IBM MONITOR REPAIR NOTES: Models 8512, 8513, 8514, 5154, 5175 and 3192

Contents:

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Chapter 1) About the Author

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Chapter 2) 8512, 8513

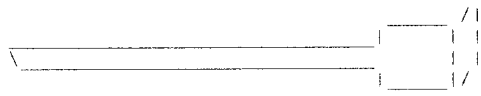
IBM's "PS/2" VGA color monitors, models 8512 and 8513, have had frequent maintenance problems. There are at least two different models of each monitor. They are manufactured in Korea, probably by Samsung or Tatung.

Schematic diagrams are apparently unavailable. The following is a summary of many frustrating hours at the repair bench:

2.1) Opening the cases

The top of the 8512 or 8513 case is fastened either by two internal plastic clips (see below), or "tamperproof" Torx T-20 screws with center pins. The Torx driver must have a long, slender shaft (preferably magnetic) to reach the screw heads.

S/N 23-xxxxx: Plastic clips hold top front of case. The internal catches can be released by inserting a pair of special tools made of sheet-metal, shaped approximately like:



The angle at the end is more acute (25 degrees) than shown in this ASCII diagram.

Alternatively, insert long, thin screwdriver into rectangular holes and push clips downward. An Apple Macintosh case-separation tool is sometimes useful to help remove back the cover. It is best to release both clips simultaneously.

NOTE: Cut the silicone glue at the CRT base and unplug the tube before working on the main board! The glass neck is easily broken. A monitor with broken CRT is not economically repairable. The voice of experience speaks. :-)

Symptom: No power or intermittent power:

Some models (including those whose serial numbers begin with 23) have the AC power connector soldered directly to the main circuit board. The wave-soldered connections are too thin for heavy components or those subject to flexure: They crack, opening the circuit. Resolder them, using lots of solder. Also use a magnifying lens to inspect the solder joints of the flyback transformer, the deflection-yoke connector and (rarely) the CRT socket. These often fail in the same manner as the power connector. I always resolder all the above- mentioned connections on general principle.

Symptom: High voltage present but screen dark

Inspect solder joints on CRT socket, especially if serial number begins with 23-. (See above.)

Symptom: Horizontal line across screen, remainder dark

Failed component: Vertical amplifier (large IC attached to heat sink; TDA-1670A manufactured by SGS, whose quality control is infamous). People at IBM have told us that this chip is a weak point. Use heat- sink compound when installing new IC. The replacement IC may last indefinitely, or may fail in a few days. Sylvania's ECG 1862 is a replacement for TDA1670A.

When the IC fails, a 2.2 ohm 1/4-watt resistor in series with its power supply lead (diode and capacitor leading to a flyback pin) burns beyond recognition. This resistor is used as a fuse. The value is not critical (may be up to 20 ohms) but be sure the replacement resistor is a metal-film type which burns quiescently, instead of a carbon resistor which will start a fire. Leave the resistor leads long, mounting the resistor one inch [2cm] mabove the circuit board.

Before replacing IC, inspect for cracked solder connections on the male deflection-yoke connector (mounted on the main circuit board).

In old monitors, especially 8513 with serial numbers beginning with 72- , replace vertical deflection-yoke coupling capacitor C313 (3.3 uF 160v), especially if it shows signs of overheating (shrink tube retracted from top of metal can).

Also check C309 (2200uf 16v). If C309 is bad, the new amplifier may fail immediately or in a few days.

Symptoms: Power Supply Problem:

1. **Immediate power supply shutdown.**
2. **Power supply shutdown/restart about once per second.**
3. **Squeal from power supply, wavy left and right edges of picture; may become normal after warmup.**

Bad component: C120 (10 uf 35v). This capacitor is common to most models of 8512/8513, and has the same identifying number on their circuit boards. It is located near the front of the power supply area, in the corner with the green LED pilot light, sometimes near a large green resistor. Replace this capacitor on general principle anytime you open an 8512 or 8513. This capacitor fails from heat; dissection of bad capacitors reveals no moisture within. The replacement should have a temperature rating of 105 deg. C. (typified by end plug made of epoxy instead of rubber). Heat-induced capacitor failure is a common problem in switching power-supplies. If high- temp. capacitors are unavailable, leave the leads long so that the new capacitor can be placed further from the abovementioned resistor which gets hot enough to discolor the circuit board and adjacent plastic standoff.

If capacitor is good, check diode CR105. This diode sometimes has thermal problems resulting in intermittent or permanent short, causing symptoms as above. Replace with a fast-recovery diode such as 1N4937; leave leads long for cooling. (We use 1N4937 as a generic replacement for high-frequency rectifiers in monitors, both in switching power supplies and flyback-derived voltage sources. Common rectifier diodes such as 1N4004 will overheat when used at the frequencies of switching power supplies or of flyback transformers.

Also check CR212, near the flyback transformer. It often shorts. Rating is 3A, 600V.

Symptom: Blown fuse

Bad component: De-gaussing thermistor (rectangular black box with 3 leads, near de-gauss coil connector).

If new thermistor is unavailable: Remove the shorted device, use a handheld de-gaussing coil after the monitor has been

returned to its operating position.

Replacement thermistors are not available from IBM. A suitable replacement for the thermistor in IBM 8512, 8513 and 3192 is the one used in NEC 1401 monitors. It is NEC part number 38112026, "positive thermistor degaussing control," $2.95 from:

NEC Home Electronics
1255 Michael Dr.
Wood Dale IL 60191-1094.

The NEC device is slightly larger and apparently more robust than the original. On some types the middle leg must be bent to fit the hole in the printed-circuit board.

(Rare): Blown fuse may result from shorted diodes which rectify 115 VAC power, or from shorted FET power-supply switching transistor.

Chapter 3) Symptom: Bad Power Supply (ones in metal case)

Bad power supply (in model where power supply is a separate unit in gold-colored metal cage), verifiable by swapping for known-good power supply:

Replace two small electrolytic capacitors located under a rectangular ceramic power resistor which stands about 1" above the circuit board.

Symptom: 8513 s/n 23-xxxxx: R203 burned

Replace resistor (120 ohms, 1/4 watt), resolder C202. C202's solder joints often break from vibration, or from being bumped during chassis disassembly/reassembly.

Symptom: 8513 23-xxxxx, single bottom-screw, metal subchassis, crt-board shield with top overhang: Red color very dim or absent:

Resolder broken connections on the "red cut" control (RV801 on the CRT board). The manufacturer produced a large number of this model with that device improperly installed. Re-balance colors as necessary.

