 2625 I10 | 7613 F11 | |
| 2626 I9 | 7614 G11 | |
| 2627 I10 | 7615 H11 | |
| 2632 C9 | 7616 H2 | |
| 2633 C9 | 7617 I11 | |
| 2634 C3 | 7618 I11 | |
| 2635 C3 | 7620 E3 | |
| 2636 C4 | 7621 E4 | |
| 2637 D3 | 7622 H1 | |
| 2638 D3 | F600 A14 | |
| 2639 D4 | F601 A14 | |
| 2640 F12 | F602 A14 | |
| 2641 F12 | F603 A13 | |
| 2642 F13 | F604 A4 | |
| 2643 F13 | F605 A2 | |
| 2644 F13 | F606 A13 | |
| 2645 F14 | F607 A14 | |
| 2646 H4 | F608 B4 | |
| 3605 D6 | F609 B7 | |
| 3606 C11 | F610 B7 | |
| 3607 B13 | F611 B14 | |
| 3608 B12 | F612 B13 | |
| 3609 C13 | F613 B13 | |
| 3610 A13 | F614 B3 | |
| 3611 B13 | F615 B3 | |
| 3612 B6 | F616 B14 | |
| 3613 B7 | F617 B7 | |
| 3614 C7 | F618 C2 | |
| 3615 C11 | F619 C11 | |
| 3616 D13 | F620 C13 | |
| 3617 D12 | F621 C7 | |
| 3618 D9 | F622 C11 | |
| 3619 D10 | F623 D2 | |
| 3620 A13 | F624 C10 | |
| 3621 D13 | F625 D13 | |
| 3622 C10 | F626 D11 | |
| 3623 E11 | F627 D2 | |
| 3624 E11 | F628 E6 | |
| 3625 E12 | F629 D10 | |
| 3626 F12 | F630 D13 | |
| 3627 B8 | F631 B3 | |
| 3628 B8 | F632 F2 | |
| 3629 C11 | F633 E13 | |
| 3630 C8 | F634 C4 | |
| 3631 F10 | F635 E12 | |
| 3632 F11 | F636 C2 | |
| 3633 G10 | F637 E12 | |
| 3635 B13 | F638 E12 | |
| 3636 C13 | F639 E8 | |
| 3637 C12 | F640 E12 | |
| 3642 B6 | F641 E12 | |
| 3647 G9 | F643 F11 | |
| 3648 H9 | F644 E12 | |
| 3651 I9 | F645 I2 | |
| 3654 I9 | F646 F12 | |
| 3655 I10 | F647 F10 | |
| 3656 I10 | F648 F11 | |
| 3657 H10 | F649 F12 | |
| 3658 I11 | F651 G10 | |
| 3659 I11 | F652 G11 | |
| 3660 H11 | F653 G12 | |

SCHEMATIC DIAGRAM

A/V (U, C, A, R, T) 1/2

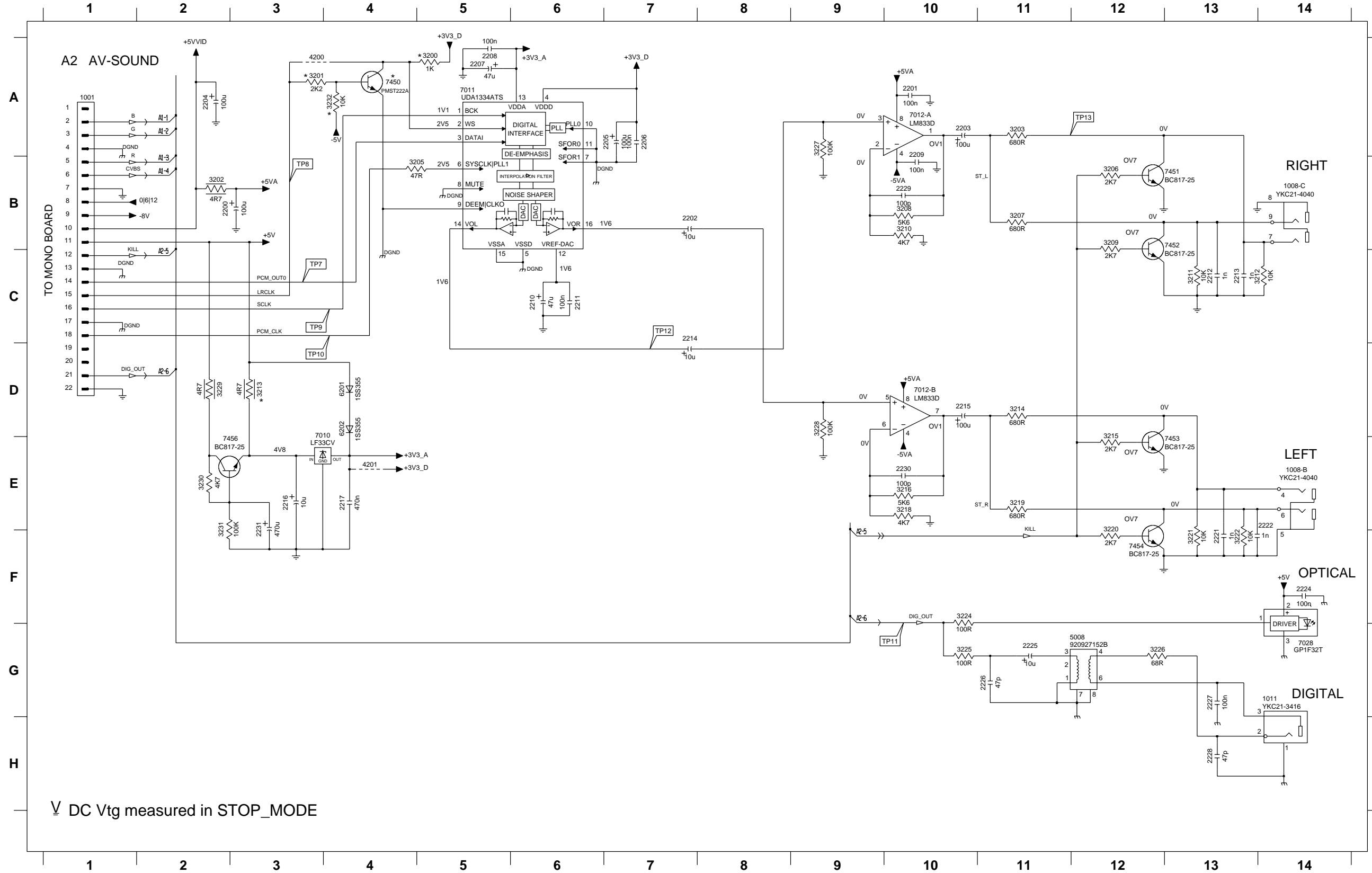


V DC Vtg measured in STOP_MODE

- 1000 B1
- 1003 E14
- 1006-A F14
- 1006-B G14
- 1006-C I14
- 1008-A B14
- 2001 A6
- 2004 C11
- 2007 D7
- 2008 E6
- 2009 E12
- 2010 E13
- 2011 F12
- 2012 G10
- 2013 H10
- 2014 H12
- 2015 H2
- 2016 G5
- 2020 A7
- 3000 A5
- 3001 A4
- 3002 A4
- 3003 A9
- 3004 A10
- 3005 A5
- 3006 B10
- 3007 B10
- 3009 B12
- 3010 B2
- 3011 B4
- 3012 B11
- 3013 B7
- 3014 B6
- 3015 B10
- 3016 B10
- 3017 B7
- 3018 B2
- 3019 B5
- 3020 C5
- 3021 C13
- 3022 C2
- 3023 C5
- 3024 C12
- 3025 D4
- 3028 C5
- 3029 D6
- 3030 D5
- 3031 D6
- 3032 D11
- 3033 D7
- 3034 D5
- 3035 D6
- 3037 E2
- 3038 E4
- 3039 E7
- 3040 F6
- 3041 F3
- 3042 F2
- 3043 F9
- 3044 F11
- 3045 F10
- 3046 G9
- 3047 G9
- 3048 G11
- 3049 G9
- 3050 G9
- 3052 H9
- 3053 H10
- 3054 H9
- 3055 I9
- 3056 I11
- 3057 I9
- 3058 I9
- 3059 I9
- 3060 H10
- 3061 E2
- 3062 F4
- 3063 F5
- 3064 F6
- 3065 F5
- 3066 F5
- 3067 G5
- 3068 G5
- 4000 A5
- 4001 A10
- 4003 C10
- 4004 C6
- 4006 E6
- 4007 F12
- 4008 G12
- 4009 H2
- 4010 E6
- 4011 E3
- 5003 B13
- 5004 B13
- 5005 F12
- 5006 G12
- 5007 H2
- 6000 B3
- 6001 B4
- 6002 D8
- 6003 F7
- 6004 C12
- 6005 F11
- 6006 H11
- 6007 H1
- 6008 B12
- 7001-A E3
- 7001-B I10
- 7001-C G10
- 7002 A6
- 7400 C3
- 7403 B5
- 7404 C5
- 7405 B6
- 7406 B6
- 7407 D5
- 7408 D6
- 7409 A5
- 7410 D7
- 7411 A9
- 7412 A10
- 7413 A11
- 7414 B12
- 7415 F10
- 7455 E6
- 7457 F4
- 7458 F5
- 9102 F9

SCHEMATIC DIAGRAM

A/V (U, C, A, R, T) 2/2



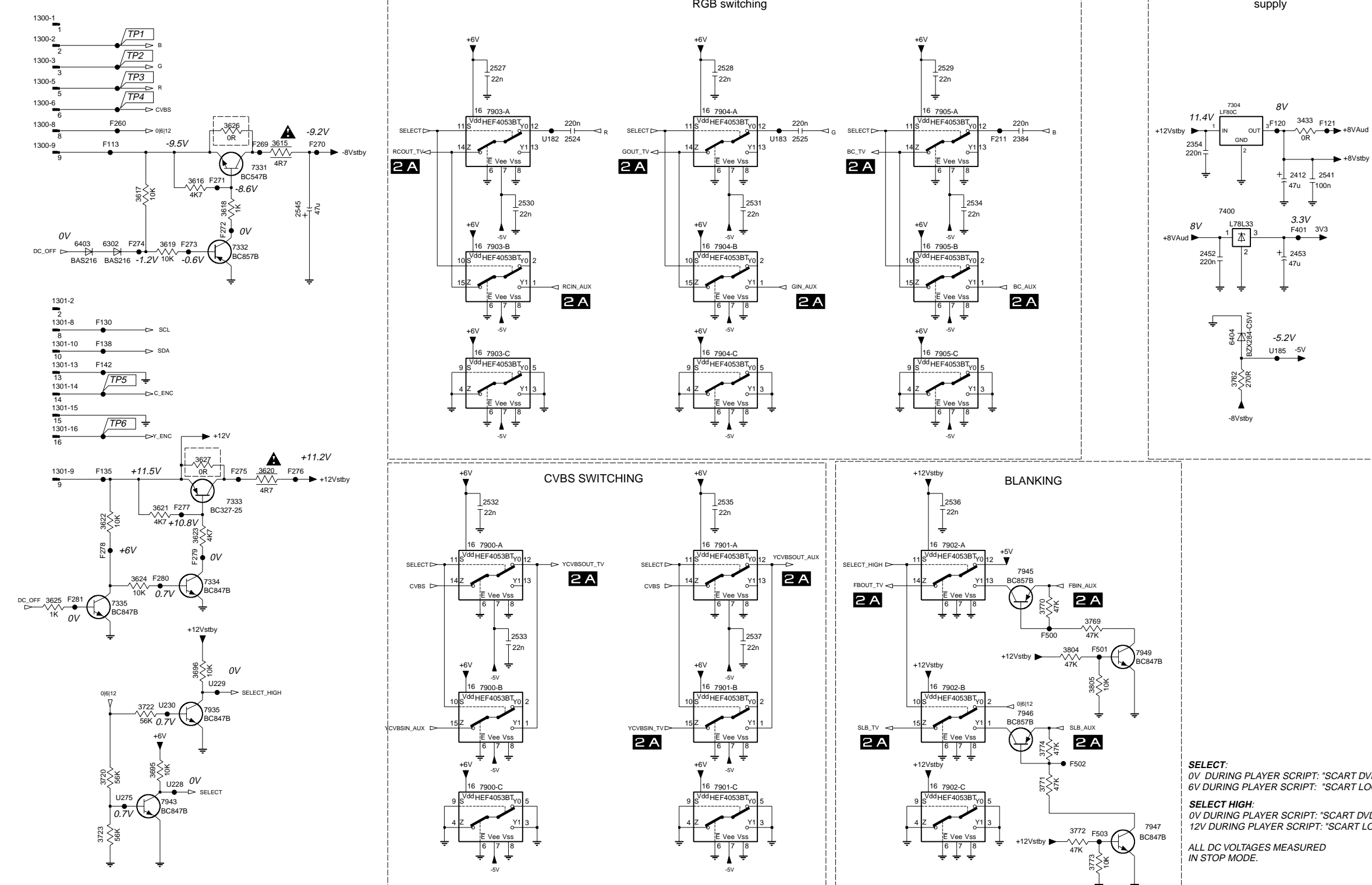
- 1001 A1
- 1008-B E14
- 1008-C B14
- 1011 G14
- 2200 B2
- 2201 A10
- 2202 B7
- 2203 A10
- 2204 A2
- 2205 A7
- 2206 A7
- 2207 A5
- 2208 A5
- 2209 B10
- 2210 C6
- 2211 C6
- 2212 C13
- 2213 C13
- 2214 C7
- 2215 D10
- 2216 E3
- 2217 E4
- 2218 F13
- 2219 E4
- 2220 F14
- 2221 G11
- 2222 G11
- 2223 G13
- 2224 H13
- 2225 B10
- 2226 E10
- 2227 E3
- 2228 G11
- 2229 B10
- 2230 E10
- 2231 E3
- 2232 A5
- 2233 A3
- 2234 B2
- 2235 A11
- 2236 B4
- 2237 B12
- 2238 B10
- 2239 B12
- 2240 B10
- 2241 B10
- 2242 C13
- 2243 D3
- 2244 D11
- 2245 E12
- 2246 E10
- 2247 E10
- 2248 F12
- 2249 F13
- 2250 F10
- 2251 G10
- 2252 G12
- 2253 A9
- 2254 D9
- 2255 D2
- 2256 E2
- 2257 E2
- 2258 A4
- 2259 A3
- 2260 E4
- 2261 G11
- 2262 D4
- 2263 E3
- 2264 A5
- 2265 A10
- 2266 G14
- 2267 A4
- 2268 B13
- 2269 B13
- 2270 E13
- 2271 F12
- 2272 D3

∇ DC Vtg measured in STOP_MODE

SCHEMATIC DIAGRAM

A/V (B, G) 1/4

1 A SUPPLY & VIDEO SWITCHING



SELECT:
 0V DURING PLAYER SCRIPT: "SCART DVD"
 6V DURING PLAYER SCRIPT: "SCART LOOP"

SELECT HIGH:
 0V DURING PLAYER SCRIPT: "SCART DVD"
 12V DURING PLAYER SCRIPT: "SCART LOOP"

ALL DC VOLTAGES MEASURED
 IN STOP MODE.

PB A/V MUX
 3104 123 4248
 130-1

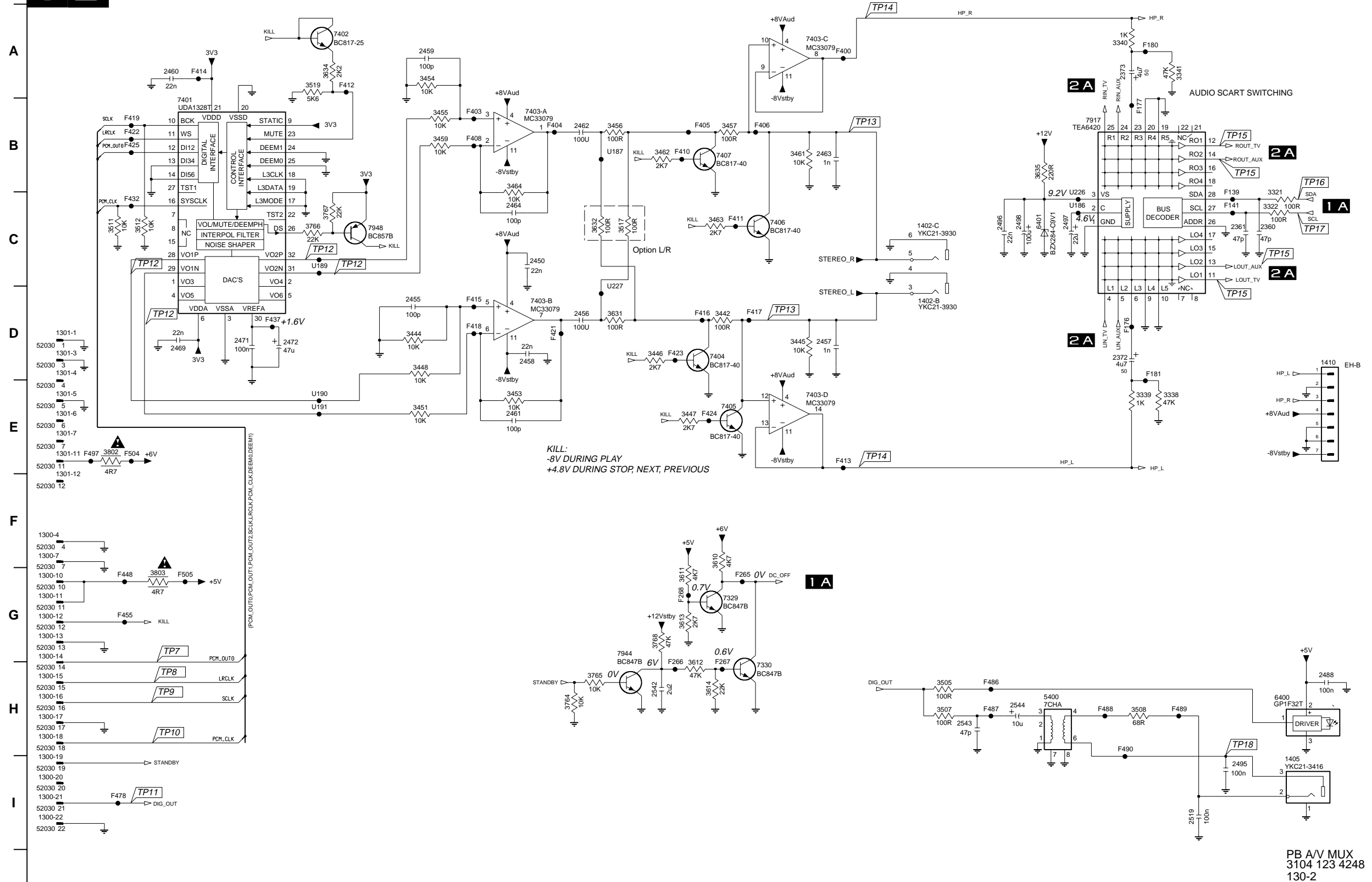
- 1300-1 A1
- 1300-2 A1
- 1300-3 A1
- 1300-5 A1
- 1300-6 B1
- 1300-8 B1
- 1300-9 B1
- 1301-10 D1
- 1301-13 D1
- 1301-14 D1
- 1301-15 E1
- 1301-16 E1
- 1301-2 D1
- 1301-8 D1
- 1301-9 E1
- 2354 B13
- 2384 B11
- 2412 B14
- 2452 C13
- 2453 C14
- 2524 B6
- 2525 B9
- 2527 A6
- 2528 A8
- 2529 A10
- 2530 C6
- 2531 C8
- 2532 F6
- 2533 G6
- 2534 C10
- 2535 F8
- 2536 F10
- 2537 G8
- 2541 B14
- 2545 C4
- 3433 B14
- 3615 B3
- 3616 B3
- 3617 C2
- 3618 C3
- 3619 C2
- 3620 E3
- 3621 F2
- 3622 F2
- 3623 F3
- 3624 F2
- 3625 G1
- 3626 B3
- 3627 E3
- 3695 H2
- 3696 G3
- 3720 H2
- 3722 H2
- 3723 I2
- 3762 D13
- 3769 G12
- 3770 G11
- 3771 H11
- 3772 I11
- 3773 I12
- 3774 H11
- 3804 G11
- 3805 G12
- 6302 C2
- 6403 C1
- 6404 D13
- 7304 B13
- 7331 B3
- 7332 C3
- 7333 F3
- 7334 F3
- 7335 G2
- 7400 C13
- 7900-A F6
- 7900-B G6
- 7900-C H6
- 7901-A F8
- 7901-B G8
- 7901-C H8
- 7902-A F10
- 7902-B G10
- 7902-C H10
- 7903-A B6
- 7903-B C6
- 7903-C D6
- 7904-A B8
- 7904-B C8
- 7904-C D8
- 7905-A B10
- 7905-B C10
- 7905-C D10
- 7935 H3
- 7943 I2
- 7945 F11
- 7946 H11
- 7947 I12
- 7949 G12
- F106 A2
- F109 A2
- F110 A2
- F112 B2
- F113 B2
- F120 B13
- F121 B14
- F130 D2
- F135 E2
- F138 D2
- F142 D2
- F144 D2
- F150 E2
- F211 B11
- F260 B2
- F269 B3
- F270 B4
- F271 B3
- F272 C3
- F273 C2
- F274 C2
- F275 E3
- F276 E4
- F278 F2
- F279 F3
- F280 F2
- F281 G1
- F401 C14
- F500 G11
- F501 G12
- F502 H11
- F503 H12
- F504 B6
- F505 B8
- F506 B8
- F507 B8
- F508 B8
- F509 B8
- F510 B8
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- F512 B8
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- F561 B8
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- F563 B8
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- F565 B8
- F566 B8
- F567 B8
- F568 B8
- F569 B8
- F570 B8
- F571 B8
- F572 B8
- F573 C2