Chapter 4) 8512 s/n 72-xxxxxxx (7 digits after 72-)

This model has extensive metal shielding inside. The power supply is a separate unit in gray metal housing. Power cord permanently attached, cover has Torx screws:

Symptom: Squealing sound from power supply; supply operates normally when 2-wire (red/white) power connector is removed from CRT board:

Failure: One or more shorted video driver transistors: 2SC3502, 2SA1370. (No ECG equivalents are listed.)

Symptom: No power, or power supply making squealing sound. Exploded capacitors on CRT board or inside power supply:

Replace exploded capacitors (10 uf 100v) as required. Replace C18, C21 and C22 in the power supply. Use high-temperature types. Failure of these capacitors may cause the power supply's regulation to fail, causing power filter and video decoupling capacitors to explode. The power supply to the CRT board should deliver aprox. 70 volts.

Symptom: Vertical foldover, possibly decreasing with warmup: replace C408 and C425 (near extruded heatsink).

Symptom: One color absent or displayed improperly, or "2401" error.

Problem: Bad video cable. Wires often break inside the connector. There are several variations of the inner end of the cable. The one most prone to failure is used on 8512 s/n 72-xxxxxxx. Its IBM part number is 61X8888. It is also available from other sources.

New connectors are available from electronics parts distributors, but installing them is very difficult because the inner

conductors of the coaxial cables are small and brittle. We have spliced a few cables recovered from junked monitors but that is a laborious process.

IBM agreed to replace some 8512 and 8513 monitors under certain conditions: See IBM documents 8512 ECA026 and 8513 ECA017. The replacement offer has long EXPIRED.

8512's: Serial number with "72" prefix, s/n between 72-0120000 AND 72-0405000: Display is out of focus and/or excessively bright.

8513's: Serial number with "72" prefix, s/n below 72-0640000: Display out of focus.

Those series appear no less reliable than others. Some replacement units were new, others are used/reworked and have new serial numbers attached. These appear to have new flyback transformers. Some have subsequently failed for other reasons.

Symptom: Out of focus (8513 s/n 72-...)

If the focus control on the flyback is turned to the end of its travel and the display is still out of focus, replace the flyback. Replacement type is TFB-185A. The replacement may appear to have two controls instead of one; the control labeled SCREEN is a dummy (see below).

Many of our 8512 and 8513 monitors have failed from long service: Since they have integral power switches, and the screens are black when the computer is turned off, users tend to leave them on forever. Life will be significantly extended by turning them off overnight and on weekends.

CRT focus degrades with age. If the picture will not focus satisfactorily and the focus control is not at an extreme (see above), repair is not economical unless you have a good tube salvaged from a scrapped unit. Transplant the CRT and deflection yoke together; if the yoke is disturbed, reconvergence of colors is extremely difficult.

Symptom: Left and right edges of picture are curved inward (pincushion distortion); internal adjustments (E/W and Width) inoperative. Occurs after a few years' service.

Replace capacitor C225 (22uF 50v 105 deg.C).

Symptom: Fluctuating brightness due to erratic screen voltage in 8513 with serial number beginning 72-xxxx:

R477 (3.3M 1/4 watt) fails from high-voltage breakdown. Replace with same value, 1/2 watt, or two 1.6M 1/4w in series. Resistor is located between flyback transformer and aluminum heatsink of horizontal output transistor. This model 8513 has only one control (focus) on its flyback; the screen-voltage control is on the board attached to the CRT socket.

I replace this resistor on general principle in aging monitors, and readjust the screen voltage (variable resistor on CRT-socket circuit board). These monitors usually also need their color balance readjusted (controls labled R.BKG, G.BKG, B.BKG at rear of main board).

Symptom: No picture, no high voltage; pilot lamp on or blinking:

Replace flyback transformer. We have had many flyback failures, and have located a good source of replacements:

Component Resource Corp.
15316 East Valley Blvd.
City of Industry, Ca. 91746 1-800-366-1272

This company also has replacement flybacks for DEC VT-240 color monitors (actually manufactured by Amdek).

Before replacing flyback: Look for broken solder connection at flyback pins and deflection yoke connector.

The horizontal-output transistor appears robust; we have never replaced one, even after flyback transformer failure.

Symptom: One color absent or displayed improperly.

The large circuit board attached to the CRT socket contains the cathode drivers for each color. The large output transistors and their driver transistors often fail. Apply a test pattern (e.g., white-on-black text) and use an oscilloscope to compare the three color channels, to locate the failed component(s).

Before we discovered the most common problems of 8512 and 8513 and located a source of replacement flybacks, we had several repaired (with good results) by:

Circuit Test, Inc.
12479 W. Hillsborough Ave.
Tampa, Florida 33635

Connector pinout of IBM color VGA connector (model 8513):

```
1  Red video                          9 Reserved
2  Green video                       10 Ground
3  Blue video                        11 Monitor sense (ground)
4  Reserved (absent)                 12 Monitor sense (open)
5  Self test                         13 Horizontal synch
6  Red video return (coax shield)    14 Vertical synch
7  Green "     "       "     "       15 Reserved (absent)
8  Blue  "     "       "     "
```

The "self test" line causes a white raster on the screen when the cable is disconnected. The video signals are terminated at 75 ohms.

Chapter 5) IBM 8514 MONITOR

Model 8514 appears far more reliable than 8512 and 8513. Relatively few of them are in use at this location, and they have needed little repair.

Symptom: Squealing noise, vertically-unstable picture.

Replace the small electrolytic capacitors in the power supply. Use high-temperature types.

Chapter 6) IBM 5154 AND 5175 MONITORS

EGA (5154) and PGA (5175) monitors are nearly identical except for the video electronics contained in a metal box on the left side (when facing the screen). Schematics ARE available from IBM, in _Technical Reference, Options and Adapters, Volume 3_ of the "Personal Computer Hardware Reference Library." Introduced in the mid 1980's, many 5154 and 5175 monitors are nearing the end of their service lifetimes, i.e., tubes have dim picture and poor focus, and numerous capacitors' values have decreased. In severe cases, we advise users to scrap the monitors and convert to VGA.

The most common failure is in the power supply: Symptoms include chirping noise, repetitive startup/shutdown (blinking LED pilot lamp) or jagged edges on left and right of picture.

Replace three small electrolytic capacitors in the power supply: C11 (47uF 40v), C13 (10uF 35v) and C14 (1uF 35v). These capacitors fail from heat after long service.

The power-supply unit is removable. You must drill-out three pop- rivets to open the metal box; replace them with sheet-metal screws.