■ SCHEMATIC DIAGRAM

A/V (B, G) 2/4

1 B

AUDIO



KILL: -8V DURING PLAY +4.8V DURING STOP, NEXT, PREVIOUS

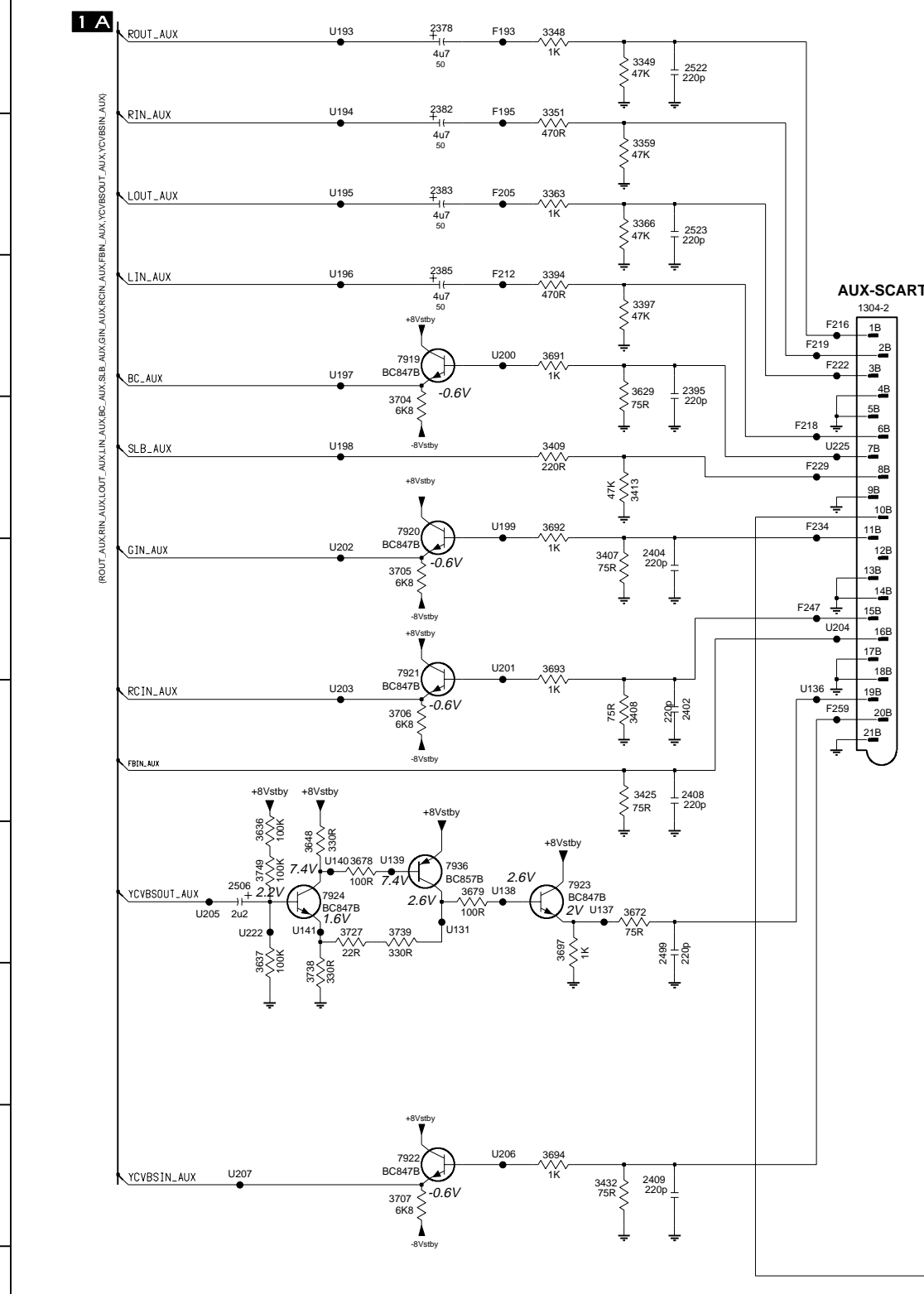
- 1300-10 G1
- 1300-11 G1
- 1300-12 G1
- 1300-13 G1
- 1300-14 G1
- 1300-15 H1
- 1300-16 H1
- 1300-17 H1
- 1300-18 H1
- 1300-19 I1
- 1300-20 I1
- 1300-21 I1
- 1300-22 I1
- 1300-4 F1
- 1300-7 F1
- 1300-1 D1
- 1301-1 D1
- 1301-11 E1
- 1301-12 F1
- 1301-3 D1
- 1301-4 D1
- 1301-5 E1
- 1301-6 E1
- 1301-7 E1
- 1402-B D10
- 1402-C D10
- 1402-D D10
- 1402-E D10
- 1402-F D10
- 1402-G D10
- 1402-H D10
- 1402-I D10
- 1402-J D10
- 1402-K D10
- 1402-L D10
- 1402-M D10
- 1402-N D10
- 1402-O D10
- 1402-P D10
- 1402-Q D10
- 1402-R D10
- 1402-S D10
- 1402-T D10
- 1402-U D10
- 1402-V D10
- 1402-W D10
- 1402-X D10
- 1402-Y D10
- 1402-Z D10
- 1402-AA D10
- 1402-AB D10
- 1402-AC D10
- 1402-AD D10
- 1402-AE D10
- 1402-AF D10
- 1402-AG D10
- 1402-AH D10
- 1402-AI D10
- 1402-AJ D10
- 1402-AM D10
- 1402-AN D10
- 1402-AO D10
- 1402-AP D10
- 1402-AQ D10
- 1402-AR D10
- 1402-AS D10
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- 1402-AU D10
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- 1402-BB D10
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- 1402-BD D10
- 1402-BE D10
- 1402-BF D10
- 1402-BG D10
- 1402-BH D10
- 1402-BI D10
- 1402-BJ D10
- 1402-AM D10
- 1402-AN D10
- 1402-AO D10
- 1402-AP D10
- 1402-AQ D10
- 1402-AR D10
- 1402-AS D10
- 1402-AT D10
- 1402-AU D10
- 1402-AV D10
- 1402-AW D10
- 1402-AX D10
- 1402-AY D10
- 1402-AZ D10
- 1402-BA D10
- 1402-BB D10
- 1402-BC D10
- 1402-BD D10
- 1402-BE D10
- 1402-BF D10
- 1402-BG D10
- 1402-BH D10
- 1402-BI D10
- 1402-BJ D10

SCHEMATIC DIAGRAM

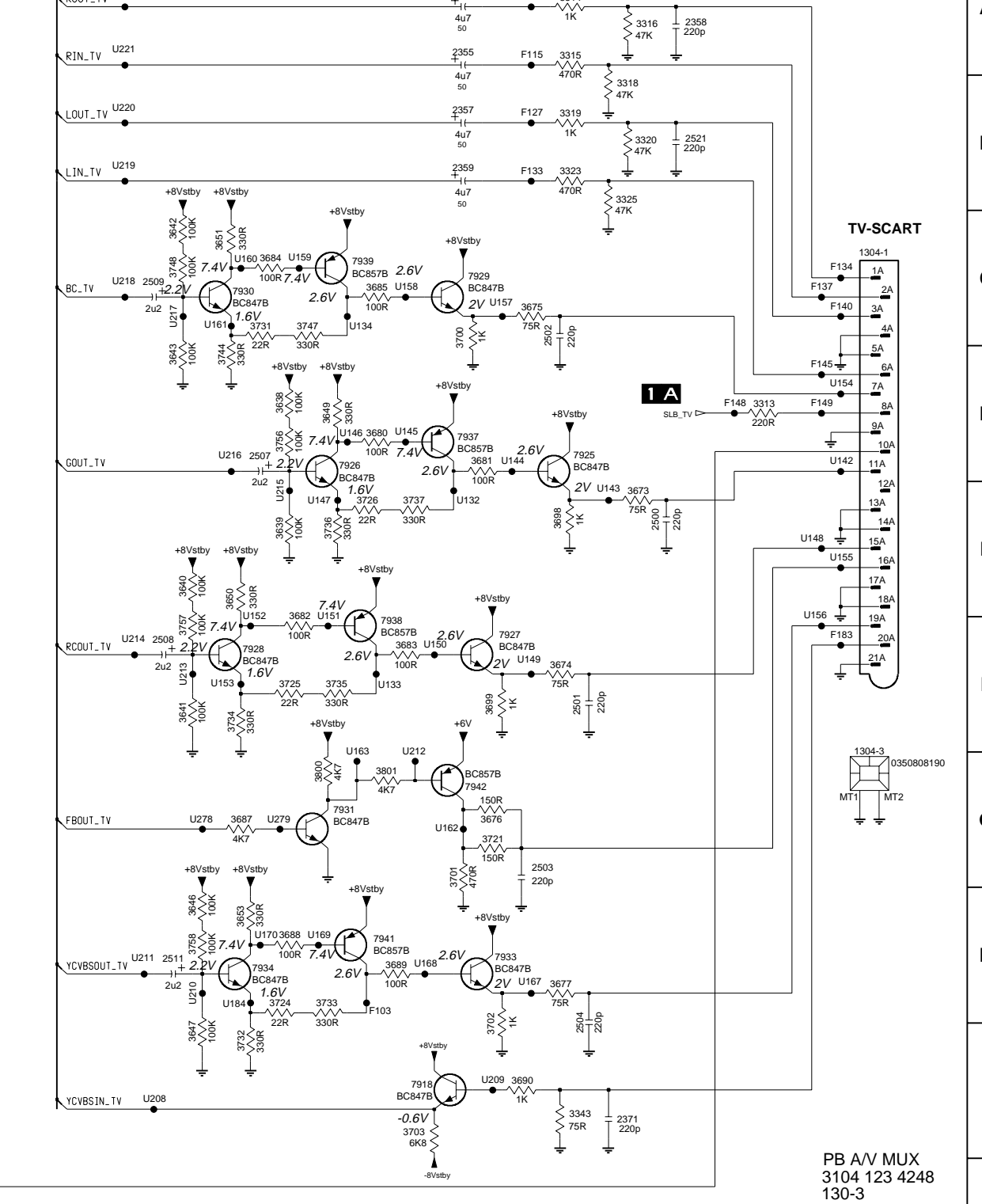
A/V (B, G) 3/4

2A

SCART



1A



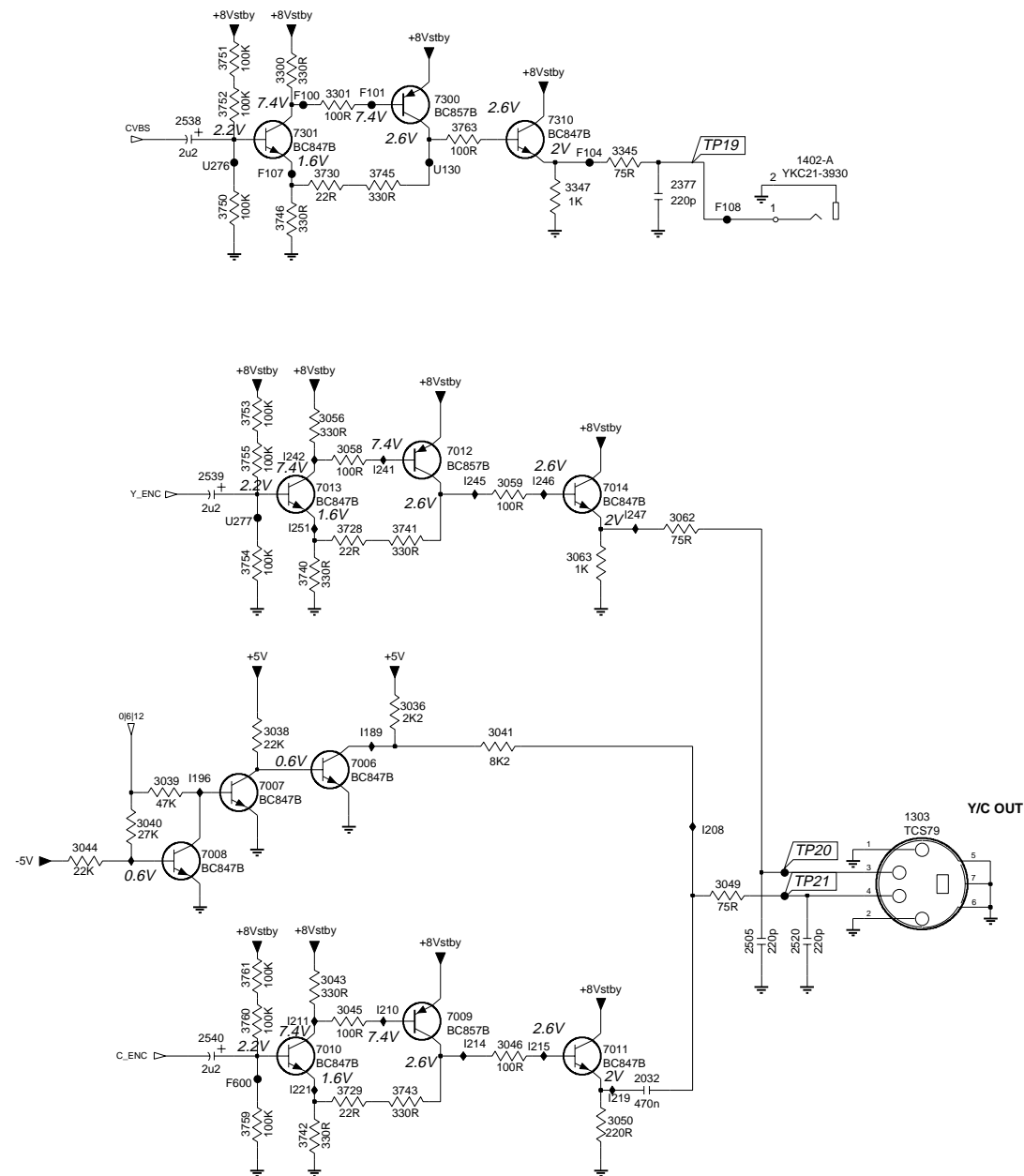
PB A/V MUX
3104 123 4248
130-3

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1304-2 C6	3738 H2	U215 D9
1304-3 G13	3739 G3	U216 D8
2353 A10	3744 D8	U217 C8
2355 A10	3747 C9	U218 C8
2357 B10	3748 C8	U219 B8
2358 A12	3749 G2	U220 B8
2359 B10	3756 D9	U221 A8
2371 I11	3757 F8	U222 G2
2378 A3	3758 H8	U223 A8
2382 A3	3800 G9	U225 D6
2383 B3	3801 G10	U228 G8
2385 C3	7918 I10	U279 G9
2395 C5	7919 C3	
2402 F5	7920 D3	
2404 E5	7921 E3	
2408 F5	7922 I3	
2409 I5	7923 G4	
2499 G5	7924 G2	
2500 E12	7925 D11	
2501 F11	7926 D9	
2502 C11	7927 F10	
2503 G11	7928 F9	
2504 H11	7929 C10	
2506 G2	7930 C8	
2507 D9	7931 G9	
2508 F8	7933 H10	
2509 C8	7934 H9	
2511 H8	7936 G3	
2521 B12	7937 D10	
2522 A5	7938 F10	
2523 B5	7939 F9	
3313 D12	7941 H9	
3314 A11	7942 G10	
3315 A11	F103 H10	
3316 A12	F114 A11	
3318 B11	F115 A11	
3319 B11	F127 B11	
3320 B12	F133 B11	
3323 B11	F134 C13	
3325 B11	F137 C13	
3343 H11	F140 C13	
3348 A4	F145 D13	
3349 A5	F148 D12	
3351 B4	F149 D13	
3359 B5	F183 F13	
3363 B4	F193 A4	
3366 B5	F195 B4	
3394 C4	F205 B4	
3397 C5	F212 C4	
3407 E5	F216 C6	
3408 F4	F218 D6	
3409 D4	F219 C6	
3413 D4	F222 C6	
3425 F5	F229 D6	
3432 I4	F234 D6	
3629 C5	F247 E6	
3636 G2	F259 F6	
3637 G2	U131 G3	
3638 D9	U132 E10	
3639 E9	U133 F10	
3640 E8	U134 C9	
3641 F8	U136 F6	
3642 C8	U137 G4	
3643 D8	U138 G4	
3646 H8	U139 G3	
3647 I8	U140 G2	
3648 G2	U141 G2	
3649 D9	U142 D13	
3650 E8	U143 E11	
3651 C8	U144 D11	
3653 H9	U145 D10	
3672 G5	U146 D9	
3673 E11	U147 E9	
3674 F11	U148 E13	
3675 C11	U149 F11	
3676 G10	U150 F10	
3677 H11	U151 F9	
3678 G3	U152 F9	
3679 G3	U153 F8	
3680 D10	U154 D13	
3681 D10	U155 F13	
3682 F9	U156 F13	
3683 F10	U157 C10	
3684 C9	U158 C10	
3685 C10	U159 C9	
3687 G9	U160 C9	
3688 H9	U161 C8	
3689 H10	U162 G10	
3690 I11	U163 G9	
3691 C4	U167 H11	
3692 D4	U168 H10	
3693 E4	U169 H9	
3694 I4	U170 H9	
3697 G4	U184 H8	
3698 E11	U193 A2	
3699 F10	U194 B2	
3700 C10	U195 B2	
3701 G10	U196 C2	
3702 I10	U197 C2	
3703 H10	U198 D2	
3704 D3	U199 D4	
3705 E3	U200 C4	
3706 F3	U201 E4	
3707 I3	U202 E2	
3721 G10	U203 F2	
3724 H9	U204 E6	
3725 F9	U205 G2	
3726 E9	U206 I4	
3727 G3	U207 I2	
3731 C9	U208 I8	
3732 I9	U209 I10	
3733 H9	U210 H8	
3734 F8	U211 H8	
3735 F9	U212 G10	
3736 E9	U213 F8	

SCHEMATIC DIAGRAM

A/V (B, G) 4/4

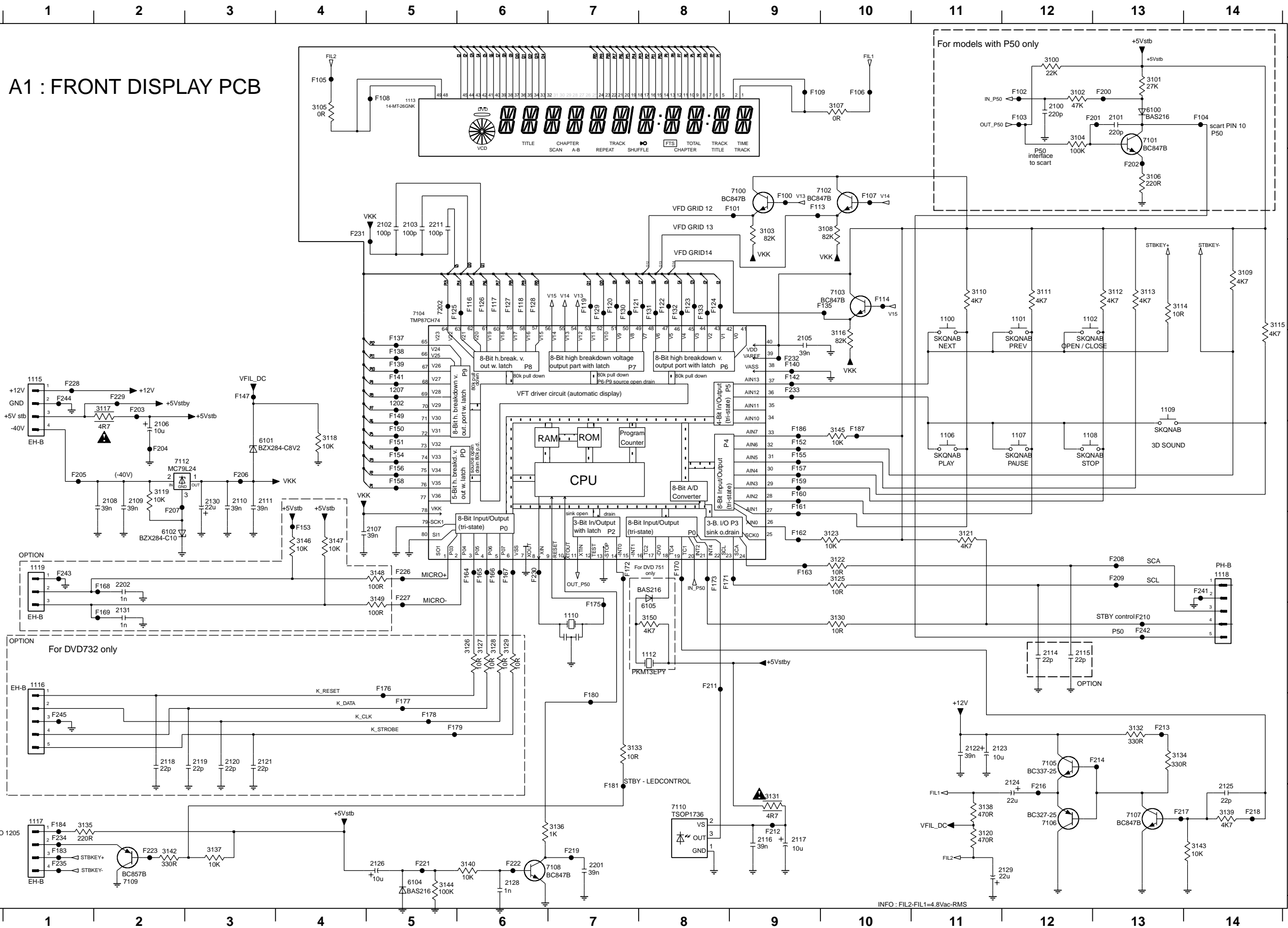
2B CVBS & YC



- 1303 F10
- 1402-A B9
- 2032 H8
- 2377 B9
- 2505 G9
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- 3300 B6
- 3301 B6
- 3345 B8
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- 3753 D6
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- 3755 D6
- 3759 H6
- 3760 G6
- 3761 G6
- 3763 B7
- 3999 I1
- 7006 F6
- 7007 F6
- 7008 F6
- 7009 G7
- 7010 H6
- 7011 H8
- 7012 D7
- 7013 D6
- 7014 D8
- 7300 B7
- 7301 B6
- 7310 B8
- F100 B6
- F101 B7
- F104 B8
- F107 B6
- F108 B9
- F600 H6
- I189 F7
- I191 F6
- I196 F6
- I208 G5
- I209 F9
- I210 G7
- I211 G6
- I214 H7
- I215 H8
- I219 H6
- I221 H6
- I241 D7
- I242 D6
- I245 D7
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- I247 D8
- I251 D6
- U130 B7
- U192 G9
- U224 G9
- U276 B6
- U277 D6

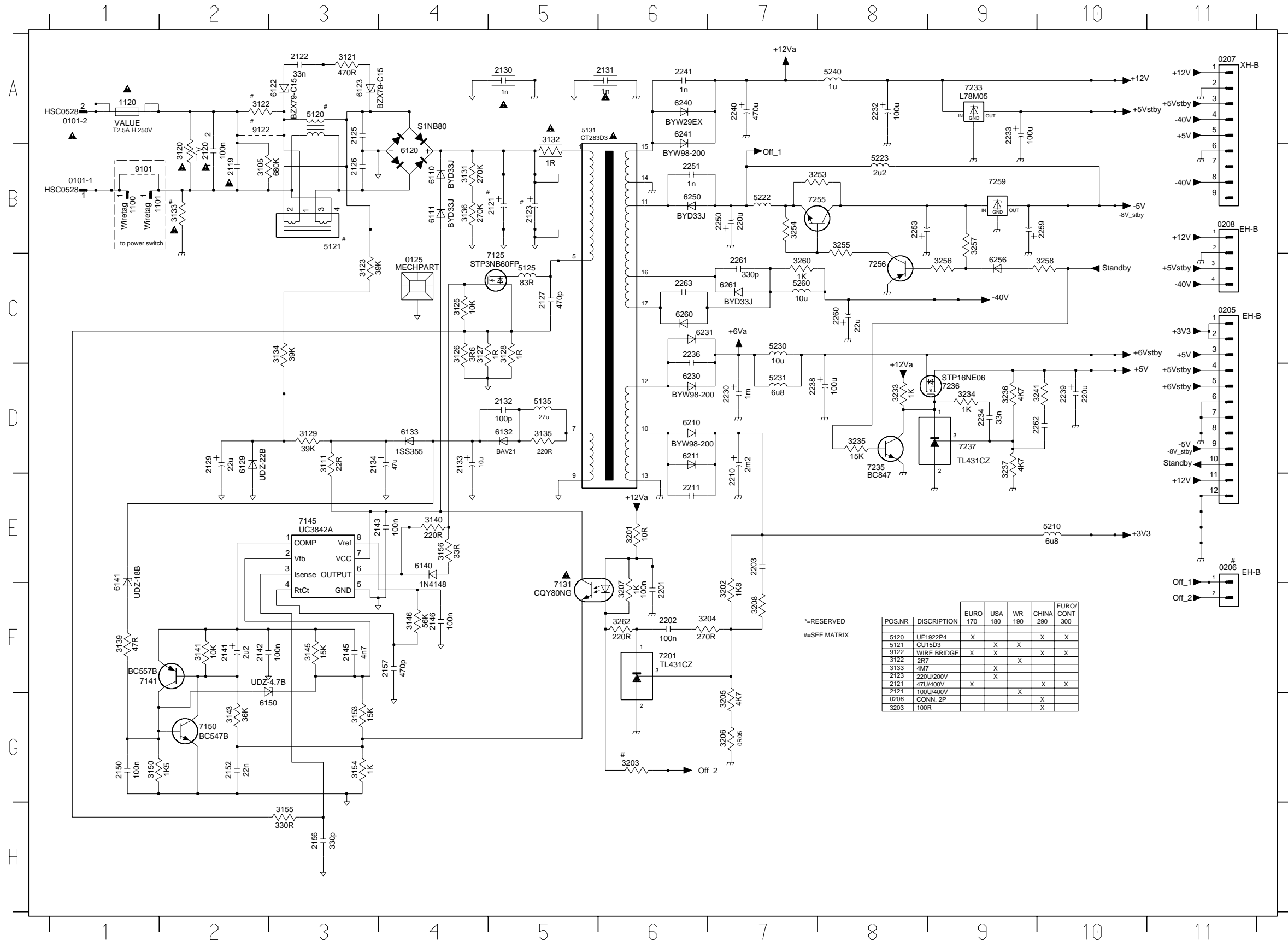
PB A/V MUX
3104 123 4248
130-4

SCHEMATIC DIAGRAM DISPLAY



SCHEMATIC DIAGRAM

POWER (B, G)



POS.NR	DISCRIPTION	EURO 170	USA 180	WR 190	CHINA 290	EURO/CONT 300
5120	UF1922P4	X			X	X
5121	CU15D3	X	X	X	X	X
9122	WIRE BRIDGE	X	X		X	X
3122	2R7			X		
3133	4M7		X			
2123	220U/200V		X			
2121	47U/400V	X	X		X	X
2121	100U/400V			X	X	
0206	CONN. 2P			X	X	
3203	100R				X	

*RESERVED
#-SEE MATRIX

DVD PLAYER

DVD-S510/DV-S5350

SERVICE MANUAL

IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components, and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that any service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and part replacement. Recheck all work before you apply power to the unit.