Symptom: Vertical foldover in EGA mode, or incorrect vertical centering.

Replace C311 (100 uf 40v) near vertical amplifier (IC300).

Chapter 7) IBM 3192 CRT Terminal

My employer, an enormous state university, has found it very economical to discontinue maintenance contracts on about eight hundred IBM 3192 terminals and repair them in-house. 3192 repairs are generally trivial, however, the assumed importance of the administrative functions for which they are used makes it extremely expedient to keep an adequate supply of spares available for instant replacement.

The 3192's color monitor has insides somewhat reminiscent of the 8512 and 8513 VGA monitors (see above).

Case Removal:

The back cover of the monitor is held by two screws on the bottom and two plastic spring-clips on the upper left and right sides (visible with flashlight through rear ventilation slots). Use two L-shaped tools (e.g., back-plates from IBM PC), inserted through upper ventilation slots on the sides, to depress both clips simultaneously. Then lift the cover off.

Symptom: No power, blown fuse.

The de-gaussing thermistor has probably shorted. This is the most common failure we have encoutnered in 3192's. The thermistor is identical to those used in 8512 and 8513; see above. Before replacing fuse, use analog ohmmeter, or diode-test function on DVM, to check the junctions of the two large power transistors in the power supply section. Alternatively, measure resistance across the line-voltage filter capacitor (C107) with power OFF and capacitor discharged. The resistance should be greater than 500 ohms.

An intermittent "flutter" of the display can indicate incipient failure of the de-gaussing thermistor; it is supposed to conduct current through the de-gaussing coil for a few seconds during initial power-on. Prior to failure, it may begin to conduct during normal operation after warmup.

Symptom: No picture; repetitive clicking or beeping sound.

Bad part: High-voltage divider (the assembly between the flyback transformer and the CRT anode), IBM part number 6405282 (about $20).

Replacement is easy: Unclip and unplug the ends going to CRT and circuit-board. Pry the red plastic retaining ring out of the flyback transformer; save it for the new divider assembly.

We have had difficulty obtaining voltage dividers from IBM; an equivalent is available from Component Resource Corp (see address above), same part number. Its red high-voltage wire is larger in diameter than the original component: Use a 11/64" drill to enlarge the hole in the red ferrule on the flyback; use a flat file to reduce the bumps on the sides, and use a rat-tail file to make the split part of the plastic thinner.

Voltage-divider failure causes additional damage in about 50% of 3192's:

Symptom: Vertically-rolling picture (no vertical synch) but video is present over entire face of tube.

This symptom often appears after the HV divider is replaced. The bad component is IC303, which is a 7406 (TTL open-collector hex inverter). Installing a 14-pin socket at IC303 may be advisable.

Horizontal-synch problems may also result from failed IC303 (7406).

A severely-shorted voltage divider may pull power-supply voltages to low levels, resulting in the unit appearing dead (no pilot-light) although the fuse is intact. Disconnect the red HV wire from the flyback transformer, then apply power. If pilot light illuminates, replace voltage-divider.

Chapter 8) 3192 MAJOR MELTDOWN

A 3192 left on for a long time with shorted high-voltage divider will destroy multiple components in succession without blowing the fuse. All these parts may be bad:

```
Switching transistor Q201 (2SD1441 or 2SD1739 *)
Driver transistor Q101 (2SD836)
     Look for burned transistors or other signs of high heat.
Flyback transformer (about 25% of cases)
One or both 0.82 ohm 5w resistors
7406 (IC 303)
Vertical amplifier TDA2653.
```

* Newer models of 3192 are recognizable by a lighter shade of green circuit board with a smaller parts count and natural-aluminum heat sinks (instead of black anodized). The power-supply switching transistor is 2SD1739 (ECG2324

equivalent) instead of 2SD1441. These types are not interchangeable because 2SD1441 contains an internal damper diode.

Symptom: Power supply dead, no pilot light.

Check diode D210. In the new model it is a plastic diode instead of ceramic, and several have been found shorted. Other power supply components (listed above) may also be damaged. D210 must be a fast- recovery type diode.

Symptom: No vertical synch, horizontal line in center of tube, possibly with deflection above or below line.

Bad part: Vertical amplifier (TDA2653A: large IC on heat sink). Sometimes fails along with power supply, voltage divider and IC303, as described above.

Symptom: No video but high voltage and sweep are present.

Check Q204 (npn), Q203 (pnp), or IC201 (7812; 20v in, 12v out). The front-panel contrast pot controls Q404 which biases the video drivers on the CRT board. Q204 and Q203 are powered by +12v from IC201. Failure of any of those three devices will cut off video.

Most 3192's have proprietary-numbered integrated circuits. By inspecting numerous units, we have compiled a list of industry-standard numbers:

```
IC201     7812       +12v regulator
IC301     TDA2582    (rare failure makes power supply inoperative.)
IC302     74LS221    function?
IC303     7406       vert. and horiz. sync buffers
IC401     LM723      voltage reg. IC for +5v; drives Q404.
IC501     TDA2653A   vertical amplifier.
IC800     LM320T-12  or 7912  (-12v regulator)
IC801       ?        function?
```

8.1) Other semiconductors

```
D401      MUR815    high-speed rectifier for +5v supply.
Q101      2SD836A   power supply switcher
Q201      2SD1441   power supply switcher
Q203      2SA1127   (pnp) failure causes loss of video.
Q204      2SC1685   (npn) controls contrast via front panel pot.
Q301      2SC1685
Q302      2SC1685
Q401      2SD1441   horizontal output
Q403      2SA777
Q404      2SD1442   +5v pass transistor
Q405      2SA1127
Q409      2SC1685
```

8.2) Video drivers on CRT board

```
Q604,5,6  2SC1789O
Q601,2,3  2SC2258
```

Connect terminal to the appropriate communications system and adjust the picture as needed, before replacing the back cover. The upper knob on the flyback transformer is CRT focus, the lower knob is screen voltage (a.k.a. "sub-brightness").

Power switches commonly fail in 3192's. The switch (part number 8233403) is available from IBM. Since 3192's are rarely turned off, it is practicable to remove a broken switch and solder wires between the circuit-board pads in order to return a unit to service temporarily if new switches are not in stock.

25-pin connector on back of 3192 CRT unit

```
1, 4, 5, 13, 14, 16, 25 GND
2                       +12v
3                       -12v
6, 10, 11, 12, 19       ?
7,9                     +5v
8, 15, 20               NC
17                      vertical sync
18                      horizontal sync
22, 23, 24              video (3 colors)
```

Chapter 9) Cable A603 to CRT board

```
1                       +5v
2, 4, 6, 8, 10          0v
3, 5, 7                 video (3 colors)
11                      +123v
12                      +65v
13                      +90v
14                      3-6v front-panel contrast control via Q204.
```

Mac Monitor Company Database

The largest database of Mac monitor companys.

Acer America Corporation
Addonics
ADI Systems
Altima
AMAX Enginnering Corp.
Amdek
Amstrad
AOC International (USA)
Apollo Audio Visual
Apple Computer, Inc.
Arche Technologies, Inc.
ArtMedia
AST Research
ATI Technologies Inc
Aydin Controls
Barco, Inc.
Business Technology Manufacturing, Inc.
CalComp, Inc. (Div. of Lockheed)
CD Solutions
Compaq Computer
Conrac Display Products, Inc.
Corion Industrial Corp.
Cornerstone Technology
Covid, Inc.
CTX International, Inc.
Cutting Edge
Darius Technology, Ltd.
Daytek Corporation
Digital Equipment Corporation
Dell Computer Corporation
Delta Products Corporation
Diamond Multimedia
Digiview
DTI
Emachines (Radius, Inc.)
Ehman Engineering, Inc.
Electrohome Display Systems
Epson America, Inc. (subsid of Seiko)
ETC Computer, Inc.
Everex Systems
Focus Enhancements, Inc.
Fora, Inc.
Generation X Technologies
Genova, Inc.
GoldStar Technology, Inc.
GVC/MaxTech Corp.
Hardware That Fits
Hewlett-Packard Company
Hitachi America, Ltd.
Hyundai Electronics America
IBM
IDEK / Iiyama North America, Inc.
Identity Systems Technology, Inc.
Iicon Corp.
Ikegami Electronics (U.S.A.), Inc.
Image Systems Corp.

Infotek, Inc.
Inteeolor
IOcomm International Technology
ISIDORE Systems
Josiah Systems
KDS USA
KFC/Elecom Systems
Lapis
LG Electronics (see Samsung)
Link Technologies (see Wyse)
Liyama North America
MacProducts, USA
MAG InnoVision, Inc.
Magnavox (Phillips Consumer Electronics
Mantech Solutions Corp.
MegaGraphics
Megatron Computer Systems
Micro Display Systems
MicroTouch Systems
Microvitec, Inc.
Mirror Technologies, Inc. (Div. of MacUS
Synnex Information Technology
Mitsuba Corp.
Mitsubishi Electronics America, Inc.
Mobius Technologies, Inc.
Moniterm
NANAO USA Corp.
NEC Tecnologies, Inc.
Nokia Display Products, Inc.
Nissei Sangyo America Ltd. (Hitachi)
Number NineVisual Technology
Nutmeg Systems, Inc.
Optiquest Inc.
Orchestra MultiSystems Inc.
Packard Bell Electronics, Inc.
Panasonic Communications & Systems
Personal Computer Peripherals Corp.
PDS Video Technology
Philips Consumer Electronics Co.
Pixelink Corporation
Planer Systems
Portrait Display Labs, Inc.
Power R, Inc.
Presenta Technologies Corp.
Princeton Graphic Systems
Products Interactive, Inc.
Proton Corporation
ProView Electronics Corporation
Proxima Corp.
Qume Corporation
Radius, Inc.
Rasterops Corp.
Relax Technology, Inc.
Relisys
Sampo Technology, Inc
Samsung Electronics America, Inc.
Samtron Displays, Inc.
Sceptre Technologies, Inc.
Seiko Corporation of America
Sharp Electronics Corp.
Sigma Designs, Inc.
Silicon Graphics, Inc.

Smile International, Inc.
Sony Electronics, Inc.
Sun Microsystems
SuperMac (Radius Inc.)
Swan Technologies
Tatung Co. of America, Inc.
Taxan
Tech 101 Office Automation
Techmedia Computer Systems
TriAm, Inc.
TTX Computer Products
TVM Professional Monitor Corp.
TW Casper Corporation
TechWare Electronics Corp (TWE USA)
VCS (Hitachi)
ViewSonic Corp.
Wen Technology Corp.
Wyse Technology
Zenith Data Systems

Sources of Repair Information and General Comments

Contents:

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Chapter 1) About the Author

SOURCES OF REPAIR INFORMATION AND GENERAL COMMENTS

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Corrections/suggestions: [Feedback Form] [mailto]

Chapter 2) Sources of Information

2.1) Manufacturer's service literature

Service manuals are available for a great deal of consumer electronics. Once you have exhausted the obvious possibilities or mechanical problems, the cost may be well worth it. Depending on the type of equipment, these can range in price from $10-50 or more. Some are more useful than others. However, not all include the schematics so if you are hoping to repair an electronic problem try to check before buying.

2.2) SAM's Photofacts

These have been published for over 45 years (I don't know for how long but I have a set for a 1949 portable (3 inch) Pilot TV - about as portable as an office typewriter if you remember what one of those was like) and are generally the best most consistent source of service info for TVs, radios, some VCRs and other consumer electronics. There are some Computerfacts but the number of these is very limited. The VCRfacts are also somewhat limited and the newer ones tend to have strictly mechanical information.

SAM's are often available (for photocopy costs) from you local large public library which may subscribe to the complete series. If not, a large electronic distributor can order the selected folder for you.

Jump to info on [Where to buy SAMs manuals...]

One advantage of the SAM's info is that it is compiled in a very consistent format so that once you are familiar with one model TV, it is easy to transfer that knowledge to any other. They provide waveforms at key locations and DC voltage measurements almost everywhere. Additional info such as IC pin to ground and coil resistances are often provided as well. The manufacturer's service manuals are generally not nearly as complete.

(BTW, I have no connection with SAM's.)

2.3) Inside cover of the equipment

TVs often have some kind of circuit diagram pasted inside the back cover. In the old days, this was a complete schematic. Now, if one exists at all, it just shows part numbers and location for key components - still very useful. Some TVs - as late as 10 years ago, maybe even now - included a complete schematic with the product information and owner's manual. I have a 1984 Mitsubishi which has this. It is, however, the exception rather than the rule anymore.

Microwave ovens almost always have a schematic diagram of the microwave power generation circuitry pasted inside the sheetmetal cover. This will always include the high voltage transformer, interlocks, rectifier, capacitor, and magnetron. Since most microwave oven problems are in these areas, this is all you are likely to need. The controller, especially electronic units, is often omitted or only covered superficially.