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TO SERVICE PERSONNEL	1	INTERACTIVE TESTS	11~17
WARNINGS	1~2	TEST INSTRUCTIONS DISPLAY BOARD	18~19
PREVENTION OF ELECTROSTATIC DISCHARGE	3	TROUBLESHOOTING	20~25
LOCALE MANAGEMENT INFORMATION	3	TECHNICAL SPECIFICATIONS DVD MODULE	26~27
FRONT PANELS	4	LIST OF ABBREVIATIONS	28
REMOTE CONTROL TRANSMITTER	4	IC DESCRIPTIONS	29~39
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SERVICE HINTS	8	SCHEMATIC DIAGRAM	67~95
DIAGNOSTIC SOFTWARE	9~10	PARTS LIST	96~107




このサービスマニュアルは、エコマーク認定の再生紙を使用しています。
This Service Manual uses recycled paper.



■ TO SERVICE PERSONNEL

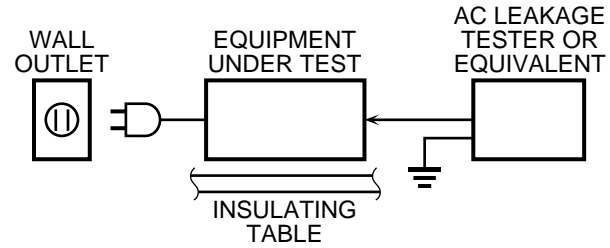
1. Critical Components Information

Components having special characteristics are marked  and must be replaced with parts having specifications equal to those originally installed.

2. Leakage Current Measurement (For 120V Models Only)

When service has been completed, it is imperative to verify that all exposed conductive surfaces are properly insulated from supply circuits.

- Meter impedance should be equivalent to 1500 ohm shunted by 0.15 μ F.
- Leakage current must not exceed 0.5mA.
- Be sure to test for leakage with the AC plug in both polarities.



CAUTION: USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

THE DVD-VIDEO PLAYER SHOULD NOT BE ADJUSTED OR REPAIRED BY ANYONE EXCEPT PROPERLY QUALIFIED SERVICE PERSONNEL.

■ WARNINGS

WARNING: CHEMICAL CONTENT NOTICE!

The solder used in the production of this product contains LEAD. In addition, other electrical/electronic and /or plastic (where applicable) components may also contain traces of chemicals found by the California Health and Welfare Agency (and possibly other entities) to cause cancer and/or birth defects or other reproductive harm.

DO NOT PLACE SOLDER, ELECTRICAL/ELECTRONIC OR PLASTIC COMPONENTS IN YOUR MOUTH FOR ANY REASON WHATSOEVER!

Avoid prolonged, unprotected contact between solder and your skin! When soldering, do not inhale solder fumes or expose eyes to solder/flux vapor!

If you come in contact with solder or components located inside the enclosure of this product, wash your hands before handling food.

WARNING: Laser Safety

This product contains a laser beam component. This component may emit invisible, as well as visible radiation, which may cause eye damage. To protect your eyes and skin from laser radiation, the following precautions must be used during servicing of the unit.

- 1) When testing and/or repairing any component within the product, keep your eyes and skin more than 30 cm away from the laser pick-up unit at all times. Do not stare the laser beam at any time.
- 2) Do not attempt readjustment, disassemble or repair of the laser pick-up, unless noted elsewhere in this manual.
- 3) CAUTION: Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Laser Emitting conditions:

- 1) When the Top Cover is removed, and the POWER SW is turned to the "ON" position, the laser component will emit a beam for several seconds to detect if a disc is present. During this time (5 - 10 sec.) the laser may radiate through the lens of the laser pick-up unit. Do not attempt any servicing during this period!
If no disc is detected, the laser will stop emitting the beam. when a disc is set, you will not be exposed to any laser emissions.
- 2) The laser power level can be adjusted with the VR on pick-up PWB, however, this level has been set by the factory prior to shipping from the factory. Do not adjust this laser level control unless instruction is provided elsewhere in this manual. Adjustment of this control can increase the laser emission level from the device.

Laser Diode Properties

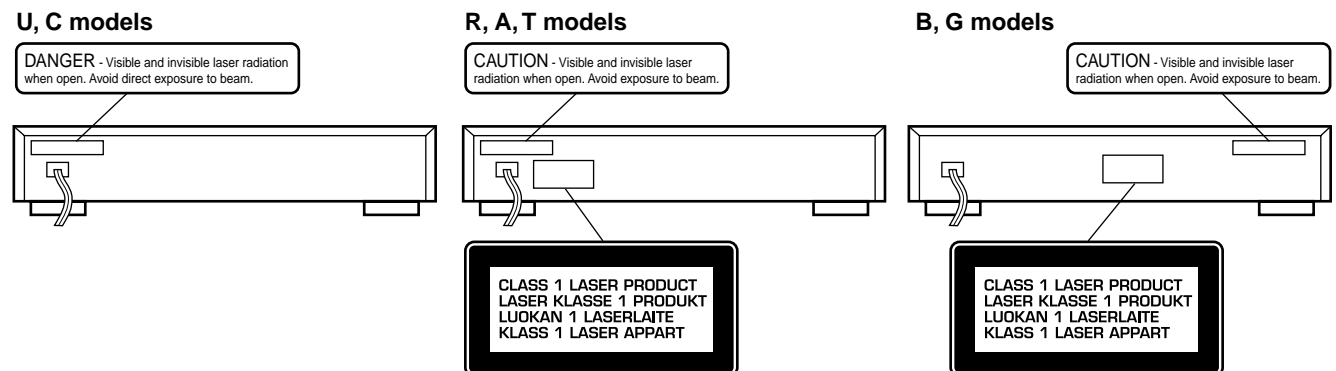
Type:	Semiconductor laser GaAlAs
Wave length:	650 nm (DVD) 780 nm (VCD/CD)
Output Power:	7 mW (DVD) 10 mW (VCD/CD)
Beam divergence:	60 degree

Output value is determined by CFR CHAPTER1, SUBCHAPTER J

VARO!	: AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASER-SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
WARNING!	: OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

WARNING

The use of optical instruments with this product will increase eye hazard.
Repair handling should take place as much as possible with a disc loaded inside the player



WARNING LOCATION: REAR PANEL

CAUTION VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING UNDGÅ UDSÆTTELSE FOR STRÅLING
ADVARSEL SYNLIG OG USYNLIG LASERSTRÅLING NÄR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN
WARNING SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD BETRAKTA EJ STRÅLEN
VARO! AVATT AESSA OLET ALTTIINA NÄKYVÄLLE JA NÄKYMÄTTÖMÄLLE LASER SÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN
VORSICHT SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETZEN
DANGER VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID DIRECT EXPOSURE TO BEAM
ATTENTION RAYONNEMENT LASER VISIBLE ET INVISIBLE EN CAS D'OUVERTURE EXPOSITION DANGEREUSE AU FAISCEAU

Warning for power supply

The primary side of the power supply including the heatsink carries live mains voltage when the player is connected to the mains even when the player is switched off !

This primary area is not shielded so it is possible to touch copper tracks and/or components when servicing the player. Service personnel have to take precautions to prevent touching this area or components in this area .

The primary side of the power supply has been indicated with a lightning stroke and a stripe-marked print on the printed wiring board

Note:

The screws on the DVD mechanism (position 18-1 in on the exploded view drawing) may never be touched, removed or re-adjusted.

Handle the DVD mechanism with care when the unit has to be exchanged!

The DVD mechanism is very sensitive for dropping or giving shocks.

■ PREVENTION OF ELECTROSTATIC DISCHARGE

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor “chip” components. The following techniques should be used to help reduce the incidence of component damage caused by electro static discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static (ESD protected)” can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

HANDLING PRECAUTIONS

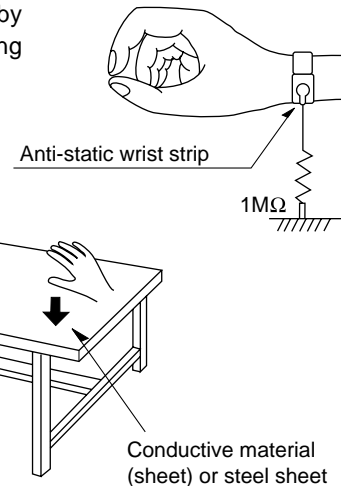
The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body. So be careful of electrostatic breakdown during repair of the DVD mechanism.

Grounding for electrostatic breakdown prevention

1. Human body grounding.
Use the antistatic wrist strap to discharge the static electricity from your body.
2. Work table grounding.
Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed and ground the sheet.

Caution:

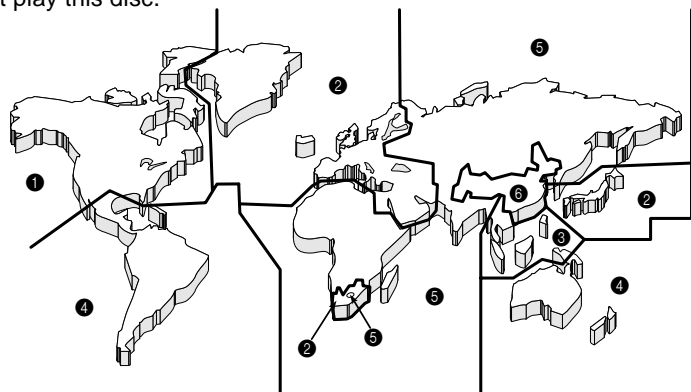
The static electricity of your clothes will not be grounded through the wrist strap. So take care not to let your clothes touch the optical pickup.



■ LOCALE MANAGEMENT INFORMATION

Locale Management Information : This DVD player is designed and manufactured to respond to the Locale Management Information that is recorded on a DVD disc. If the Locale number described on the DVD disc does not correspond to the Locale number of this DVD player, this DVD player cannot play this disc.

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■ SPECIFICATIONS

PLAYBACK SYSTEM

DVD-Video
Video CD
CD (CD-R and CD-RW)

OPTICAL READOUT SYSTEM

Laser type Semiconductor AlGaAs
Numerical Aperture 0.60 (DVD)
0.45 (VCD/CD)
Wavelength 650 nm (DVD)
780 nm (VCD/CD)

DVD DISC FORMAT

Medium	Optical Disc	
Diameter	12cm (8cm)	
Playing time (12cm)	One layer	2.15 h*
	Dual layer	4 h*
	Two side	4.30 h*
	Single layer	
	Two side	8 h*
	Dual layer	

TV STANDARD

	EUROPE	USA
	(PAL/50Hz)	(NTSC/60Hz)
Number of lines	625	525
Playback	Multistandard	(PAL/NTSC)

VIDEO FORMAT

DA Converter 10 bits
Signal handling Components
Digital Compression MPEG2 for DVD,
MPEG1 for VCD

DVD

Horiz. Resolution	720 pixels**	720 pixels**
Vertical Resolution	576 lines	480 lines

VCD

Horiz. Resolution	352 pixels	352 pixels
Vertical Resolution	288 lines	240 lines

VIDEO PERFORMANCE

Video output 1 Vpp into 75 ohm
S-Video output Y: 1 Vpp into 75 ohm
C: 0.3 Vpp into 75 ohm
Y 1 Vpp into 75 ohm (U, C, A, R, T)
CR 0.7 Vpp into 75 ohm (U, C, A, R, T)
CB 0.7 Vpp into 75 ohm (U, C, A, R, T)
RGB output 1 Vpp into 75 ohm (B, G)
Black Level Shift On/Off
Video Shift Left/Right

AUDIO FORMAT

Digital	MPEG	Compressed Digital
	DTS	Compressed Digital
	AC-3	Compressed Digital
	PCM	
Analog	Analog Sound Stereo	
	Dolby Pro Logic downmix from AC-3 multi-channel sound	
	3D Sound for virtual 5.1 channel sound on 2 speakers	

AUDIO PERFORMANCE

DA Converter	24 bits	
DVD	fs 48 kHz	2 Hz - 22 kHz
Video CD	fs 44.1 kHz	2 Hz - 20 kHz
CD	fs 44.1 kHz	2 Hz - 20 kHz
Signal-Noise (1kHz)	95 dB	
Dynamic Range (1kHz)	95 dB	
Harmonic Distortion + Noise (1kHz)	0.0035 %	

CONNECTIONS

SCART	SCART2x (B, G)	
S-Video Output	Mini DIN, 4 pins	
Component Video (U, C, A, R, T)	Y	Cinch (green)
	PB	Cinch (blue)
	PR	Cinch (red)

Video Output	Cinch (yellow) (B, G)
Video Output	Cinch (yellow) x2 (U, C, A, R, T)
Audio L+R output	Cinch (white/red) (B, G)
Audio L+R output	Cinch (white/red) x2 (U, C, A, R, T)
Digital Output	1 coaxial, 1 optical IEC958 for CDDA / LPCM IEC1937 for MPEG1/2, AC-3 and DTS

GENERAL

Dimensions(w x h x d)	435 x 91 x 314 mm
Weight	Approx. 3.3 Kg
Finish	Black color (U, C, A, B, G)
	Gold color (R, G, T)
	Titan color (G)
Power supply	120 V, 60 Hz (U)
	230 V, 50 Hz (B, G)
	240 V, 50 Hz (A)
	110/120/220/240 V, 50/60 Hz (R)
Power consumption	220 V, 50 Hz (T)
	20 W
	Standby mode

PACKAGE CONTENTS

DVD-Video Player, Remote Control & Batteries,
AC Power cord, Owner's Manual, Audio/Video cable (U, C, A, R, T),
Audio cable (B, G), Video cable (B, G)

GENERAL FUNCTIONALITY

Stop / Play / Pause
Fast Forward / Backward
Time search
Step Forward / Backward
Slow
Title / Chapter / Track Select
Skip Next / Skip Previous
Repeat (Chapter / Title / All) or (Track / All)
A-B Repeat
Shuffle
Enhanced ease of use graphical interface
Zoom (x1.33, x2, x4) with picture enhancement
3D Sound
Audio and video bit rate indicator

DVD FUNCTIONALITY

Multi-angle Selection
Audio Selection (1 out of max. 8 languages)
Subtitles Selection (1 out of max. 32 languages)
Aspect Ratio conversion (16:9, 4:3 Letterbox, 4:3 Pan Scan)
Parental Control and DISC Lock
Disc Menu support (Title Menu and Root Menu)
Resume (5 discs) after stop / standby
Screen Saver (Dim 75% after 15 min.)
Programming Titles/chapters with Favorite Selection

VIDEO CD FUNCTIONALITY

Playback Control for VCD 2.0 discs
Parental Control and DISC lock
Resume (5 discs) after stop / standby
Screen Saver (Dim 75% after 15 min.)
Programming Tracks with Favorite Selection

AUDIO CD FUNCTIONALITY

Time Display (Total / Track / Remaining Track Time)
Full audio functionality with remote control
Programming with Favorite Track Selection

* typical playing time for movie with 2 spoken languages and 3 subtitle languages.

** equivalent to 500 lines on your TV

Specifications subject to change without prior notice.

U	U.S.A. model	C	Canada model
G	Europe model	B	British model
A	Australia model	R	General model
T	China model		

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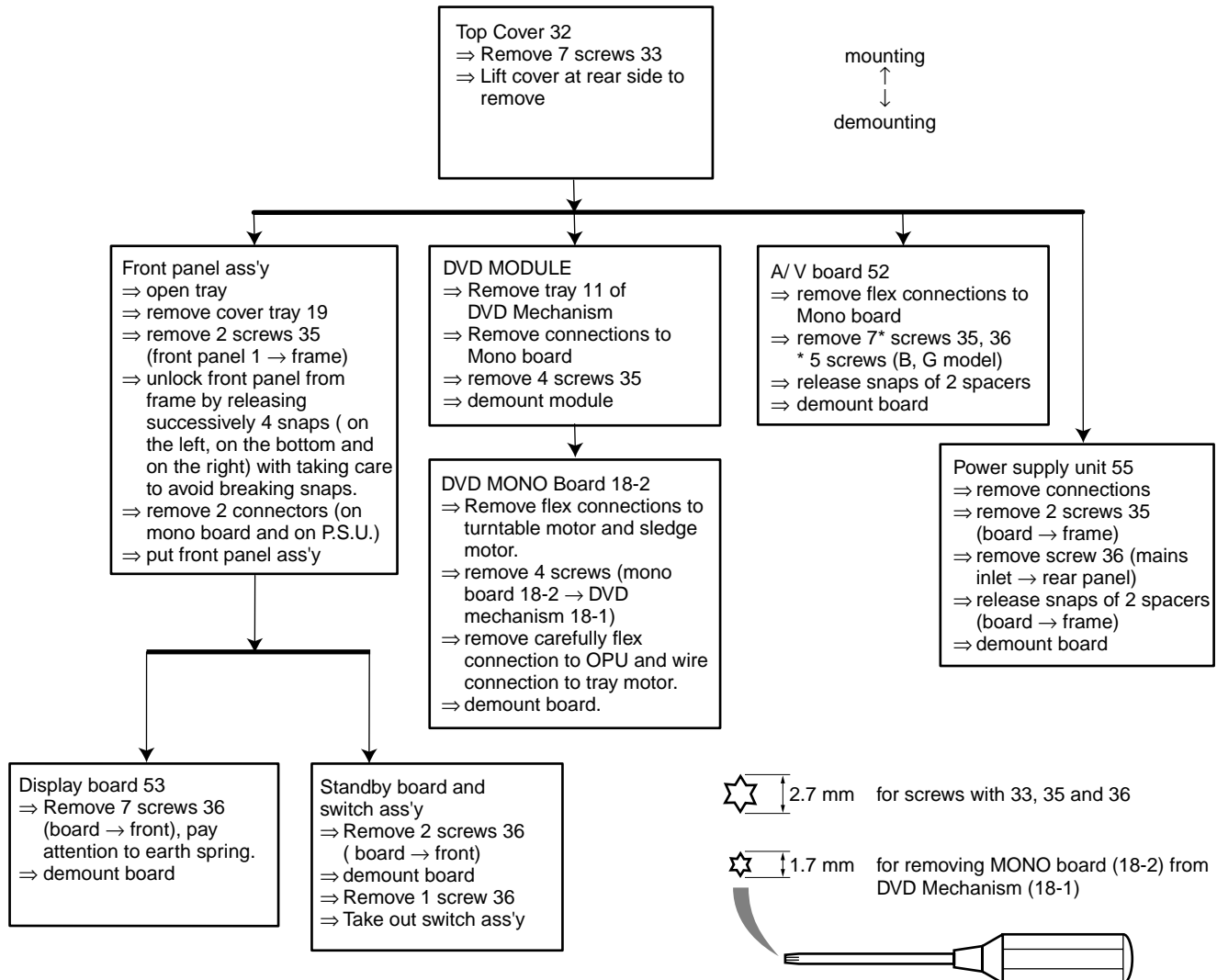
This product incorporates copyright protection technology that is protected by method claims of certain U. S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only, unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

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DISASSEMBLY PROCEDURES

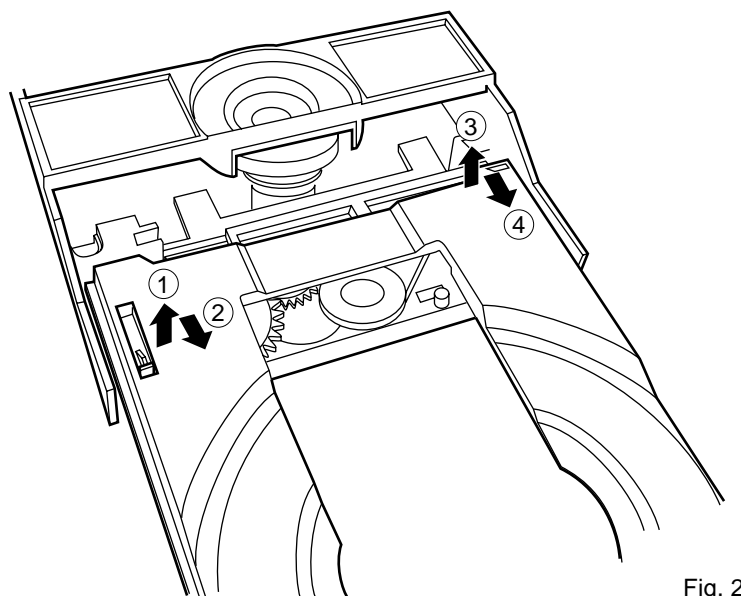
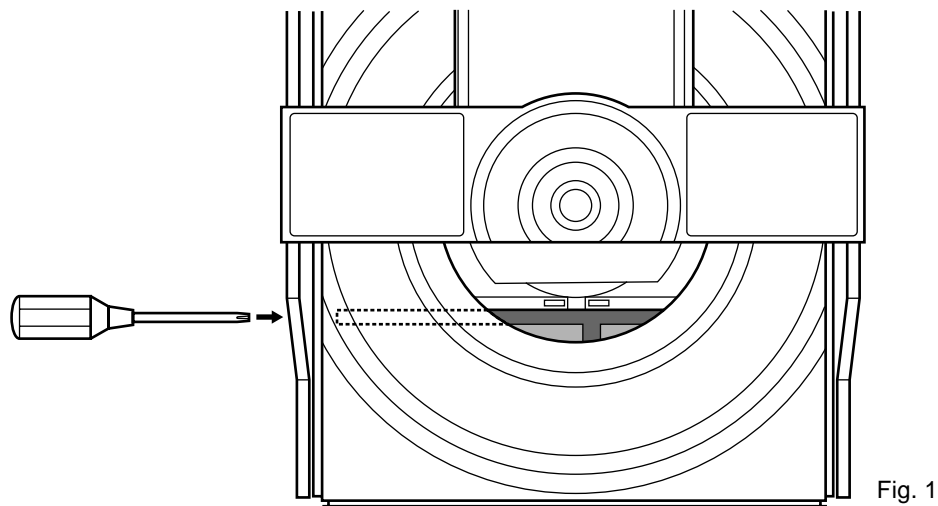
See exploded view for item numbers.