2.4) Parts information

I have found the most useful single source for information on semiconductors to be the ECG Semiconductors Master Replacement Guide, about $6 from your local Philips distributor. STK, NTE, and others have similar manuals. The ECG manual will enable you to look up U.S., foreign, and manufacturer 'house' numbers and identify device type, pinout, and other information. Note that I am not necessarily recommending using ECG (or other generic) replacements if the original replacements are (1) readily available and (2) reasonably priced. However, the cross reference can save countless hours searching through databooks or contacting the manufacturers. Even if you have a wall of databooks, this source is invaluable. A couple of caveats: (1) ECG crosses have been known to be incorrect - the specifications of the ECG replacement part were inferior to the original. (2) Don't assume that the specifications provided for the ECG part are identical to the original - they may be better in some ways. Thus, using the ECG to determine the specifications of the parts in your junk bin can be risky.

2.5) Common Parts Suppliers (North America)

(From the Editor)

I pulled the above from other documents on this site and added some on my own. I hope Sam doesn't mind I stuffed it in the middle of his document :-)

Note: If you represent an company that would like to be included here, please send me your contact info/summary. The only **conditions** for inclusion are that you sell parts in small quantities and deal with individuals (minimum orders below $50). That's who these pages are for, after all :-) (In this regard, Fox Int is pushing its luck...)

Computer Component Source
Tel: 1-800-356-1227 (US)
Fax: 1-800-926-2062 (US)
Tel: 1-516-496-8780 (Int)
Fax: 1-516-496-8784 (Int)
Mostly computer monitor replacement parts, also, some electronic components including semiconductors.

CRC Components, Inc.
Tel: 1-909-468-9711
They sell monitor and TV flybacks.

Dalbani
Tel: 1-800-325-2264 (US)
Fax: 1-305-594-6588 (US)
Tel: 1-305-716-0947 (Int)
Fax: 1-305-716-9719 (Int)
Excellent Japanese semiconductor source, VCR parts, other consumer electronics, Xenon flash tubes, car stereo, CATV.

Electro Dynamics Inc (EDI)
Tel: 1-800-426-6423
Has flybacks and repair parts for a lot of TVs, monitors, and VCRs.

Electronix
Tel: 1-800-223-3205
WWW: http://www.electronix.com/elexcorp
E-Mail: sales@electronix.com

VCR parts and other replacement parts. [Request Free Catalog]

Fox International
23600 Aurora Rd.
Bedford Hts., OH 44146
Tel: 1-800-321-6993
Fax: 1-800-445-7991 (FaxBack, 24-hours/day)
VCR parts and an excellent catalog with cross-ref guide.

NOTE: They will **NOT** send you a catalog without a Tax ID number. They tried to sell me on the reason for this is that they sell some chemicals which they can not sell to end-users (as if that BS even slowed me down :-)

International Components Marketing (ICM)
Tel: 1-800-748-6232
Has flybacks and repair parts for a lot of TVs, monitors, and VCRs.

JDR Microdevices
Tel: 1-800-538-5000
Tel: 1-800-538-5002 (tech support)
WWW: http://www.jdr.com
Has basic chips, tools, crystals, **no minimum order**.

MCM Electronics
Tel: 1-800-543-4330
Fax: 1-513-434-6959
VCR parts, Japanese semiconductors, tools, test equipment, audio, consumer electronics including microwave oven parts and electric range elements, etc.

Mouser Electronics
Tel: 1-800-34-MOUSER (Sales/Service)
Tel: 1-800-346-6873 (US)
Tel: 1-800-992-9943 (US Catalog Subscription) General electronics parts including trigger transformers, magnet wire, rechargeable batteries, laserdiodes, photodiodes.

Parts Express
Tel: 1-800-338-0531
VCR parts, tools, speakers, and other replacement parts.

Premium Parts
Tel: 1-800-558-9572
Fax: 1-800-887-2727
Very complete VCR parts, some tools, adapter cables, very extensive selection of all the usual and unusual belts, tires, rollers, etc. They can also custom "rebuild" a roller if you send them the dead one. The catalog is a must-have.

2.6) Internet Sources

Many manufacturers are now providing info via the World Wide Web. The answer to you question may be a mouse click away. Perform a net search or just try to guess the manufacturer's home page address. The most obvious is often correct. It will usually be of the form "http://www.xxx.com" where xxx is the manufacturers' name, abbreviation, or acronym. For example, Hewlett Packard is hp, Sun Microsystems is sun, Western Digital Corp. is wdc. It is amazing what is appearing freely accessible via the WWW. For example, disk drive manufacturers often have product information including detailed specifications as well as complete jumper and switch settings for all current and older harddrives.

2.7) Taking the unit to a repair shop

As with medical problems, an accurate diagnosis can only be made with good complete information. Use your senses to their fullest. If you do decide to have the unit professionally repaired - and depending on your level of experience and confidence, this may be the wisest choice - the more complete your description of the problem the easier (and cheaper) it will be to locate the problem. Include functional behavior or lack thereof, mechanical and electronic sounds it makes, anything that is related at all to the operation of the unit. Sometimes seemingly unrelated factors can be important. For example, the fact that your officemate rearranged their desk and you monitor's image is now shaking. Don't omit anything - even what you feel is inconsequential - leave that judgement to the repair person. Also, what may have changed in your setup, did you move the equipment recently or add a component? What about your cable connections? Did you rearrange the furniture? When was the last time you know it worked properly? What were you trying to do at the time of the failure? To paraphrase a famous quote: 'The only stupid or useless information is that which is not provided'. However, unless you really are sure of what you are talking about, don't try to tell the repair person what you think the problem is likely to be. Don't bombard them with buzzwords - any competent tech will see right through that. You can be sure that if you mention that you suspect the expensive flyback is toast, it will be diagnosed as bad. Let them do their job. Listen carefully to their diagnosis. You should be able to tell if it makes sense.

2.8) Posting to sci.electronics.repair

This is a bit different - speculation is safer. There is enough crosschecking such that any gross errors in analysis will be uncovered. There is also generally no profit motive. If your speculation is totally bogus, you will find out quickly enough, turn various shades of red - and learn from the responses. Here are some tips:

- **Please read the Repair FAQs or Repair Notes first.** Your problem may be covered. Even if an exact solution is not provided there, the additional information will allow you to ask your questions more intelligently and therefore arrive at a solution more quickly.
- Put the type of device (i.e., VCR, CD player), manufacturer, and model number in the subject header as this will get the attention of the professionals. If you do not provide this info, the first reply you will get will be to provide it. Avoid this waste of Net bandwidth. For general questions, such info may be unnecessary, but it will not hurt.
- As with professional repairs, provide as much relevant information as possible. Ambiguity can lead to totally bogus advice.
- **Don't ask for an email response.** First of all, it is very impolite. Sci.electronics.repair was not created for your benefit. We do this because we like to help people but at the same time do not want to feel like we are being taken advantage of or taken for granted. We are not your private consulting service. In addition, others will know when an adequate response to your query has been provided and will not need to waste their time repeating the same information. And, everyone will learn something in the process.

  More importantly for you, receiving replies via email will circumvent one of the most important functions of the newsgroup - crosschecking to locate errors in responses either because the responder didn't know what they were

talking about or made an error in interpretation. Yes, you will need to read the newsgroup for a few days. That will be a small sacrifice and well worth the effort.

- Don't accept the first response as the definitive word. Gather a few replies and followups and then you will be able to make an evaluation of which to believe and act upon. Post a question for clarification, if needed.

Where can I get a manual/schematics for equipment?

Note: If you know of something that is incorrect or missing from this page, please [send me your info/comments]. Thanks!

[Test areas are mostly HP and Tektronix oriented]

Contents:

[Document Version: **2.15**] [Last Updated: **3/26/96**]

Chapter 1) Contributors

Rich Osman, Michael Covington, Jim Mc Vein, Richard D. McRoberts, Jeff Gruszynski, James Walker, Bill Mayhew, Stanley Perkins, Mike Serafin, Thomas G Booth, Scott Holderman, John T. Black, Ronald Zettlemoyer, Jerilyn McLaren, Paul Hudson, Stan Griffiths W7NI, Terry O'Laughlin, Mark Wolfe, Joel Kolstad, Jim Tannenbaum, Bob Parnass AJ9S, Gary H. Harmon, Jr., Nigel Cook, and John De Armond

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Chapter 2) Tektronix Manuals/Parts

- http://www.tek.com/Measurement/App_Notes/XYZs/contents.html
  XYZs of Oscilloscopes. Courtesy Tektronix

- Ed Matsuda
  Test Equipment Manuals
  P.O. Box 390613
  San Diego, CA 92149
  Tel: 1-619-479-0225
  Fax: 1-619-479-1670

  "He Sells HP and Tek Manuals"

- Deane E. Kidd W7TYR
  27270 S.W. Ladd Hill Road
  Sherwood, OR 97140
  Tel: 1-503-625-7363

  Mr. Kidd is a retired Tek engineer who sells old Tektronix manuals:

  For example, a 465 manual is $35. Also available, for $20, is Stan Griffith's "Oscilloscopes: Selecting and Restoring a Classic"... As reviewed by Wes:

"I bought that one through Tucker Electronics and it is one good book for anyone who has an old Tek scope. It details how to troubleshoot them, where to find parts and most of all, it rates them as to their serviceability in today's electronics. It also covers the MANY plug-in's out there. I had no Idea how Many was there! Like a strain gauge pulg-in?? Good book and worth the money (as I own 4 old Tek scopes and love each of them dearly ;-)"

And here's a something from Stan Griffiths, the author himself:

[in response to a plea from an owner of a dead 454 scope]

> Mac, I was sorry to hear that your 454 bit the dust. It is certainly worth a lot of effort to get it going again. One thing you might check are the tunnel diodes in the sweep and trigger circuits. I have seen them go bad for no explainable reason. I have some 152-0125-00 TDs if you need them for $5 each. (Tek wants $38 each.) If you don't know if you need one or not, you can test your TDs on a 575 Curve Tracer. If you don't have access to a curve tracer, you can mail your TDs to me and I will test them on my 575 for you. I will send checked ones to you if I find a bad one.

You may recognize my name as the author of "OSCILLOSCOPES--Selecting and Restoring a Classic". I love old Tektronix scopes and I want to see yours run again. I own 454 S/N B010100 (the first one!) which I bought in a local estate sale. It was the estate of one of the design engineers who worked on the project. I guess you don't have to be dead to have an estate sale since he was there personally to sell me the instrument!

Stan Griffiths, W7NI
E-mail: W7NI@teleport.com

- Bob Garcia
  Tel: 1-404-977-5701

  Bob is a retired Tek engineer who refurbishes and sells scopes for spending money. A typical deal will be a 60 MHz transistorized Tek scope for about $125. Anyone who attends hamfests in the southeast will recognize Bob as "Mr Scope."

- R5-D3 Electronic Surplus
  Portland, OR
  Tel: (503) 774-6560
  Ask for Bob Lee.

  [Older Tektronix 'scope stuff/plugins/manuals]

  If he doesn't have what you are looking for, he will know who to point you to here in the land of Tektronix.

- Tektronics, Inc.
  P.O. Box 500
  Beaverton, Oregon 97077
  Tel: 1-800-426-2200 (best)
  Tel: 1-800-838-3553

  Most older manuals are available as fische only. The paper versions are sky high if they're available. I paid $7 for a 561A manual, and $5 and $10 for the amp and timebase plug-in manuals. Newer scope manuals are about $25 on fische, and in excess of $100 for the paper version. I was able to find a surplus fische reader at the SW Bell surplus store for $10, so it's not to bad.

  HP is much better when it comes to pricing on their paper manuals :-(

- Research Products Corp
  1015 E. Washington Ave
  Madison, WI 53703
  Tel: 608-257-8801

  The source of the OEM Tek scope air filters is alive and well.

Chapter 3) Hewlett Packard (HP) Manuals

- Hewlett Packard also sells manuals for [basic] instruments. If they don't have printed manuals anymore, they still try to stock the microfiche versions.

  In the US & Canada: 1-800-227-8164, 6AM-5PM Pacific Time, Monday-Friday. (Prices are between $25-$40 each for these ones when I looked, but this could change tomorrow. Call to get the latest prices)

  Tel: 1-800-227-8164 6AM-5PM Pacific Time, Monday-Friday

  Call to get the latest prices.

  Another number to try is:

  Tel: 1-800-452-4844

  But it could be old.

Chapter 4) BK/B&K/B+K

B+K Precision
Maxtec International Corp.
6470 W. Cortland St. (could be '6460')
Chicago IL 60635
Tel: (312) 889-1448
Fax: (312) 794-9740

Ask them for the servicing information manual and calibration procedure. Inform them of the model year and serial number.

Chapter 5) Various Other Manuals Sources

- Domain BBS 1-208-375-6571

  Marty Gasmans service manuals are included as are manuals from other individuals. You may search the database while online, add your own entries, change your own entries and delete your own entries. Anyone may log onto the BBS and search any of the databases. Please feel free to add service manuals that you no longer need and would like to sell. If you have a very large list of manuals, contact the sys-op for a free database program that will let you enter the manuals off-line and then upload them to the database.