When disassembling, use the special screw driver with tip shape in figure.



● The way to remove tray

1. Push left end of the lever under the tray toward the right by using screwdriver, move the tray by pulling it forward. (Fig. 1)
2. While lifting up the lever (①), move the left side of the tray by pulling it forward (②). (Fig. 2)
3. While lifting up the tray (③), remove the tray by pulling it forward (④). (Fig. 2)



■ SERVICE HINTS

Diagnostic software

In chapter "Diagnostic software", some tests are referring to the SCART functionality.

These tests are for sets with RGB-output.

For sets without RGB-output, no SCART connector is mounted.

In these sets, the SCART tests will automatically be skipped.

■ DIAGNOSTIC SOFTWARE : SCRIPT INTERFACES

1. DEALER SCRIPT

1.1 Purpose of Dealer Script

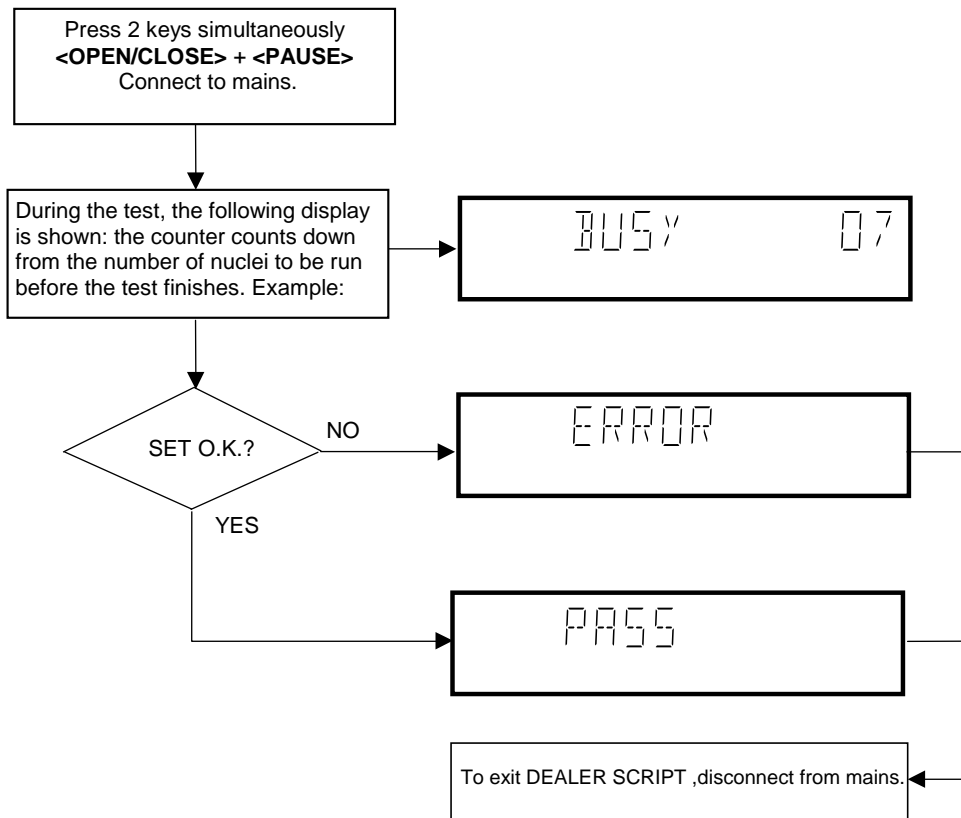
The dealer script can give a diagnosis on a standalone DVD player; no other equipment is needed to perform a number of hardware tests to check if the DVD player is faulty. The diagnosis is simply a "error" or "pass" message; no indication is given of faulty hardware modules. Only tests within the scope of the diagnostic software will be executed hence only faults within this scope can be detected.

1.2 Contents of Dealer Script

The dealer script executes all diagnostic nuclei that do not need any user interaction and are meaningful on a standalone DVD player.

The nuclei called in the dealer script are the following (the number after each nucleus name corresponds with the number being on the local display when the nucleus is executed during the dealer script):

Nucleus		Description
VideoColSetupComm	9	Checks the I2C interface with the RGB video processor on the Audio/Video board (only for DVD players with RGB video processor).
VideoScartSwComm	8	Checks the I2C interface with the scart switch on the Audio/Video board
PapChksFl	7	Calculate and verify checksum of FLASH memory.
PapDramWrR	6	Pattern test of all locations in the DRAM(s).
PapI2cDisp	5	Checks the I2C interface with the slave processor on the display PCB.
PapS2bEcho	4	Checks the I2C interface to the basic engine.
PapI2cNvram	3	Checks the I2C interface with the NVRAM.
PapNvramWrR	2	Pattern test of all locations in the NVRAM
CompSdramWrR	1	Pattern test of all locations in the SDRAM(s).



2. PLAYER SCRIPT

2.1 Purpose of Player Script

The Player script will give the opportunity to perform a test that will determine which of the DVD player's modules are faulty, to read the error log and error bits and to perform an endurance loop test. To successfully perform the tests, the DVD player must be connected to a TV set to check the output of a number of nuclei. For DVDv2b a multi-channel amplifier, a set of 6 boxes and an external video source are necessary to test. To be able to check results of certain nuclei, the player script expects some interaction of the user (i.e. to approve a test picture or a test sound). Some nuclei (e.g. nuclei that test functionality of the Basic Engine module) require that the DVD player itself is opened, to enable the user to observe moving parts and approve their movement visually. Only tests within the scope of the diagnostic software will be executed hence only faults within this scope can be detected.

2.2 Contents of Player Script

The player script contains all nuclei that are useful on a DVD player that is connected to a TV-set and help to determine which module of the DVD player is faulty, as well as to read out the contents of the error logs.

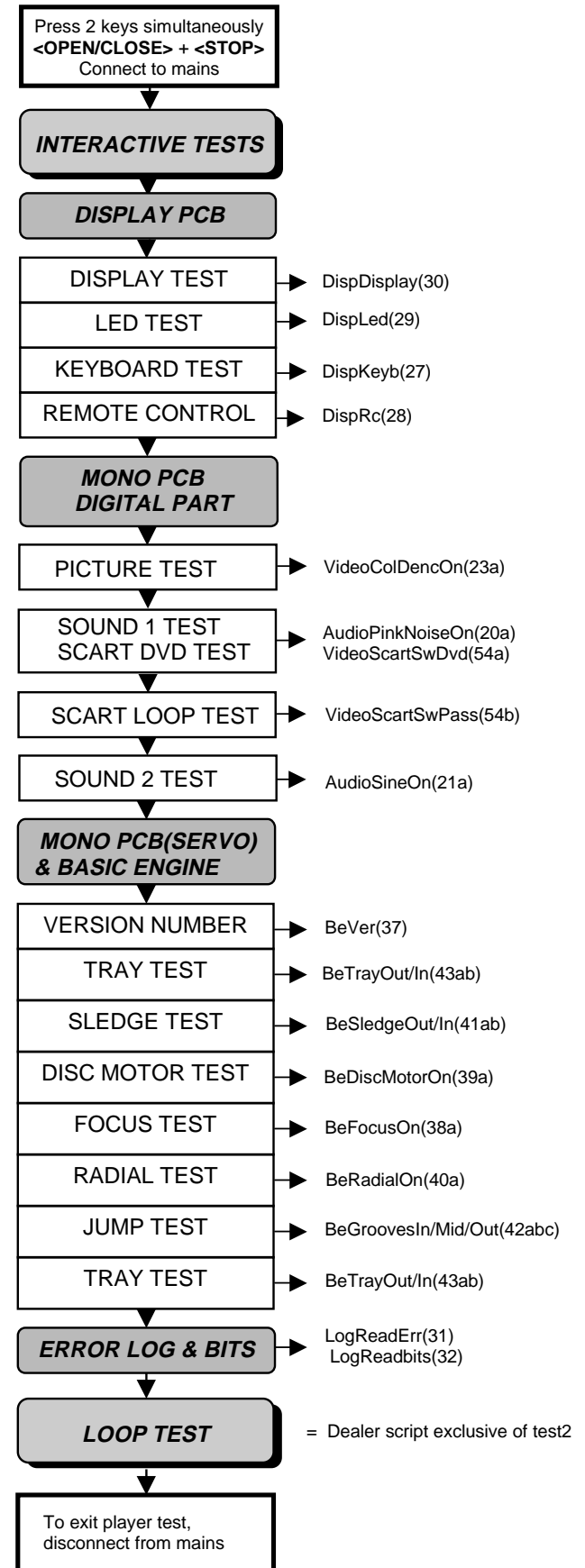
2.3 Structure of Player Script

The player script consists of a set of nuclei testing the three hardware modules in the DVD player: the Display PWB, the Digital PWB and the Basic Engine.

Nuclei run by the player test need some user interaction; in the next paragraph this interaction is described. The player test is done in two phases:

1. Interactive tests: this part of the player test depends strongly on user interaction and input to determine nucleus results and to progress through the full test. Reading the error log and error bits information can be useful to determine any errors that occurred recently during normal operation of the DVD player.
2. The loop test will perform the same nuclei as the dealer test, but it will loop through the list of nuclei indefinitely.

2.4 Survey



■ INTERACTIVE TESTS

1. DISPLAY PCB

1.1 DISPLAY TEST

The display test is performed by nucleus DispDisplay. By putting a series of test patterns on the local display, the local display is tested. To step through all different patterns, the user must either press PLAY (pattern is ok) or PAUSE (pattern was incorrect) to proceed to the next pattern. The display of patterns is continued in a cyclic manner until the user presses NEXT. If the user presses NEXT before all display patterns are tested, the DispDisplay nucleus will return TRUE (display test successful).

1.2 LED TEST

The LED(s) on the DVD player is (are) tested by nucleus DispLed. The user must check if the LED(s) is (are) lighted; if it is, press PLAY, if it is not, press PAUSE. By pressing NEXT the script will proceed to the next test. If the user presses NEXT before PLAY or PAUSE, the DispLed nucleus will return TRUE (LED test successful).

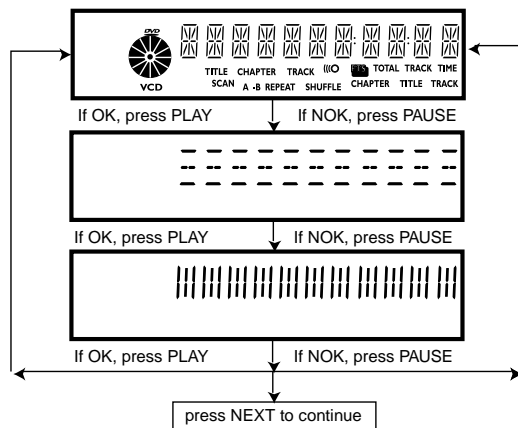


Figure 1

1.3 KEYBOARD TEST

The keyboard of the DVD player is tested by nucleus DispKeyb. The user is expected to press all keys on the local keyboard once. The code of the key pressed is shown on the local display (1 hexadecimal digit) immediately followed by a (hexadecimal) number indicating how many times that key has been pressed. Example of the local display during this test:

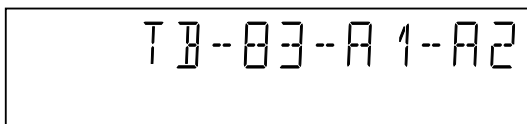


Figure 2

The key-codes displayed on the local display will scroll from right to left when the display gets full, the text "tb-" will remain on display.

key id.	key
0	PLAY
1	NEXT
2	PREVIOUS
3	PAUSE
4	STOP
5	OPEN / CLOSE
A	POWER (B, G models)

Figure 3

If any keys are detected more than once (due to hardware error), the key-code is displayed twice (or more), with the second digit increased by 1.

If the user does not press all keys minimally once (in any order), the DispKeys nucleus will return FALSE and cause an error in the overall result of the player script.

The user can leave the keyboard test by pressing the NEXT key on the local display of the DVD player for at least one full second.

The result of the keyboard test is shown on local display as follows:

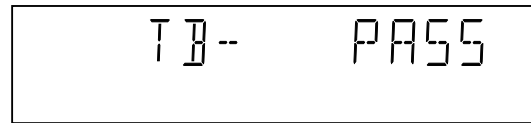


Figure 4

Or

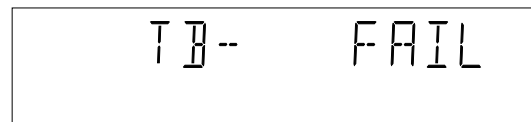


Figure 5

Pressing NEXT on the local keyboard again will proceed to the next text.

1.4 REMOTE CONTROL TEST

The remote control of the DVD player is tested by nucleus DispRc. The user must press any key on the remote control just once. The codes of the key pressed will be shown on the local display in hexadecimal format. Example:

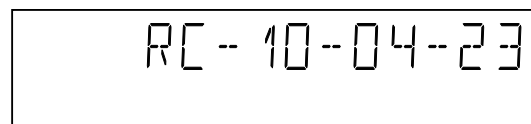


Figure 6

In this example 23 is the hexadecimal code of the pressed RC key. The user can leave the remote-control test by pressing NEXT on the local keyboard of the DVD player. The remote control test is successful if a code was received before the user pressed the NEXT key; pressing the NEXT key before pressing a key on the remote control gives an error in the remote control test (note that the remote control test will also fail if a key on the remote control was pressed but no code was received). The remote control test does not check upon the contents of the received code, that is it will not be checked if the received code matches the key pressed. If desired, the user can manually check this code by using a code-table for the remote control key-codes.

RC Key id	Hexadecimal code
STANDBY	C
STOP	31
PLAY	2C
PLAY BACKWARD	2D
PAUSE	30
STEP FORWARD	F6
STEP BACKWARD	F5
FORWARD	28
FORWARD 4X	DF
FORWARD 8X	E0
BACKWARD	29
BACKWARD 4X	DE
BACKWARD 8X	DD
SLOW	22
SLOW 2	D8
SLOW BACKWARD	23
SLOW BACKWARD 2	DB
NEXT	20
PREVIOUS	21
CURSOR UP	58
CURSOR DOWN	59
CURSOR LEFT	5A
CURSOR RIGHT	5B
OK	5C
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
TITLE/CHP	C8
ANGLE	85
AUDIO	4E
SUBTITLES	4B
SUBTITLE ON/OFF	E3
ROOT MENU	54
TITLE MENU	71
MENU	D1
SETUP MENU	82
ON SCREEN	F
RETURN	83
RESUME	D7
SCAN	2A
SHUFFLE	1C
REPEAT	1D
A/B REPEAT	3B
TOGGLE SCART	43
OPEN/CLOSE	42
FTS	FB
KARAOKE	E4
OPTION	FA
ZOOM	F7

Figure 7

After pressing NEXT, the result of the remote control test is displayed on the local display of the DVD player as follows:

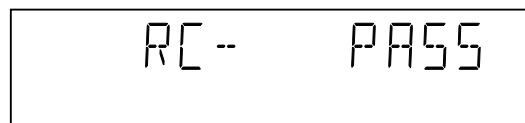


Figure 8

Or

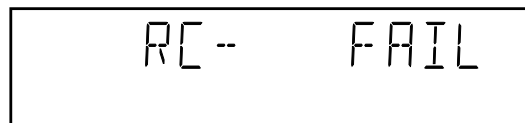


Figure 9

Pressing NEXT on the local keyboard again will proceed to the next test.

2 MONO PCB DIGITAL PART

2.1 PICTURE TEST

The picture test is performed by putting a predefined picture (colour bar) on the display (nucleus VideoColDencOn) and asking the user for confirmation. The display shows the following message:

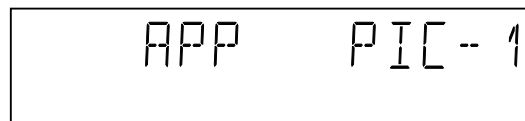


Figure 10

By pressing PLAY, the user confirms the test; pressing PAUSE will indicate the picture was invisible or incorrect. Pressing NEXT will proceed to the next test

2.2 SOUND 1 & SCART DVD TEST

The first soundtest is performed by starting a pink noise sound that needs confirmation from the user (nucleus AudioPinkNoiseOn); the display shows the following message very shortly:

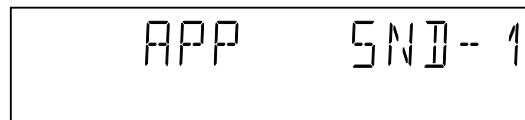


Figure 11

This sound will only be audible from version cut3.1 of Sti5505(item7503 on mono board) onwards. After starting up sound 1, SCART loop-trough will be simultaneously active during this test. SCART loop-trough will be measured with the aid of an external video source. When entering the SCART loop-trough, the local display indicates:

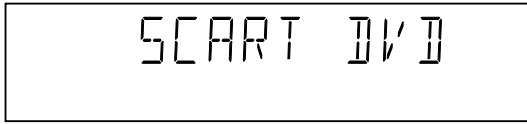


Figure 12

On the TV screen, a colour bar (generated by nucleus VideoColDencOn) is visual and the internally generated pinknoise is audible. By pressing PLAY, the user confirms the test; pressing PAUSE will indicate the sound was inaudible or incorrect. Pressing NEXT will proceed to the next test; if the user presses NEXT without pressing PLAY or PAUSE first, the result of this test will be TRUE (sound ok). By pressing the NEXT button, there will be switched over to the external source, this must become now visible on the TV screen (using the SCART). The local display indicates:



Figure 13

The internally generated colour bar is still available on the CVBS and Y/C outputs. And the pinknoise-signal is still available on the cinch audio outputs. By pressing the PREV button, the internal generated colour bar becomes visual again.

The test can be left by pressing the NEXT key for more than one second.

2.3 SOUND 2 TEST

The second soundtest is performed by producing a sine sound (nucleus AudioSineOn). The signal can be stopped by pressing the STOP-key. The display shows the following message:



Figure 14

By pressing PLAY, the user confirms the test; pressing PAUSE will indicate that something went wrong. Pressing NEXT will proceed to the next; if the user presses NEXT without pressing PLAY or PAUSE first, the result of this test will be TRUE (sound ok).

3 BASIC ENGINE

note) Basic engine means DVD mechanism.

3.1 VERSION NUMBER

In the basic engine tests, the version number of the Basic Engine will be shown first, as the following example:

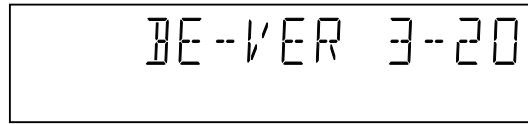


Figure 15

By pressing the NEXT key, the Basic Engine tests are started.

3.2 TRAY TEST

First, the tray is tested. The purpose of this test is also to give the user the opportunity to put a disc in the tray of the DVD player. Some tests on the Basic Engine require that a disc (e.g. DVD MPTD test disc) is present in the player. At the end of the Basic Engine tests, this tray test will be repeated solely to enable the user to remove the disc in the tray. The local display looks as follows:

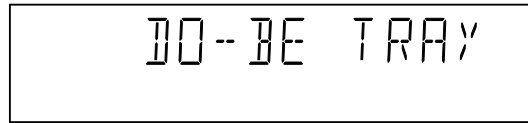


Figure 16

By pressing PLAY or PAUSE, the user can toggle the position of the tray. Note that this test will not contribute to the test result of the Basic Engine. Pressing NEXT will proceed to the next test, after the tray has been closed (by the software) if it was open.

3.3 SLEDGE TEST(visual test)

The second Basic Engine test tests the sledge; the user can move the sledge as many times as desired by using PLAY (nucleus BeSledgeOut) and PAUSE (nucleus BeSledgeIn).

Pressing NEXT on the local keyboard proceeds to the next test.

Note that this test will not contribute to the test result of the Basic Engine. The local display looks as follows during the sledge test:

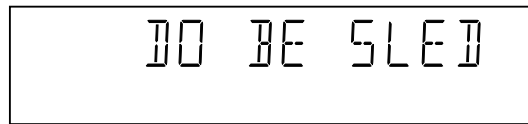


Figure 17

3.4 DISC MOTOR TEST(visual test)

The third Basic Engine test tests the disc motor (nucleus BeDiscMotorOn); the local display looks as follows:

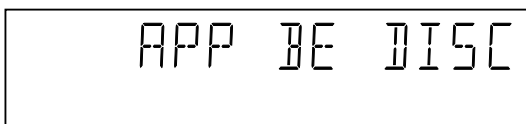


Figure 18

By pressing PLAY, the user confirms that the disc motor is running; pressing PAUSE indicates the disc motor does not work. Pressing NEXT proceeds to the next test, after a reset of the disc motor (nucleus BeDiscMotorOff). If the user presses NEXT before pressing PLAY or PAUSE, the result of this test will be TRUE (disc motor is running).

3.5 FOCUS TEST(visual test)

The fourth Basic Engine test tests the focussing; first focussing is turned on by calling nucleus BeFocusOn. The display looks as follows:

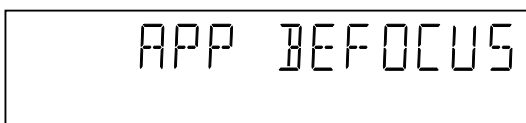


Figure 19

By pressing PLAY, the user confirms that the focussing was successful; pressing PAUSE indicates a focussing failure.

Pressing NEXT proceeds to the next test after a reset of the focussing (nucleus BeFocusOff); if NEXT is pressed before PLAY or PAUSE, the result of this test will be TRUE (focus successful).

3.6 RADIAL TEST(visual & listening test)

The fifth Basic Engine test tests the radial functionality (nucleus BeRadialOn); the local display looks as follows:

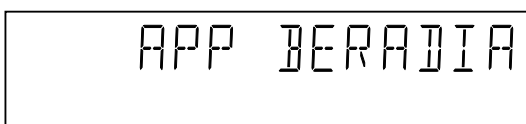


Figure 20

By pressing PLAY, the user confirms that the radial function worked; pressing PAUSE indicates the function does not work.