- Trilithic
  9202 E. 33 St.
  Indianapolis, IN 46236-4200
  Tel: (317)895-3600

  They provide support and manuals for older **Texscan** brand spectrum analyzers, signal generators, or field strength meters.

- Fair Radio Sales
  Lima, OH
  Tel: 1-419-223-2196
  Tel: 1-419-227-6573 (old?)

  They carry some older manuals as well as tubes of all sorts. Call them and ask for a catalog.

- Manuals Plus
  Tel: 1-206-531-8031

  These folks deal in service manuals for test equipment. Expect to pay $30-$50. I've been hit for over $100 on manuals for newer equipment.

- Service Center
  Paramus NJ
  Tel: (201) 262-9550

  They have Service/Information on Fluke meters.

- Tucker Electronics
  Dallas, TX
  Tel: 1-800-527-4642

  They are another good source of used manuals for older instruments.

- Alton H. Bowman (W2ZUX)
  4172 East Ave., RD2
  Canandaigua, NY 14424-9564

  Al says he has manuals for everything from garage door openers to electronic organs, CB radio (gulp), test equipment, ham radio, etc. He specializes in equipment from the 1920-1970 era, and says,

  > " Most of my material is tube type (that could mean BAs for those of you in Rio Linda). [...] I charge $5 for a schematic with 1-6 pages of text. Real complicated schematics I enlarge to 11X17, same price. Manual proces depend on the number of pages; 6-10 pages $6, 16-30 pages $8, etc. Material is good photocopy, subject to yur approval, or your money refunded."

Chapter 6) Heathkit Schematics/Parts

- Heathkit Education Systems
  Heath Company
  PO Box 1288
  455 Riverview Dr
  Benton Harbor Mi 49023-1288