Pressing NEXT proceeds to the next test, after a reset of the radial (nucleus BeRadialOff). If the user presses NEXT before pressing PLAY or PAUSE, the result of this test will be TRUE (radial successful).

3.7 JUMP TEST(listening test)

The sixth and last Basic Engine test tests the jumping by calling nuclei BeGroovesIn, BeGroovesMid and BeGroovesOut.

During this test, the local display looks as follows:

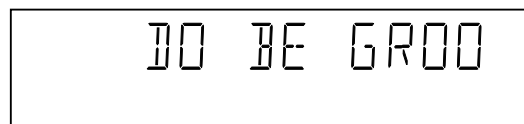


Figure 21

The user can switch between the three different types of groove settings by pressing PLAY (forward to next nucleus in the list In-Mid-Out) or PAUSE (backward in the list In-Mid-Out).

This is done in a cyclic manner; note that this test will not contribute to the test result of the Basic Engine. Pressing NEXT proceeds to the next test, after the disc motor has been shut off with a call to nucleus BeDiscMotorOff.

3.8 TRAY TEST

As a last action for the Basic Engine tests, the tray test is repeated. The local display looks as follows:

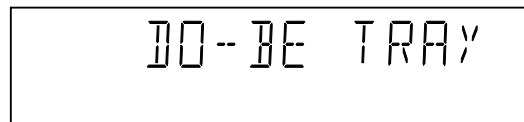


Figure 22

This test is meant to give the user the opportunity to remove the disc in the tray. The tray position can be toggled using the PLAY and PAUSE key. The tray will be closed (by the software, if it is open) before proceeding to the next test when the user presses the NEXT key.

3.9 ERROR LOG

Reading the error log and error bits information can be useful to determine any errors that occurred recently during normal operation of the DVD player. Reading the error log is done by nucleus LogReadErr. The display during the errorlog readout looks as follows :

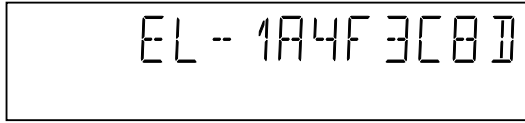


Figure 23

By pressing PLAY or PAUSE, the user can move forward or backward (respectively) through the logged error codes. The highlighted number indicates which errorcode is currently on display (in the example above, errorcode number 4 is displayed). If "0000" is displayed at all positions, the error log is empty. Display of the logged errors is done in a cyclic manner.

The errorcode with the lowest highlighted number is the most recent. By pressing NEXT on the local keyboard, the user can proceed to the next test.

3.10 ERROR BITS

Reading the error bits is done by nucleus LogReadBits. The display during the errorbits readout looks as follows:

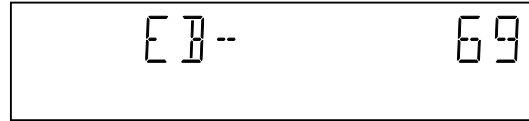


Figure 24

Only the set errorbits will be shown by their (decimal) number.

Refer to the appropriate documentation for the explanation of each bit number. If the display only shows "EB-0", no error bits were set. By pressing NEXT, the user can continue to the next test.

See table below:

Error log / bits table	Read ERROR LOG in player script	Read ERROR BITS in player script
Basic engine errors	Value:	Value:
Command to the Basic Engine not allowed in this state or unknown command	150101	8
Parameter(s) from the command to the Basic Engine is not valid	150102	7
Sledge could not be moved to the inner home position	150103	6
Focus failure	150104	5
Turntable motor speed could not be reached within timeout	150105	4
Radial servo could not get on track on the disc	150106	3
PLL could not lock in the accessing or tracking state	150107	2
Subcode or sector information could not be read	150108	1
requested subcode could not be found	150109	16
Tray could not be closed or opened completely	15010A	15
TOC could not be read within timeout	15010B	14
The requested seek on the disc could not be executed	15010C	13
A requested lead-in is not on the disc	15010D	12
A non existing burst cutting area is requested	15010E	11
S2b communication error	1501F0	10
S2b communication error	1501F1	9
S2b communication error	1501F3	24
S2b communication error	1501F4	23
S2b communication error	1501F5	22
Digital PWB errors		
Communication error with the Sti 5505	90000	32
Communication error with the Sti 5505	90001	31
Disply processor errors		
Communication error with the display processor	190000	40

4. LOOP TEST

At the start of the loop test, the display will show the result of the interactive player test:

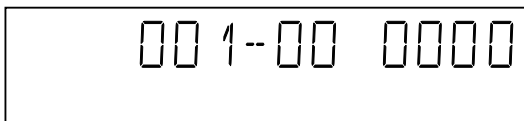


Figure 25

The left side of the display contains a 3-digit code, which can have a value between 000 and 111. These values are to be interpreted as follows:

Displayed Value	Indication for each module		
	Basic Engine	Mono PCB	Display PCB
000	ok	ok	ok
001	ok	ok	faulty
010	ok	faulty	ok
011	ok	faulty	faulty
100	faulty	ok	ok
101	faulty	ok	faulty
110	faulty	faulty	ok
111	faulty	faulty	faulty

Figure 26

The loop test will perform the same nuclei as the dealer test, but it will loop through the list of nuclei indefinitely. The display of the DVD player will display not only the three digits indicating correct/faulty modules and the last found error code (as mentioned, faults are detected as far as they can be within the scope of the diagnostic software), but also a loop counter indicating how many times the loop has been gone through.

Example:

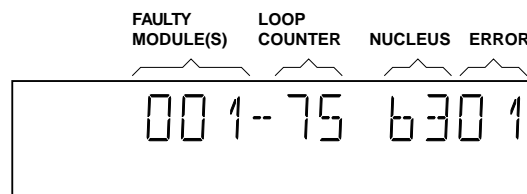


Figure 27

The number after the hyphen indicates the number of times the loop test has been performed; the 4 digits at the right side of the display show the last error that was found when running the loop test: the leftmost two digits of this code indicate which nucleus resulted in a fault; the rightmost two digits refer to the faultcode within that nucleus. For further explanation of this error code, see list of error codes below.

ERROR CODES LOOP TEST

ERROR CODE	NUCLEUS NUMBER	ERROR DESCRIPTION
0601	6	Calculated checksum of FLASH is not correct
0901	9	The DVD DRAM is faulty
1104	11	I2C bus busy before start
1102		NVRAM access time-out
1103		No NVRAM Acknowledge
1104		NVRAM reply time-out
1201	12	I2C bus busy
1202		I2C bus not working
1203		Slave controller not responding
1204		Slave response is not correct
1301	13	Parity error from basic engine to serial
1302		Parity error from serial to basic engine
1303		No communication between serial and basic engine
1304		Communication time-out error
1601	16	The SDRAM is faulty

Figure 28

5. Servicing DVD module and MONO board

5.1 Reset of Virgin Mode

After the player has been powered up for test by the dealer, it would have gone through the Virgin Mode. It is possible to reset the settings made during that mode before the delivery of player to the customer. This can be done as shown in the following diagram:

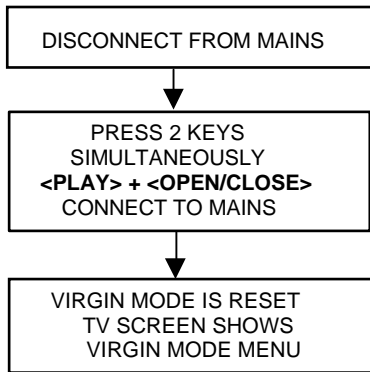


Figure 29

5.2 Trade Mode

When the player is in Trade Mode, the player cannot be controlled by means of the front key buttons, but only by means of the remote control.

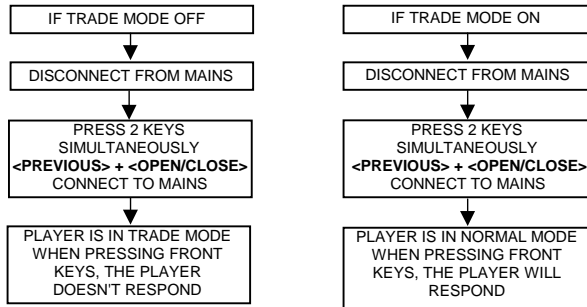


Figure 30

TEST INSTRUCTIONS DISPLAY BOARD

1. Display board

1.1 Introduction

These test instructions are written for all versions of the display PCB.

The contents of the PCB can be split up into next blocks:

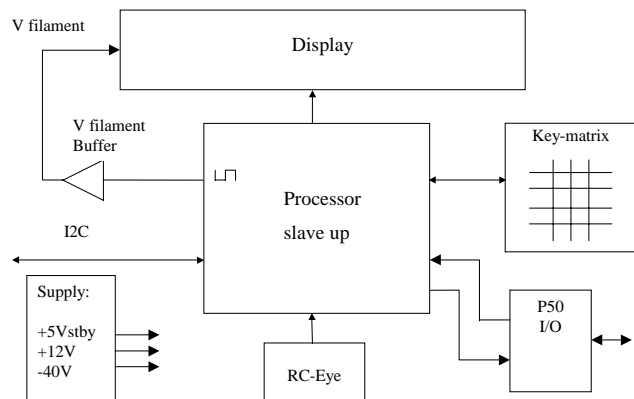


Figure 1

1.2 Functionality description:

The essential component of the display PCB is the μP (slave).

This slave works on an 8MHz resonator and has a reset circuit that is triggered by the +5Vstby. After the reset pulse, the standby control line will release the reset of the host μP . This host μP will then initialize the slave. In addition, when going to stand-by, the slave will put the host μP in reset. When the slave receives the right IR or key code to leave the standby mode, the reset of the host μP will be released.

Other slave functions are:

- Square signal generator to generate the filament voltage, which is required for an AC FTD.
- Generating the grid and segment scanning for the FTD.
- Generating a scanning grid for the keys (separated from display scanning).
- Having inputs for RC (RC5 and RC6) and P50 (P50 controller is built in).

1.3 Reset

Check next reset timing with an oscilloscope at pin 10 of the microprocessor.

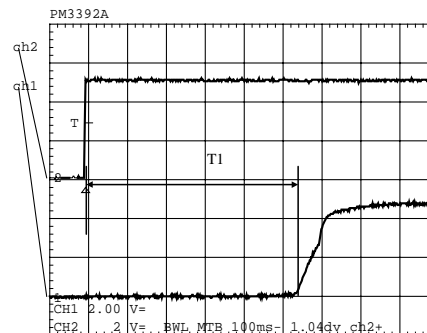


Figure 2

Timing: $400\text{msec} < T1 > 700\text{msec}$.

CH1: +5Vstby voltage at power on.

CH2: Voltage at pin 10.

1.4 Display steering

Check next timing and level for all grid-lines (G1 r G14).

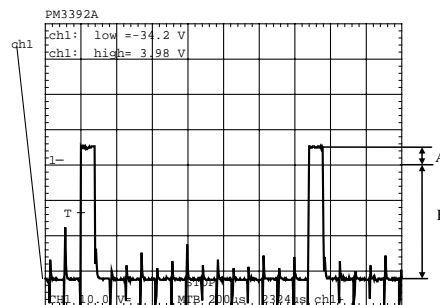


Figure 3

1. Check level A: +4V5 +/-10% for grid lines 1 => 11
2. Check level A: +4V0 +/-10% for grid lines 12 => 14
3. Check level B: -33V +/-10%
4. Check timing and levels of segment-lines P1 => P10:

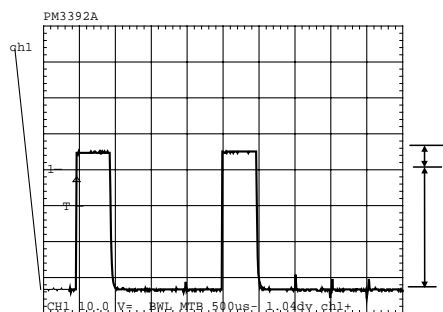


Figure 4

Level A: +4V5 +/-10%

Level B: -33V +/-10%

The data on these segment lines depend on the characters that are displayed.

The characters can be set by sending I2C commands to the display.

See the Slave URS how to send a display command.

1.5 Key-matrix

Connect a extra 10kpull-up resistor to pin 36 en 37 of the μ P and check next matrix scanning at these pins.

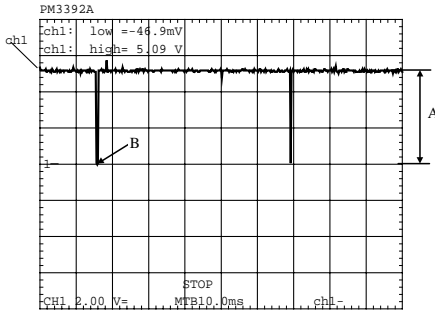


Figure 5

Level A: 5.0V +/-7%

Level B: 0V +/-200mV

Check matrix scanning from pin 26 until 33 of the μ P.

The results should be the same as the diagram above.

1.6 I.R. receiver

Check at pin 23 of the μ P if this line switches from low (< 0.3V) to high (> 4.5V), while pressing a key on a Philips RC5 or RC6 remote control.

1.7 Karaoke interface

The karaoke interface (4 lines) is a single direction communication.

This means that it consists of four μ P output lines.

The interface can be checked by setting or resetting these output-ports via the I2C bus.

Send next command via the I2C bus:

- Address : 0x70
- Command byte : 0x24
- Data byte : xxxxabcd
- Where : a = Karaoke reset.
- : b = Karaoke data.
- : c = Karaoke clock.
- : d = Karaoke strobe.

1.8 P50 interface

P50 is a bi-directional serial interface, which is used for communication between video equipment. For European sets, this communication goes via pin 10 of the scart-bus. In other regions, it can be a cinch bus at the back of the set.

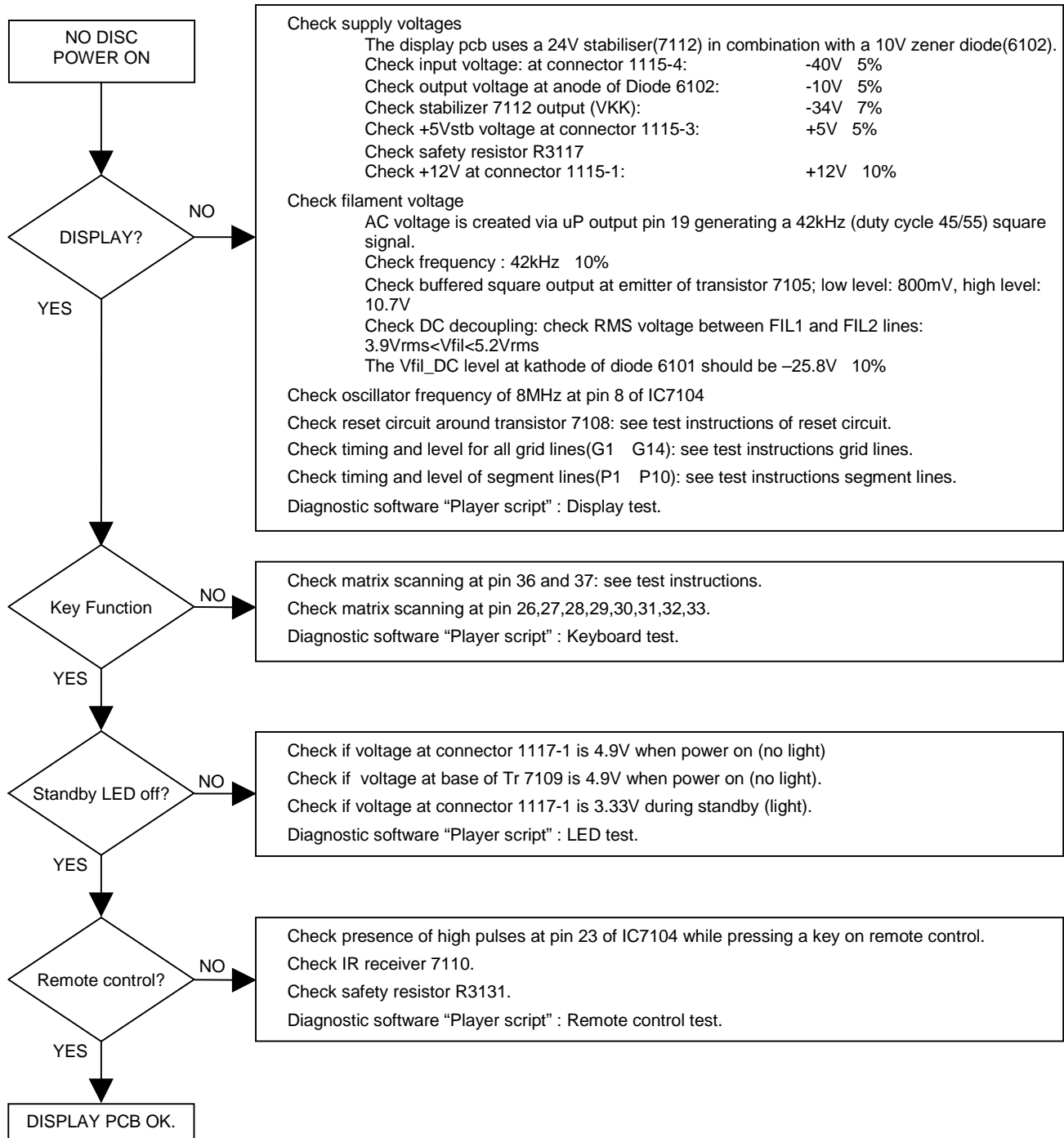
1. Keep the μ P in reset by short-circuiting emitter and collector of transistor 7108, via resistor 3100 and 3104 transistor 7101 is switched on.
2. Check the voltage at the P50 output connector 1118-5: < 200mV.

When the reset is released the μ P output-pin becomes low and transistor 7101 is switched off.

1. Check the voltage at the P50 output connector 1118-5: 4.9V +/-5%.
2. Check also the μ P P50 input (μ P pin 20): 5V +/-5%.
3. Connect the P50 line (connector 1118-5) to ground.
4. Check again the μ P P50 input (μ P pin 20): <0.3V.

■ TROUBLESHOOTING

Display board

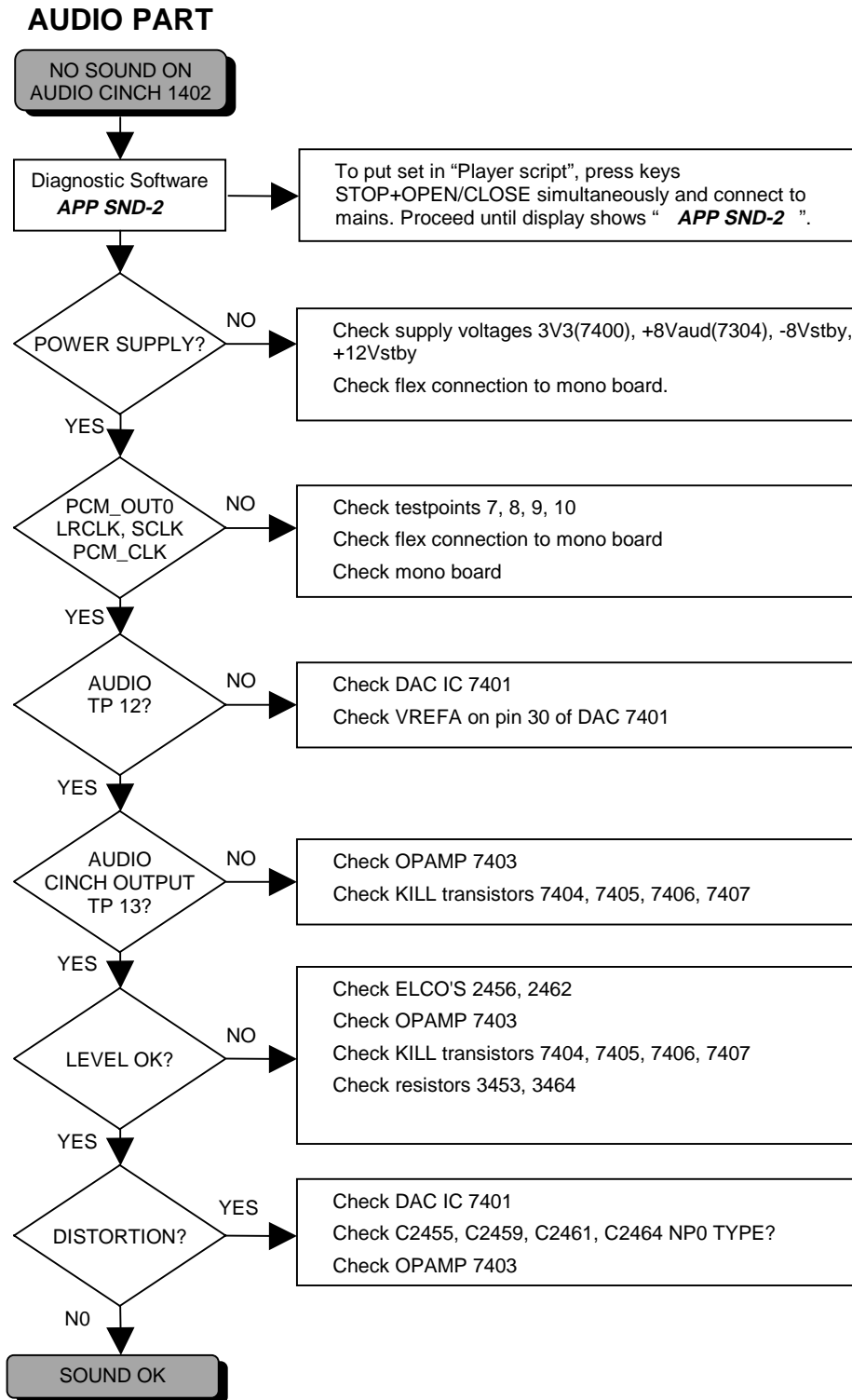


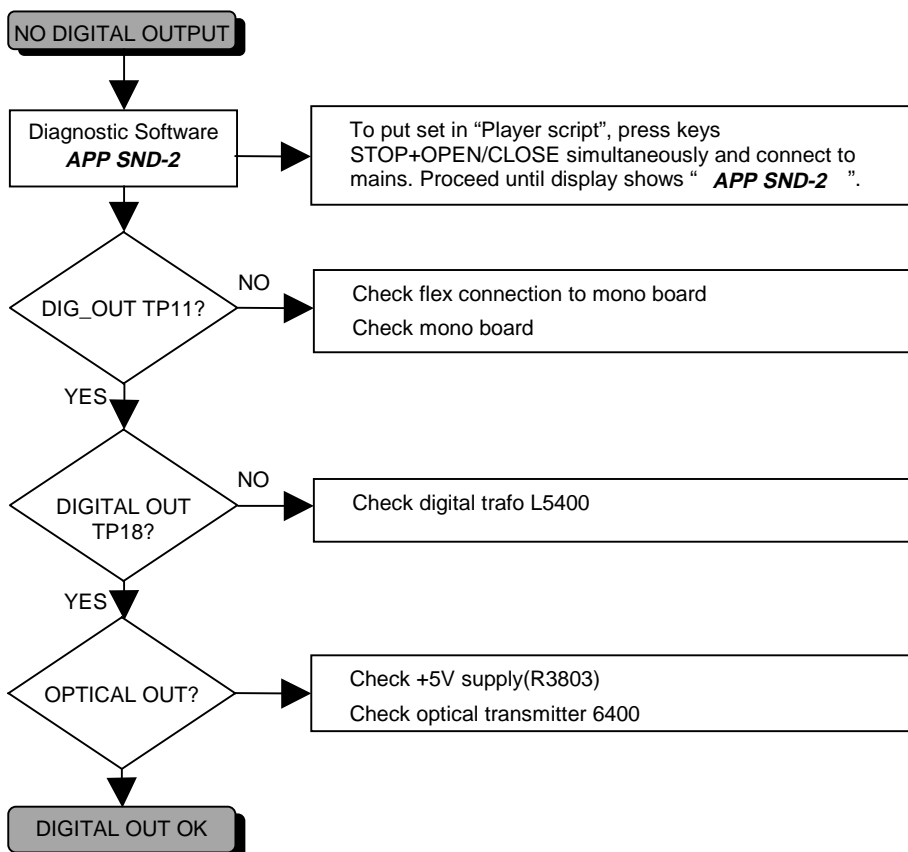
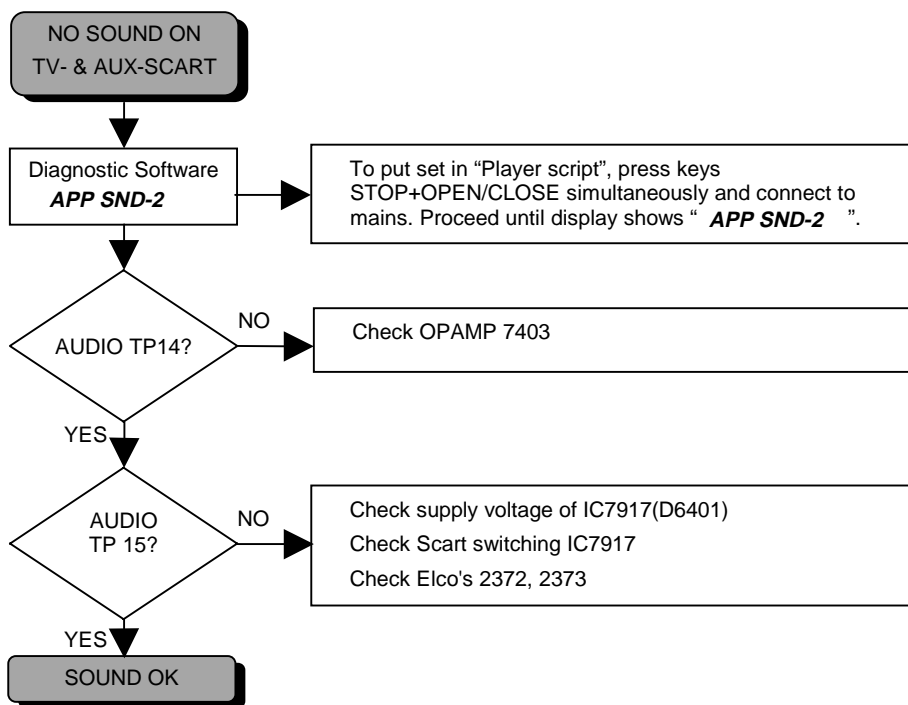
A/V board (B, G models)

Testing of A/ V board can be done using diagnostic software “Player script”.

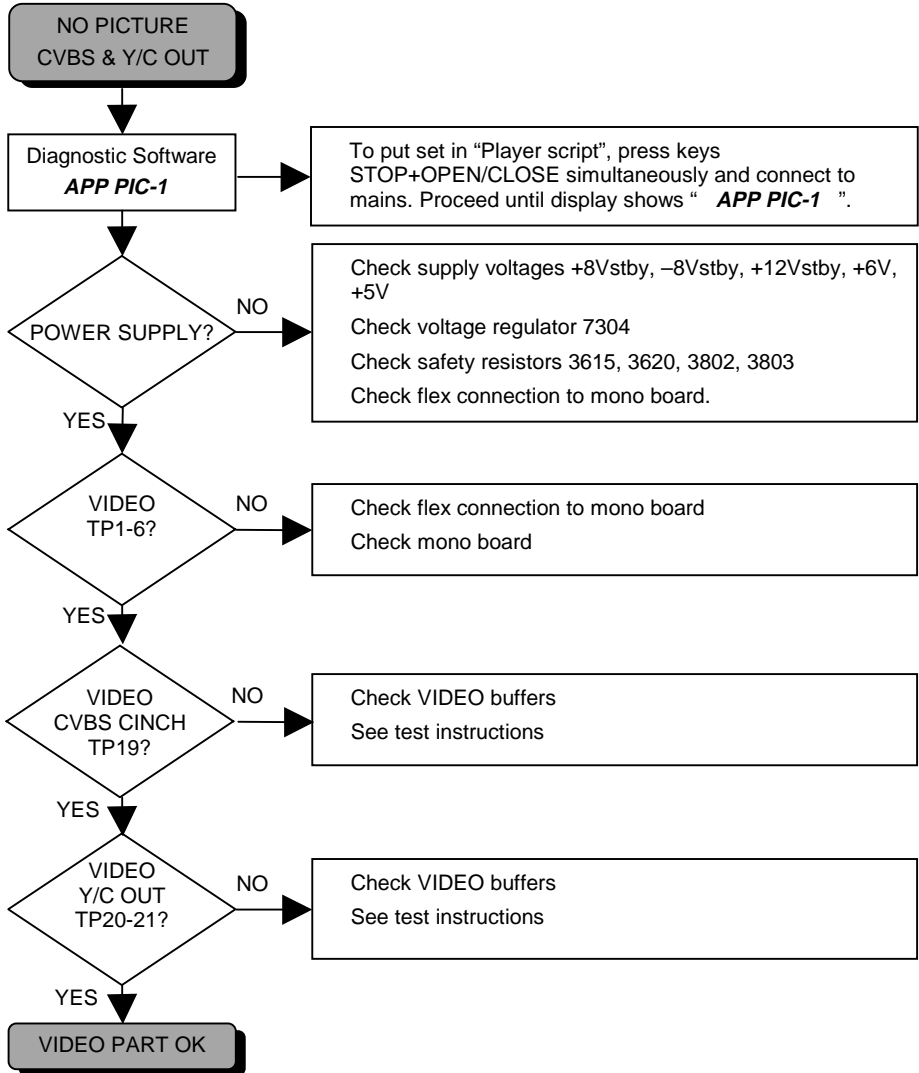
Mono board is used to generate a sinus with the soundtest SND- 2 or a VIDEO signal with the picture test PIC- 1.

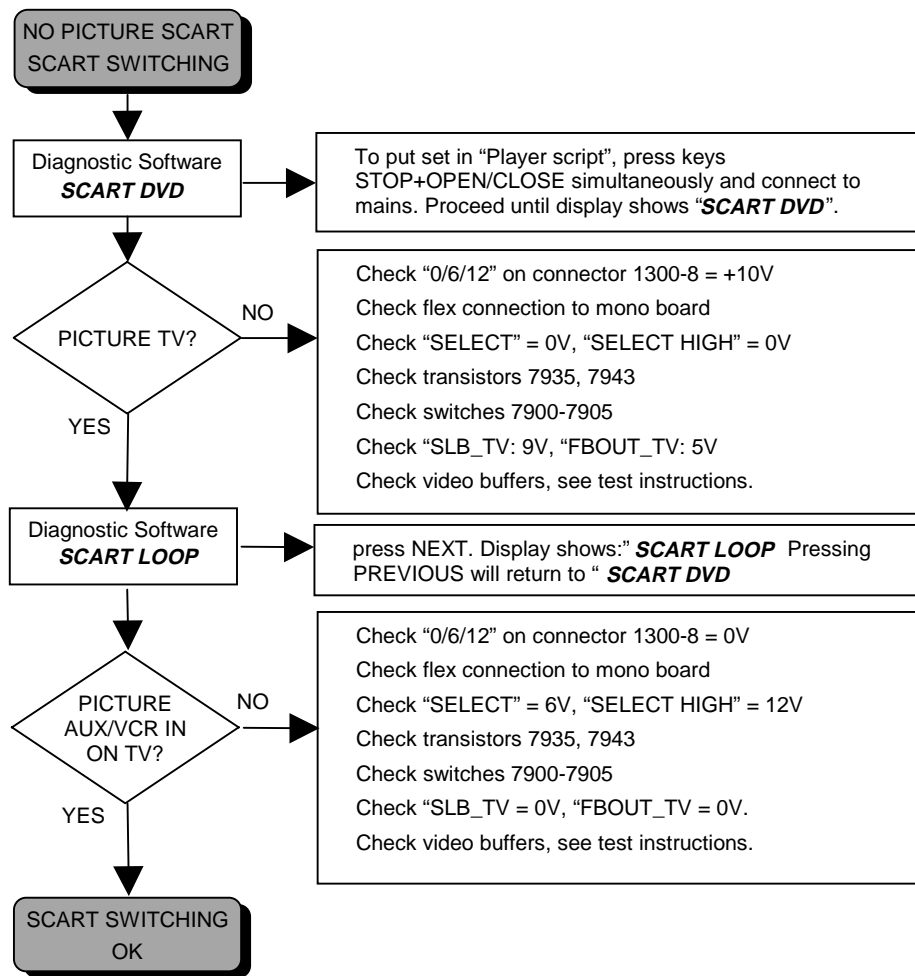
See description in chapter “Diagnostic Software : Script Interfaces”

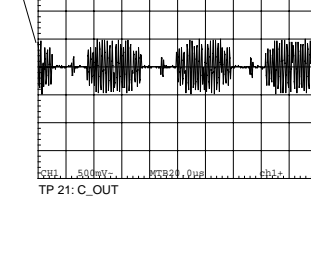
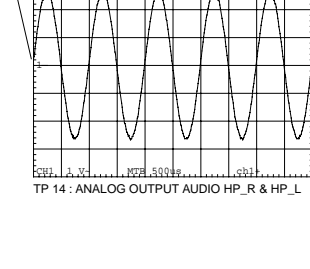
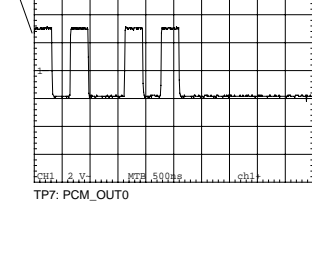
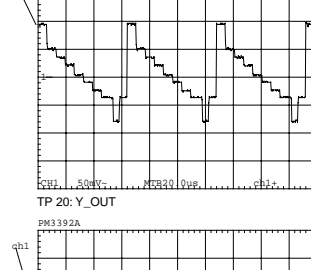
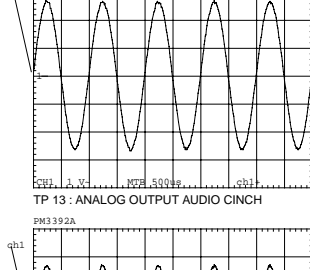
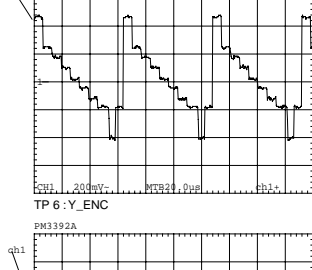
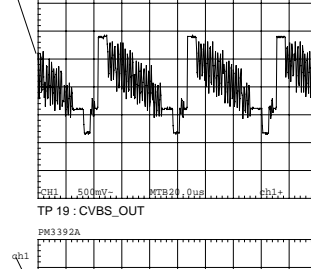
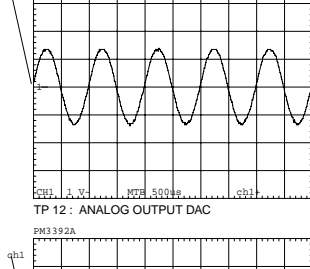
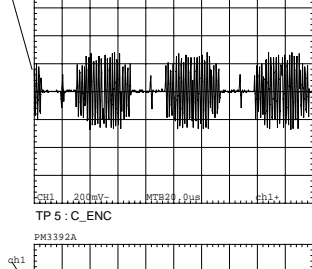
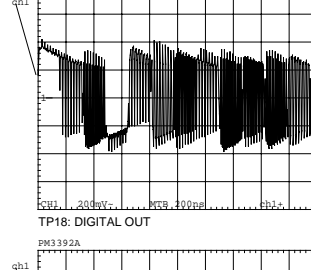
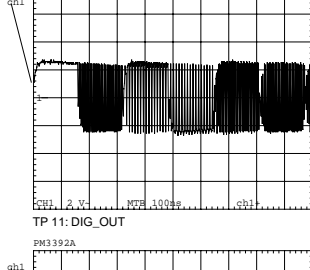
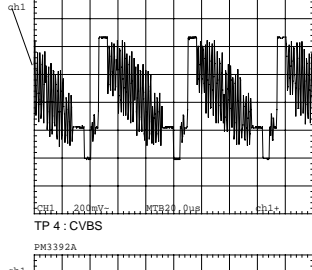
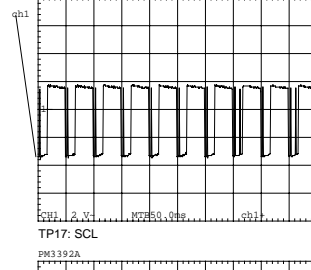
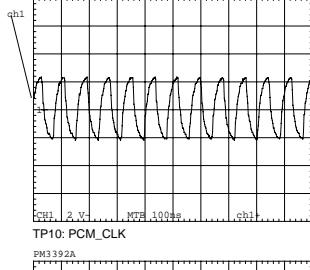
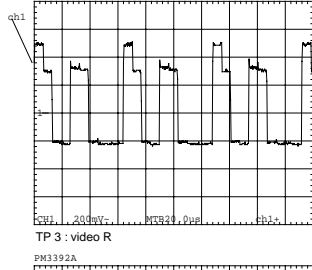
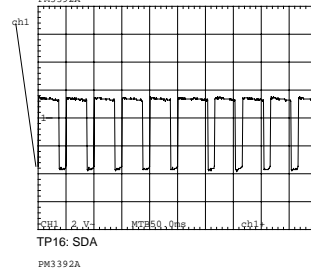
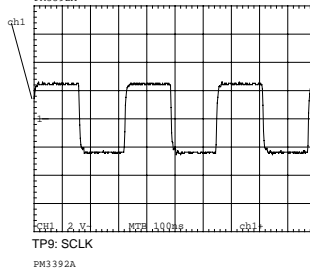
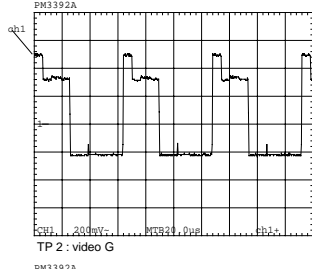
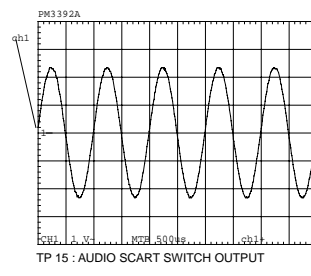
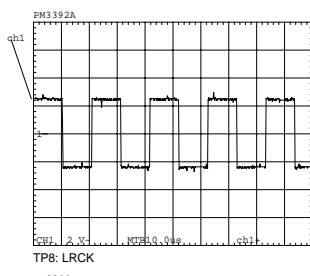
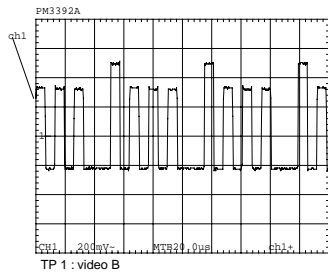




VIDEO PART







■ TECHNICAL SPECIFICATIONS DVD MODULE

1. Connections

1.1 Connector 1600 : Supply input connector.

1. +3.3Vstby
2. +3.3Vstby
3. +5V
4. +5Vstby
5. Vreserved
6. GND
7. GND
8. GND
9. -8Vstby
10. Standby control line
11. +12Vstby
12. GND

1.2 Connector 1603 : A/V 1 connector.

1. P50
2. Blue Video
3. Green Video
4. GND
5. Red Video
6. CVBS
7. GND
8. Slow blanking scart
9. -8Vstby
10. +5V
11. +5V
12. Audio mute
13. GND
14. I2S data0 out
15. I2S wordselect
16. I2S bitclock
17. GND
18. I2S systemclock
19. Center_on
20. Kar_bypass
21. Kar_bypass
22. GND

1.3 Connector 1604 : A/V 2 connector.

1. GND
2. Hor. sync.
3. GND
4. I2S data 2 out
5. GND
6. I2S data 1 out
7. -8Vstby
8. I2C clock
9. +12Vstby
10. I2C data
11. Vreserved
12. +3.3V
13. GND
14. C video
15. GND
16. Y video

1.4 Connector 1501 : I2C interface connector.

1. I2C clock
2. GND
3. I2C data
4. Standby control line
5. P50

1.5 Connector 1602 : Service connector.

1. TXD
2. Service activation
3. RXD
4. Reserved for RTS
5. 5 : GND
6. Reserved for CTS
7. +5V

2. Signal specifications

This the specification of all signals as described under "Connections"

H = +5V \pm 0.5V

h = 3.3V \pm 0.3V

L = 0V \pm 0.5V

I = 0V \pm 0.3V

- | | | |
|-------------------------------|---|--|
| Stby | : | If the set supports a "standby" function, all supply voltages marked with "stby" have to stay on during standby. |
| Standby control line | : | HStandby mode
: LOn mode. |
| P50 | : | Connection between front and A/V board, and can be used as P50 signal line. The signal is not connected to the module electronics. |
| Slow blanking scart | : | This signal switches between
: 0V (220output impedance)
: 12Vstby/2 (455output impedance)
: 12vstby (690output impedance) |
| Audio mute | : | Can be used for audio mute transistors during stop or power on/off.
: Mute on : +5Vstby
: Mute off : -8Vstby via a 10k resistor. |
| I2S data0 out | : | I2S front data output.
: Level h/l |
| I2S wordselect / I2S bitclock | : | I2S timing signals
: Level h/l |

I2S systemclock	: 256xFS audio systemclock. : Level H/L
Kar_bypass	: Bypasses the karaoke chip on the A/V board. : Bypass active H : Bypass off L
Center_on	: Switches the center audio to the scart output. : Center to scart h : L/R to scart l
SPDIF out	: Digital audio output : Level H/L
Hor. Sync	: Video Horizontal synchronisation : Level h/l
I2S data1 out	: I2S surround data output. : Level : h/l.
I2S data2 out	: I2S center/sub data output. : Level h/l.
I2C clock / I2C data	: I2C databus : Level : H/L
TXD / RXD / RTS / CTS	: Service UART to be connected direct to PC serial input. : Output levels H/L : Input levels RS232 compliant
Service activation	: Signal open Normal module start-up : Signal tied to GND Module start-up in service mode.
Vreserved	: Reserved in case the A/V board requires an extra supply voltage. : This supply is limited by a positive polarized 47uF/16V elco +100nF/16V.

3. Performance:

3.1 Digital output

CDDA/LPCM	: According IEC958
MPEG1 is converted to LPCM	:
MPEG2, AC3 audio.	: According IEC1937
DTS.	: According IEC61937 Amendment 1. : Digital output level is 0V / 5V with GND as reference. To meet the standards a decouple circuit is necessary.

3.2 I2S output

Accuracy	: Up to 24bit.
Sample rate	: 44.1kHz / 48kHz.
Standard	: Philips I2S output
Number of I2S outputs	: 3 (6 channel : Front / Surround / Center-Bass)
Deemphasis	: Already processed in module.
Audio source streams	: CDDA / MPEG1 / LPCM / MPEG2 / AC3 : No DTS decoding.
Audio trick modes	: Dolby Pro Logic (multichannel downmix on front output) : 3D sound.