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Catalog/Mailing list subscribe:  1-800-44-HEATH
Order by Phone                :  1-800-253-0570
Order by FAX                  :  1-616-925-4876
Customer Service              :  1-800-253-0570
Technical Consulting          :  1-616-925-4914
Parts Replacement/Repairs     :  1-616-925-3273
Manuals                       :  1-616-925-5899 (8-4 EST)
```

- The Manual Man
  27 Walling St
  Sayreville, NJ 08872
  Tel: (908) 238-8964

Chapter 7) Computer Schematics

(From JohnM@daka.com)

Detailed schematics for Mac's are available. They can be obtained from:

Bomarc Services
P.O. Box 1113
Casper Wyo 82602
Tel: (307) 234-3488

Chapter 8) Misc Articles/Info

- If I may blow my own horn for a moment, September 1994 issue of Electronics Now contains an article I wrote called, "New Life for Old Oscilloscopes," by Michael Covington, complete with a schematic of a Heath IO-12.
- If you are looking for some obscure manual, you should just a hop skip and jump to **THE** ham radio mecca in Dayton, OH at the end of the month of April. There's no excuse available for not going. Things like weddings get postponed so hams can make it to the Hamvention. I'm sure you'll find manuals for the scope frame and all the plug-ins at Dayton. Cost is probably about $5 to $15 each.

Chapter 9) SAMS Manuals

9.1) New

Howard W Sams & Company
2647 Waterfront Parkway East Drive
Indianapolis, IN 46214-2041
Tel: 1-800-GET-SAMS
Tel: 1-800-428-7267

Ask for a catalogue. Sams Photofacts is a company that publishes service data on TVs and radios going back to the 1930s. More importantly, their catalogue is full of ads for parts suppliers, and it also gives manufacturers' addresses.

9.2) Used (but a lot cheaper)

(From Jim Tannenbaum)

A. G. Tannenbaum
P. O. Box 386
Ambler, PA 19002
Tel: (215) 540-8055
Fax: (215) 540-8327

E-Mail: k2bm@agtannenbaum.com

Note: They have moved to Pennsylvania from East Rockaway N.Y. Old address is no longer valid (above is new address).

(From Michael Roberge)

Sams PhotoFact folders:

- Number 1 to 1400 cost $5.00/each
- Number 1400 and up cost $7.00/each

VCR manuals(Sams or Originals):

- $15.00/each

Other manuals:

- Please Call

This source carries previously owned schematics for VCR, TV, AUDIO and some test equipment. Being previously owned they are able to resell them for a fraction of the cost of new. Coupled with this is the fact that they have a wide selection from many manufactures. They carry SAMS PHOTOFACTS and original manufactures service literature. I have personally purchased many manuals from this source. Initially I was concerned that they are used but I must say that this has not been a problem. Never has a single page been missing and otherwise in almost like new condition.

In the event that they don't have the exact schematic for a specific model the owners have cross reference manuals which they use in an effort to locate possible 'look-a-like' chassis for which they might have a manual. I am told that they have many...many filing cabinets full of manuals.

Payment is generally expected in advance until a good working relationship is established. All manuals are shipped first class for $1.50 and they get them out fast.

Tell them I sent you.

Chapter 10) VGA/SVGA Monitor Schematics

Before you send off for any schematic, it is **highly** recommended that you:

- Read the Notes on repair and diagnosis of Computer and Video Monitors FAQ
- Post to sci.electronics.repair group to ensure that you actually **need** the schematic.

Some problems can be fixed without one and in other cases, a schematic will not help to begin with. Most schematics will cost over US$50 and, as a rule, are **NOT** returnable!

In your post to sci.electronics.repair, please include:

1. Brand, Model Number, and FCC code
2. Clear and accurate description of the problem
3. How the problem appeared and what are the symptoms
4. What you have checked already (including the FAQ!)
5. The level of your electronics repair experience

Note: If you represent a firm that provides schematics to consumers (quantity of 1 and under $100 minimum order), please [send me your info/contacts] information. Thanks!

- Computer Component Source (CCS)
  Tel: 1-800-356-1227
- MI Technologies
  Tel: (513) 335-4560
- Amkotron
  1-800-344-3882
- EDI
-
-
-
-

Chapter 11) Misc Trivia

HP's 54600 series knows how to play Tetris!

In the Display/Utility menu, press soft keys 2 and 3 both at once. Or maybe it's 1 and 2. Or maybe 3 and 4. :-) [One of those two other key combinations will get you into a cool debugging menu!])

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*This article was written by **filipg@paranoia.com** [Feedback Form] [mailto]. The most recent version is available on the WWW server http://www.paranoia.com/~filipg [Copyright] [Disclaimer]*

UL Codes

Thanks to several members for providing this list of UL codes. This list is by no means complete.

If you see any errors, or have info to add, please post it to NESDAnet so we can all benefit. After the list is the phone number and information on how to call the FCC for specific FCC numbers.

UL Code/Manufacturer

130Z Magnavox

136J Marantz

146C Goldstar

146T JC Penney

153L NEC

16M4 Samsung,Supra,Multitech,Totevision, GE, RCA, Sears, Proscan

174Y Toshiba, Sears

186Z Akai

238Z Hitachi, RCA, GE, JC Penney, Proscan, Pentax

23K4 Harmon Kardon

246T Daewoo

270C Sony

277C JVC

282B Sharp

285B Sharp

289X Emerson

333J Teknika

333Z Funai, Teac, Realistic, Memorex, Porta Video, Magnavox, Symphonic

336H RCA

347H Philips

398U Fisher

403Y Sanyo/Fisher, Realistic, Sears

409C Mitsubishi

418U Sanyo

41K4 Daewoo, Portland, Daytron, GE

436L Quasar

439F JVC, Zenith, Kenwood, Sansui, Magnavox

43K3 Kawasho

444H Zenith

44L6 TMK, Emerson, Lloyds, Brooksonic

459E GE, Jensen

48J2 Sony

49K0 RCA

504F Sharp, Wards, KMC

51K8 Shintom, Portavideo, Logik, Proteck, Portland, Colt

522K Sony

536Y Mitsubishi, Emerson, Video Concepts, MGA

539Y Mitsubishi

540B GE

570F Sony, Zenith

623J Sampo

628E Samsung, MTC, Totevision, JC Penney, Magnin

637J Yamaha

645Y Magnavox

672J Fostex

679F Panasonic, RCA, GE, Magnavox, Quasar, Canon, Philco, Proscan

723L Sanyo, Fisher

725F GE

727H Hitachi, Bell & Howell

74K6 Funai, Harley Davidson, Magnavox, Symphonic, LXI, Zenith, Wards

771Z Emerson

781Y NEC, Dumont, Video Concepts, Vector, Sears

796T Sony, Sony medical-dental

828B Panasonic, Olympus, RCA, Hitachi, Quasar

837G Mitsubishi

843T Magnavox

857T Teknika

86BO Goldstar, Realistic, JC Penney, Totevision, Shintom, Sears, Magnavox, Philco, Zenith

863C Soundesign

873G Mitsubishi

977B Pioneer

Here is some information on how to call for specific FCC numbers which was provided by:

Sheldon Fingerman

Aspen Technical Services

sheldon@rof.net

Yes, there is a BBS out there that lists the manufacturers for every FCC number. It's run by the FCC, and is called P.A.L. (Public Access Link).

You need a modem, and just about any communications software you can get your hands on. Whatever came with your modem is fine, or you can even use the Terminal program that comes with Windows.

The phone number is 301-725-1072. Once connected go to the Authorization Database, which should be #1. Next select Names and addresses by code, which should be #2.

At that point you only need to enter the first three digits (letters and numbers) of the FCC ID #. For example, Sony is AK8.

The answers you get may be surprising. Yes, you will find out that the product (AK8) is manufactured by Sony, but you will get Sony's address in Japan.

You have about eight minutes on-line time.

Back to NESDA Home Page

FCC ID Numbers Cross Reference

Note: If you know of something that is incorrect or missing from this page, please send me your info/comments. Thanks!

Contents:

[Document Version: **1.00**] [Last Updated: **Apr_22_1995**]

Chapter 1) Computer Video Monitors

1.1) About the Author

FCC ID Numbers Cross Reference

Author: Andy Laberge
E-Mail: tic-toc@wolfe.net
Date: 22 Apr 1995

1.2) Introduction

Below is a list of FCC ID numbers for monitors.

I have just started to list the monitors as they come into my shop for repair. What I want to do is create a cross reference for monitors so that technicians and consumers can tell what monitors are similar to others. An example is:

FCC ID Number	Make	Model
CSYSC-431VA	BSR	3100V
CSYSC-431VS	SAMTRON	SC-428VS

These two monitors are basically identical. I've worked on both types. The point is that if someone has a problem with a BSR and another person has a cure for the same type problem on a Samtron then the BSR can be fixed.

If people would like to e-mail me info off the back of their monitors I will add it to the list and then make that list available.

e-mail me at tic-toc@wolfe.net

I will need Make, Model and the FCC ID number. This system works in the US but if they use another system to ID monitors in other countries we will incorporate that into the system some how. Hopefully this will help the people with the problem and the people with the solutions get together.

1.3) Cross Reference

Sorted by ID number

	RADIUS	TPD
	WYSE	WY-50
5F7NF13CM20	HEWITT-RAND	HR-SV-14
A3L9QN5154	IBM	5154
A3L9QNC1452M	IMTEC	1453MI
A3L9QNTWB	PACKARD/BELL	PB1431
A7RM260A	SCOTT	SM2350A
ACJ928KMX-F408	PANASONIC	C1395
AMPJK1461	WEN	JK1461
ARSCM3350	POWERII	HIGHRES3E
ATO90CZCM1492	ZENITH	ZCM-1492
ATO9M7DC13492R	ZENITH	ZVM-1330
BEJCA453	APPLE	M1787
BGB9JBAUM-1381A	MITSUBISHI	AUM-1381A
BJM9UBCM12A01	IBM	8513
BJM9UBMM1232	IBM	8503
BRFCAC14NF	TOUCH	CAD14NF
C4ZYG0010	SEIKO	CM-1440C
C5F7NF13CM14	IBM	8512-001
CKL8J7HMM-1401	HYUNDAI	HMM-401
CKLHCM-421	HYUNDAI	HCM-421E
CSYSC-431VA	BSR	3100V
CSYSC-431VS	SAMTRON	SC-428VS
DBLCMS-1461A	CTX	CMS-1461
DBLCVP-5468NI	CTX	CVP-5468NI
E808ZATE9513	RELYSIS	RE9513
FEK8J7TM-5156H	CASPER	TM-5156
FVI7034T	VIEWSONIC	7034T
FVI7035B	ADDONICS	7035B
G2DVGM-1414	ALR	VGM-1414
GBVCK1405	KFC	CK-1405
GQBXXX4290	COMPAQ	420T
IAWLX1564	GATEWAY	CS-1572FS
IEHVM1491H	VIT	VM1491H
IQXSRC1451	SHAMROCK	SRC1451

1.4) UL Numbers

There also exists a list of UL numbers at URL:
http://www.nesda.com/ul.htm