3.3 Analog output

The module has no analog audio output.	: The analog audio specification will be determined by the external DAC circuit.
--	--

3.4 Video.

Standards	: The video output standard will follow the source material. : The OSD standard is switchable between PAL or NTSC.
Outputs	: The module has 6 analog outputs (3 f o r m a t s) : Y/ C C V B S RGB.
Specification.	: The output is fully according PQR3 IMS except : Output load >1kto GND / Cap. load <47pF. : Level 0.5Vpp with 100% white : DC-levelSync bottom = -0.65V ±10% : Some specification points are significantly better then PQR3 : SNR on all video outputs is better than 60dB. : Video bandwidth >5MHz (±3dB)

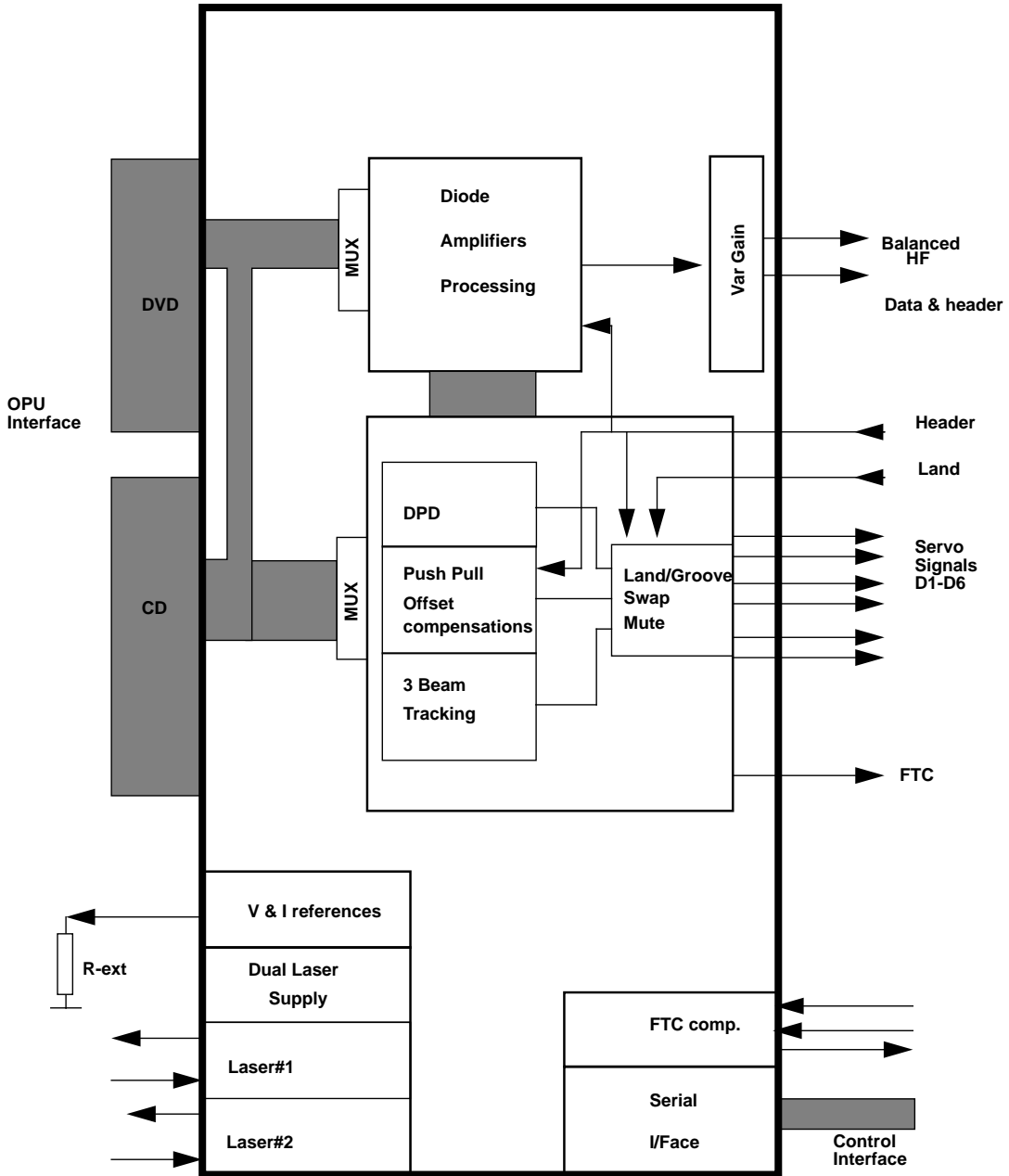
■ LIST OF ABBREVIATIONS

B	Buffered Video input Blue from DVD monoboard	Y_ENC	Buffered Luma input from DVD monoboard
BC_AUX	Blue or Chroma input from AUX-scart	YCVBSIN_AUX	Luma or CVBS input from AUX-scart
BC_TV	Blue or Chroma output to TV-scart	YCVBSIN_TV	Luma or CVBS input from TV-scart
C_ENC	Buffered Chroma input from DVD monoboard	YCVBSOUT_AUX	Luma or CVBS output to AUX-scart
CVBS	Buffered Composite video input from DVD monoboard	YCVBSOUT_TV	Luma or CVBS output to TV-scart
DC_OFF	Control signal to switch off -5Vstby and +12Vstby during standby	0/6/12	Scart switch control signal A/V board. 0V : loop through (AUX to TV), 6V : play 16:9 format, 12V : play 4:3 format
DIG_OUT	Digital out		
FBIN_AUX	Fast blanking input from AUX-scart		
FBOUT_TV	Fast blanking output to TV-scart		
G	Buffered Video input Green from DVD monoboard		
GIN_AUX	Video input Green from AUX-scart		
GOUT_TV	Video output Green to TV-scart		
HP_L	Audio output left to headphone and audio scart switch TEA6420		
HP_R	Audio output right to headphone and audio scart switch TEA6420		
KILL	Kill control signal for audio outputs and for soft mute of DAC		
LIN_AUX	Audio input left from AUX-scart		
LIN_TV	Audio input left from TV-scart		
LOUT_AUX	Audio output left to AUX-scart		
LOUT_TV	Audio output left to TV-scart		
LRCLK	Left/Right clock		
PCM_CLK	Audio system clock for DAC		
PCM_OUT0	Audio serial output data		
R	Buffered Video input Red from DVD monoboard		
RCIN_TV	Red or Chroma input from TV-scart		
RCOUT_TV	Red or Chroma output to TV-scart		
RIN_AUX	Audio input right from AUX-scart		
RIN_TV	Audio input right from TV-scart		
ROUT_AUX	Audio output right to AUX-scart		
ROUT_TV	Audio output right to TV-scart		
SCL	I2C bus clock		
SCLK	Audio serial bit clock		
SDA	I2C bus data		
SELECT	Control signal for video scart switches; high = TV ,low = AUX		
SELECT_HIGH	Control signal for switching fast blanking and slow blanking signals; high = TV, low = AUX		
SLB_AUX	Slow blanking control signal from AUX-scart		
SLB_TV	Slow blanking control signal to TV-scart		
STANDBY	Control signal from STI5505 used to swith off -5Vstby and +12Vstby during standby.		
STEREO_L	Audio cinch output left		
STEREO_R	Audio cinch output right		

■ IC DESCRIPTIONS

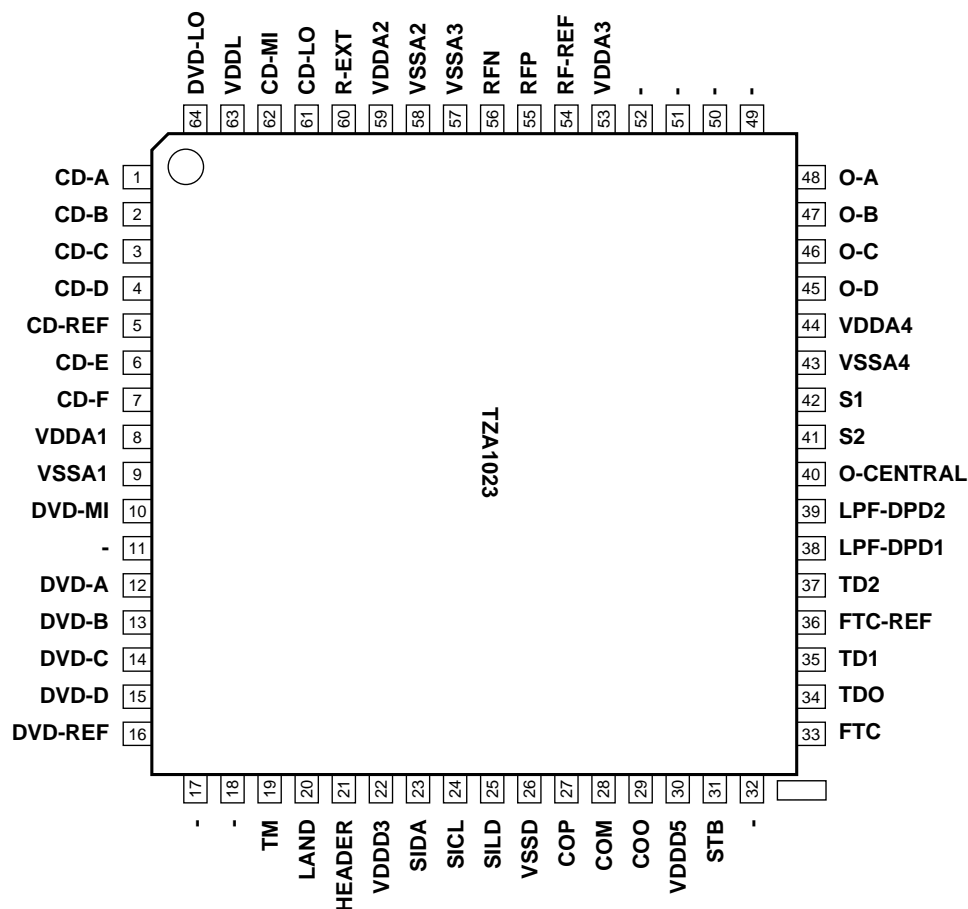
TZA1033

DVDALAS2plus Advanced Analog DVD Signal Processor and Laser Supply



TZA1033

DVDALAS2plus Advanced Analog DVD Signal Processor and Laser Supply



Pin description

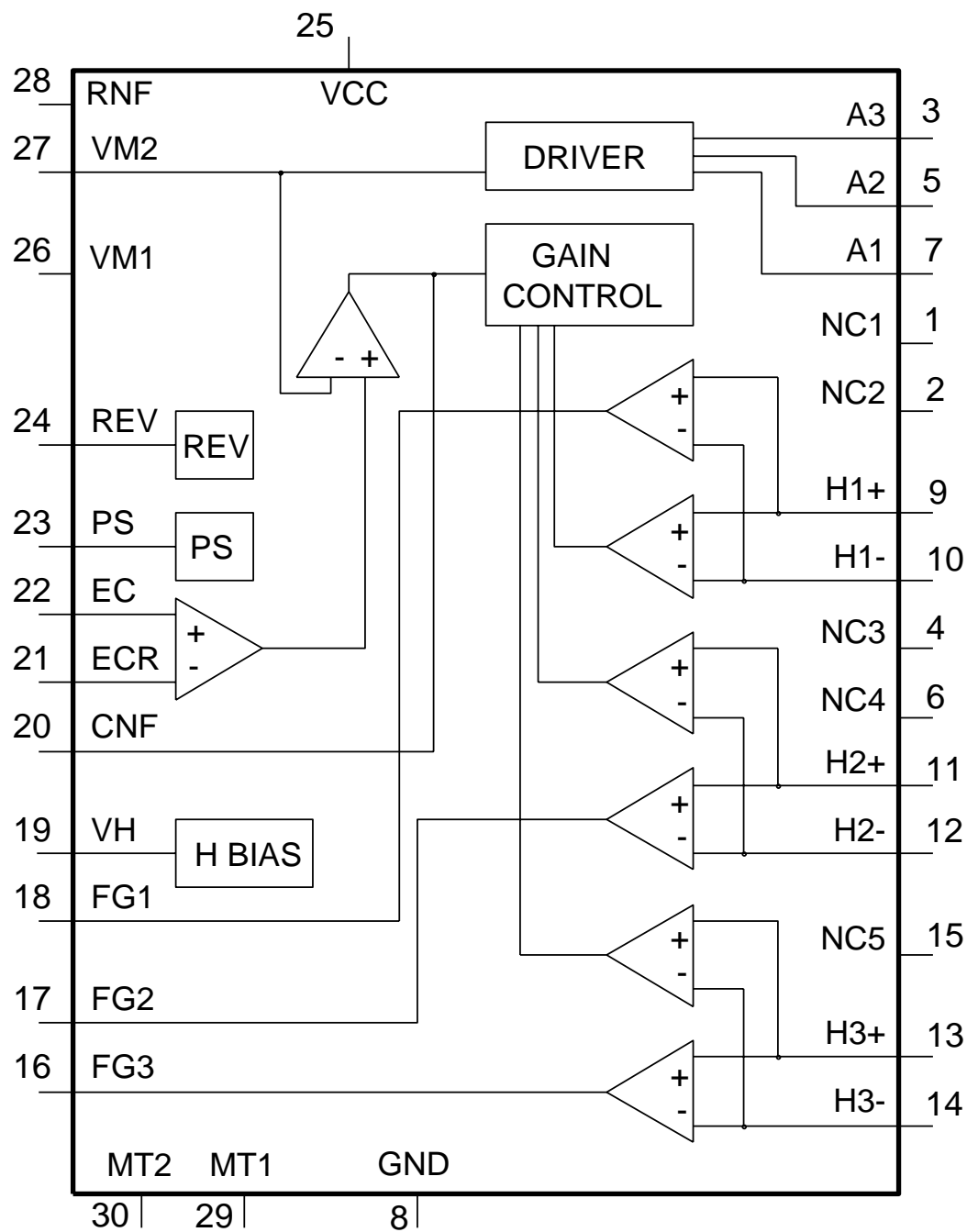
Name	Pin	Description
CD-A	1	CD pick up input A
CD-B	2	CD pick up input B
CD-C	3	CD pick up input C
CD-D	4	CD pick up input D
CD-REF	5	CD pick up reference voltage
CD-E	6	CD pick up input E
CD-F	7	CD pick up input F
DVD-A	12	DVD pick up input A
DVD-B	13	DVD pick up input B
DVD-C	14	DVD pick up input C
DVD-D	15	DVD pick up input D
DVD-ref	16	DVD pick up reference voltage
O-A	48	Servo current output for Focus-A
O-B	47	Servo current output for Focus-B
O-C	46	Servo current output for Focus-C
O-D	45	Servo current output for Focus-D

TZA1033**DVDALAS2plus Advanced Analog DVD Signal Processor and Laser Supply**

Name	Pin	Description
O-central	40	Test pin for offset cancelation
TD2	37	Internally connected
FTC-ref	36	Servo output voltage reference input
S1	42	Servo current output for radial tracking
S2	41	Servo current output for radial tracking
TD1	35	Internally connected
FTC	33	Fast track count voltage output
RFP	55	pos. RF output signal
RFN	56	neg. RF output signal
RF-REF	54	DC Reference signal input RF
LPF-DPD1	38	DPD Low pass bandwidth capacitor, channel pos
LPF-DPD2	39	DPD Low pass bandwidth capacitor, channel neg
Land	20	Land/groove toggle input
HEADER	21	Header detector window input
CD-MI	62	CD laser monitor input
DVD-MI	10	DVD laser monitor input
CD-LO	61	CD laser output
DVD-LO	64	DVD laser output
COP	27	Positive input FTC comparator
COM	28	Inverting input FTC comparator
COO	29	FTC comparator output
SIDA	23	Serial host interface data input
SICL	24	Serial host interface clock input
SILD	25	Serial host interface load
VDDA1	8	Analog Supply voltage 1 (RF input)
VDDA2	59	Analog Supply voltage 2 (RF internal)
VDDA3	53	Analog Supply voltage 3 (RF output stage)
VDDA4	44	Analog Supply voltage 4 (Servo)
VDDD5	30	Digital Supply voltage (5V dig core)
VDDD3	22	Digital Supply voltage (3V I/O pads and FTC comp.)
VDDL	63	Supply voltage for laser
VSSA1	9	Analog Ground 1
VSSA2	58	Analog Ground 2
VSSA3	57	Analog Ground 3
VSSA4	43	Analog Ground 4
VSSD	26	Digital ground
R-EXT	60	Reference current input (Connect 12k1 to VSSA4)
STB	31	Standby input
TM	19	Test mode input
TDO	34	Test data out

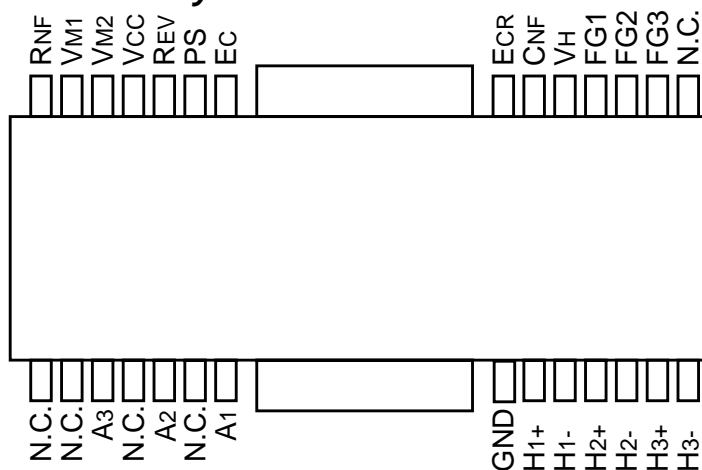
BA6856FP

3 Phase motor driver for DVD players



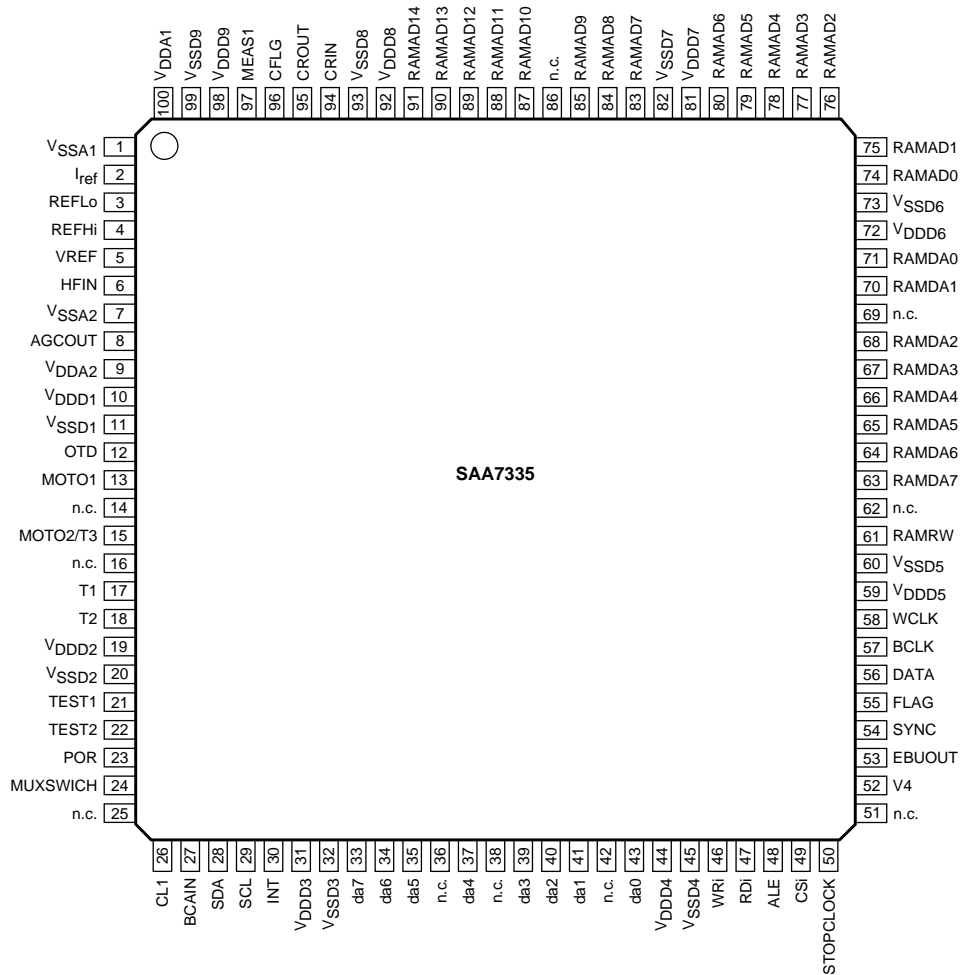
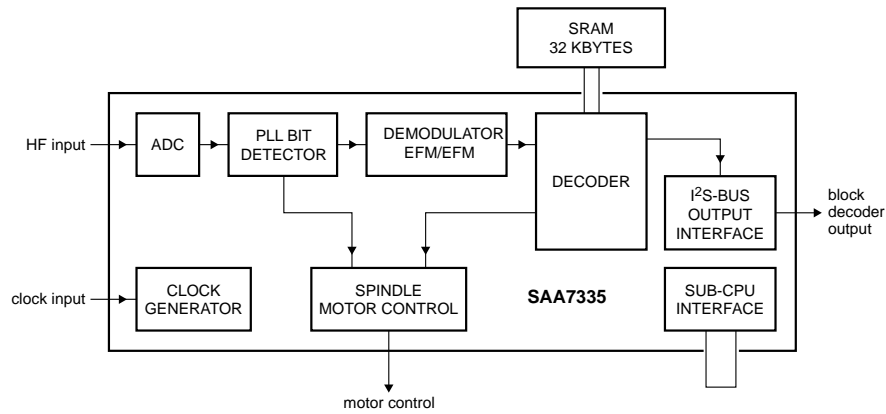
BA6856FP**3 Phase motor driver for DVD players****Pin description**

PIN No	PIN NAME	DESCRIPTION
1	N.C.	Not connected
2	N.C.	Not connected
3	A3	Output 3 for motor
4	N.C.	Not connected
5	A2	Output 2 for motor
6	N.C.	Not connected
7	A1	Output 1 for motor
8	GND	Ground
9	H1+	Hall input Amp1. positive input
10	H1-	Hall input Amp1. negative input
11	H2+	Hall input Amp2. positive input
12	H2-	Hall input Amp2. negative input
13	H3+	Hall input Amp3. positive input
14	H3-	Hall input Amp3. negative input
15	N.C.	Not connected
16	FG3	FG3 signal output terminal
17	FG2	FG2 signal output terminal
18	FG1	FG1 signal output terminal
19	VH	Hall Bias
20	CNF	Capacitor connection pin for phase compensation
21	ECR	Torque control standard voltage input terminal
22	EC	Torque control voltage input terminal
23	PS	POWER SAVE switch
24	REV	Reverse terminal
25	VCC	Power supply for signal division
26	VM2	Power supply 2 for driver
27	VM1	Power supply 2 for driver
28	RNF	Power supply for driver division

Terminal lay-out

SAA7335

DSP for CD and DVD-ROM system



SAA7335**DSP for CD and DVD-ROM system****Pin description**

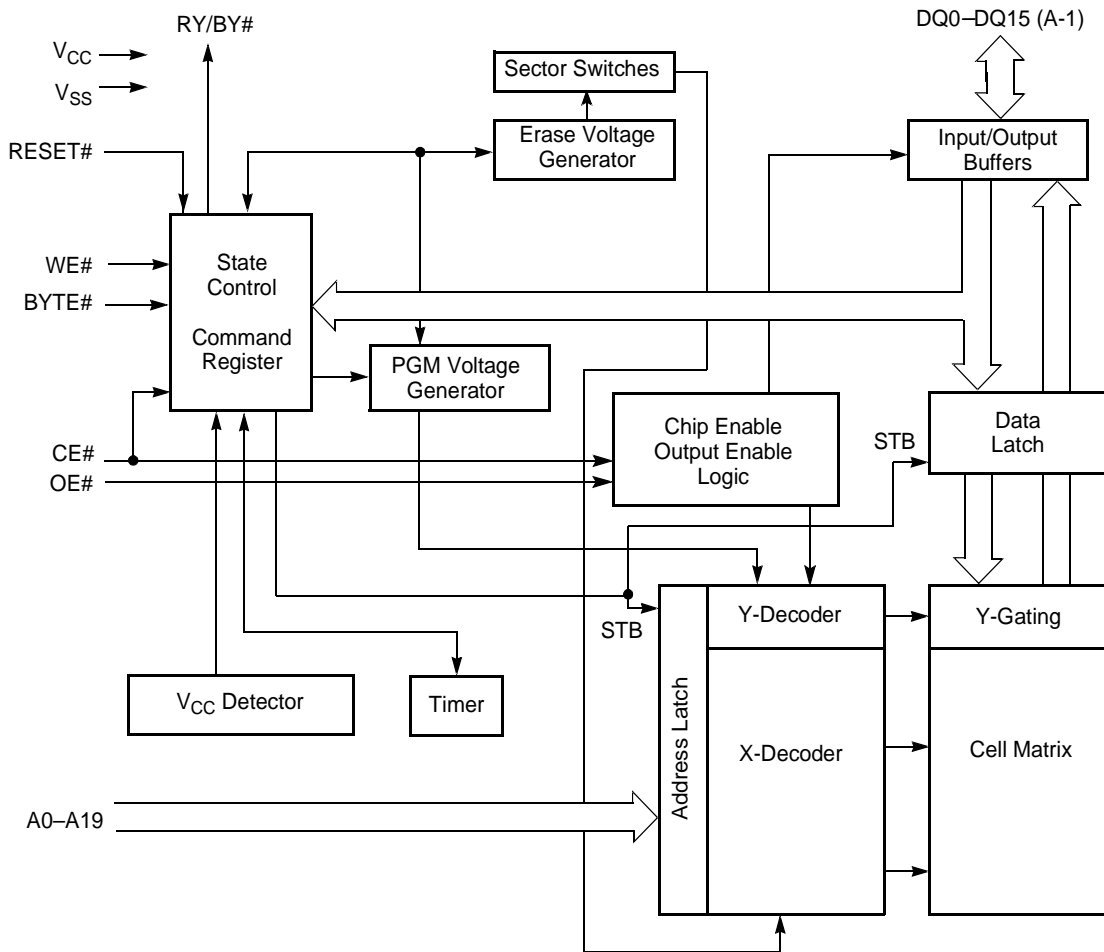
SYMBOL	PIN	TYPE	DESCRIPTION
VSSA1	1	supply	analog ground 1
Iref	2	I	analog current reference input for ADC
REFLo	3	I	analog low reference input for ADC
REFHi	4	I	analog high reference input for ADC
VREF	5	I	analog negative input
HFIN	6	I	analog positive input
VSSA2	7	supply	analog ground 2
AGCOUT	8	O	analog test pin output
VDDA2	9	supply	analog supply voltage 2
VDDD1	10	supply	digital supply voltage 1
VSSD1	11	supply	digital ground 1
OTD	12	I	off track detect input
MOTO1	13	O	3-state motor control output
n.c.	14	–	not connected, reserved
MOTO2/T3	15	I/O	motor control output/tachometer 3 input
n.c.	16	–	not connected, reserved
T1	17	I	tachometer 1 input
T2	18	I	tachometer 2 input
VDDD2	19	supply	digital supply voltage 2
VSSD2	20	supply	digital ground 2
TEST1	21	I	test input 1
TEST2	22	I	test input 2
POR	23	I	power-on reset input
MUXSWICH	24	I	use clock multiplier input
n.c.	25	–	not connected, reserved
CL1	26	O	divided clock output
BCAIN	27	I	BCA input
SDA	28	I/O	sub-CPU I 2 C-bus serial data input/output
SCL	29	I	sub-CPU I 2 C-bus serial clock input
INT	30	O	sub-CPU interrupt output (open-drain)
VDDD3	31	supply	digital supply voltage 3
VSSD3	32	supply	digital ground 3
da7	33	I/O	sub-CPU data bus bit 7 input/output (parallel)
da6	34	I/O	sub-CPU data bus bit 6 input/output (parallel)
da5	35	I/O	sub-CPU data bus bit 5 input/output (parallel)
n.c.	36	–	not connected, reserved
da4	37	I/O	sub-CPU data bus bit 4 input/output (parallel)
n.c.	38	–	not connected, reserved
da3	39	I/O	sub-CPU data bus bit 3 input/output (parallel)
da2	40	I/O	sub-CPU data bus bit 2 input/output (parallel)
da1	41	I/O	sub-CPU data bus bit 1 input/output (parallel)
n.c.	42	–	not connected, reserved
da0	43	I/O	sub-CPU data bus bit 0 input/output (parallel)
VDDD4	44	supply	digital supply voltage 4
VSSD4	45	supply	digital ground 4
WRi	46	I	sub-CPU write enable input (active LOW)
RDi	47	I	sub-CPU read enable input (active LOW)
ALE	48	I	sub-CPU address latch enable input
CSi	49	I	sub-CPU chip select input (active HIGH)
STOPCLOCK	50	O	stop clock output

SAA7335**DSP for CD and DVD-ROM system**

SYMBOL	PIN	TYPE	DESCRIPTION
n.c.	51	–	not connected, reserved
V4	52	O	serial subcode output (for CD)
EBUOUT	53	O	digital audio output
SYNC	54	O	I ² S-bus sector sync output
FLAG	55	O	I ² S-bus correction flag output
DATA	56	O	I ² S-bus serial data output
BCLK	57	I/O	I ² S-bus bit serial clock input/output
WCLK	58	I/O	I ² S-bus word clock input/output
VDDD5	59	supply	digital supply voltage 5
VSSD5	60	supply	digital ground 5
RAMRW	61	O	RAM read/write control output
n.c.	62	–	not connected, reserved
RAMDA7	63	I/O	RAM data bus bit 7 input/output
RAMDA6	64	I/O	RAM data bus bit 6 input/output
RAMDA5	65	I/O	RAM data bus bit 5 input/output
RAMDA4	66	I/O	RAM data bus bit 4 input/output
RAMDA3	67	I/O	RAM data bus bit 3 input/output
RAMDA2	68	I/O	RAM data bus bit 2 input/output
n.c.	69	–	not connected, reserved
RAMDA1	70	I/O	RAM data bus bit 1 input/output
RAMDA0	71	I/O	RAM data bus bit 0 input/output
VDDD6	72	supply	digital supply voltage 6
VSSD6	73	supply	digital ground 6
RAMAD0	74	O	RAM address bit 0 output
RAMAD1	75	O	RAM address bit 1 output
RAMAD2	76	O	RAM address bit 2 output
RAMAD3	77	O	RAM address bit 3 output
RAMAD4	78	O	RAM address bit 4 output
RAMAD5	79	O	RAM address bit 5 output
RAMAD6	80	O	RAM address bit 6 output
VDDD7	81	supply	digital supply voltage 7
VSSD7	82	supply	digital ground 7
RAMAD7	83	O	RAM address bit 7 output
RAMAD8	84	O	RAM address bit 8 output
RAMAD9	85	O	RAM address bit 9 output
n.c.	86	–	not connected, reserved
RAMAD10	87	O	RAM address bit 10 output
RAMAD11	88	O	RAM address bit 11 output
RAMAD12	89	O	RAM address bit 12 output
RAMAD13	90	O	RAM address bit 13 output
RAMAD14	91	O	RAM address bit 14 output
VDDD8	92	supply	digital supply voltage 8
VSSD8	93	supply	digital ground 8
CRIN	94	I	analog crystal input
CROUT	95	O	analog crystal output
CFLG	96	O	correction statistics output
MEAS1	97	O	front-end telemetry output
VDDD9	98	supply	digital supply voltage 9
VSSD9	99	supply	digital ground 9
VDDA1	100	supply	analog supply voltage 1

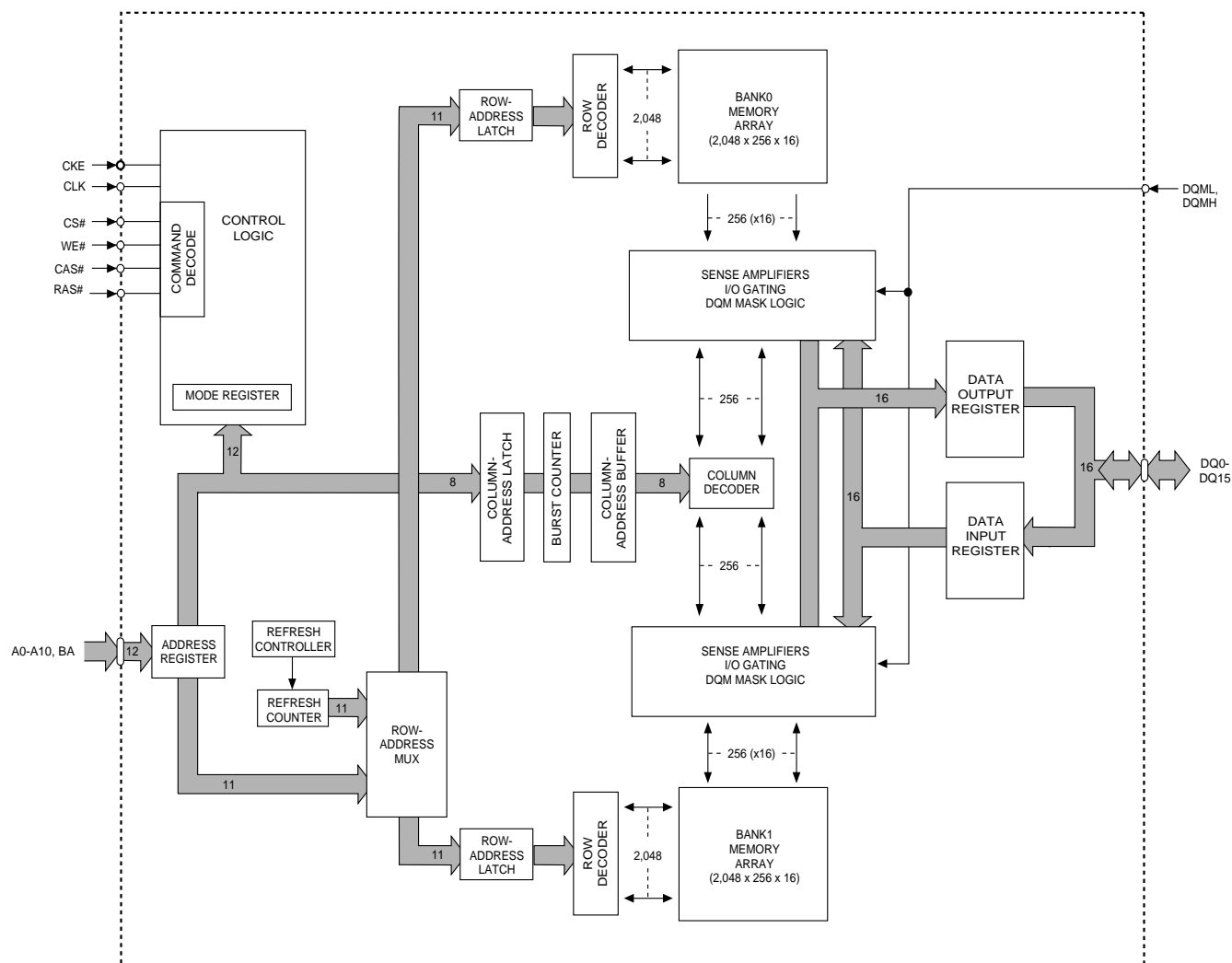
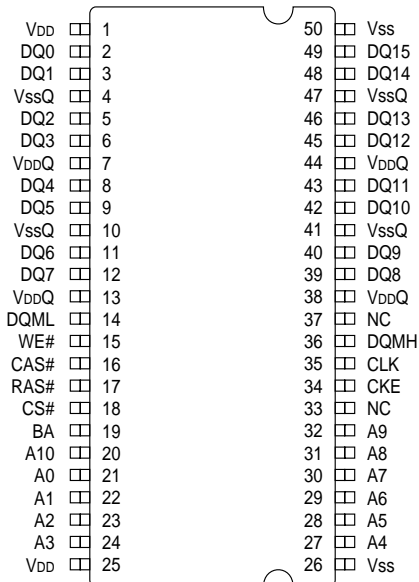
Am29LV160B

16 MB (2 M x 8-bit / 1 M x 16-bit) CMOS 3.0 Volt-only Sector Erase Flash Memory



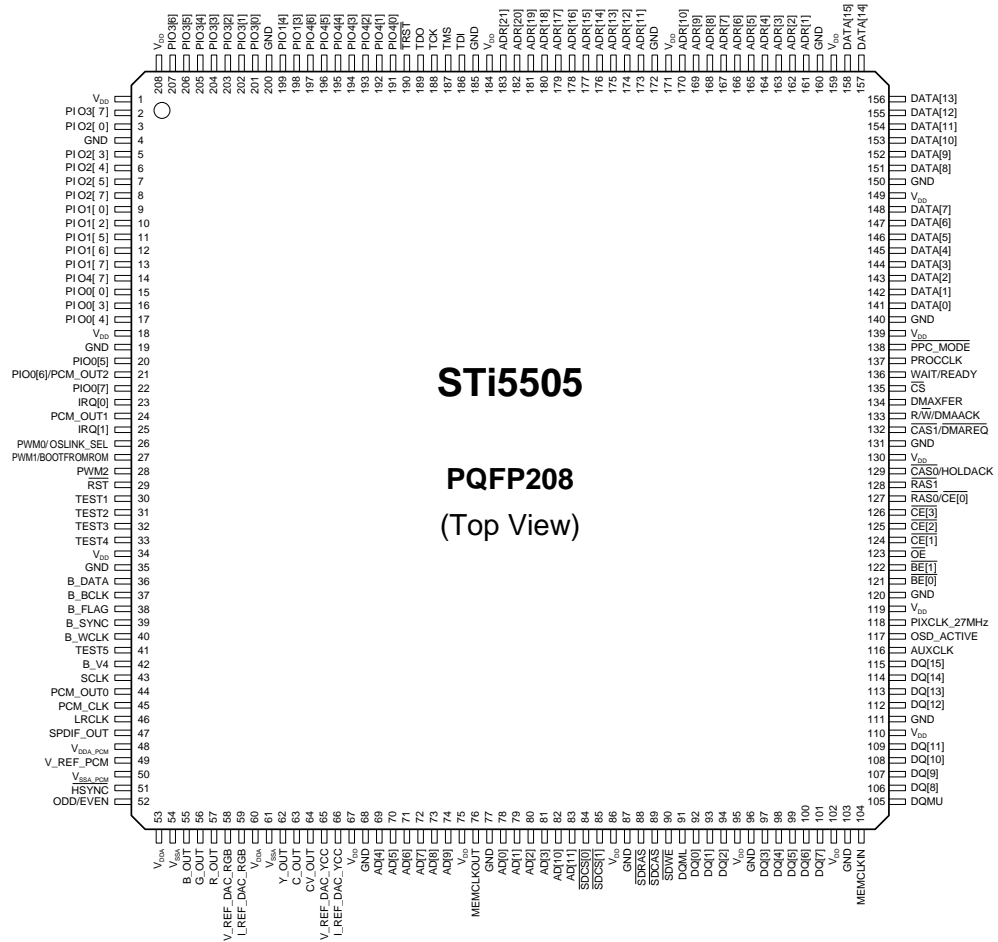
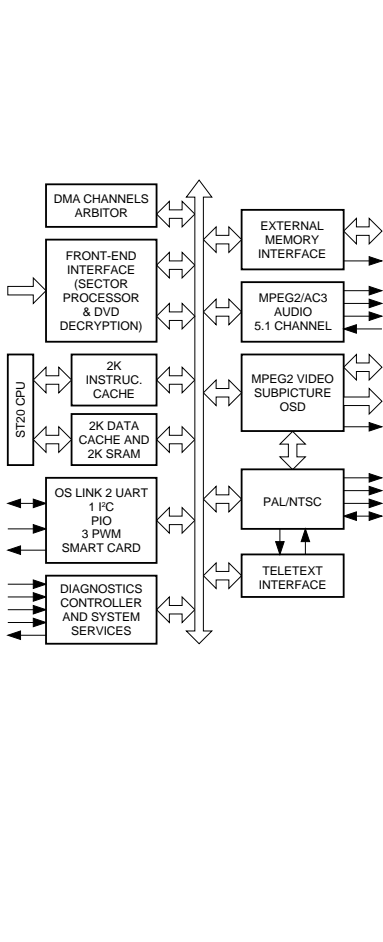
MT48LC1M16A1TG S

Synchronous DRAM



STi5505

DVD backend decoder with integrated host processor

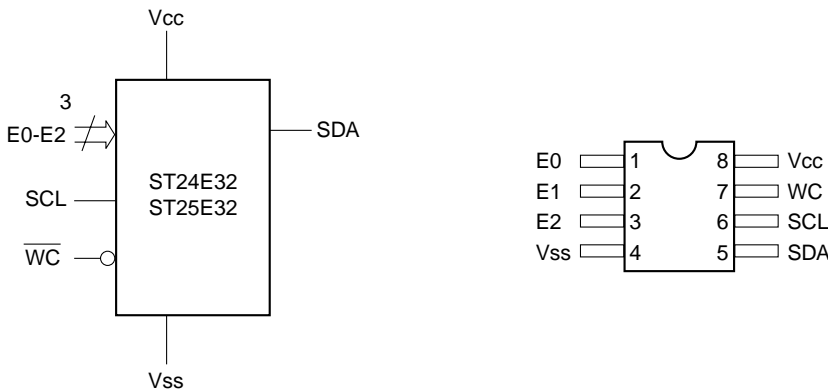


STi5505

PQFP208
(Top View)

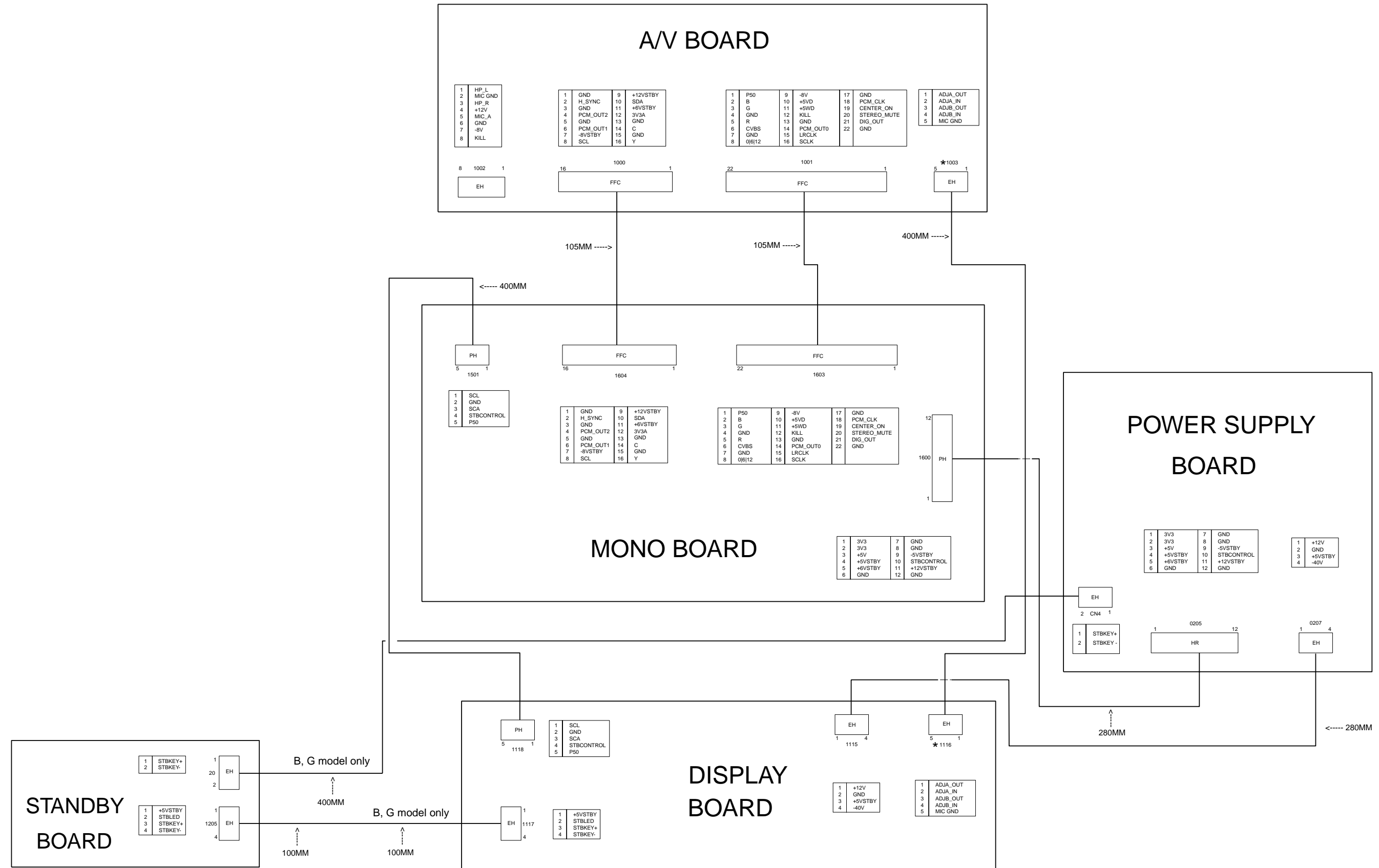
ST24E32 / ST25E32

32k serial I²C EEPROM with extended addressing

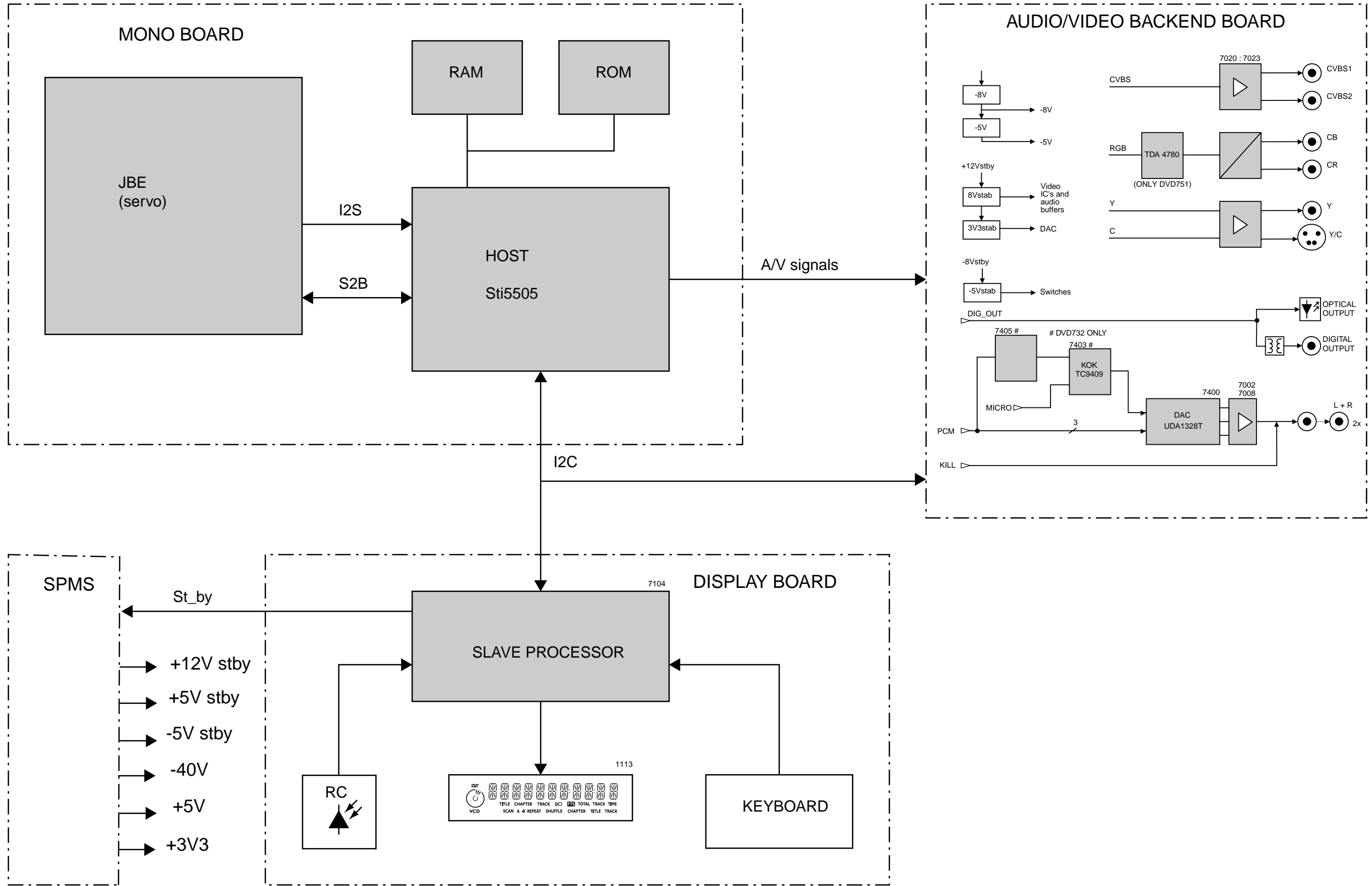


1 ■ WIRING DIAGRAM

1
2
3
4
5
6
7



■ BLOCK DIAGRAM (U, C, A, R, T)



1 ■ BLOCK DIAGRAM (B, G)

